

Dec
2021

Executive Summary

Proposed Rough stone and Gravel quarry- 1.29.5 Ha

For

PUBLIC HEARING

At

**S.F Nos : 46/1, 46/2, 46/3, and 46/4, Sundakkottai Village,
Aruppukottai Taluk, Virudhunagar District, Tamil Nadu**

**Project Proponent
Thiru. S.K.Subba Reddiar
S/o S.Kasthuri Reddiar,
No.99, Keelakkarandhai Kamatchi,
Chettiar Street, South Street,
Aruppukottai Town
Aruppukottai Taluk.
Virudhunagar - 623 101.**

EIA Notification 2006 Schedule 1(a) Category B1 (Cluster)

**Prepared By:
Ecotech Labs Pvt. Ltd.**



**NABET Accredited EIA Consultant
No.48, 2nd Main road,
Ram nagar south extention,
Pallikaranai, Chennai-600100**

EXECUTIVE SUMMARY

1. Project Background:

The Proposed project is Rough stone and Gravel quarry over an extent of 1.29.5 Ha, Own patta land in Sundakottai Village of Aruppukottai Taluk, Virudhunagar District. The category of project is B1 (cluster), The lease area exhibits plain terrain topography with very gentle slope towards south and covered by brownish red sand soil followed by weathered rock formation and massive charnockite rock formation.

The quarry operation is proposed to carry out with conventional open cast semi mechanized mining with 6.0 meter vertical bench with a bench width of 5.0 meter. The Quarry operation involves shallow jack hammer drilling, slurry blasting, loading and transportation.

The quarry operation is proposed up to depth for 31.0m below ground level. Geological Resources is estimated at 3,10,743 m³ of Rough stone up to a depth of 31.0m(Max) and 70,452 m³ of Gravel up to a depth of 31.0m. The Mineable Reserves is 94,318 m³ of Rough Stone and 47,640 m³ of Gravel up-to the depth of 31.0 meters. Production Schedule is proposed an average production of 94, 318 m³ of Rough Stone and 47,640 m³ of Gravel production for the period of five years.

Mining plan is approved by Geology and Mining department of Virudhunagar district letter vide no.Roc.No:KV1/245/2020 dated: 27.01.2021 from the date of execution lease dead. The project area does not fall in Hill Area Conservation Authority region. There is no interstate boundary, CRZ zone, Western Ghats, notified Bird sanctuaries, wild life sanctuaries as per Wild life protection Act 1972, within the radius of 15Km.

2. Nature & Size of the Project

The proposed Rough stone and gravel quarry over an extent of 1.29.5 Hectares land is located Sundakottai Village of Aruppukottai Taluk, Virudhunagar District.

Mineral intends to quarry	: Rough stone and Gravel
District	: Virudhunagar
Taluk	: Aruppukottai
Village	: Sundakottai
S. F. Nos.	: 46/1, 46/2, 46/3, and 46/4
Extent	: 1.29.5 hectares

Table 1: Brief Description of the Project

S. No	Particulars	Details
1	Latitude	09° 28' 20.65" to 09° 28' 25.83" N
2	Longitude	78° 10' 52.34" to 78° 10' 57.25" E
3	Site Elevation above MSL	74 m from MSL
4	Topography	Plain
5	Land use of the site	Patta Land
6	Extent of lease area	1.29.5 Ha
7	Nearest highway	SH 38 (Aruppukottai – Sayalkudi) - 6.2km, NW
8	Nearest railway station	Aruppukottai Railway Station – 10.0 km, NW
9	Nearest airport	Madurai Airport – 45km, NW
10	Nearest town / city	Town - Aruppukottai - 10 Km -NW City - Madurai - 7 Km -N District - Virudhunagar - 27 Km - NW
11	Rivers / Canal	Gundur River – 7km - NE
12	Lake	❖ Thumbai Kulam – 9 km W ❖ Malai Arasan Kovil Lake – 11.11km NW ❖ Seva Kanmai - 11 km, NW
13	Hills / valleys	Nil in 15 km radius
14	Archaeologically places	Nil in 15 km radius
15	National parks / Wildlife Sanctuaries	Nil in 15 km radius
16	Reserved / Protected Forests	Nil in 15km radius
17	Seismicity	Proposed Lease area come under Seismic zone-II(low risk area)

3. Need for the Project

- ❖ The mining activities as proposed are the backbone of all construction and infrastructure projects as the raw material for construction is available only from such mining. The Rough stone extracted will be transported to be Stone crusher of district Virudhunagar.
- ❖ The raw Rough stone as well as the crushed material of stone is in high demand in real estate, construction projects as well as in building construction projects.
- ❖ Rough stone is quarried for producing crusher aggregates to the nearby building contractors, road contractors and nearby villagers.

- ❖ After quarrying the entire reserves mined out, the area will be used as water reservoir to have an artificial recharge to the nearby wells.
- ❖ No damage to the land is caused, no reclamation or back filling is required.

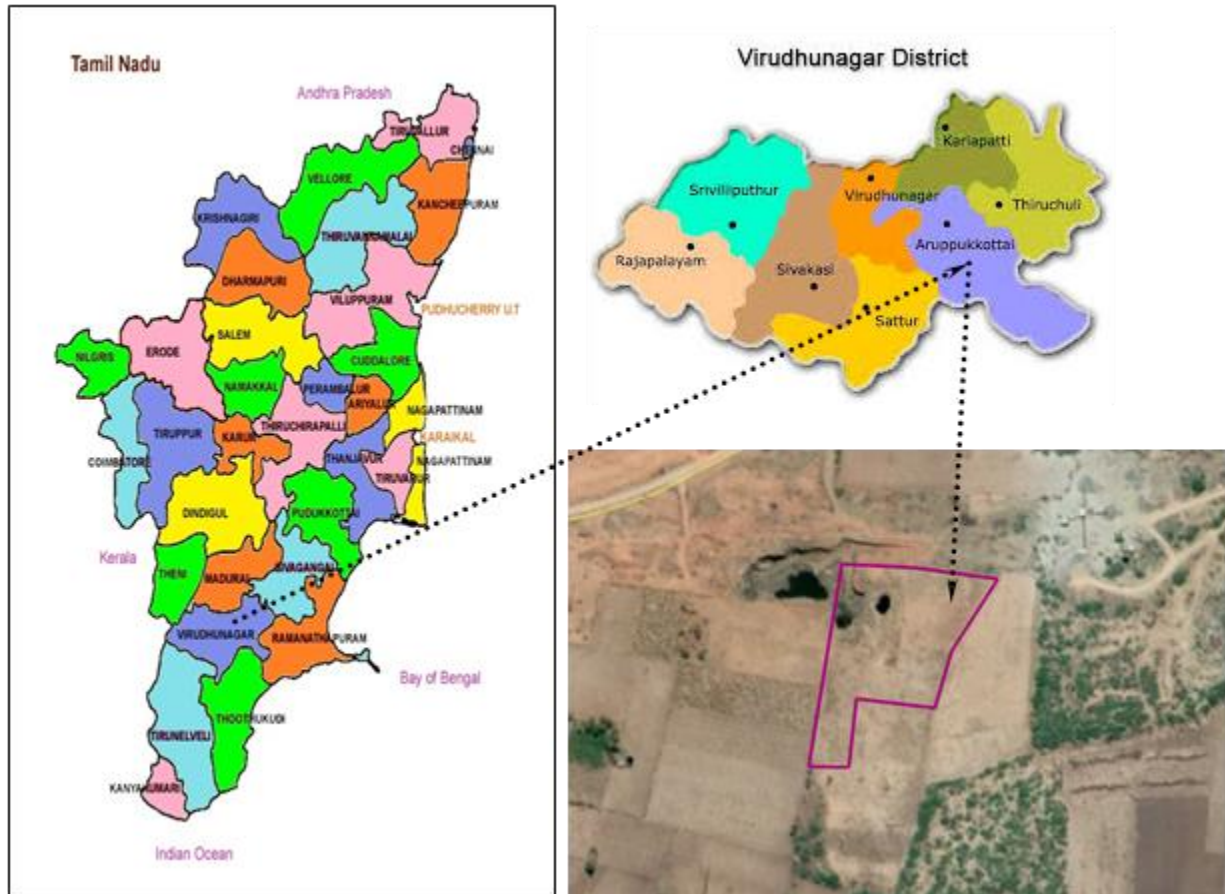


Figure 1: Location Map of the Project Site



Figure 2: Google Image of the Project Site

4. Charnokite

Generally, the Charnockite is grey to greenish colored, coarse to medium grained, greasy nature with or without garnet. Because of the limited outcrops, the quarry sections are studied to infer the various interrelationships between the litho units. Charnockite is interbanded nature with crystalline carbonate rocks are observed in most of the quarry in Pandalgudi, Lakshmipuram, Gopalapuram, Sundakottai, Weathering of the Charnockite on the surface gives a deceptive look of gneiss and in the quarry sections at depth the fresh charnockite is exposed, which are well exemplified in almost all the Charnockite quarry sections.

5. Geological Resources

The geological reserves have been calculated based on the cross section method

Table 2. Geological resources

SECTION	LENGT H (M)	WIDTH (M)	HEIGHT (M)	ROUGH STONE VOLUME (M ³)	GRAVEL VOLUME (M ³)
A-A' & B-B'	58	117	6.0	-	40,716
	58	117	25.0	1,69,650	-
A-A' & C- C'	38	99	6.0	-	22,572
	38	99	25.0	94,050	-
A-A' & D- D'	63	31	6.0	-	11,718
	63	31	25.0	48,825	-
TOTAL GEOLOGICAL RESERVES				3,12, 525	75,006
Less: pit	45	43	2.0	-	3,870
excavated	19	12	3.0	-	684
A-A' & B- B'	18	11	9.0	1,782	-
ALREADY EXCAVATED				(-)1,782	(-)4,554
BALANCE GEOLOGICAL RESERVES				3,10,743	70,452

Existing Pit Dimensions

Section	Length (Max) (m)	Width (Max) (m)	Depth (Max) (m)
A-A' & B-B'	45	43	14.0

TABLE 3. Year wise Production Plan

SECTION	YE A R	LENGT H (M)	WIDT H (M)	HEIGH T (M)	ROUGH STONE VOLUME (M ³)	GRAVEL VOLUME (M ³)
A-A' & B-B'	I- Ye ar	39	99	6.0	-	23,166
		27	88	5.0	11,880	-
		17	78	5.0	6,630	-
		7	68	5.0	2,380	-
SUB TOTAL					20,890	23,166
Less pit: A-A' & B-B'		45	35	2.0	-	3,150
		19	12	3.0	-	684
		18	11	9.0	1,782	-
ALREADY EXCAVATED RESERVES					(-)1,782	(-)3,834
I – YEAR PRODUCTION					19,108	19,332

A-A' & B-B'	II- Year	10	99	6.0	-	5,940
		14	88	5.0	6,160	-
		14	78	5.0	5,460	-
		14	68	5.0	4,760	-
		11	58	5.0	3,190	-
A-A' & C-C'		2	81	6.0	-	972
Less pit: A-A' & B-B'		SUB TOTAL			19,570	6,912
		45	8	2.0	-	(-)720
II – YEAR PRODUCTION					19,570	6,192
A-A' & B-B'	III- Year	2	88	5.0	880	-
		7	78	5.0	2,730	-
		12	68	5.0	4,080	-
		12	58	5.0	3,480	-
		13	48	5.0	3,120	-
A-A' & C-C'		14	81	6.0	-	6,804
		10	70	5.0	3,500	-
		5	60	5.0	1,500	-
III – YEAR PRODUCTION					19,290	6,804
A-A' & C-C'	IV- YEA R	13	81	6.0	-	6,318
		13	70	5.0	4,550	-
		13	60	5.0	3,900	-
		13	50	5.0	3,250	-
		8	40	5.0	1,600	-
		3	30	5.0	450	-
A-A' & B-B'		5	58	5.0	1,450	-
		10	48	5.0	2,400	-
IV – YEAR PRODUCTION					17600	6,318
A-A' & C-C'	V- YEA R	9	81	6.0	-	4,374
		15	70	5.0	5,250	-
		15	60	5.0	4,500	-
		15	50	5.0	3,750	-
		15	40	5.0	3,000	-
		15	30	5.0	2,250	-
A-A' & D-D'		55	14	6.0	-	4,620
V – YEAR PRODUCTION					18750	8,994
TOTAL PRODUCTION FOR FIVE YEARS					94,318	47,640

6. Mining

Opencast mining

The quarry operation is proposed to carry out with conventional open cast semi mechanized mining with 6.0 meter vertical bench with a bench width of 5.0 meter. The Quarry operation involves shallow jack hammer drilling, slurry blasting, loading and transportation.

Process Description

- The reserves and resource are arrived based upon the Geological investigation
- Removal of Topsoil by Excavators and directly Loaded Into Tippers.
- Removal of Rough Stone by Excavators by Drilling and Blasting.
- Shallow Drilling With Jackhammer of 32-36mm Dia.
- Minimum Blasting With Class 2 Explosives.
- Loading of Rough Stone By Excavators Into Tippers.

7. Water Requirement

Total water requirement for the mining project is 2.50 kLD. The 90% water will be required for the suspension of dust and green belt development domestic water will be sourced from nearby Kalloorani Village and other water will be source from nearby road tankers supply

Table 4. Water Balance

Purpose	Quantity	Source
Drinking Water	0.50 KLD	Packaged drinking water is available from nearby water vendors in Kalloorani Village is an out 2.55 km on the southwest of the area.
Green belt	1.0 KLD	Other domestic activities through road tankers supply.
Dust suppression	1.0 KLD	From road tankers supply.
Total	2.50 KLD	

8. Man Power

Total manpower required for the project is approximately 10 persons. Workers will be from nearby villages.

Table 5.Man Power

1.	Skilled	Mine Foreman/ Permit Mines Manager	1 No
		Jack Hammer Operator	2 Nos
		Blaster/ Mate	1 No
2.	Unskilled	Helper	6 Nos
Total			10Nos

No child less than 21 years will be entertained during quarrying operations.

9. Solid Waste Management

Table .6 Solid Waste Management

S.No	Type	Quantity	Disposal Method
1	Organic	1.8 kg/day	Municipal bin including food waste
2	Inorganic	2.7 kg/day	TNPCB authorized recycler

As per CPCB guidelines: MSW per capita/day =0.45 kg/day

Table.7 500m Radius Cluster Mine

S. No.	Quarry detail	Village	S.F No	Extent (Ha)
I. Existing Quarry				
1	M.Jesmuthu	Sundakottai	52/3 & 5	1.49.5
II. Abandoned Quarry				
1	B Bose	Sundakottai	3/4B, 3/5B, 3/10 etc.,	2.31.5
III. Proposed Quarry				
1	S.K. Subba Reddiar	Sundakottai	46/1, 46/2, 46/3, 46/4	1.29.5
2	T.R Varadarajan	Sundakottai	48/12,13&14 etc	2.22.5
3	M Thiruvappu	Sundakottai	64/3A, 64/3B, 64/3D et	3.40.5
Total				8.42.0

10. Land Requirement

The total extent area of the Proposed project is 1.29.5 Ha, Own patta land in Sundakottai Village of Aruppukottai Taluk, Virudhungar District.

Table .8 Land Use Breakup

S. No.	Land Use	Area in use during the quarrying period (Hect)
1.	Quarrying Pit	0.19.3
2.	Infrastructure	0.01.0
3.	Roads	0.04.0
4.	Green Belt	0.31.6
5.	Unutilized	0.73.6
	Total	1.29.5Ha

11. Human Settlement

There are no habitations within 500m radius. There are villages located in this area within 5km radius of the quarry.

Table.9 Habitation

DIRECTION	VILLAGE	POPULATION	DISTANCE
North	Konkanakurichi	600	2.0 Km
	Konraikulam	500	2.5 Km
South	Bommakottai	1000	3.5 Km
	Kalayarkarisalkulam	600	3.0 Km
East	Aladipatti	1000	1.5 Km
	Kalyanasundarapuram	500	1.5 Km
West	Kalloorani	2000	2.5 Km
	Mudduramalingapuram	1000	3.5 Km

12. Power Requirement

The Rough stone and gravel quarry project does not require huge water and electricity for the project.

16 Litre diesel per hour for excavator for mining and loading for rough stone and **10 litre** diesel per hour for gravel needed.

13.Scope of the Baseline Study

The chapter contains information on existing environmental scenario on the following parameters.

1. Micro – Meteorology
2. Water Environment
3. Air Environment
4. Noise Environment
5. Soil / Land Environment
6. Biological Environment
7. Socio-economic Environment

13.1 Micro – Meteorology;

Meteorology plays a vital role in affecting the dispersion of pollutants, once discharged into the atmosphere. Since meteorological factors show wide fluctuations with time, meaningful interpretation can be drawn only from long-term reliable data.

- i) Average Minimum Temperature : 30⁰C
- ii) Average Maximum Temperature. : 38.5⁰C
- iii) Average Relative Humidity (%) : 65 to 85 %
- iv) Average Annual Rainfall of the area : 1061.3 mm

13.2 Air Environment

Ambient air monitoring was carried out on monthly basis in the surrounding areas of the Mine Lease area to assess the ambient air quality at the source. To know the ambient air quality at a larger distance i.e. in the study area of 5 km. radius, air quality survey has been conducted at 5 locations over a period of Pre Monsoon Season. Major air pollutants like, Particulate Matter (PM10), Sulphur Dioxide (SO₂), Nitrogen Dioxide (NO₂) were monitored and the results are summarized below,

The baseline levels of PM₁₀ (59-36 µg/m³), PM_{2.5} (25-12 µg/m³), SO₂ (17-5µg/m³), NO₂ (23-10 µg/m³), all the parameters are well within the standards prescribed by National Ambient Air Quality during the study period from June to August 2021.

13.3 Noise Environment

Ambient noise levels were measured at 5 locations around the proposed project site. The maximum Day noise and Night noise were found to be 54 dB(A) and 46 dB(A) in Kalyanasundarapuram. The minimum Day Noise and Night noise were 45 dB(A) and 35 dB(A) which was observed in Sundakottai.

13.4 Water Environment

- The average pH ranges from 7.15-7.65.
- TDS value varied from 298 mg/l to 1520 mg/l
- Hardness varied from 159 to 857 mg/l
- Chloride varied from 27.4 to 396 mg/l

13.5 Land Environment

The analysis results show that soil is neutral in nature as pH value ranges from 7.28 to 8.05 with organic matter 0.08 % to 0.34 %. The concentration of Nitrogen, Phosphorus & Potassium has been found to be in good amount in the soil samples.

13.6 Biological Environment

The proposed Mining lease area is mostly dry barren ground with small shrubs and bushes. No specific endangered flora & fauna exist within the mining lease area.

14. Rehabilitation/ Resettlement

- The overall land of the mine is private patta land. There are no displacement of the population within the project area and adjacent nearby area. Social development of nearby villages will be considered in this project.
- The mine area does not cover any habitation. Hence the mining activity does not involve any displacement of human settlement.

15. Greenbelt Development

1. The development of greenbelt in the peripheral buffer zone of the mine area.
2. Green belt has been recommended as one of the major components of environmental Management plan, which will improve ecology, environment and quality of the surrounding area.
3. Local trees like, Neem, Pungam, Naval etc will be planted along the south side lease boundary and avenues as well as over non-active dumps at a rate of 50 trees per annum with interval 5m.
4. The rate of survival expected to be 80% in this area.

Table.10 Plantation/ Afforestation Program

Year	Name of species	Place of planted	No of species	Spacing	Survival
2021	Neem/Pungam	North	50	5m	80%
2022	Naval	South	50	5m	80%
2023	Poovarasu/Pungam	East	50	5m	80%
2024	Naval/Pungam	South	50	5m	80%
2025	Neem	West	50	5m	80%
Total			250		

16. Anticipated Environmental Impacts

Air Environment and Mitigation Measures

1. Water sprinkling will be done on the roads & unpaved roads.
2. Proper mitigation measures like water sprinkling will be adopted to control dust emissions.
3. Plantation will be carried out on approach roads, solid waste site & nearby mine premises.
4. To control the emissions regular preventive maintenance of equipment's will be carried out.

Noise Environment and Mitigation Measures

1. Periodical monitoring of ambient noise will be done as per CPCB guidelines.
2. No other equipment except the transportation vehicles and excavator for loading will be allowed.
3. Noise generated by these equipment's shall be intermittent and does not cause much adverse impact

17. Responsibilities for Environmental Management Cell (EMC)

The responsibilities of the EMC include the following:

- i. Environmental Monitoring of the surrounding area
- ii. Developing the green belt/Plantation
- iii. Ensuring minimal use of water
- iv. Proper implementation of pollution control measures

18. Environmental Monitoring Program

A monitoring schedule with respect to Ambient Air Quality, Water & Wastewater Quality, Noise Quality as per Tamil Nadu State Pollution Control Board (TNPCB), shall be maintained.

19. Project Cost

The total project cost is Rs. **44,66,160** for deployment of machinery and creation of infrastructural facilities like approach road, Mine office / Workers Shed, First Aid Room etc., including electrifications and water supply.

Table 11 Project Cost details

S.No.	Description	Cost (Rs)
1	Project Cost	4,60,000
2	Expenditure Cost	40,06,160
	Total	44,66,160

EMP Cost	Rs.4,91,000
CER Cost	Rs.90,000

20. Corporate Environmental Responsibility

The Corporate Environment Responsibility (CER) fund will be provided to the below activity

Table .12 CER Cost

S.No.	CER Activity	CER 2% of the project cost (Rs in lakhs)
1.	Developing sports facilities and providing toilet, water filter facilities, furniture's, to Government school in Kalloorani Village.	0.90

21. Benefits of the Project

- There is positive impact on socio-economics of people living in the villages. Mining operations in the subject area has positive impact by providing direct and indirect jobs opportunities
- The project is environmentally compatible, financially viable and would be in the interest of construction industry thereby indirectly benefiting the masses.
- Quarrying in this area is not going to have any negative impact on the social or cultural life of the villagers in the near vicinity.