

**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 = 13.77.55 hectares

ROUGHSTONE QUARRY

At

Anjur Village, Pugalur Taluk, Karur District,

Tamil Nadu State

TOR File No.10577

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

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

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

ENVIRONMENTAL CONSULTANT

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

Valid till: 31.12.2026

ENVIRONMENTAL LAB

ACCURACY ANALABS AND

ENVIRO FARMERS LABS & TECHNOLOGIES

Baseline Study Period – March through May 2023



1. INTRODUCTION

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

2. PROJECT DESCRIPTION

The proposed project area is located between Latitudes from 11°2'50.76"N to 11° 3'1.69"N Longitudes from 77°47'3.49"E to 77°47'12.09"E in Anjur Village, Pugalur Taluk, Karur District, Tamil Nadu. According to the approved mining plan, about 277958m³ of rough stone and 8730 m³ of top soil will be mined up to the depth of 45 m BGL in the five years. The quarrying operation is proposed to be carried out by open cast manual mining method involving drilling and formation of benches of the prescribed dimensions.

3. DESCRIPTION OF THE ENVIRONMENT

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

3.1 Land Environment

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

Table.1 LULC Statistics of the Study Area

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

3.2 Soil Environment

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

3.3 Water Environment

Surface Water

Noyyal River is the prominent surface water resources present in the study area. This river was ephemeral in nature, which convey water only after rainfall events. The proposed project area is located 1.29 km NW of Noyyal River, as shown in Table 3.5 and Figure 3.7. Four surface water sample, known as SW01 were collected from the Noyyal River (Anjur, 0.1.29 km NW), SW02 were collected from the Noyyal River (Korakkattupudur, 3.82 km NE), SW03 were collected from the Noyyal River (Muthur, 5.09km NW), SW04 were collected from Aathupalayam Dam (4.13 km SE) to assess the baseline water quality. Table 3.6b summarizes surface water quality data of the collected sample.

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

Ground Water

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

indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

Data regarding depth to groundwater levels are essential to infer the direction of groundwater movement within the study area. Knowledge of groundwater flow direction is must in choosing location for background groundwater quality monitoring well and in locating recharge and discharge areas. Therefore, data regarding groundwater elevations were collected from 9 open wells and 9 bore wells at various locations within 2 km radius around the proposed project sites for the period from March through May 2023 (Pre-Monsoon Season) and from October through December 2022, (Post Monsoon Season).

The open well water level data thus collected onsite are provided in Tables 3.7 and 3.8. According to the data, average depths to the static water table in open wells range from 20.6 to 23.5 m BGL in pre monsoon and 11.5 to 16.3 m BGL in post monsoon. The bore well data thus collected onsite are provided in Tables 3.9 and 3.10. The average depths to static potentiometric surface in bore wells for the period of October through December (Post-Monsoon Season) vary from 62.3 to 65.8 m and from 63.8 to 67.6 m for the period of March through May, (Pre-Monsoon Season). Data on the depths to static water table and potentiometric surface were used to draw contour lines connecting groundwater elevation (also known as equipotential hydraulic head) to determine the groundwater flow direction perpendicular to the contour lines.

3.4 Air Environment

As per the monitoring data, PM_{2.5} ranges from 18.5 µg/m³ to 22.9 µg/m³; PM₁₀ from 37.7 µg/m³ to 42.1 µg/m³; SO₂ from 6.0 µg/m³ to 8.9µg/m³; NO_x from 18.3µg/m³ to 23.4g/m³. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

Air quality Index

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

3.5 Noise Environment

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

3.6 Biological Environment

The study found that there is no endemic, endangered migratory fauna found in the area. This area is not also a migratory path of any faunal species. Hence, this small mining

operation over short period of time will not have any significant impact on the surrounding flora and fauna.

Flora in core zone

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

Flora in 300 m radius zone

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

Fauna in Core Zone

The 25 varieties of species observed in the core zone. Among them numbers of Insects 8 (32%), Reptiles 3 (12%), Mammals 5 (20%) and Avian 9 (36%). A total of 25 species belonging to 22 families have been recorded from the core mining lease area. Number of species decreases towards the mining area this might be due the lack of vegetation. None of these species are threatened or endemic

Fauna in Buffer Zone

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

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 4.75 KLD of water from water vendors, it will not extract water by developing abstraction structures in the lease area. Therefore, the project will not have impact on depletion of aquifer beneath the lease area.

Mitigation Measures

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

4.3 AIR ENVIRONMENT

Anticipated Impact

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

Mitigation Measures

- To control dust at source, wet drilling will be practiced. Where there is a scarcity of water, suitably designed dust extractor will be provided for dry drilling along with dust hood at the mouth of the drill-hole collar
- Controlled blasting will be carried out using suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone
- Blasting will be restricted to a particular time of the day i.e., at the time of lunch hours
- Before loading of material water will be sprayed on blasted material
- Dust mask will be provided to the workers and their use will be strictly monitored
- Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation
- Transportation of material will be carried out during day time and material will be covered with tarpaulin
- The speed of tippers plying on the haul road will be limited to < 20 km/hr to avoid generation of dust
- The un-metalled haul roads will be compacted weekly before being put into use
- It will be ensured that all transportation vehicles carry a valid PUC certificate
- Haul roads and service roads will be graded to clear accumulation of loose materials
- Planting of trees all along main mine haul roads and around the project site will be practiced to prevent the generation of dust
- Dust mask will be provided to the workers and their use will be strictly monitored

4.4 Noise Environment

Anticipated Impact

Total noise level in all the sampling areas is well below the CPCB standards for industrial and residential areas. The peak particle velocity produced by the charge of 19.8kg

is well below that of 0.3 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997.

Mitigation Measures

- The blasting operations in the cluster quarries will use shallow holes and delay detonators to reduce the ground vibrations
- Proper quantity of explosives, suitable stemming materials and appropriate delay system will be used during blasting
- Adequate safe distance from blasting will be maintained as per DGMS guidelines
- Blasting shelter will be provided as per DGMS guidelines
- Blasting operations will be carried out only during day time
- During blasting, other activities in the immediate vicinity will be temporarily stopped
- Drilling parameters like depth, diameter and spacing will be properly designed to give proper blast
- A fully trained explosives blast man (Mining Mate, Mines Foreman, 2nd Class Mines Manager/ 1st Class Mines Manager) will be appointed
- A set of shot firing rules will be drawn up and blasting shall commence outlining the detailed operating procedures that will be followed to ensure that shot firing operations on site take place without endangering the workforce or public
- Sufficient angular stemming material will be used to confine the explosive force and minimise environmental disturbance caused by venting / misfire
- The detonators will be connected in a predetermined sequence to ensure that only one charge is detonated at any one time and a NONEL or similar type initiation system will be used
- The detonation delay sequence shall be designed so as to ensure that firing of the holes is in the direction of free faces so as to minimise vibration effects
- Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

4.5 Biological Environment

Anticipated Impact

- During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- The Number of plants in the mining lease area is given in Chapter 3 which vegetation in the lease area may be removed during mining.

- Carbon released from quarrying machineries and tippers during quarrying would be 2337 kg per day, 631059 kg per year and 3155293 kg over five years, as provided in Table 4.11.

Mitigation Measures

- ❖ During conceptual stage, the top bench will be re-vegetated by planting local /native species and lower benches will be converted into rainwater harvesting structure following completion of mining activities, which will replace habitat resources for fauna species in this locality over a longer time.
- ❖ Existing roads will be used; new roads will not be constructed to reduce impact on flora.
- ❖ To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 38721 kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
- ❖ As per the greenbelt development plan as recommended by SEAC (Table 4.13), about 1615 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 193606 kg of the total carbon

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

Table.2 Environment Monitoring Program

S. No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	2 Locations (1 Core & 1 Buffer)	24 hours	Once in 6 months	Fugitive Dust, PM _{2.5} , PM ₁₀ , SO ₂ and NO _x .
2	Meteorology	At mine site before start of Air Quality Monitoring & IMD Secondary Data	Hourly / Daily	Continuous online monitoring	Wind speed, Wind direction, Temperature, Relative humidity and Rainfall
3	Water Quality Monitoring	2 Locations (1SW & 1 GW)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms
4	Hydrology	Water level in open wells in buffer	-	Once in 6 months	Depth in m BGL

		zone around 1 km at specific wells			
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 four proposed project is well below the permissible limit of Peak Particle Velocity of 5 mm/s
- The proposed four projects will allocate Rs. 20,00,000/- towards CER as recommended by SEAC
- The proposed four projects will directly provide jobs to 79 local people, in addition to indirect jobs
- The proposed four projects will plant 6888 about trees in and around the lease area
- The proposed four projects will add 783 PCU per day to the nearby roads.

7. Project Benefits

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

- Direct employment to 29 local people
- Creation of community assets (infrastructure) like school buildings, village roads/ linked roads, dispensary & health Centre, community Centre, market place etc.,
- Strengthening of existing community facilities through the Community Development Program
- Skill development & capacity building like vocational training.
- Rs. 5,00,000 will be allocated for CER

8. ENVIRONMENT MANAGEMENT PLAN

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