

EXECUTIVE SUMMARY

OF

DRAFT EIA / EMP REPORT

FOR

ROUGHSTONE AND GRAVEL QUARRY

EXTENT- 2.23.0Ha

5 YEAR PRODUCTION OF

1,94,570m³ OF ROUGHSTONE,

72,270m³ OF WEATHERED ROCK AND

79,170 m³ OF GRAVEL

SURVEY NO – 389/1B

**VILLAGE – MELATHATTAPARAI, TALUK - THOOTHUKUDI,
DISTRICT - THOOTHUKUDI, STATE - TAMILNADU.**

TMT.T.PALAVESAMMAL

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THOOTHUKUDI DISTRICT, PIN CODE– 628 304.

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Creating Possibilities

MAY 2021

ROUGH STONE AND GRAVEL QUARRY OF TMT.T.PALAVESAMMAL AT SURVEY NO.389/1B OVER AN AREA OF 2.23.0HA IN MELATHATTAPARAI VILLAGE, THOOTHUKUDI TALUK, THOOTHUKUDI DISTRICT, TAMIL NADU.

SUMMARY

1.0 GENERAL:

Tmt.T.Palavesammal proposes to operate a **Rough Stone and Gravel Quarry** at Survey No.389/1B over an area of 2.23.0Ha in Melathattaparai Village, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu, for the TOR approved production capacity of 1,85,600m³ of Rough Stone, 72,270m³ of weathered rock and 79,170m³ of gravel formation for the period of Five years.

Precise area communication letter was obtained from the District Collector, Thoothukudi District vide letter no. Rc.No.G.M.1-465/2017 dated 03.02.2020. Mining plan for this project was approved vide letter no. Rc.No.465/G&M/2017 dated 04.09.2020 by the Assistant Director, Geology & Mining.

Although the individual lease area of this project is less than 5 Ha, including the other existing quarries within the 500m radius along with this subject project works out to >5 Ha and as such this proposal is considered under **Category – B1** and public hearing is to be conducted.

ToR for this project has been received from SEIAA, Tamil Nadu vide their letter No. SEIAA-TN/F.No.7930/SEAC/TOR-884/2020 dated 16.03.2021. 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 and Gravel Quarry of Tmt.T.Palavesammal
2.	Location of the project	Melathattaparai Village, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu
3.	Mining Lease area (ML area)	2.23 Ha
4.	Latitude & Longitude	Latitude: 08°48'17"N to 08°48'21"N Longitude: 78°01'37"E to 78°01'45"E.
5.	Mine site topography	95m (maximum) from MSL
6.	Type of land	The entire mine lease area of 2.23.0 Ha is a patta land jointly registered in the name of Tmt.Chinnammal, Applicant and Thiru.Sakthivel, vide patta No.2414 and the applicant has obtained

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		consent from other pattadhars and got it registered.
7.	Temperature °C (Minimum & Maximum)	The annual mean minimum and maximum temperature are 23°C and 29°C respectively.
8.	Average Annual rainfall	570 mm to 740 mm
9.	Nearest Highway	(NH-45B) Madurai – Thoothukudi - 5.5km - E
10.	Nearest Railway station	Thattapparai -2.5Km (NW)
11.	Nearest Airport	Tuticorin – 8.5 Km (S)
12.	Nearest major water bodies	Madagiri Odai. 1.2km - SW
13.	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.
14.	Reserved / Protected Forests	Nil within 10km radius
15.	Nearest Town	Thoothukudi – 10.0 km
16.	Nearest villages	Keela Thattapparai - 610m - S
17.	Other Industries (in Aerial distance)	Other than crushers, Roughstone quarries and few windmills are located in the study area.
18.	Seismic Zone	Area falls in Zone – II (Least Active)

2.1 PROJECT DESCRIPTION:

S.No	Particulars	Details			
1.	Geological resources	Roughstone: 6,69,000cum Weathered Rock: 1,11,500cum Gravel: 1,11,500cum			
2.	Mineable reserves	Roughstone: 1,85,600cum Weathered Rock: 72,270cum Gravel: 79,170cum			
3.	Production Capacity for 5 years lease period	YEAR	ROUGHSTONE (m3)	WEATHERED ROCK (m3)	GRAVEL (m3)
		I	38745	46720	50700
		II	38760	25550	28470
		III	38990	-	-

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		IV	39050	-	-
		V	30055	-	-
		Total	185600	72270	79170
4.	Life of the mine	5 years			
5.	Total Waste	There is no waste generation anticipated in this quarry operation since the entire excavated material will be utilized.			
6.	Method of mining	Quarry operations involve shallow jack hammer drilling, blasting, excavation, loading and transportation of Roughstone to needy buyers.			
7.	Bench parameters	Bench height - 5 m, bench widths - 5m			
8.	Ultimate mine depth	35m			
9.	Manpower	Permanently-14 persons, Temporarily-8 persons			
10.	Water Requirement & source	The total water requirement for this project will be 2.5KLD. The required water will be procured from outside agencies initially. Leter Rain Water collected in the mine pit shall be used.			
11.	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.			
12.	Site services	This is a proposed project. Site services like mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.			
13.	Project cost	Total Cost - Rs. 77.57 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 2020 to February 2021**) 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 2.23Ha. 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 there are 27 Rural villages from three Taluks namely Thoothukudi, Ottapidaram and Srivaikuntam and 5 urban areas of two taluks namely Pudiamputhur (CT), Ottapidaram Taluk and Sankaraperi(CT), Milavittan(CT), Kumaragiri(CT) & Athimarapatti(CT) of Thoothukudi Taluk.

The distribution of population is as below:

- Male - 81669 (50.29%)
- Female - 80740(49.71%)
- Total - 162409 (100%)
- Scheduled caste - 24.24%
- Scheduled tribes - 0.16%
- Total literacy rate in the area - 77.94% of the people are literate and 22.06% of the people are illiterate.

The occupational structure of the area is as below:

- Total main workers - 56401 (34.73%)
- Total marginal workers - 8580 (5.28%)
- Total non-workers - 97428 (59.99%)

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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 2020 to February 2021)

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	52.1 to 63.7	24.3 to 29.4	4.5 to 6.6	7.6 to 10.4
2	BUFFER ZONE (4 Locations)	R	41.2 to 55.6	18.9 to 26.2	3.1 to 5.7	5.8 to 9.2
CPCB LIMITS			PM₁₀	PM_{2.5}	SO₂	NO₂
2009 Notification			100	60	80	80

* Note: BDL- Below Detectable Limit, DL- Detectable Limit.

Conclusion: The existing Ambient Air Quality levels in the monitored locations for PM₁₀, PM_{2.5}, SO₂, NO₂ & 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 2020 to February 2021)				
	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)	6.98 to 7.55	642.5 to 1214	385 to 730	52.4 to 151	204 to 405	156 to 332	54.2 to 72.1	0.02 to 0.05	1.98 to 3.11	0.34 to 0.61
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 alternative source*.										

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3.3.3 Noise Environment:

No of locations – 5		Season: Winter, December 2020 to February 2021)		
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	48.6	90	41.7 to 45.2	55
Night Equivalent	40.0		35.8 to 36.9	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	7.21	61.56	clay loam	0.56	220	1.21	452	810
Buffer Zone	6.75 – 7.89	57.99 – 84.27	sand clay loam	0.75 – 1.21	125 - 312	0.94 – 1.35	296 - 390	439 - 644

3.3.5 LAND ENVIRONMENT:

Landuse pattern carried out through remote sensing satellite data show that 36.35 % of the study area is agriculture land and 26.07 % are fallow land. Land with scrub constitutes 18.96 %. There are no perianal water sources in the region. Agriculture lands are Mostly seasonal, rain fed and done in patches only.

3.3.6 BIOLOGICAL ENVIRONMENT:

The lease area is a non forest, private land with scrub and thorny bushes. The lease area is dominated with *Senna auriculata* , *Prosopis juliflora* , *Calotropis gigantea* . *Abutilon indicum* .

The buffer zone is dominated by species like *Borassus flabellifer* , *Prosopis juliflora* , *Calotropis gigantean* , *Jatropha glandulifera* , *Morinda tinctoria* , *Madhuca longifolia* , *Syzygium cumini* ,



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Ziziphus jujube, Abutilon indicum Casuarina equisetifolia, Ficus benghalensis, Cassia tora, Acacia nilotica, Albizia amara, Acalypha indica ,paddy ,etc.

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 are no major perennial water bodies in proximity to the lease area. In the study area, the shallow aquifer is developed through dug wells and deeper aquifer through tube wells. The groundwater has revealed that potential fractures are encountered at deeper levels. From the Geophysical survey, it is found that the subsurface litho units are gravel, weathered layers poorly fractured and terminated with hard and compact massive rocks with fully devoid of fractures. 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.

From the above it can be interpreted that the water table is deep and largely dependent on rain water. Effective rain water harvesting both within the lease area and its nearby area is imperative and to be implemented during the operation stage of the project. Rain Water Collected in the mine pit will be effectively used,

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, & Gravel. The identified impacts due to this mine during mining and associated activities have been studied in relation to various environmental components like Air, water, noise, vibration, land, transport etc.

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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:

- Deployment of 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.

The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model developed by Lakes Environmental Software which is based on steady state Gaussian plume dispersion.

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 49.1 – 68.4 µg/m³ and with respect to PM_{2.5} are in the range of 22.6-31.7 µg/m³ which are well within the statutory norms 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

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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 2.5KLD. 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 stockpiles. 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, 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 flow to the downstream users.

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 in not envisaged.

The dynamic ground water resources for Thoothukudi District and Keelathattapari Firka have been provided by the National Water Mission, Ministry of Jal Shakti, Department of Water Resources, RD & GR in the 'Ground water reports of Tamil Nadu Districts, - Notes on Thoothukudi'. it is seen that the stage of groundwater development of Keelathattapari Firka where the study area can be categorized as 'Safe' from ground water development point of view. Thus there is scope for further ground water development.

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 at 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.

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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:

The entire lease area is in the possession of the project proponent. In the post mining stage, entire 1.58.0Ha of mined out area will be left as water body. 0.02.0Ha will be the mine roads and 0.63.0Ha 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 equipments etc., will be carried out to prevent dust generation & any further impact on the vegetation. In the lease area, safety barrier of 7.5m 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:

Entire Land is in proponent possession 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:

- Employment for about 22 persons.

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- 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 development
- Improvement in medical care system for the locals.
- Benefit to State and central exchequer by way of royalty, taxes.

Towards the socio economic development of the surrounding area, the proponent has earmarked an amount of Rs.5 Lakhs under Corporate Environmental Responsibility. 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 like sanitation, drinking water etc in nearby school
- Periodic health checkup, medical camps for the locals.
- Desilting of nearby village ponds.

4.7 IMPACT ON LOCAL LOGISTICAL SYSTEM DUE TO PROJECT:

From this proposed quarry the entire output will be transported to the consumers. Since the productivity is less, there will be hardly about 6 trips per hour. The transport route can easily absorb this negligible traffic due to this project. 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.

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4.8 OCCUPATIONAL HEALTH AND SAFETY ASPECTS:

In order to ensure minimisation of occupational health and safety problems in the project operation, the following preventive remedial measures will be effectively exercised in the project operations, so as to comply with applicable standards.

- Medical examination of workers at pre-entry level stage of workers, etc., by qualified doctors, with periodical examination of all workers/staff at least once a year, as per DGMS circulars.
- Regular awareness campaigns amongst staff and workers
- Staff will be provided with PPE to guard against excess noise levels, Dust generation and inhalation, etc., as per standards prescribed by DGMS.

4.9 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 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. 3.0 lakhs is allocated under capital cost. Besides, Rs. 10.0 lakhs per annum will be spent under recurring cost.

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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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