

SUMMARY
OF
DRAFT EIA / EMP REPORT
FOR
ROUGHSTONE, JELLY AND GRAVEL QUARRY
EXTENT- 3.99.0Ha
FIVE YEARS PRODUCTION OF
6,77,950m³ OF ROUGHSTONE
1,36,500m³ OF WEATHERED ROCK AND
55,932m³ OF GRAVEL FORMATION
Project Cost : 74.46 lakhs
VILLAGE - MARUTHAMPUTHUR PART-I,
TALUK- ALANGULAM,
DISTRICT - TIRUNELVELI, STATE - TAMILNADU

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ROUGH STONE, JELLY AND GRAVEL QUARRY OF THIRU.G.KARUPPASAMY SURVEY NOS. 35/4A, 35/4B, 35/4C, 35/4D, 35/4E, 35/4F, 35/4G, 35/4H AND 35/4I OVER AN AREA OF 3.99.0Ha IN MARUTHAMPUATHUR PART-I VILLAGE, ALANGULAM TALUK, TIRUNELVELI DISTRICT, TAMILNADU

SUMMARY

1.0 GENERAL:

Thiru.G.Karuppasamy has applied for mining lease for **Rough Stone, Jelly and Gravel Quarry** at Survey Nos. 35/4A, 35/4B, 35/4C, 35/4D, 35/4E, 35/4F, 35/4G, 35/4H and 35/4I over an area of 3.99.0Ha in Maruthamputhur Part-I Village, Alangulam Taluk, Tirunelveli District, Tamil Nadu. The entire lease area is in proponents possession.

Precise area communication letter for this lease was obtained from District Collector, Tirunelveli vide letter no. Rc.No.M1/24418/2017 dated 06.09.2018. Mine plan for this project was approved by Deputy Director, Geology & Mining, Tirunelveli vide Rc.No. M1/24418/2017, dated 09.10.2018.

ToR for this project has been issued by SEIAA, Tamil Nadu vide their letter No. SEIAA-TN/F.No.7194/SEAC/TOR-679/2020 dated 03.01.2020. Based on the ToR granted by SEIAA, Tamil Nadu and in conformance with the MOEF&CC 2006 guidelines, EIA/EMP report has been prepared.

Salient details of the EIA/EMP report are as follows:

2.0 SITE DESCRIPTION:

The salient features of the project are briefly given below.

S.No	Particulars	Details
1.	Name of the Project	Rough Stone, Jelly and Gravel Quarry of Thiru.G.Karuppusamy
2.	Location of the project	Maruthamputhur Part-I Village, Alangulam Taluk, Tirunelveli District, Tamil Nadu
3.	Mining Lease area (ML area)	3.99 Ha
4.	Production Capacity for 5 years lease period	Roughstone: 6,77,950 cum Weathered Rock:1,36,500 cum Gravel: 55,932cum
5.	Latitude & Longitude	Latitude: 08°49'11"N to 08°49'19"N Longitude: 77°31'22"E to 77°31'31"E
6.	Mine site topography	126m (maximum) from MSL



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7.	Type of land	The lease area is a patta waste barren land with thorny bushes.
8.	Temperature °C (Minimum & Maximum)	The normal temperature varies between 24.4°C and 27.1°C at mean minimum. March to May month has the hottest climate with temperatures of 38.5°C at the highest.
9.	Average Annual rainfall	814.8 mm
10.	Nearest Highway	(NH-208)Tirumangalam–Tenkasi- 31.5km –(W) (SH-39) Tirunelveli - Alangulam 3.5Km -(N)
11.	Nearest Railway station	Ambasamudram -15.5Km (SW)
12.	Nearest Airport	Tuticorin – 56.0 Km (SE)
13.	Nearest major water bodies	Seasonal odai -Passing on western side for which 50m safety distance is left. Marandai Channel - 4.7Kms – (NE) Manur Channel - 6.3Kms – (N) Tambraparni - 9.8Kms – (S) Vel Odai – 1.1Kms – (SW) There are a few tanks located in the study area.
14.	Environmental sensitive areas, Protected areas as per Wildlife Protection Act, 1972 (Tiger reserve, Elephant reserve, Biospheres, National parks, Wildlife sanctuaries, community reserves and conservation reserves)	Nil within 10km radius.
15.	Reserved / Protected Forests	Kottamalai RF - 6.6Kms (NE) Kavalkutti Parambu RF -6.6Kms (NE) Okkanindran Pottal RF -8.0Kms (NW) Reserve Forest - 6.9Kms (W)
16.	Nearest Town	Alangulam – 5.0 km
17.	Nearest villages	Chockampatti - 3.8km – (SW) Boganallur - 5.8km – (SW) Kambaneri Pudukudi - 7.3km – (SW) Kadayanallur - 7km – (SW)
18.	Other Industries (in Aerial distance)	Other than crushers, Roughstone quarries and few windmills, no other major industries are located in the study area.
19.	Seismic Zone	Area falls in Zone – II (Least Active)

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2.1 PROJECT DESCRIPTION:

S.No	Particulars	Details
1.	Geological resources	Roughstone: 25,82,125cum Weathered Rock:1,98,625cum Gravel:79,450cum
2.	Mineable reserves	Roughstone: 6,77,950 cum Weathered Rock:1,36,500 cum Gravel: 55,932cum
3.	Life of the mine	5 years
4.	Total Waste	There is no waste generation anticipated in this quarry operation since the entire excavated material will be utilised.
5.	Method of mining	Opencast semi mechanized mining using jackhammer drilling, blasting, excavation through excavator & mineral transport through tippers will be carried out.
6.	Bench parameters	Bench height - 5 m, bench widths - 5m
7.	Ultimate mine depth	72m bgl
8.	Manpower	Direct – 19, Indirect - 100
9.	Water Requirement & source	The total water requirement for this project will be 3.5KLD. The water will be sourced initially from outside agencies. Later the rainwater collected in the mine pit sump will be used for this purpose.
10.	Power Requirement	All the equipment will be diesel operated. No electricity is needed for mining operation. The minimum power requirement for office, etc will be met from state grid.
11.	Site services	Site services like mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.
12.	CER Budget	Rs.20 lakhs.
13.	Project cost	Total Cost - Rs. 74.46 Lakhs

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3.0 EXISTING ENVIRONMENTAL SCENARIO:

3.1 GENERAL:

The studies and data collection have been carried out systematically and meticulously as per relevant IS codes, CPCB and MoEF&CC guidelines and as per approved ToR during **(Winter Season, December 2019 to February 2020)**. For the purpose of this study, the area has been divided into two zones, namely, core and buffer zones. Core zone is considered as the total lease area, while buffer zone encompasses an area of 10 km radius distance from the periphery of core zone.

3.2 SOCIO-ECONOMIC STATUS:

i. Core Zone:

The total mine lease area of 3.99Ha. Entire ML area is a patta land with no forest or agricultural area involved.

ii. Buffer Zone:

Based on 2011 census data, in the 10km radius of the mine lease area there are 39 Rural villages from three Taluks namely Alangulam, Tirunelveli and Ambasamudram and 3 urban areas of two taluks namely Nallur (CT), Alangulam (TP) of Alangulam Taluk and Mukkudal (TP) of Ambasamudram Taluk

The distribution of population is as below:

• Male	-	92411 (49.22%)
• Female	-	95346 (50.78%)
• Total	-	187757
• Scheduled caste	-	24214 (12.90%)
• Scheduled tribes	-	320 (0.17%)
• Total literacy rate in the area	-	131837 (70.22%) (Male – 37.85%, Female - 32.36%)
• Total illiteracy rate in the area	-	55920 (29.78)% (Male – 11.36%, Female – 18.42%)

The occupational structure of the area is as below:

Total main workers	-	95755 (51.00%)
Total marginal workers	-	7120 (3.80%)
Total non-workers	-	84882 (45.20%)

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3.3 EXISTING ENVIRONMENTAL QUALITY:

3.3.1 Ambient Air Quality:

The ambient air quality data for PM₁₀, PM_{2.5}, SO₂, NO₂, CO studied at 5 locations as per prescribed guidelines/ methods. The AAQ monitored data for all locations for above parameters are shown in below.

Season: (Winter Season, December 2019 to February 2020)

Values in µg/m³

S. N O	PARAMETERS	Cat.* (R,I,S)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO ₂ (µg/m ³)
1	CORE ZONE (1 Location)	I	62.2 to 79.3	28.4 to 36.4	4.9 to 9.4	7.7 to 11.5
2	BUFFER ZONE (4 Locations)	R	36.1 to 67.1	16.5 to 31.6	3.1 to 9.7	5.4 to 11.9
CPCB LIMITS			PM₁₀	PM_{2.5}	SO₂	NO₂
2009 Notification		I & R	100	60	80	80
		S	100	60	80	80
* Note: Category - R - Residential, I - Industrial, S – Sensitive BDL- Below Detectable Limit, DL- Detectable Limit.						
Conclusion: The existing Ambient Air Quality levels in the monitored locations for PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ & CO are within the prescribed CPCB limits.						

3.3.2 Water Environment:

Parameter	No of Samples – 5 Bore well water samples					Season: Winter Season, December 2019 to February 2020)				
	pH	EC (µmhos /cm)	TDS (mg/L)	Chloride (mg/L)	Total Hardness (mg/L)	Total Alkalinity (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Nitrate (mg/L)	Fluoride (mg/L)
BUFFER ZONE (5 Locations)	7.55 to 8.01	720.4 to 1217	435 to 736	114 to 234	142 to 492	192 to 336	48.9 to 180	0.03 to 0.07	BDL to 2.44	0.42 to 0.62
Limits* Permissible	6.5-8.5	-	2000	1000	600	600	400	0.3	45	1.5
Conclusion: The water quality of the collected ground water samples were found to be within the prescribed permissible limits of IS: 10500:2012 Norms for Drinking in the absence of an										

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alternative source*.

3.3.3 Noise Environment:

No of locations – 5		Season: Post monsoon season (October 2019 – December 2019)		
Noise Level In dB(A)	Core Zone dB(A) (1 Location)	*Work zone exposure limit dB(A)	Buffer Zone dB(A) (4 Locations)	MOEF&CC Norms dB(A)
Day Equivalent	50.5	90	44.5 to 49.2	55
Night Equivalent	41.8		39.8 to 42.2	45

*Permissible noise for industrial workers as laid down by CPCB (at 8 hrs Exposure Time)

Conclusion: While comparing with the MoEF&CC Norms, the monitored ambient noise levels are within the limit values for Residential areas.

3.3.4 Soil Quality:

Parameter	pH	Electrical Conductivity μ mhos/cm	Soil Type	Organic matter content %	Total Nitrogen mg/kg	Phosphorus mg/kg	Sodium mg/kg	Potassium mg/kg
Core Zone	6.32	46.72	Silty Clay	1.10	77.6	1.9	420.6	1340
Buffer Zone	6.14 – 6.96	21.94 - 181.2	Silt Loam	0.58- 1.30	53.6 – 644.0	1.2 – 3.1	203 – 1055	737 - 1290

3.3.5 LAND ENVIRONMENT:

Landuse pattern carried out through remote sensing satellite data show that the study area comprises of 14.08 % of crop, followed by 19.81 % of plantation, 16.53 % of fallow land and 36.08 % of Land with scrub, 1.77% of settlement, 3.55 % of Open scrub forest, 6.38 % of barren area, 0.86 % of Mining /Industries and 0.94% of water bodies.

3.3.6 BIOLOGICAL ENVIRONMENT:



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No forest land is involved in the mining lease area. Thorny bushes like *Prosopis juliflora*, *Achyranthes aspera*, *Calotropis gigantea*, *Azadirachta indica*, *Borassus flabellifer*, *Abutilon indicum* etc are observed in the lease area. Common species like *Acacia auriculiformis*, *Acacia nilotica*, *Albizia lebbek*, *Borassus flabellifer*, *Cocos nucifera*, *Mangifera indica*, *Phoenix sylvestris*, *Prosopis juliflora*, etc. are found in the study area.

No Wild Life Sanctuary or National Park within the study area of 10 km. Domesticated animals and common birds are observed in the study area.

3.3.7 HYDROLOGICAL STUDY:

- There is one seasonal odai passing on the western side of the lease area for which a safety distance of 50m has been left.
- In the study area, the shallow aquifer is developed through dug wells and deeper aquifer through tube wells. The groundwater exploration in the district show that the potential fractures are encountered beyond 100m bgl. In general, the yield from wells and bore wells especially after postmonsoon season is very low.
- The occurrence of groundwater mainly in the porous soil are weathered layers, very negligible amount of groundwater percolated through the poorly fractured layer, after that there is no existence of groundwater. Besides, the mining area consists of hard compact rock, no major water seepage within the mine is expected.
- The water table is highly fluctuated in nature according to the precipitation. The examination of water level in the existing dug well and bore well are highly fluctuating. Most of the wells get dried up during the summer period. From the above it can be interpreted that the water table is deeper and largely dependent on rain water.

Since the mining area consists of hard compact rock, no major water seepage within the mine is expected from the periphery. Effective rain water harvesting both within the lease area and its nearby area is proposed to be implemented during the operation stage of the project.

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES:

This is a proposed project and Semi – Mechanized Open Cast mining will be carried out to quarry out Rough Stone, Weathered Rock & Gravel. The identified impacts due to this mine

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during mining and associated activities have been studied in relation to various environmental components like Air, water, noise, vibration, land, transport etc.

4.1 AIR ENVIRONMENT:

The proposed mining and allied operations may cause deterioration of air quality due to pollution arising from the project operation if prompt care is not taken. The principal sources of air pollution in general due to mining and allied activities will be:

Dust generation in the mine due to:

- ❖ Drilling & blasting
- ❖ Excavation of OB & Ore.
- ❖ Movement of HEMM such as Excavators, tippers etc.
- ❖ Loading and unloading operation
- ❖ Transportation

In case of this mine, the following measures will be adopted to control impact on the air quality due to mining operations in the lease area:

- Usage of Drill bits in good condition & Covering of drill holes with wet cloth
- Well-designed blasting parameter, effective stemming to achieve optimum breakage occurs without generating dust
- Deployment of fixed and mobile water sprinkler for fugitive dust suppression in haul roads.
- Proper maintenance of roads.
- Transportation of material by tarpaulin covered trucks
- Proper maintenance of HEMM to minimize gaseous emission
- Imparting sufficient training to operators on safety and environmental parameters
- Development of green belt/ plantation in various areas within the mine lease area etc.

By adoption of all these measures, no adverse impact on air quality is envisaged due to this proposed opencast mining operation.

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Impact on air quality due to fugitive emissions was estimated based on the latest computer model - ISCST3-AERMOD View Gaussian Plume Air Dispersion Model(Ver-8.9.0) developed by USEPA.

The resultant added concentrations with baseline figures even at worst scenario, show that the values of ambient air quality with respect to PM₁₀ are in the range of 48.48 µg/m³ to 80.3 µg/m³ and with respect to PM_{2.5} are in the range of 23.7 µg/m³ to 36.9 µg/m³ which are within the statutory limits in each case.

For preservation of environment in this mine strict enforcement of management schemes will be undertaken for taking corrective actions, as needed. By adopting the effective implementation of all the mitigative measures, no adverse impact on Air quality due to the mining operation in this lease area is expected.

4.2 WATER ENVIRONMENT:

The total water requirement for this project will be 3.5KLD. The water will be sourced initially from outside agencies. Later the rainwater collected in the mine pit sump will be used for this purpose.

The domestic effluent to be generated from the project will be collected in septic tank with soak pits arrangements.

Since the entire material from the quarry face will be directly dispatched to the consumers, there will not be any rough stone stockpiles. There are no waste dumps in this quarry. As such there will not be any wash out due to stock pile or waste dumps. The rain water falling in the quarry will be harvested in the sump at the lowest level of the quarry. This sump will act as a settling pond to prevent solids escaping along with discharge, before outlet. etc. Towards surface runoff management, a garland drain will be constructed around the quarry and will be connected to a settling pond with silt traps. The supernatant clear water from the settling pond will be discharged into the nearby odai.

There is a seasonal odai passing on the western side of the lease area which is connected to a pond. For this odai, a 50m safety distance has been provided as per the conditions of the precise area communication letter. Earthen bund will be formed along the banks of the Odai in proximity to the lease area and good plantation will be carried out in the

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safety zone area. Either side of the Odai near the lease area will be properly fenced with barbed wire and it will be ensured no impact is caused on this drainage course.

The mining area consists of hard compact rock, hence no major water seepage within the mine is expected from the periphery. Since the active water table is deeper ground water intersection is not envisaged.

Towards sustainable water management. It is proposed to utilize this harvested rain water in the pit during mining as well as in the post mining stage. This water will be used to meet the water requirement of the project and the excess water if any in consultation with the local villagers and in line with Government practices shall be let out in to the nearby stream or shall be distributed to the nearby villages as per their need.

Under CER, it is proposed to clean and desilt 5 ponds in the nearby villages to augment the water storing capacity of these ponds.

4.3 NOISE ENVIRONMENT:

During mining operation there will be noise generation due to working of excavators, movement of vehicles, etc.,. However, it will be felt near the active working area only and away from its source it will get reduced. Due to natural attenuation effects, by proper green belt development, design / maintenance of machines, etc., the impact on noise levels will be negligible and are expected to be well within the prescribed limits.

4.3.1 VIBRATION:

In the proposed mine workings, blasting & vibration effects will be controlled by following measures.

- a) Optimum design for burden and spacing.
- b) Reducing explosive charge to minimum and controlled blasting with delay detonators.
- c) Proper deck charging practice
- d) Avoiding blasting in unfavorable weather condition

By adoption of above measures, it will be ensured that ground vibrational levels due to blasting will be maintained within the prescribed DGMS conditions of 10 mm/s for the domestic houses/structures.

4.4 IMPACT ON LAND ENVIRONMENT:



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At the end of the life of the mine, 2.80.0Ha of mined out area will be left as water body. 0.01.0Ha will be the mine roads and 1.18.0Ha will be covered with vegetation. Entire mined out area will be properly fenced to prevent in advertant entry of men and animals. In the post mining stage the rainwater harvested in the mined out void shall be utilized in the area in consultation with the authorities.

4.5 BIOLOGICAL ENVIRONMENT:

No major clearance of vegetation is involved in this project. Necessary mitigative measures like dust suppression, proper maintenance of equipment's, black topping of permanent roads etc., will be carried out to prevent dust generation & any further impact on the vegetation. In the lease area, safety barrier of 7.5m & 50m meters has been left around the mine periphery. Greenbelt / Plantation will be carried out to enhance the vegetative growth and aesthetic in the safety zone area.

4.6 SOCIO ECONOMIC ENVIRONMENT:

As there are no habitations or hutments in the core zone area, no rehabilitation or resettlement problems will arise here. The mining operations in the proposed mine will provide the following socio economic benefits:

- Direct employment for about 19 persons directly.
- Indirect employment and opportunity to provide raising income levels and standards of living in the area through various service related activities connected with the project operations like:
 - ✓ Project related logistical operations for transport of Rough Stone & Gravel, etc,
 - ✓ Various trading services for consumer goods, spare parts, sundry items, etc.
 - ✓ Contractual services connected with the project.
 - ✓ Green belt and horticultural works in the project.
 - ✓ Casual labor needs for various activities.
- Improvement in medical care system for the locals.
- Benefit to State and central exchequer by way of royalty, taxes.

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Towards the socio economic development of the surrounding area, the proponent has earmarked an amount of Rs. 20 Lakhs under Corporate Environmental Responsibility for a period of 5 years. The activities identified under CER will be implemented in a phased manner in the following areas:

- Provision of study materials, library books, and educational aid and improvement in facilities in nearby school
- Improvement in drinking water facilities by way of establishing RO water plant.
- Periodic health checkup, medical camps for the locals
- Under the sustainable water management and rain water harvesting measures it is proposed to desilt 5 ponds in the nearby villages to augment its water harvesting capacity and rooftop rainwater harvesting shall be constructed in nearby schools, government buildings.
- For the post mining stage, a scheme shall be drawn for effective utilization of the rain water harvested in the mined out void by the locals in consultation with the authorities and villagers .

4.7 IMPACT ON LOCAL LOGISTICAL SYSTEM DUE TO PROJECT:

From this proposed quarry the entire output will be transported to the consumers like crusher units for producing stone aggregates of different sizes or other buyers etc. The following mitigative measures are suggested for mitigation of adverse impacts on the logistical aspect of the project:

- Water sprinkling on Rough stone in the transport vehicles before transporting, so that no dust nuisance during transport will arise.
- Proper maintenance of transport roads
- Proper maintenance of transport vehicles.
- Avoiding overloading of material
- Covering of loaded vehicles with tarpaulins sheet if warranted.

4.8 WASTE MANAGEMENT:

There is no process effluent generation from this mine. Hence no liquid waste is generated. Single use plastics/ use and throwaway plastics will be banned in the site as directed by the

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Tamil Nadu Government vide GO(Ms)No.84 regarding ban on use of plastic products. The employees will be encouraged to use compostable material or reusable material.

5.0 ENVIRONMENTAL MONITORING PROGRAMME:

Regular, systematic and sustained programme schedules for implementation and monitoring of various control measures are devised with clear cut guidelines of various concerned plans for keeping a continuous surveillance on the various environmental quality parameters in the area.

The Mines Manager/Mine Incharge will undertake effective monitoring and implementation of various above said environmental control measures promptly and effectively and to oversee various environmental management schemes for air quality control, water quality status, noise level control, plantation programme, social development schemes, etc in the mine.

Towards EMP measures, Rs. 8.0 lakhs is allocated under capital cost. Besides, Rs. 7.0 lakhs per annum will be spent under recurring cost.

6.0 CONCLUSION:

By systematic and scientific mining adhering to all the statutory norms and enforcing and strictly implementing the above said mitigation measures mentioned in this report, no adverse impact is envisaged.

The proposed mining project will benefit this region in the fields of potential employment opportunities, improved income for local people, improved social welfare facilities in respect of education, medical healthcare systems, etc. in its own way and also revenue to Government through royalty, taxes etc.

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