

**EXECUTIVE SUMMARY OF 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 = 10.85.5 hectares

At

Therani Village, Alathur Taluk,

Perambalur District, Tamil Nadu State

ToR letter No. Lr. No. SEIAA-TN/F.No.10084/SEAC/ToR-1637/2023

Dated:13.12.2023

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

Name and Address	Extent & S.F.No.	Mineral Production
Mr.C. Senthil Kumar No.A-216, Vignesh Empire, Salai Road Extn, Woraiyur, Trichy- 620 003	3.21.50ha 336/4(Part), 336/5, 336/8 & 336/9	Fireclay – 219864.015 MT

ENVIRONMENTAL CONSULTANT

GEO TECHNICAL MINING SOLUTIONS



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

Oddapatti, Collectorate Post office,

Dharmapuri-636705. Tamil Nadu.

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

Website: www.gtmsind.com

NABET ACC. NO: NABET/EIA/2124/SA 0184

Valid till: 02/04/2024



ENVIRONMENTAL LAB

INTERSTELLAR TESTING CENTRE PRIVATE LIMITED

Plot.No.2, Site No.12/2A,

Industrial Estate, Perungudi, Chennai, Tamil Nadu

NABL Certificate Number: TC-6952, Valid Until : 30.07.2024

Baseline Study Period – October 2023 through December 2023

EXECUTIVE SUMMARY

1. INTRODUCTION

As the proposed fire clay mining project (P1) falls within the quarry cluster of 500 m radius with the total extent of 10.85.5 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.336/4(Part), 336/5, 336/8, & 336/9 over the extent of 3.21.50ha is situated in the cluster falling in Therani Village, Alathur Taluk, Perambalur District and Tamil Nadu. The quarries involved in the calculation of cluster extent are three proposed quarries.

2. PROJECT DESCRIPTION

The proposed project area is located between Latitudes from 11°6'50.00"N to 11°6'54.00"N and Longitudes from 78°53'27.00"E to 78°53'31.30"E. in Therani Village, Alathur Taluk, Perambalur District and Tamil Nadu. According to the approved mining plan, about 219864.015 MT of fire clay will be mined up to the ultimate depth of 22.5m in the five years. The quarrying operation is proposed to be carried out by opencast semi mechanized mining method. It is being loosen nature no drilling or blasting is proposed for this type of fire clay quarry lease, it is an eco-friendly quarrying operation.

3 DESCRIPTIONS OF THE ENVIRONMENT

Baseline data were collected to evaluate the existing environmental condition in the core and buffer areas during October to December, 2023 as per CPCB guidelines. The data were collected by both the FAEs and NABL accredited and MoEF notified Excellence Laboratory for the environmental attributes including soil, water, noise, air and by FAEs for ecology and biodiversity, traffic, and socio-economy.

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 3.1.

Table 3.1 LULC Statistics of the Study Area

S. No.	Classification	Area (ha)	Percentage (%)
1	Barren Rocky/stony waste	71.14	0.93
2	Crop land	5048.63	65.57
3	Dense Forest	167.07	2.15
4	Gullied and or Ravinous land	1771.19	22.84
5	Mining /Industrial Area	115.87	1.9
6	Land with or without scrub	292.87	3.78
7	Plantations	37.81	0.49
8	Settlement	33.24	0.43
9	Water bodies	179.45	2.31
Total		7754.27	100

Source: Sentinel II Satellite Imagery

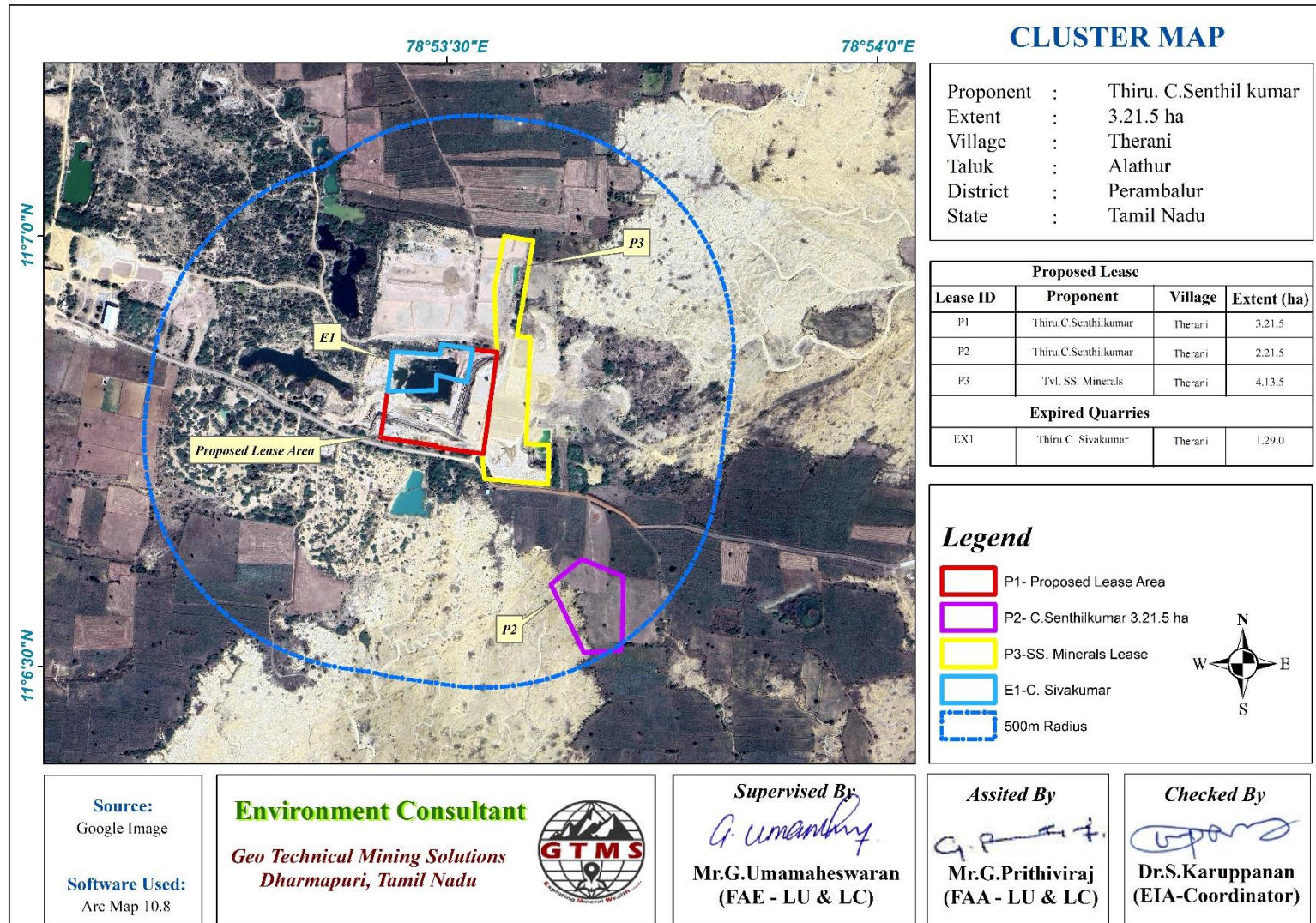


Figure 1.1 Location of Proposed and Existing Fireclay Quarry in the Cluster of 500 m Radius

3.2 Soil Environment

The soil samples in the study area show loamy textures varying between silty clay loam, silty loam and loam. pH of the soil varies from 7.81 to 8.79 indicating slightly alkaline nature. Electrical conductivity of the soil varies from 180.2 to 2287 μ s/cm. Bulk density ranges between 1065 to 1277 kg/cm³. Nitrogen ranges between 158 and 242 mg/kg. Phosphorus ranges between 20.8 and 131.2 mg/kg. Potassium ranges between 1196 and 4995 mg/kg. Calcium ranges between 4329 and 38125 mg/kg. Magnesium ranges between 7185 and 18301 mg/kg.

3.3 Water Environment

Pichaikuttan Lake (Ayinapuram), Garudamangalam and Therani Lake are the three prominent surface water resources present in the study area. The proposed project area is located 3.92 km E of the Pichaikuttan Lake (Ayinapuram), 4.39 km SE of the Garudamangalam and 1.43 km SW of the Therani Lake as shown in Table 3.5 and Figure 3.8. Totally three surface water samples, known as SW1, SW2 and SW3 were collected and to assess the baseline water quality. Four groundwater samples, known as BW1, BW2, BW3 and OW1 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.

Result for surface water and ground water sample 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 5 km radius around the proposed project sites for the period from March through May 2023 (Pre-Monsoon Season) and from October through December, 2023 (Post Monsoon Season).

According to the data, average depths to the static water table in open wells range from 4.50 to 5.80 m BGL in pre monsoon and 5.60 to 7.50 m BGL in post monsoon. The bore well data thus collected onsite are provided in Tables 3.7 and 3.8. The average depths to static potentiometric surface in bore wells for the period of October through December 2023 (Post-

Monsoon Season) vary from 52.00 to 51.90 m and from 52.00 to 52.70 m for the period of March through May, 2023 (Pre-Monsoon Season).

3.4 Air Environment

As per the monitoring data, PM_{2.5} ranges from 19.3 µg/m³ to 21.60 µg/m³; PM₁₀ from 39.30µg/m³ to 47.90µg/m³; SO₂ from 5.1 µg/m³ to 5.8µg/m³; NO_x from 12.2µg/m³ to 15.40g/m³. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

Air quality Index (AQI)

The AQI shows that the air quality of the study area falls within good category 44 causing minimal impact to human health.

3.5 Noise Environment

Noise level in core zone was 45.2 dB (A) Leq during day time and 41.9 dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 37.8 to 48.1dB (A) Leq and during night time from 35.2 to 41.0dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

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.

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.

4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

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

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 2.0 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

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 activities.

Mitigation Measures

- 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

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.

Mitigation Measures

- Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise.
- Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise
- Silencers / mufflers will be installed in all machineries
- Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise

- Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured through training and awareness

4.5 Biological Environment

Anticipated Impact

Anticipated Impact

- 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 718 kg per day, 194005 kg per year and 970026 kg over five years.

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
- Quarry approach roads are sprayed with water 3 times a day to control dust. Thus, the damage to the nearby farmlands is controlled
- 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 38541 kg of carbon per year. Therefore, we recommend 1607 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 1607 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 38541kg of the total carbon.

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

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.

5. 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 _{2.5} , PM ₁₀ , SO ₂ and NO _x .
2	Meteorology	At mine site before start of Air Quality	Hourly / Daily	Continuous online	Wind speed, Wind direction,

		Monitoring & IMD Secondary Data		monitoring	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	Soil	2 Locations (1 Core & 1 Buffer)	-	Once in six months	Physical and chemical characteristics
7	Greenbelt	Within the project area	Daily	Monthly	Maintenance

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

6 ADDITIONAL STUDIES

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.

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.

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
- The three proposed projects will allocate Rs. 15,00,000/- towards CER as recommended by SEAC
- The three proposed project will directly provide jobs to 58 local people, in addition to indirect jobs.
- The three proposed project will plant 4784 about trees in and around the lease area
- The three proposed project will add 162 PCU per day to the nearby roads.

6.4 Project Benefits

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

- Direct employment to 18 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

7. ENVIRONMENT MANAGEMENT PLAN

In order to implement the environmental protection measures, an amount of **Rs. 3500043** as capital cost and recurring cost as **Rs. 1338470** 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. 6034573**.