

**EXECUTIVE SUMMARY OF 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 = 10.77.50 hectares**

**At**

**Punnam Village, Pugalur Taluk,**

**Karur District, Tamil Nadu State**

**ToR Letter No. SEIAA-TN/F.No.10406/SEAC/ToR-1602/2023 Dated:06.11.2023**

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

<b>Name and Address</b>	<b>Extent &amp; S.F.No.</b>	<b>Mineral Production</b>
<b>Tmt.T.Sathya</b> W/o.Thangarasu Door No.2, Masagoundanpudhur Punjaipugalur South, Najaipugalur, Moolimangalam, Pugalur Taluk, Karur.	1.80.0 Ha & 1287/1(Part) & 1287/3	Rough Stone-37800 m <sup>3</sup> Gravel – 2516 m <sup>3</sup>

**ENVIRONMENTAL CONSULTANT**

**GEO TECHNICAL MINING SOLUTIONS**



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

Valid till: April 02, 2024



**ENVIRONMENTAL LAB**

**EXCELLENCE LABORATORY**

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**Madurai, Tamil Nadu**

**NABL Certificate Number: TC-6932, Valid Until : 19.03.2024**

**Baseline Study Period – October 2023 through December 2023**

## **EXECUTIVE SUMMARY**

### **1 INTRODUCTION**

As the proposed rough stone mining project (P1) falls within the quarry cluster of 500 m radius with the total extent of 10.77.50 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.1287/1(Part) & 1287/3 over the extent of 1.80.0 ha is situated in the cluster falling in Punnam Village, Pugalur Taluk, Karur District and Tamil Nadu. The quarries involved in the calculation of cluster extent are three proposed quarries, one existing quarries, and the one expired quarry.

### **2 PROJECT DESCRIPTION**

The proposed project area is located between Latitudes from 10°59'21.05"N to 10°59'26.37"N and Longitudes from 77°57'59.23"E to 77°58'03.34"E in Punnam Village, Pugalur Taluk, Karur District and Tamil Nadu. According to the approved mining plan, about 37800 m<sup>3</sup> of rough stone and 2516 m<sup>3</sup> of gravel will be mined up to the depth of 25 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.

### **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.

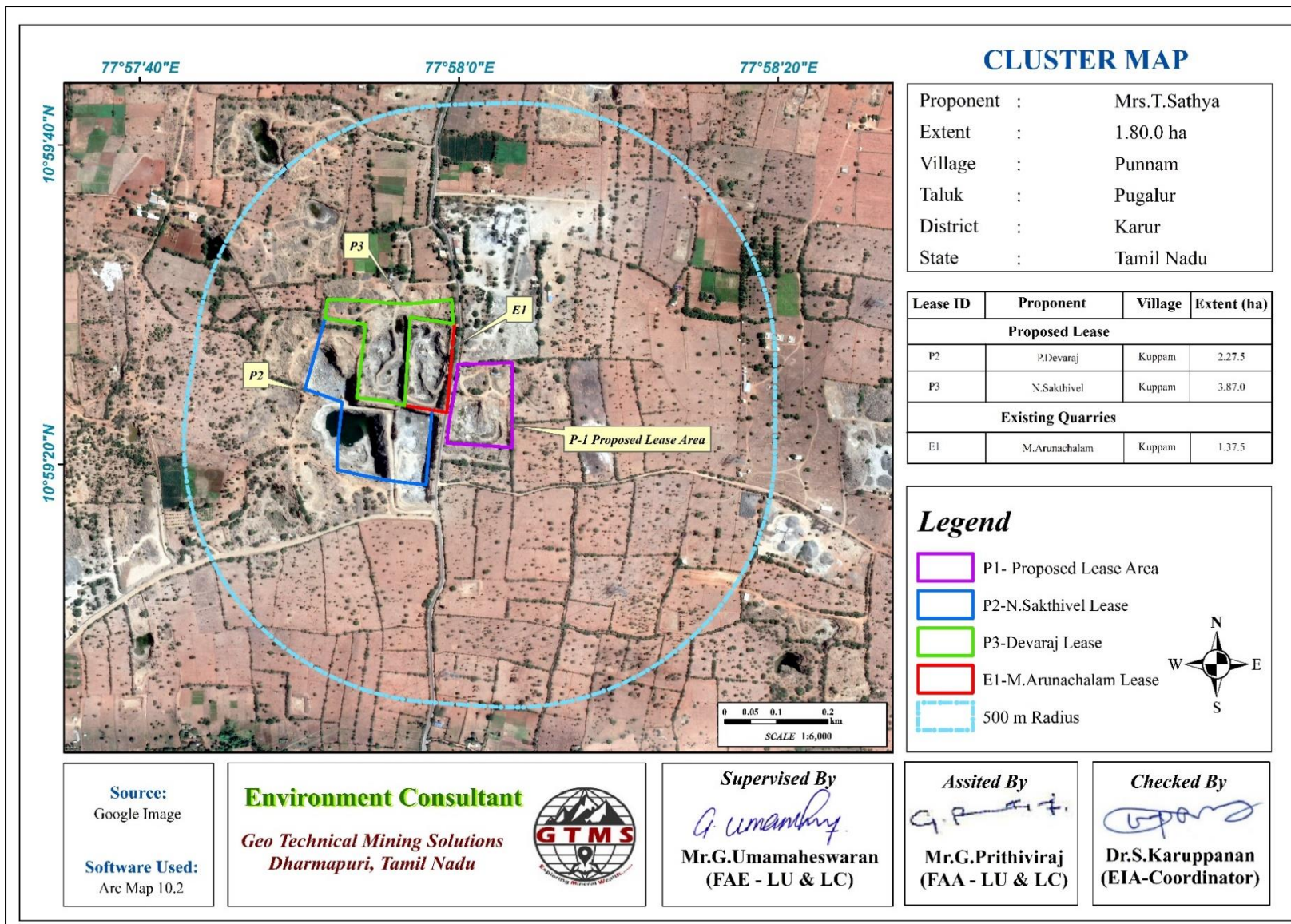


Figure 2.1 Location of the proposed and existing rough stone quarries in the cluster of 500m radius

**Table 3.1 LULC Statistics of the Study Area**

<b>S. No.</b>	<b>LU/LC Type</b>	<b>Extend (ha)</b>	<b>Percentage</b>
1	Crop Land	6958.63	91.06
2	Dense Forest	65.87	0.86
3	Land with/without scrub	181.51	2.38
4	Mining/Industrial lands	216.95	2.84
5	Plantations	213.52	2.79
6	Settlement	5.29	0.07
<b>Total</b>		<b>7641.76</b>	<b>100.0</b>

*Source: Sentinel II Satellite Imagery*

### **3.2 Soil Environment**

The soil samples in the study area sandy loam textures varying between, silty loam and sandy loam. pH of the soil varies from 6.5 to 7.7 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 161 to 338  $\mu\text{S}/\text{Cm}$ . Bulk density ranges between 1.2 and 9.2  $\text{g}/\text{cm}^3$ . Nitrogen ranges between 1.04 and 2.05 %. Potassium ranges between 0.12 and 0.27 %. Calcium ranges between 301 and 512  $\text{mg}/\text{kg}$ . Organic matter content ranges between 0.25 and 4.2 %. Manganese ranges between 1.5 and 45  $\text{mg}/\text{kg}$ .

### **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.

Eight groundwater samples, known as OW01, OW02, BW01, BW02, BW03, BW04, BW05 and BW06 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. summarizes ground water quality data of the eight samples.

Results for indicate that the physical, chemical and biological parameters 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 2023, (Post Monsoon Season).

The open well water level data thus collected onsite According to the data, average depths to the static water table in open wells range from 14.2 to 16.3 m BGL in pre monsoon and 10.6 to 11.3 m BGL in post monsoon. 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 67.3 m and from 63.7 to 70.7 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

### **3.4 Air Environment**

As per the monitoring data, PM<sub>2.5</sub> ranges from 17.4µg/m<sup>3</sup> to 21.9µg/m<sup>3</sup>; PM<sub>10</sub> from 37.2µg/m<sup>3</sup> to 42.5µg/m<sup>3</sup>; SO<sub>2</sub> from 6.5µg/m<sup>3</sup> to 9.4µg/m<sup>3</sup>; NO<sub>x</sub> from 15.7µg/m<sup>3</sup> to 17.4g/m<sup>3</sup>. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

### **3.5 Noise Environment**

Noise level in core zone was 45.5 dB (A) Leq during day time and 38.4dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 36.2 to 44.8dB (A) Leq and during night time from 30.1 to 40.1dB (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 3.75 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

### **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
- 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-metaled 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

#### **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 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***

- Drilling parameters like depth, diameter and spacing will be properly designed to give proper blast
- 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 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

#### **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 vegetation in the lease area may be removed during mining.
- Carbon released from quarrying machineries and tippers during quarrying would be 332 kg per day, 89622 kg per year and 448112 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 21578 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 900 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 2835 kg 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
- 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, Spiro metric 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 <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 (1OW & 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 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
- PPV resulting from three proposed project is well below the permissible limit of Peak Particle Velocity of 5 mm/s
- The proposed three projects will allocate Rs. 15,00,000/- towards CER as recommended by SEAC
- The proposed three projects will directly provide jobs to 52 local people, in addition to indirect jobs
- The proposed three projects will plant 3973 about trees in and around the lease area
- The proposed three projects will add 270 PCU per day to the nearby roads.

## **7 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 24 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

## **8 ENVIRONMENT MANAGEMENT PLAN**

In order to implement the environmental protection measures, an amount of Rs.2146890 as capital cost and recurring cost as Rs.1129200 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.8447032.