

EXECUTIVE SUMMARY

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT OF ROUGH STONE QUARRY

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

Category- B1 (Cluster)

Project Proponent

M/s. Kuthavakkam Properties Pvt. Ltd.,
Reg. Off. Kothari Buildings, 1st Floor,
115 Nungambakkam High Road
Nungambakkam, Chennai-600034

Project Details

S. F. No : 136/1B (P), 136/1C (P), 136/2A, etc.,
Extent Area : 4.64.0 Ha
Village : Athimugam
Taluk : Shoolagiri
District : Krishnagiri

ToR Identification No: TO24B0108TN5547502A Dated: 06.09.2024

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

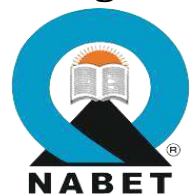
Website: www.abmenvirotec.com

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

Mob: 98427 29655.



2024



EXECUTIVE SUMMARY

M/s. Kuthavakkam Properties Pvt Ltd of Rough stone quarry over an extent of 4.64.0 hectare is located in S.F. No: 136/1B (P), 136/1C (P), 136/2A, 136/2B, 136/2C, 136/2D, 136/2E, 371/2 (P), 372/4 (P), 372/6, 372/7, 372/8(P), 373(P), 376/3(P), 376/5 (P), 377/5 (P), 377/4 (P), 377/3 (P), 377/6, 377/7 (P) Athimugam Village, Shoolagiri Taluk, Krishnagiri District. The area is marked in the survey of India Toposheet No.57H/14. The area lies between northern latitude of 12°44'30.94" to 12°44'38.55" N and eastern longitude from 77°57'38.78" to 77°57'50.35" E. The mining plan was approved in favor M/s Kuthavakkam Properties Pvt Ltd vide Roc.no.107/2019/Mines, dated 22.08.2019.

The proposed area comes under cluster classification, based on the Deputy Director, Krishnagiri letter, vide Rc. No. 107 /2019/Mines dated: 28.08.2019. So, this project has to obtain Terms of Reference for conducting EIA studies. There is one abandoned quarry (1.06.00 Ha) and one applied quarry (4.92.5 Ha) found within the 500m radius from the proposed quarry (4.64.0 Ha).

As per MoEF&CC OM: F.No. L-11011/175/2018-IA-II (M), dated 12.12.2018, 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/48555/2021 Dated 20.12.2020. The ToR proposal was placed in 213th SEAC meeting, dt 11.06.2021 and 447th SEIAA meeting, dated 05.07.2021. Then ToR has been issued by the SEIAA vide Lr. No. SEIAA-TN/F.No.7136/SEAC/TOR-979/2019 dated 05.07.2021 and ToR Extension SEIAA vide Lr. No: TO24B0108TN5547502A Dated: 06.09.2024. After detailed discussions, the Authority accepts the recommendation of SEAC and granted Terms of Reference (ToR) along with Public Hearing. The EIA report has been prepared based on the recommended Standard ToR and Specific ToR.

1.1 SCOPE OF THE PROJECT

The proposal for Environmental Clearance of Rough stone mine of M/s Kuthavakkam Properties Pvt Ltd requires EIA report as per Terms of Reference vide Lr. No. SEIAA-TN/F.No.7136/SEAC/TOR-979/2019 dated 05.07.2021 and ToR Extension SEIAA vide Lr. No: TO24B0108TN5547502A Dated: 06.09.2024.

1.2 PROJECT DESCRIPTION

Table No 1. 1 Project Details

Project Details	
Proponent	M/s. Kuthavakkam Properties Pvt Ltd
Total Mine Lease Area	4.64.0 Hectares (Patta land)
Survey No.	136/1B (P), 136/1C (P), 136/2A, 136/2B, 136/2C, 136/2D, 136/2E, 371/2 (P), 372/4 (P), 372/6, 372/7, 372/8(P), 373(P), 376/3(P), 376/5 (P), 377/5 (P), 377/4 (P), 377/3 (P), 377/6, 377/7 (P)
Site Location	Athimugam Village, Shoolagiri Taluk, Krishnagiri District
Geographical Co-ordinates	Latitude: 12°44'30.94" to 12°44'38.55"N Longitude: 77°57'38.78" to 77°57'50.35"E
Toposheet No.	57- H/14
Elevation	826m above MSL
Accessibility	
Nearest Village	Punnagaram-0.53 km-Southeast
Nearest Town	Shoolagiri-9.5 km-Southeast
Nearest Roadway	NH- 7– Krishnagiri to Bangalore – 6.92 km – S SH 17- Hosur – Rayakottai – 12.5 km- SW Berigai to Shoolagiri Road (MDR)– 1.45 km -NE Athimugam to Bukkasagaram Road – 0.52 km-SE
Nearest Railway station	Hosur Railway Station – 15km – Southwest
Nearest Airport	Bengaluru Airport - 54km –North
Environmental Sensitiveness	
Interstate Boundary	Tamil Nadu- Karnataka Interstate Boundary – 7.6 km – Northeast
Coastal Zone	Bay of Bengal –222km (SE)
Reserve Forest	<ol style="list-style-type: none"> 1. Athimugam RF range 1- 85m- N 2. Miditepalli RF- 3.3 km N- 3. Berkai Extension RF- 3.1km N 4. Settipalli RF- 4.2km- SE 5. Sanmavu RF- 5.2km- SW

	6. RF near Ramasamuthiram – 3.1km – SW But the proposed rough stone does not cause any harm to the forest products.
Wildlife sanctuary	No wildlife sanctuary is located within 10km radius. Hence the area does not attract the Wildlife Protection Act, 1972 and C.R.Z. Notification, 1991.
Water bodies	Kalavarapalli Reservoir – 9.7 km – NW Kamandoddi Lake – 6.7 km – S Muttalai Lake – 6.15 km – NW Three lakes are situated at 7.4 km from lease area near Berigai Village (N). Konerapalli Lake – 7.0 Km - S Chappadi Lake – 7.5 km – SE Ponnaiyar River – 6.5 km –W Gangaram Lake – 6.3 km – SW Kamandoddi Lake 2 – 6.8 km - SW
Habitations	Doripalli – 0.60 Km – N- 3681 Population Punnagaram – 0.53 km – E – 463 Population Athimugam – 1.36 km – NE – 4540 Population Venkateshapuram – 3.14 km – W – 2873 Population
Defense Installations	Nil within 10km radius
Quarries around 500m radius (AD Letter furnished)	One abandoned Quarry (1.06.00 Ha) and one applied quarry (4.92.5 Ha) is found within 500m radius from the boundary of proposed quarry (4.64.0 Ha), AD Letter. No: Roc.107/2019/Mines dated 28.08.2019
Seismic Zone	Zone-II, Low damage risk zone as per BMTPC, Vulnerability atlas Seismic zone of India IS:1893-2002
Mining Details	
Method of Mining	Open cast, Mechanized mining
Geological resources (100%)	Rough stone- 3010317 m ³ Top soil- 50702m ³
Mineable reserves (100%)	Rough stone- 1815733m ³ as per AMP to a depth of 66m. The mineable reserves are revised as 1397636 m ³ up to 45m (1m

	top soil and 44m rough stone) as per guidance of SEAC.
Production (100%)	36m ³ /Annum or 1210m ³ /Day as per AMP. As per SEAC recommendation the proposed production is 279527.2 m ³ /Annum or 1397636 m ³ for 5 years.
Topsoil	43497 m ³ as per AMP
Overburden	-
Side burden	-
Rejects	-
Depth of Mining	66m (22m Above Ground level+ 44m Below the surface level) as per AMP As per SEAC recommendation the depth of mining is restricted up to 45m (1m top soil and 44m rough stone)
Water Table	70m bgl
Overall Pit Slope	45°
Period of Lease	5 Years
Project Cost	78 Lakhs
EMP Cost	6.35 Lakhs

1.3 Description of the environment

1.3.1 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 1st 2022 – February 28th, 2023 to assess the existing environmental scenario in the area. For the purpose of EIA studies, mine lease area was considered as the core zone and area outside the mine lease boundary up to 10km radius from the lease boundary was considered as buffer zone.

Table No 1.2 Baseline Data

Particulars	Details	Standards
Meteorology (December 1st 2022 – February 28th, 2023)		
Rainfall (Avg.)	98 mm	--
Temperature (Avg.)	14-34°C	--
Wind speed	2.5 m/s	--
Wind Direction	WNW and WSW	
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	7-22 µg/m ³	80 µg/m ³
NO _x	11-32 µg /m ³	80 µg/m ³
Noise Level (CPCB Standards)		
Day time (6:00 am - 10:00 pm)	Core zone –36.9 – 42.1 dB (A) Buffer zone – 37.4- 39.8 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 – 30.9– 34.1 dB (A) Buffer zone – 32.4-36.1dB(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
Electrical conductivity at 25°C	758-2100 micromhos/cm	
Total Hardness as CaCO ₃	190-460 mg/l	200 mg/l
Silica SiO ₂	-	200 mg/l
Total suspended solids	1 - 6 mg/l	IS:3025:P.16:1984:R.2012
Chlorides Cl	220 – 430 mg/l	250
Total iron Fe	0.04-0.08 mg/l	0.3mg/l
Sulfates SO ₄	43 - 93mg/l	200
Soil Quality		
pH	7.55-8.32	slightly acidic
Bulk density	1.04-1.65 g/cc	Favorable physical condition for plant growth.
Hydro Geology		
Depth of Mining	66m (22m Above Ground level+ 44m Below the surface level) as per AMP As per SEAC recommendation the depth of mining is restricted up to 45m (1m top soil and 44m rough stone)	
Water Table	70m bgl	

1.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

1.4.1 Air Environment

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

AERMOD was used for prediction of impact of PM₁₀ during conditions i) Loading/unloading and transportation of rough stone by trucks on Haul roads ii) ii) Blasting by using area source model to predict GLC of PM₁₀ during these conditions. Total predicted 24-h maximum GLC of PM₁₀ at project site for scenario 1 i.e loading-unloading and transportation and scenario 2 i.e blasting was 87.8µg/m³ and 80.8 µg/m³ respectively occurred at the project site after superposition of base-line value 54 µg/m³ over the incremental 33.8 µg/m³ and 26.8 µg/m³ respectively due to combined impact of loading and unloading and transportation over the haul road and due to blasting. Meteorological data under worst case scenario providing 24-h maximum average GLC was discussed above.

1.4.2 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. The charge per blast of 250kg is well below the Peak Particle Velocity below 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.

1.4.3 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 mining activity will not intersect ground water table and it is 26 m above ground water table. Based on the water quality index it is found that the water samples from the core zone (project site) and Doripalli village are unfit for drinking purposes. The water sample from Doripalli village is high in Total Hardness, TDS and Chlorides and also contains few numbers of total coliform. Prolonged consumption of water containing high TDS causes cancer, liver failure, kidney failures, nervous system disorders and weaken immunity. Prolonged consumption of water having high chlorides content causes bladder cancer in human body. For the excellent quality of drinking the water must be treated with reverse osmosis process to overcome above mentioned such impacts on human body.

1.4.4 Soil Environment

Soil characteristics indicate favorable condition for plant growth. The top soil generated for the entire life of the mine will be 43497m³. It is being used for plantation purpose.

1.4.5 Waste Dump

The top soil generated for the entire life of the mine will be 43497 m³. Top soil will be removed and part of the soil will be used for plantation purpose. Other than for plantation will be dumped into North, South and Western side of the 7.5m Boundary Barrier of the lease area. The proposed rate of production of Rough Stone is about 1815733m³ at the rate of 100% recovery up to permissible depth as per APM. The mineable resources permitted by SEAC are 1397636 m³ up to 45m (1m top soil and 44m rough stone). So, there is no rejects in this site.

Proposed Dump Dimension
Top soil – 8359 m ² x 5.20 m (H) = 43497 m ³

1.4.6 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.

1.4.7 Land Environment

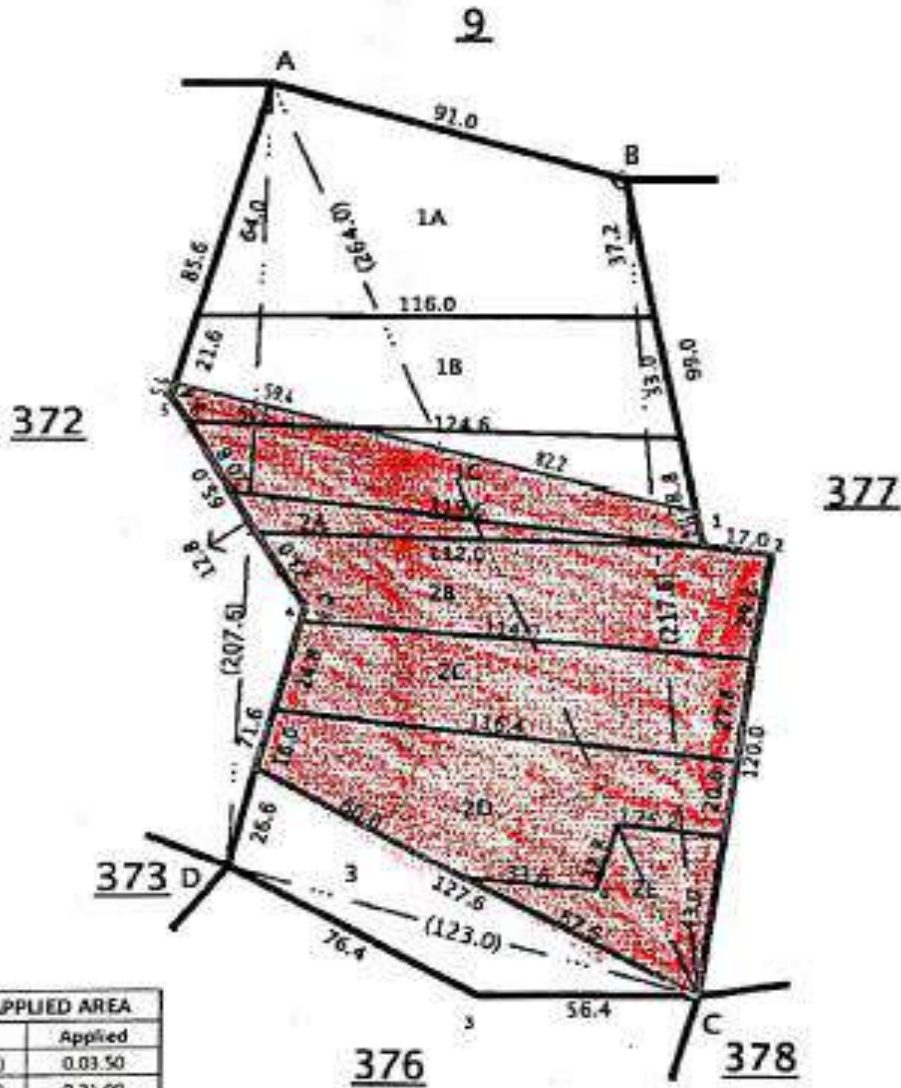
The Rough stone mine will result in disturbance of the land use pattern of the mine lease area. The land degradation is unavoidable during mining activities like excavation, overburden dumping, soil extraction etc. So, reclamation of mined out land and proper formation of benches will be given due importance. 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. 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.

1.4.8 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. The literacy rate may be increased with the economic benefits may arises from the mining activities.

District : Krishnagiri
 Taluk : Shoolagiri
 Village : ATHIMUGAM [69]

Survey No : 136
 Area : Hect 02 Area 51.50
 Scale : 1 : 1606



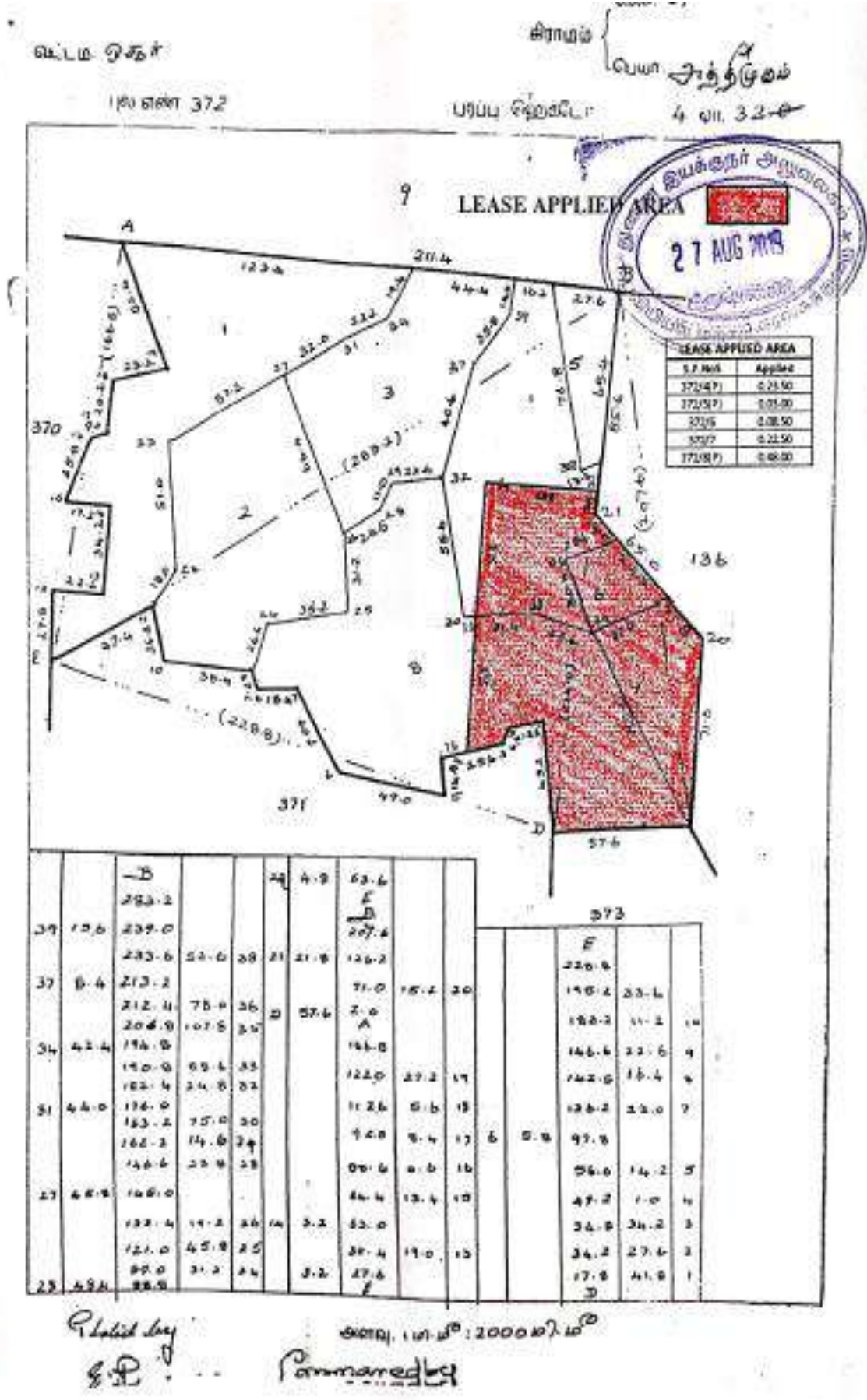
LEASE APPLIED AREA	
S.F.No's	Applied
136/19(P)	0.03.50
136/1C(P)	0.21.00
136/2A	0.06.00
136/2B	0.32.00
136/2C	0.29.00
136/2D	0.31.00
136/2E	0.11.00

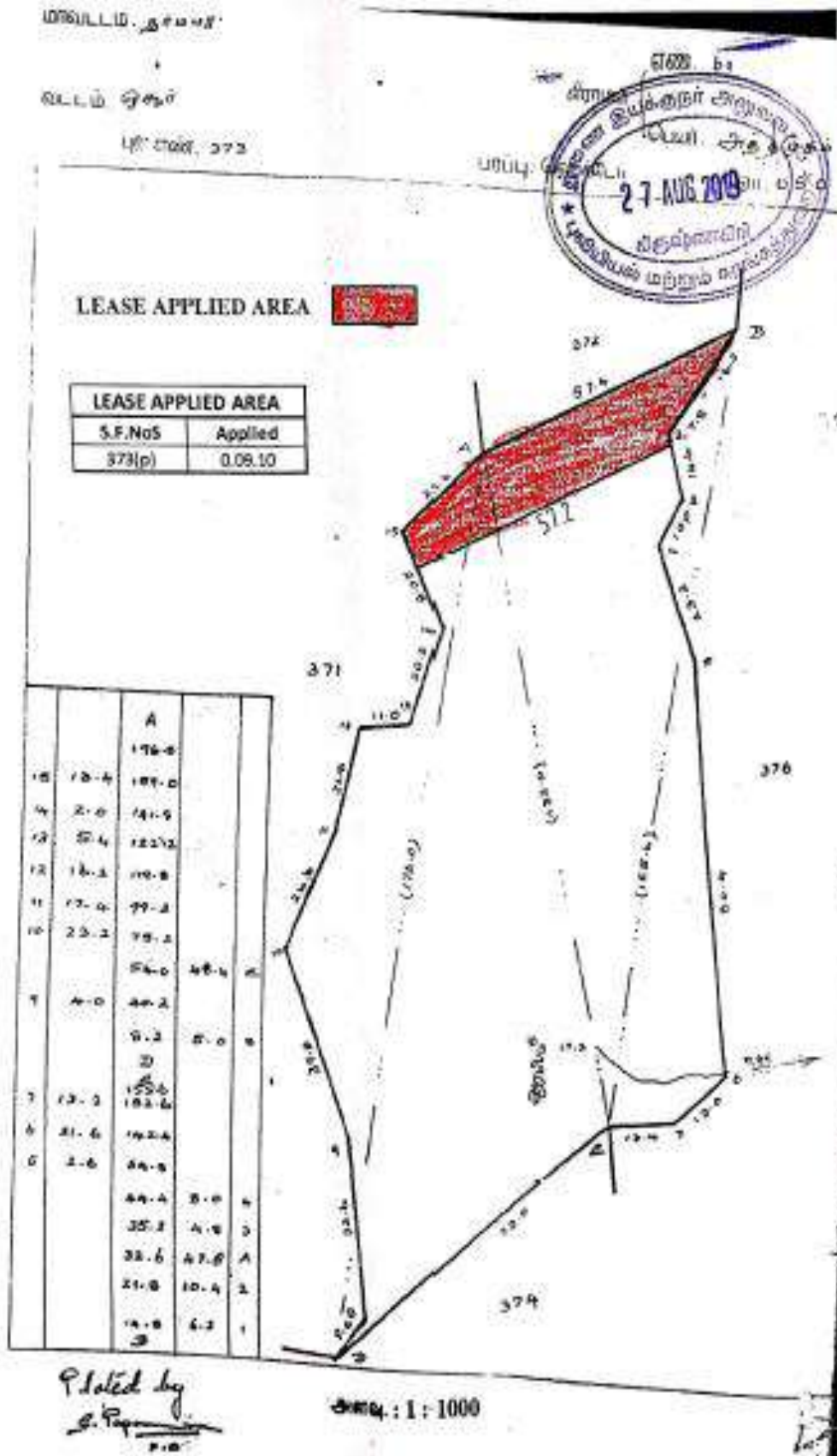
LEASE APPLIED AREA

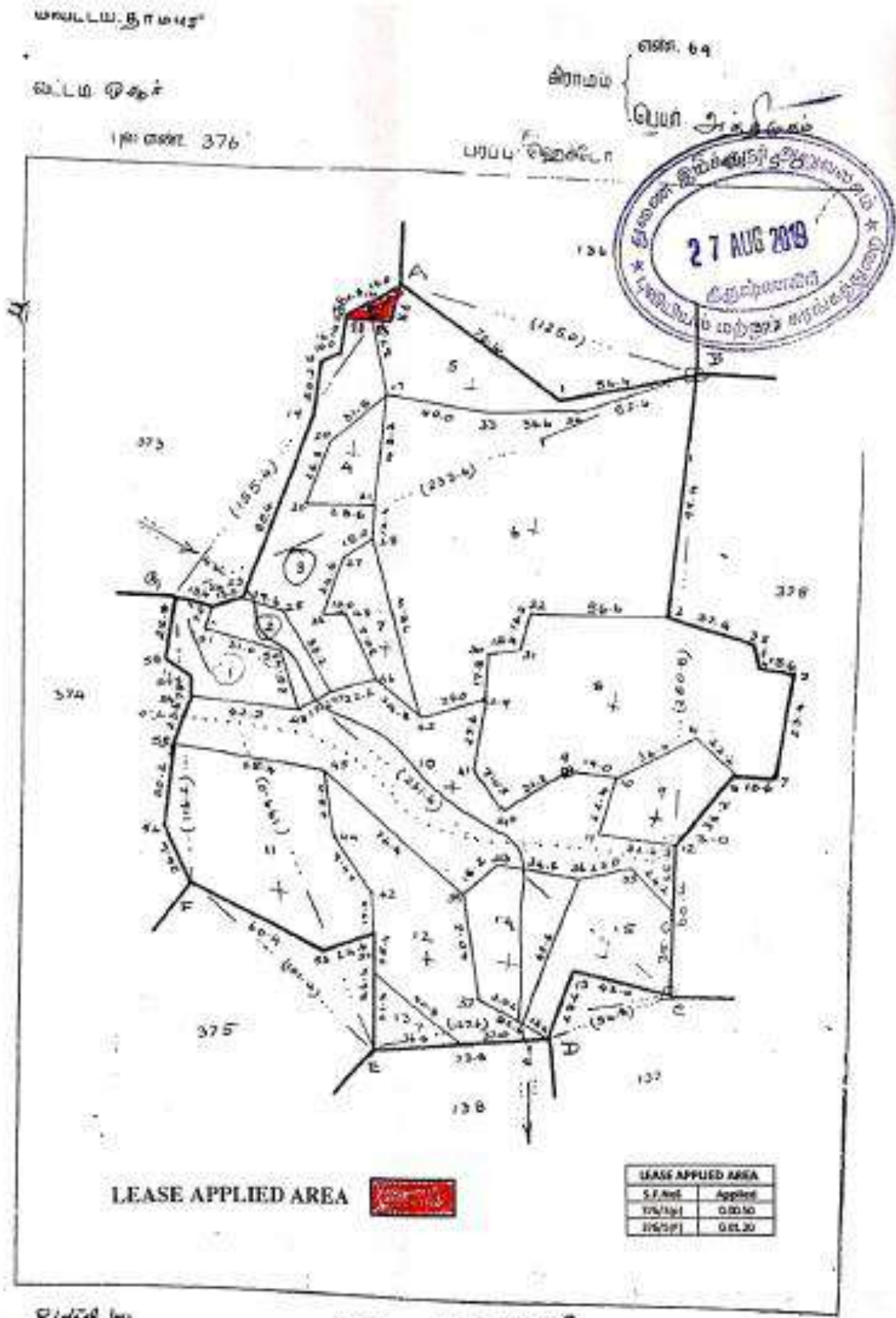
SCALE : 1 : 2000

Date of Issue: 27-11-2018 10:35:07

Survey and Settlement Department, Government of TamilNadu







Prepared by
 S. Raju
 F.S
 7-12-23

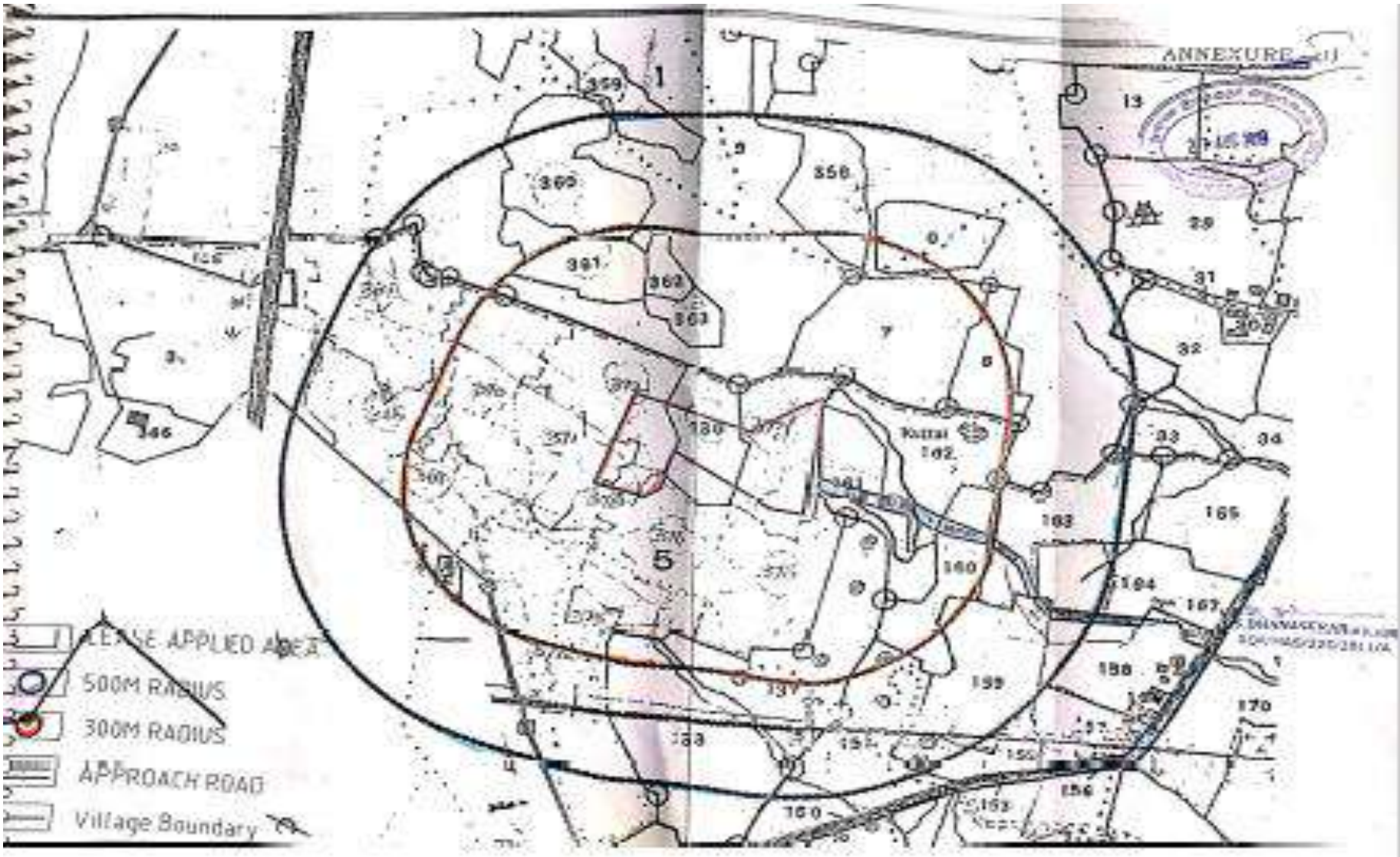


Fig No 1.1: FMB

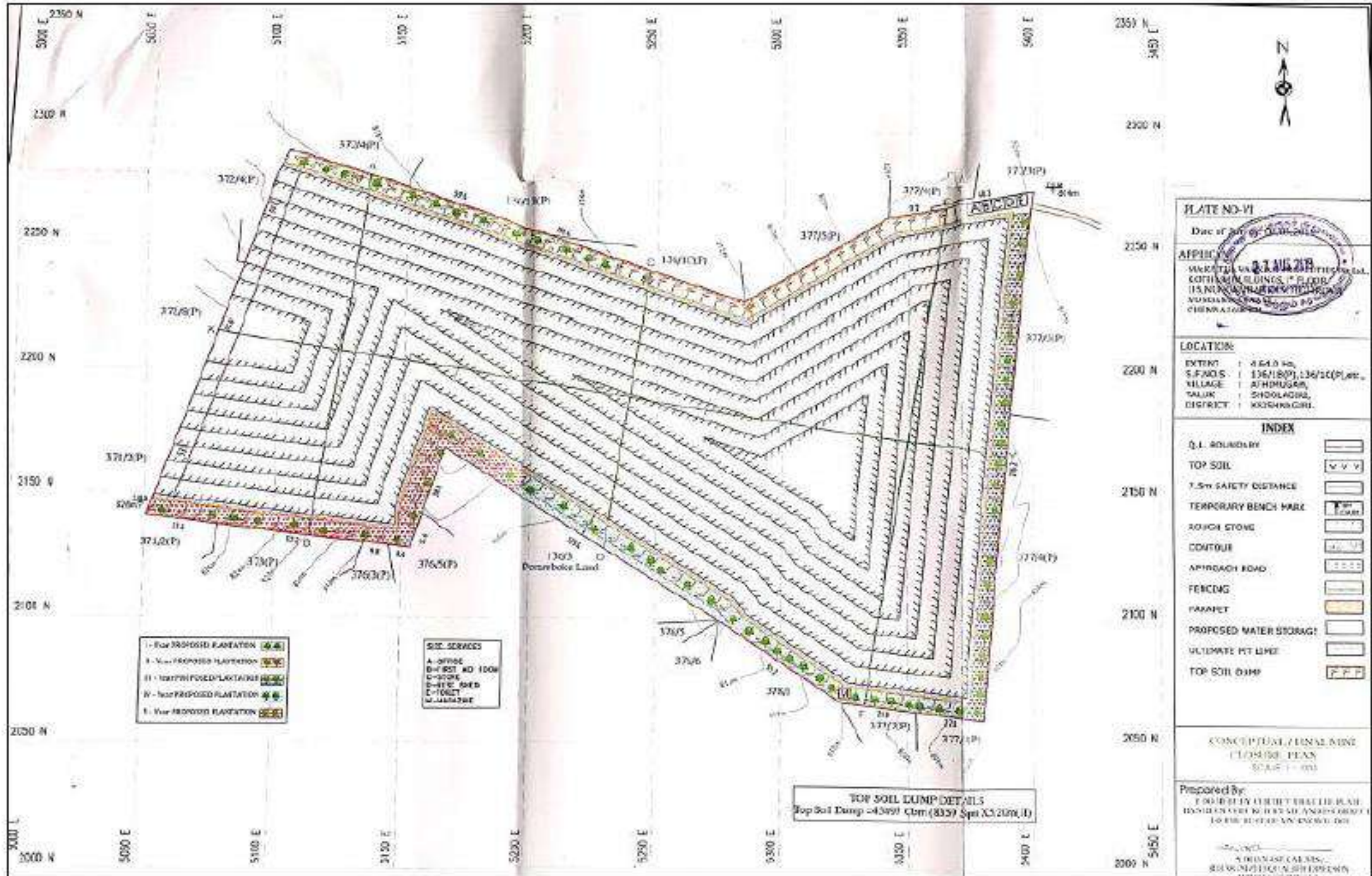
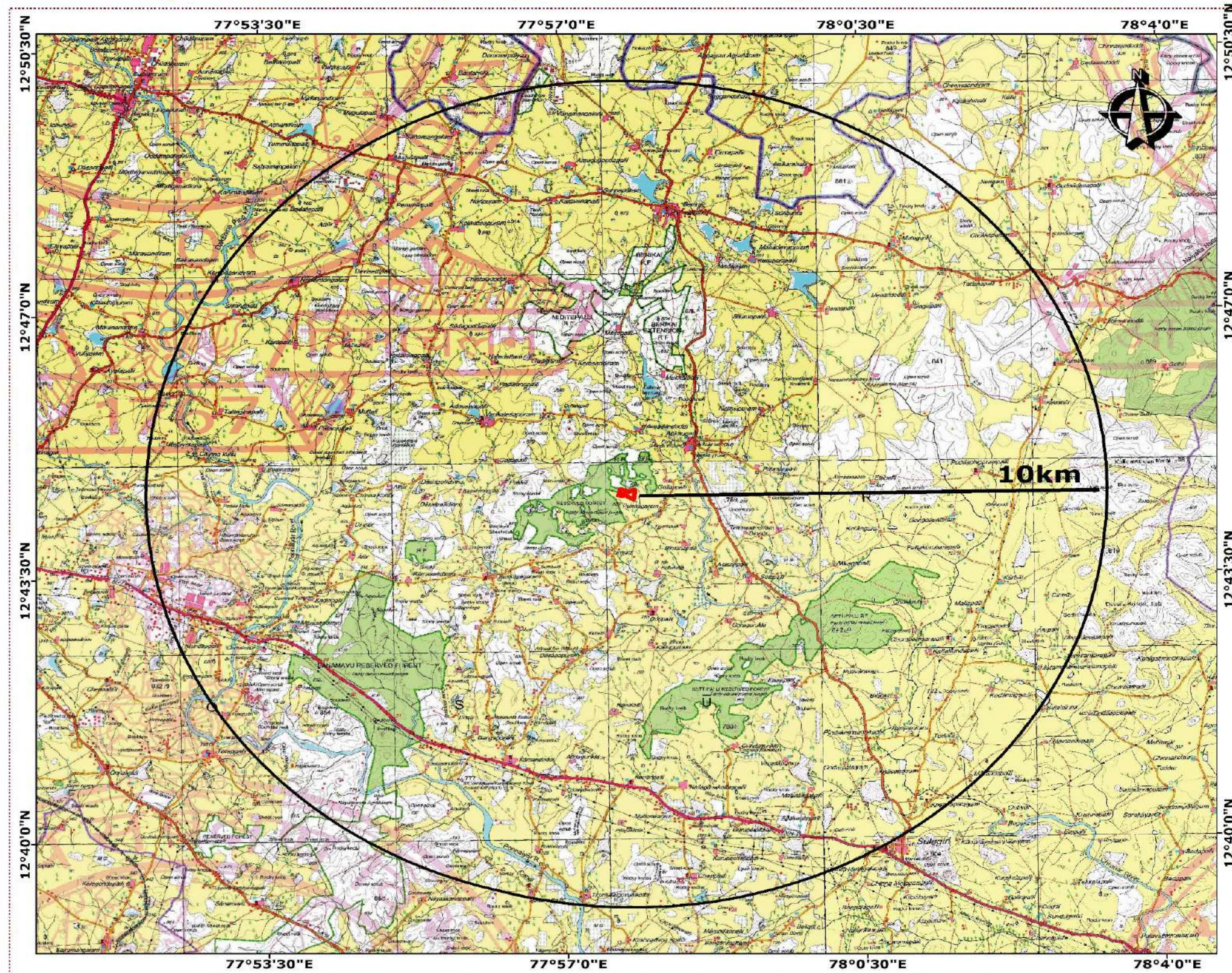


Fig No 1.2: Conceptual Mining Plan/Final Mine Closure Plan

Toposheet showing Project Location map around 10km radius



Source: Survey of India

INDEX

Toposheet No: 57H/13,14 & 57L/1,2

CONVENTIONAL SYMBOLS	
Express Highway with 4 or 6 lanes; with 2 lanes each	[Symbol]
Roads, metalled according to importance	[Symbol]
Roads, double cartway according to importance	[Symbol]
Unmetalled road, Cart-track, Foot-track with pass, Foot path	[Symbol]
Seasonal water track in bed, unmetalled, Class	[Symbol]
Dam: masonry or rock filled, earthwork, Wall	[Symbol]
River dry with water channel, with island & rocks, Tidal river	[Symbol]
Submerged rocks, Shoal, Swamp, Floods	[Symbol]
Well: lined, unlined, Tubewell, Spring, Tank, Perennial, dry	[Symbol]
Embankment road or rail, bank, Broken ground	[Symbol]
Railway, broad gauge, double, single with station, under construction	[Symbol]
Railways, other gauges, double, single with station, under construction	[Symbol]
Mineral line or banyan, R.R. Casing with tunnel	[Symbol]
Canals with sub-structures, Rock dykes, Dams	[Symbol]
Dam: Embankment (fill), Check-dam, Impervious (stone masonry)	[Symbol]
Town or Village: inhabited, deserted, Fort	[Symbol]
Habitat permanent, temporary, Tower, Anil, etc.	[Symbol]
Temple, Church, Mosque, Igloo, Tomb, Graves	[Symbol]
Lighthouse, Lightship, Buoy, Fish-pond, Irrigation, Air-raid, etc.	[Symbol]
Area: Vaccinated, malarial, scrub	[Symbol]
Palms, papyrus, other, Florula, Garden, Bamboo, Other trees	[Symbol]
Area: cultivated, wooded, surveyed, etc.	[Symbol]
Boundary, International	[Symbol]
State, semi-urban, unmetalled, road	[Symbol]
State, urban, metalled, road or other, road	[Symbol]
Boundary pillars, survey, unmetalled	[Symbol]
Height, triangulation station, spot, approximate	[Symbol]
Bench-mark, geodetic, levelling, canal	[Symbol]
Post office, Telegraph office, Overhead tank	[Symbol]
Rest house or inspection, bungalow, Club house, Petrol station	[Symbol]
Camping ground, Forest: reserved, protected	[Symbol]
Quarry, mine, adit, etc. locality or mine	[Symbol]
Hospital, Dispensary, Veterinary, Hospital, Dispensary	[Symbol]
Airfield, Helipad, Trench, etc.	[Symbol]
Power line, with pylons surveyed, with poles unsurveyed	[Symbol]

LOCATION

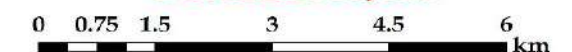
S.F.No: 136/1B(P),1C(P), etc.,
 Extent: 4.64.0 Ha
 Village: Athimugam
 Taluk: Shoalagiri
 District: Krishnagiri

APPLICANT

M/s Kuthavakkam Properties Pvt Ltd
 Kothari Buildings, 1st Floor
 No.115, Nungambakkam High Road
 Nungambakkam
 Chennai

- Lease Boundary
- Buffer Zone 10km Radius

SCALE 1: 50,000



Prepared by

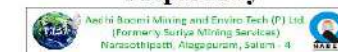


Fig No 1.3: Toposheet showing Location of the Mines around 10km radius

Table 1.3 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 to control fly of dust. ○ Labours engaged in such dust prone areas should be provided with safety devices like ear muff, mask, 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 ○ Desilting will be carried out before and immediately after the monsoon

			season
		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 equipment's. ○ The noise generated by the machinery will be reduced by proper lubrication of the machinery and other equipment's. ○ Speed of trucks entering or leaving the 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.

			<ul style="list-style-type: none"> ○ Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects.
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.
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 Greenbelt 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 equipment's such as Thick Gloves, Goggles, ear plugs, safety boot wears, etc.,

1.5 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.

1.6 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: 1.4 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 ₂ 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	Physico-chemical, microbiological characteristics
4	Hydrogeology	Water level in open wells in buffer zone around 1km at specific wells	-	Once in 6months	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 (Grab samples)	–	Once in six months	Physical and Chemical characteristics

1.7 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 of rough stone 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 equipment's, 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.

1.8 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.