

June
2022

Executive Summary

Tmt.R.Rethinam Rough stone quarry- 2.57.0 Ha

For

PUBLIC HEARING

At

**S.F Nos.: 589/1C (Part) and 589/1D of Lembalakudi Village,
Thirumayam Taluk, Pudukkottai District, Tamil Nadu**

PROJECT PROPONENT

**Tmt.R.Rethinam,
W/o.PL.Rajendran,
No.1/1, Main Road,
Lembalakudi Post,
Thirumayam Taluk
Pudukkottai District.**

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 Extension,
Pallikaranai, Chennai-600100**

EXECUTIVE SUMMARY

1. Project Background:

The proposed rough stone quarry over an extent of 2.57.0 Ha, Own Patta land in Lembalakudi Village, Thirumayam Taluk, Pudukkottai District. The category of the project is B1 (cluster), the lease area exhibits plain terrain and sloping towards Western side covered with Rough Stone.

The quarry operation is proposed to carry out with conventional open cast semi mechanized mining with 5.0 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 47m below ground level. The Total Geological reserve is about 4,57,530 m³ of Rough stone. The Mineable and the Recoverable reserves are 1,88,105 m³ and 1,78,703 m³ respectively, the proposed Year wise production is carried out 1,78,703 m³ of Rough Stone is to be mined for (Sixty months) Five years only.

Mining plan was approved by Geology and Mining department of Pudukkottai district vide letter R.c.No.423/2020/(G&M) dated 13.08.2021. 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 quarry over an extent of 2.57.0 Hectares land is located Lembalakudi Village of Thirumayam Taluk, Pudukkottai District.

Mineral intends to quarry	: Rough stone
District	: Pudukkottai
Taluk	: Thirumayam
Village	: Lembalakudi
S. F. Nos.	: 589/1C (Part) & 589/1D
Extent	: 2.57.0 Hectares

Table 1 Brief Description of the Project

S. No.	Particulars	Details
1	Latitude	10° 18' 24.55" N to 10° 18' 20.47" N
2	Longitude	78° 44' 35.06" E to 78° 44' 29.94" E
3	Site Elevation above MSL	100 m
4	Topography	Plain terrain
5	Land use of the site	Own Patta land
6	Extent of lease area	2.57.0 Ha
7	Nearest highway	MDR 1007 – Thirumayam - Ponnamaravathy Road – 4.67 km, S SH 201 – Namanasamudram – Ponnamaravathi Road, 2.85 km, N NH 210 – Tiruchirappalli – Ramanathapuram Road – 2.89 km, E
8	Nearest railway station	Pudukkottai Railway Station – 9.70 km, NE
9	Nearest airport	Tiruchirappalli International Airport – 50.42 km, N Thanjavur Airport – 60.24 km, NE
10	Nearest town / city	Town – Thirumayam – 6.74 km, S City – Thirumayam – 6.74 km, S District - Pudukkottai - 10.51 km, NE
11	Rivers / Canal	Nil
12	Lake	Virachilai Village Pond, 4.25km, WSW Pudukulam, 12.47km, NE Perunjunai Lake, 12.98km, NNE
13	Hills / valleys	Nil in 15 km radius
14	Archaeologically places	Nil in 15 km radius
15	National parks / Wild Sanctuaries	Nil in 15 Km radius
16	Reserved / Protected Forests	Kudumiyamalai R.F. 13.63km, NW Sengirai R.F. 14.88km, SE
17	Seismicity	Proposed Lease area come under Seismic zone-II (low risk area)
18	Defense Installations	Nil in 15 Km radius

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 Pudukkottai.
- ❖ 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.

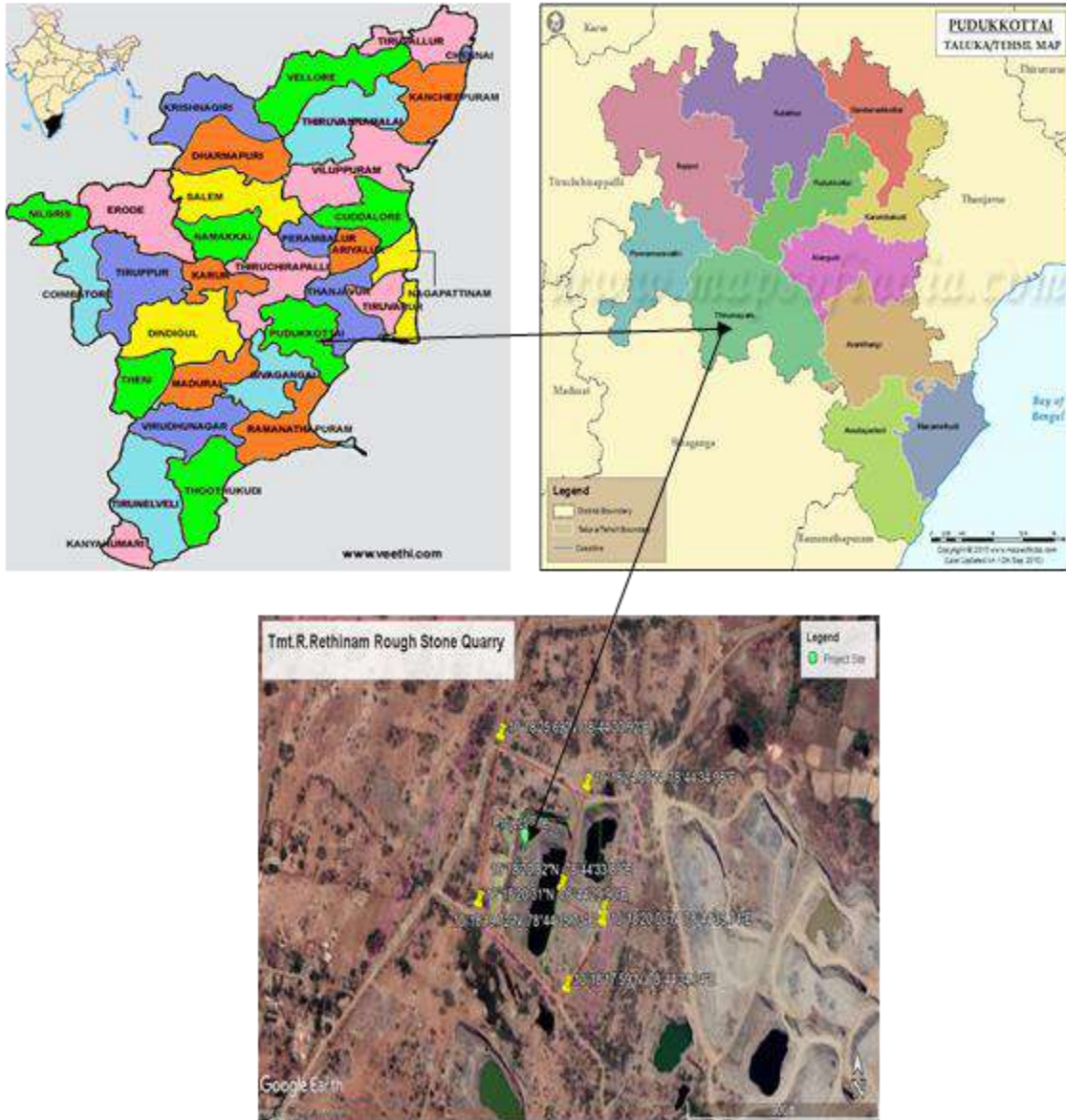


Figure 1: Location Map of the Project Site



Figure 2: Google Image of the Project Site

4. Charnockite

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 the areas of Kunnandavarkoil, Thirumayam, Kulathur, 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 Available Geological Reserve is estimated as 457530m³ respectively. Top Soil is calculated upto a depth of 2m and Rough Stone at a depth of 45m. Total Depth-47m.

Table 2 Geological reserves

GEOLOGICAL RESERVES								
Section	Bench	L (m)	W (m)	D (m)	Volume (m³)	Geological Rough stone Reserves in m³ @ 95%	Mine waste in m³ @ 5%	Top Soil (m³)
Y-AB	I	39	89	2				6942
	II	39	103	5	20085	19081	1004	
	III	39	103	5	20085	19081	1004	
	IV	39	103	5	20085	19081	1004	
	V	39	103	5	20085	19081	1004	
	VI	39	103	5	20085	19081	1004	
	VII	39	103	5	20085	19081	1004	
	VIII	49	130	5	31850	30258	1592	
	IX	81	130	5	52650	50018	2632	
	X	81	130	5	52650	50018	2632	
TOTAL					257660	244780	12880	6942

XY-CD	I	2	103	2				412
	II	2	103	5	1030	979	51	
	III	2	103	5	1030	979	51	
	IV	2	108	5	1080	1026	54	
	V	2	108	5	1080	1026	54	
	VI	15	118	5	8850	8408	442	
	VII	15	118	5	8850	8408	442	
	VIII	15	118	5	8850	8408	442	
	IX	95	178	5	84550	80323	4227	
	X	95	178	5	84550	80323	4227	
TOTAL					199870	189880	9990	412
GRAND TOTAL					457530	434660	22870	7354

Table 3 Mineable Reserves

MINEABLE RESERVES								
Section	Bench	L (m)	W (m)	D (m)	Volume (m³)	Mineable Rough stone Reserves in m³ @ 95%	Mine waste in m³ @ 5%	Top Soil (m³)
XY-AB	I	32	46	2				2944
	II	32	56	5	8960	8512	448	
	III	32	56	5	8960	8512	448	
	IV	32	56	5	8960	8512	448	
	V	32	56	5	8960	8512	448	
	VI	32	56	5	8960	8512	448	
	VII	32	56	5	8960	8512	448	
	VIII	42	83	5	17430	16559	871	
	IX	74	83	5	30710	29175	1535	
	X	69	73	5	25185	23926	1259	
TOTAL					127085	120732	6353	2944
XY-CD	I	1	49	2				98

	II	1	49	5	245	233	12	
	III	1	49	5	245	233	12	
	IV	1	54	5	270	257	13	
	V	1	54	5	270	257	13	
	VI	1	64	5	320	304	16	
	VII	1	64	5	320	304	16	
	VIII	1	64	5	320	304	16	
	IX	52	124	5	32240	30628	1612	
	X	47	114	5	26790	25451	1339	
TOTAL					61020	57971	3049	98
GRAND TOTAL					188105	178703	9402	3042

Table 4 Year wise Development and Production Reserves

YEARWISE DEVELOPMENT AND PRODUCTION RESERVES									
YEAR	Section	Bench	L (m)	W (m)	D (m)	Volume (m³)	RESERVES in m³ @ 95%	Mine waste in m³ @ 5%	Top Soil in m3
I-YEAR	XY - AB	I	32	46	2				2944
		II	32	56	5	8960	8512	448	
		III	32	56	5	8960	8512	448	
		IV	32	56	5	8960	8512	448	
		V	32	56	5	8960	8512	448	
		VI	32	56	5	8960	8512	448	
	XY - CD	I	1	49	2				98
		II	1	49	5	245	233	12	
		III	1	49	5	245	233	12	
		IV	1	54	5	270	257	13	
		V	1	54	5	270	257	13	
		VI	1	64	5	320	304	16	

	TOTAL					46150	43844	2306	3042
II-YEAR	XY - AB	VII	32	56	5	8960	8512	448	
		VIII	42	83	5	17430	16559	871	
	XY - CD	VII	1	64	5	320	304	16	
		VIII	1	64	5	320	304	16	
	TOTAL					27030	25679	1351	
III-YEAR	XY - AB	IX	74	83	5	30710	29175	1535	
	TOTAL					30710	29175	1535	
IV-YEAR	XY - CD	IX	52	124	5	32240	30628	1612	
	TOTAL					32240	30628	1612	
V-YEAR	XY - AB	X	69	73	5	25185	23926	1259	
	XY - CD	X	47	114	5	26790	25451	1339	
	TOTAL					51975	49377	2598	
GRAND TOTAL						188105	178703	9402	3042

6. Mining

Opencast mining

The quarry operation is proposed to carry out with conventional open cast semi mechanized mining with 5.0 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 25.5mm Dia.
- Minimum Blasting With Class 3 Explosives.
- Loading of Rough Stone By Excavators Into Tippers.

7. Water Requirement

Total water requirement for the mining project is 2.5 KLD. Domestic water will be sourced from nearby Lembalakudi Village and other water will be source from nearby road tankers supply.

Table 5 Water Balance

Purpose	Quantity	Source
Drinking Water	1.0 KLD	Packaged Drinking water vendors available in Lembalakudi village which is about 0.68 km, SE from the project site
Green belt	0.5 KLD	Other domestic activities through road tankers supply.
Dust suppression	1.0 KLD	From road tankers supply.
Total	2.5 KLD	

8. Man Power

Total manpower required for the project is approximately 15 persons. Workers will be from nearby villages.

Table 6 Man Power

S.No.	Name of the Employment	No. of Employees
1.	Skilled	
	Operator	2 No.
	Mechanic	1 No.
	Blaster/Mat	1 No.
2.	Semi – skilled	
	Driver	2 Nos
3.	Unskilled	
	Musdoor / Labors	4 Nos

	Cleaners	2 Nos
	Office Boy	1 No
4.	Management & Supervisory Staff	2 No
	Total	15 Nos

9. Solid Waste Management

Table 7 Solid Waste Management

S.No.	Type	Quantity	Disposal Method
1	Organic	2.7 kg/day	Municipal bin including food waste
2	Inorganic	4.05 kg/day	TNPCB authorized recyclers

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

Table 8 500m Radius Cluster Mine

1) Existing other quarries:

S. No.	Name of the lessee / Permit Holder	Village & Taluk	S.F.No.	Extent	Lease Period
1.	Thiru.A.L.Rasu	Lembalakudi & Thirumayam	601/1	1.47.5	27.09.2016 to 26.09.2021
2.	Thiru.R.Balu	Lembalakudi & Thirumayam	603/1	1.57.0	28.09.2016 to 27.09.2021
3.	A.S.Balajikumaresan	Lembalakudi & Thirumayam	9/13 (Q.No. (pt)	0.35.0	03.02.2017 to 02.02.2022

4.	Kunthavai Ponvizha Grama Suya Velai Vaippu Thitta Sangam	Lembalakudi & Thirumayam	9/13 (Q.No.	0.37.0	06.09.2017 to 05.09.2022
5.	Kurunji Mahalir Ponvizha Grama Suya Velai Vaippu Thitta Sangam	Lembalakudi & Thirumayam	9/13 (Q.No.	1.05.0	06.09.2017 to 05.09.2022
6.	Mahilambu Ponvizha Grama Suya Velai Vaippu Thitta Nala Sangam	Lembalakudi & Thirumayam	9/13 (Q.No.	0.35.0	06.09.2017 to 05.09.2022
7.	Malligai Ponvizha Grama Suya Velai Vaippu Thitta Sangam	Lembalakudi & Thirumayam	9/13 (Q.No.	0.41.0	06.09.2017 to 05.09.2022
8.	Sarajini Ponvizha Grama Suya Velai Vaippu Sangam	Lembalakudi & Thirumayam	589/7	0.30.0	06.09.2017 to 05.09.2022
9.	Sembaruthi Ponvizha Grama Suya Velai Vaippu Thitta Sangam	Lembalakudi & Thirumayam	589/13 (Q.No.10)	0.35.0	06.09.2017 to 05.09.2022
10.	Thulasi Ponvizha Grama Suya Velai Vaippu Thitta Sangam	Lembalakudi & Thirumayam	9/13 (Q.No.	0.41.0	06.09.2017 to 05.09.2022

2) Proposed Area:

S. No.	Name of the applicant	Village & Taluk.	S.F.No.	Extent
1.	Tmt.R.Rethinam	Lembalakudi & Thirumayam	589/1C (part) & 589/1D	2.57.0

3) Lease Expired:

S. No.	Name of the applicant	Village & Taluk	S.F.No.	Extent	Lease Period
1.	S.P.Ganeshan	Lembalakudi & Thirumayam	590/3 (pt)	0.50.58	22.01.2010 to 21.01.2015
2.	R.Chinnaiah	Lembalakudi & Thirumayam	589/13 (Q.No.4)	0.57.0	02.02.2012 to 01.02.2017

The Total extent of the Existing / Lease expired / Proposed quarries are 9.20.5 Ha

10. Land Requirement

The total extent area of the project is 2.57.0 Ha, Own Patta land in Lembalakudi Village of Thirumayam Taluk, Pudukkottai District.

Table 9 Land Use Breakup

Sl. No.	LAND USE	PRESENT AREA (HECT)	AREA IN USE DURING THE QUARRYING PERIOD (HECT)
1.	Area under Quarrying	1.04.0	1.43.0
2.	Infrastructure	Nil	0.01.0
3.	Roads	0.01.0	0.01.0
4.	Green Belt & Dump	Nil	0.12.0
5.	Unutilized Area	1.52.0	1.00.0
	Total	2.57.0 Ha	2.57.0 Ha

11. Human Settlement

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

Table 10 Habitation

S.No.	Direction	Village	Distance	Population
1	North	Mamarathupatti	1.0 km	130
2	East	Pillaiipatti	2.2 km	170
3	South	Nallipatti	3.2 km	210
4	West	Neikonam	2.0 km	320

12. Power Requirement

The Rough Stone Quarry project does not require huge water and electricity for the project. **16 Litres** diesel per hour for excavator for mining and loading for Rough stone needed.

13. Scope of the Baseline Study

This 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 : 33.7 °C
- ii) Average Maximum Temperature. : 24 °C
- iii) Average Annual Rainfall of the area : 922.8 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 7 km. radius, air quality survey has been conducted at 5 locations. 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 (58-44 µg/m³), PM2.5 (28-13 µg/m³), SO₂ (18-6µg/m³), NO₂ (28-10 µg/m³), all the parameters are well within the standards prescribed by National Ambient Air Quality during the study period from March to May 2022.

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 55 dB(A) and 47 dB(A) respectively in Adaikala Matha Church, Thirumayam and Project Site. The minimum Day Noise and Night noise were 41 dB(A) and 40 dB(A) respectively which was observed in Varadaraja Perumal Temple, Senthamangalam and Annai Matriculation School, Virachilai.

13.4 Water Environment

- The average pH ranges from 7.26-8.03.
- TDS value varied from 378 mg/l to 1508 mg/l
- Hardness varied from 224 to 596 mg/l
- Chloride varied from 24.5 to 411 mg/l

13.5 Land Environment

The analysis results shows that the majority of soil in the project and surrounding area is slightly alkaline in nature and pH value ranges from 7.51 to 8.13 with organic matter 0.36 % to 1.3 %. 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.

13.7 Socio Economic Environment

Thirumayam is a town in the Pudukkottai district in the State of Tamilnadu and rich with the Rough Stone. The Lembalakudi village has a population of 4539 of which 2257 are males while 2282 are females as per Population Census 2011. In Lembalakudi village Male literacy stands at 84.51% while female literacy rate was 65.55%

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 component of Environmental Management Plan, which will improve ecology, environment and quality of the surrounding area.
3. Local trees like Neem, Pungam, Naval, Casuarina etc. will be planted along the lease boundary and avenues as well as over Non-active dumps at a rate of 60 trees per annum with interval 5m.
4. The rate of survival expected to be 70% in this area

Table 11 Plantation/ Afforestation Program

Year	Name of species	Place of planted	No of species	Spacing	Survival
2022	Neem/Pungam	North	60	5m	70%
2023	Tamarind	South	60	5m	70%

2024	Poovarasu/Pungam	East	60	5m	70%
2025	Naval/Pungam	West	60	5m	70%
2026	Casuarina	South	60	5m	70%
Total			300		

16. Anticipated Environmental Impacts

16.1 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 equipments will be carried out.

16.2 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 equipments 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 57,80,000** 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 12 Project Cost details

S. No.	Description	Cost
1	Project Cost	24,60,000
2	Machinery Cost	30,00,000
3	EMP Cost	3,20,000
	Total	57,80,000

20. Corporate Environmental Responsibility

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

Table 13 CER Cost

S.No.	CER Activity	CER 2% of the project cost (Rs.)
1.	Carrying out various developmental works in the nearby region based on the need of the locals	1,15,600

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.