August 2023

# Executive Summary

# Thiru.P.Arumugam Rough stone and Gravel quarry- 2.13.0 Ha

For

## PUBLIC HEARING

At

**S.F Nos : 210/12C1A, 12C1B, 8A1A, 12B, 20 & 9C2 of Melur Village, Kulathur Taluk, Pudukkottai District, Tamil Nadu**

## PROJECT PROPONENT

**Thiru.P.Arumugam,**
**S/o.Palanivel,**
**No.3/625, Melamuthudaiyanpatti,**
**Vellanur, Kulathur Taluk,**
**Pudukkottai District,**
**622501**

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

## Prepared By:

**Ecotech Labs Pvt. Ltd.**

NABET

**NABET Accreditated EIA Consultant**
**No.48, 2nd Main Road,**
**Ram Nagar South Extension,**
**Pallikaranai, Chennai-600100**

# EXECUTIVE SUMMARY

## 1. Project Background:

The New Rough Stone Quarry over an extent of 2.13.0 Ha, Own Patta land S.F. No: 210/12C1A,12C1B, 8A1A, 12B, 20 & 9C2 of Melur Village, Kulathur Taluk, Pudukkottai District. The category of the project is B1 (cluster), the lease area exhibits plain terrain covered by massive charnockite rough stone formation.

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

The quarry operation is proposed up to depth for 57.0m(Max) ( Rough stone 57m). The Total Geological reserve is about 826340$m^3$ of Rough stone. The Mineable Reserves are 185545$m^3$ of Rough stone. Production schedule is proposed an average production of 185545$m^3$ of Rough stone for (Sixty months) Five years only.

The mining plan was approved by Assistant Director, Geology and Mining department of Pudukkottai district letter vide no. Rc.No.249/2022 (G&M) dated 17.11.2022 from the date of execution lease dead. The project area does not fall in Hill Area Conservation Authority region. There is no interstate boundaries, CRZ zone, Western Ghats, notified Bird sanctuaries, wildlife sanctuaries as per Wildlife protection Act 1972, within the radius of 15Km.

## 2. Nature & Size of the Project

The New Rough Stone Quarry over an extent of 2.13.0 Hectares land is located Melur Village of Kulathur Taluk, Pudukkottai District.

| | |
|---|---|
| Mineral intends to quarry | : Rough stone . |
| District | : Pudukkottai |
| Taluk | : Kulathur |
| Village | : Melur |
| S. F. Nos. | : 210/12C1A,12C1B, 8A1A, 12B, 20 & 9C2 |

Extent : 2.13.0 Hectares

**Table 1: Brief Description of the Project**

| S. No | Particulars | Details |
|---|---|---|
| 1 | Latitude | 10°26'42.18"N to 10°26'50.28"N |
| 2 | Longitude | 78°45'59.75"E to 78°46'04.90"E |
| 3 | Site Elevation above MSL | 113.0m above MSL. |
| 4 | Topography | Plain terrain |
| 5 | Land use of the site | Patta land |
| 6 | Extent of lease area | 2.13.0 Ha |
| 7 | Nearest highway | NH 336 – Trichy to Pudukkottai Road – 1.25 Km - E<br>SH 71 – Pudukkottai to Alangudi Road – 4.01 Km - SW |
| 8 | Nearest railway station | Vellanur Railway Station – 3.0 km - NE |
| 9 | Nearest airport | Tiruchirapalli International Airport – 54.09 km - N |
| 10 | Nearest town / city | Town - Pudukkottai – 6.45 km - SE<br>City - Pudukkottai – 6.45 km - SE<br>District - Pudukkottai – 6.45 km - SE |
| 11 | Rivers / Canal | Nil within 15km radius |
| 12 | Lake/Pond | ❖ Vellanur local Pond – 1.64 Km - E<br>❖ Thiruvengainathar Lake – 3.65 Km – S<br>❖ Kili Kulam – 2.21 Km – NE<br>❖ Temple Pond – 1.70 Km – W<br>❖ Perunjunai Lake – 3.21 Km – SW<br>❖ Melakulam – 4.09 Km – SW<br>❖ Kavinadu Kanmai – 7.62 Km – S<br>❖ Annavasal Periyakulam Lake – 8.03 Km - W |
| 13 | Hills / valleys | Nil in 15 km radius |
| 14 | Archaeologically places | ❖ Sundaresvara temple with sub-shrine, Thirukkattalai – 8.02Km – SE<br>❖ Jain image and the inscription to the south of it on the summit of the sadayapparai, Nathampannai – 5.10km – S<br>❖ Cave & Jain image, Ammachathiram – 8.11km – N<br>❖ Jain image, Annavasal – 7.85 km – W |

| | | |
|---|---|---|
| | | ❖ Siva temple. Ariyur – 4.55 km – SW<br>❖ Siva and Pillayar temple, Mangudi – 7.34 km – SW<br>❖ Jain Tirthankara idol and relics of old Jain Temple – 1.56km – N<br>❖ Amman koil, Rock-cut Siva temple, Vijayalaya Cholisvaram and the group of subshrines around it, Rock-cut Vishnu shrine – Narthamalai – 6.61 km – N<br>❖ Rock-cut Jain temple, Natural Cavern with stone beds – Eladipattam – Sittannavasal – 4.66 km – W<br>❖ Siva Temple, Thodaiyur – 6.42 km – NE<br>Kailasanatha temple, Agastisvara temple – Vellanur – 2.61 km – E |
| 15 | National parks / Wildlife Sanctuaries | Nil in 15 km radius |
| 16 | Reserved / Protected Forests | ❖ Narthamalai RF – 4.13 Km – NW<br>❖ Aladukkadu RF – 8.69 Km – N<br>❖ Perungudipatti RF – 9.06 Km – NW<br>❖ Pudukkottai RF – 5.13 Km - SE |
| 17 | Seismicity | Proposed Lease area come under Seismic zone-II (Moderate 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 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.

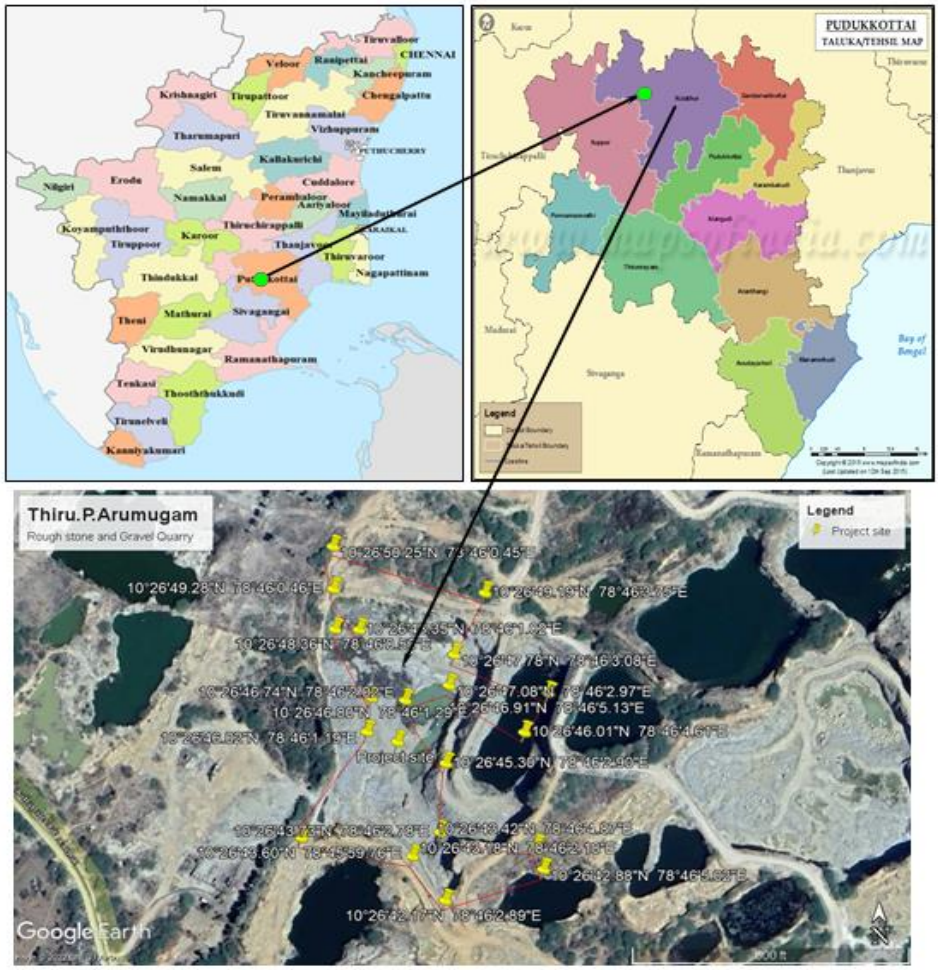


**Figure 1: Location Map of the Project Site**


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

*Table 2. Geological resources*

| GEOLOGICAL RESOURCES | | | | | | |
|---|---|---|---|---|---|---|
| **Section** | **Length in (m)** | **Width in (m)** | **Depth in (m)** | **Volume $m^3$** | **Geological Resources of Gravel in $m^3$** | **Geological Resources of Rough stone in $m^3$** |
| XY-AB | 87 | 86 | 50 | 374100 | | 374100 |
| XY-CD | 101 | 82 | 40 | 331280 | | 331280 |
| X1Y1-CD | 42 | 72 | 40 | 120960 | | 120960 |
| **TOTAL** | | | | | _ | **826340** |

**Table 2.1 Mineable Resources**

| MINEABLE RESERVES | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Section** | **Bench** | **Length in (m)** | **Width in (m)** | **Depth in (m)** | **Volume in $m^3$** | **Gravel Formation in $m^3$** | **Mineable Reserves of Rough stone in $m^3$** |
| XY-AB | 91-86 | 72 | 69 | 5 | 24840 | | 24840 |
| | 86-81 | 62 | 59 | 5 | 18290 | | 18290 |
| | 81-76 | 52 | 49 | 5 | 12740 | | 12740 |
| | 76-71 | 42 | 39 | 5 | 8190 | | 8190 |
| | 71-66 | 32 | 29 | 5 | 4640 | | 4640 |
| | 66-61 | 22 | 19 | 5 | 2090 | | 2090 |
| **TOTAL** | | | | | | | **70790** |
| X1Y1-CD | 81-76 | 86 | 72 | 5 | 30960 | | 30960 |
| | 76-71 | 76 | 67 | 5 | 25460 | | 25460 |
| | 71-66 | 66 | 62 | 5 | 20460 | | 20460 |
| | 66-61 | 56 | 52 | 5 | 14560 | | 14560 |
| | 61-56 | 46 | 42 | 5 | 9660 | | 9660 |
| **TOTAL** | | | | | | | **101100** |
| X2Y2-CD | 81-76 | 27 | 64 | 5 | 8640 | | 8640 |
| | 76-71 | 17 | 59 | 5 | 5015 | | 5015 |
| **TOTAL** | | | | | | | **13655** |
| **GRAND TOTAL** | | | | | | | **185545** |

**Table 3. Year wise Production Plan**

| YEARWISE DEVELOPMENT & PRODUCTION RESERVES | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | **Section** | **Bench** | **Length in (m)** | **Width in (m)** | **Depth in (m)** | **Volume in $m^3$** | **Gravel Formation in $m^3$** | **Recoverable Reserves of Rough stone in $m^3$** |
| I | XY-AB | 91-86 | 72 | 69 | 5 | 24840 | | 24840 |
| | | 86-81 | 38 | 59 | 5 | 11210 | | 11210 |
| **TOTAL** | | | | | | | | **36050** |
| II | XY-AB | 86-81 | 24 | 59 | 5 | 7080 | | 7080 |
| | | 81-76 | 52 | 49 | 5 | 12740 | | 12740 |
| | X1Y1-CD | 81-76 | 46 | 72 | 5 | 16560 | | 16560 |
| **TOTAL** | | | | | | | | **36380** |
| III | X1Y1-CD | 81-76 | 40 | 72 | 5 | 14400 | | 14400 |
| | | 76-71 | 24 | 67 | 5 | 8040 | | 8040 |
| | X2Y2-CD | 81-76 | 27 | 64 | 5 | 8640 | | 8640 |
| | | 76-71 | 17 | 59 | 5 | 5015 | | 5015 |
| **TOTAL** | | | | | | | | **36095** |
| IV | X1Y1-CD | 76-71 | 52 | 67 | 5 | 17420 | | 17420 |
| | | 71-66 | 19 | 62 | 5 | 5890 | | 5890 |
| | XY-AB | 76-71 | 42 | 39 | 5 | 8190 | | 8190 |
| | | 71-66 | 32 | 29 | 5 | 4640 | | 4640 |
| **TOTAL** | | | | | | | | **36140** |
| V | X1Y1-CD | 71-66 | 47 | 62 | 5 | 14570 | | 14570 |
| | | 66-61 | 56 | 52 | 5 | 14560 | | 14560 |
| | | 61-56 | 46 | 42 | 5 | 9660 | | 9660 |
| | XY-AB | 66-61 | 22 | 19 | 5 | 2090 | | 2090 |
| **TOTAL** | | | | | | | | **40880** |
| **GRAND TOTAL** | | | | | | | | **185545** |

## 6. Mining

### *Opencast mining*

The quarry operation is proposed to carry out with conventional open cast mechanized mining with 5.0meter 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 Melur Village and other water will be source from nearby road tankers supply.

**Table 4. Water Balance**

| Purpose | Quantity | Source |
|---|---|---|
| Drinking Water | 1.5 KLD | Water will be supplied through tankers from Melur village which is about 0.33 Km NE of the project area. |
| Green belt | 0.5 KLD | Other domestic activities through road tankers supply. |
| Dust suppression | 0.5 KLD | From road tankers supply. |
| **Total** | **2.5 KLD** | |

## 8. Manpower

Total manpower required for the project is approximately 27 persons. Workers will be from nearby villages.

**Table 5. Man Power**

| | | | |
|---|---|---|---|
| 1. | Skilled | Operators- Excavator & Jackhammer | 4 Nos |
| 2. | Semi – skilled | Drivers | 4 Nos |

| | | | |
|---|---|---|---|
| 3. | Unskilled | Musdoor/Labours, Cleaners & Watch man | 15 Nos |
| 4. | Management & Supervisory staff | Second Class Mines Manager (with valid statutory qualification) | 1 No |
| | | Mines Foreman (with valid statutory qualification) | 1 No |
| | | Mines Mate (with valid statutory qualification) | 1 No |
| | | Blaster | 1 No |
| **Total** | | | **27 Nos** |

No child less than 18 years will be entertained during quarrying operations.

## 9. Solid Waste Management

**Table 6 Solid Waste Management**

| S. No | Type | Quantity | Disposal Method |
|---|---|---|---|
| 1 | Organic | 4.86 kg/day | Municipal bin including food waste |
| 2 | Inorganic | 7.29 kg/day | TNPCB authorized recyclers |

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

**Table 7 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. | M/s. Sai Hridham Infraa Private Limited, 14/28, Sowrastra Street, Illuppur taluk, Pudukkottai Dt. | Melur & Kulathur | 207/21B, 207/22B2, 207/23 | 1.30.5 | 31.07.2019 to 30.07.2024 |

| | | | | | |
|---|---|---|---|---|---|
| 2. | Thiru.Jayaraj, S/o.S.K.Rengarajan, No.3/659 of Melamuthudaiyanpatti Village, Vellanur post, Kulathur Taluk, Pudukkottai District. | Melur & Kulathur | 40/5B, 40/6B, 40/7A, 40/8A, 40/9A, 40/10B2 & 40/11A | 0.81.0 | 29.06.2018 to 28.06.2023 (Cancelled) |
| 3. | Thiru.M.Rajamohamed, S/o.Mohamed Ibrahim, No.9884, Kalif Nagar 4th Street, Pudukkottai. | Melur & Kulathur | 210/21 | 0.91.0 | 21.01.2019 to 21.01.2024 |
| 4. | Thiru.M.Rajamohamed, S/o.Mohamed Ibrahim, No.9884, Kalif Nagar 4th Street, Pudukkottai. | Melur & Kulathur | 216/21A1 & 216/22B | 1.30.5 | 31.07.2019 to 30.07.2024 |
| 5. | Thiru.Ramesh Babu, S/o.Jayaraman, T.S.No.7166/2 of Maharajapuram, Thirukokarnam, Pudukkottai District | Melur & Kulathur | 210/19 & 210/9B1B | 1.50.5 | 06.11.2019 to 05.11.2024 |

**2) Proposed Area:**

| S. No. | Name of the applicant | Village & Taluk | S. F. No. | Extent |
|---|---|---|---|---|
| 1. | Thiru.P.Arumugam, S/o. Palanivel, No.3/625, Melamuthudaiyanpatti, Vellanur, Kulathur Taluk, Pudukottai Dt. | Melur & Kulathur | 210/12C1A & etc., | 2.13.0 |
| 2. | Thiru.Arockiya Raj, S/o.Rethinam Pillai, No.297/7, Sathiamoorthi Nagar, Pudukkottai. | Melur & Kulathur | 210/7A | 1.68.0 |
| 3 | Tvl. Sai Hridham Infraa Private Limited, office at 208/6, Muthudaiyanpatti, Melur Village, Kulathur Tk, Pudukottai Dt. | Melur & Kulathur | 80/3,4,5,6,17 & 19 | 1.68.0 |
| 4 | Tvl. Sai Hridham Infraa Private Limited, office at 208/6, Muthudaiyanpatti, Melur | Melur & Kulathur | 207/12, 207/16 & 207/14A1 | 3.38.5 |

| | | | | |
|---|---|---|---|---|
| | Village, Kulathur Tk, Pudukottai Dt. | | | |
| 5 | Tvl. Sai Hridham Infraa Private Limited, office at 208/6, Muthudaiyanpatti, Melur Village, Kulathur Tk, Pudukottai Dt. | Melur & Kulathur | 207/10B2 | 0.51.5 |
| 6 | Thiru.R.Muthusamy, S/o.Rengasamy, No.663, Mela Muthudaiyanpatti village, Veellanur post, Kulathur taluk, Pudukkottai District. | Melur & Kulathur | 80/20, 80/21 &80/22 | 0.82.0 |
| 7 | Tvl.Sai Hridham Infraa (p) Ltd., office at 14/28, Rasi Illam, Sowarastra Street, Illuppur Taluk, Pudukkottai District. | Melur & Kulathur | 206/7, 206/27, 206/28,206/29, 206/30, 206/31, 206/32, 206/33 and 206/24 | 2.52.0 |

**3) Lease Expired:**

| S. No. | Name of the lessee/ Permit Holder | Village & Taluk | S. F. No. | Extent | Lease Period |
|---|---|---|---|---|---|
| 1. | Thiru.S.M.Sait, 59, Charles Nagar, Pudukottai | Melur & Kulathur | 216/22A | 0.40.5 | 27.11.2013 to 26.11.2018 |
| 2. | S.Ganesan, S/o.Subramaniyan, Trichy | Melur & Kulathur | 207/13A1,13B, 24,25A, 28A | 2.63.5 | 17.06.2009 to 16.06.2014 |
| 3. | G.Anthonisamy, S/o.Gnanampillai, Plat No.321, Periyarnagar, Pudukkottai. | Melur & Kulathur | 40/1,40/2 | 0.36.0 | 03.04.2009 to 02.04.2014 |
| 4. | P.Sannasi, S/o.Poovan, Melur, Kundrathur Taluk. | Melur Kulathur | 207/20 | 1.01.0 | 01.03.2007 to 28.02.2012 |
| 5. | Thiru.A.Palanivel, S/o.Arumugam, 3/625, MelaMuthudaiyanpatti Vellanur post, Pudukkottai District. | Melur Kulathur | 210/12B etc., | 1.73.0 | 29.05.2015 to 29.05.2020 |
| 6. | Thiru.A.Periyasamy, S/o. Adaikalam, | Melur & Kulathur | 216/15B | 0.75.0 | 19.02.2015 to 18.02.2021 |

| | | | | | |
|---|---|---|---|---|---|
| | T.S.No. 6985, Thirukoharnam, Pudukottai | | | | |
| 7. | Thiru.R.Muthusamy, S/o. Rengasamy, Melur, Sathiyamangalam Post, Kulathur Tk, Pudukottai Dt. | Melur & Kulathur | 216/5 & etc., | 0.93.5 | 23.09.2016 to 22.09.2021 |
| 8. | Thiru. S.M.Sait, S/o.Mookaiah, Solahar, No.51,52, Charles nagar, Pudukottai | Melur & Kulathur | 207/8 | 0.50.0 | 20.01.2017 to 19.01.2022 |
| 9. | Thiru.M.Velu, S/0. Muthiah, Echanari Thottivayal, Melur Village, Kulathur Tk, Pudukottai Dt | Melur & Kulathur | 207/14B & 207/15A | 0.65.5 | 28.06.2017 to 27.06.2022 |
| 10. | Thiru.V.Ravichandran, S/o.R.Visvanathan, Plot No.82, Pudhunagar 2nd Street, Machuvadi, Pudukkottai | Melur & Kulathur | 207/18, 207/29 | 1.27.5 | 28.07.2017 to 27.07.2022 |
| 11. | Thiru.R.Natesan, S/o. Rengasamy, No,715A, Nakkeerar vayal, Melur, Pudukkottai Dt. | Melur & Kulathur | 216/1 | 1.47.5 | 12.09.2017 to 11.09.2022 |

The Total extent of the Existing / Lease expired / Proposed quarries are 30.295Ha.

## 10. Land Requirement

The total extent area of the project is 2.13.0 Ha, Own Patta land in Melur Village of Kulathur Taluk, Pudukkottai District.

**Table 8 Land Use Breakup**

| S. No. | Land Use | Present Area (Hect) | Area in use during the quarrying period (Hect) |
|---|---|---|---|
| 1. | Quarrying Pit | 0.98.0 | 0.98.0 |
| 2. | Infrastructure | 0.03.0 | 0.03.0 |
| 3. | Roads | 0.02.0 | 0.02.0 |

| | | | |
|---|---|---|---|
| 4. | Green Belt | 0.02.0 | 0.49.0 |
| 5. | Unutilized Area | 1.08.0 | 0.61.0 |
| | **Total** | **2.13.0** | **2.13.0** |

## 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**

| SL. NO. | DIRECTION | VILLAGE | DISTANCE | POPULATION |
|---|---|---|---|---|
| 1 | North–East | Melur | 1.4Km | 218 |
| 2 | North - West | Sttannavasal | 3.9Km | 292 |
| 3 | South - West | Maruthanthalai | 0.9 Km | 274 |
| 4 | South - East | Thiruvengavasal | 2.6 Km | 165 |

## 12. Power Requirement

The Rough Stone 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 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 : 3 3.7 $^0$C

ii) Average Maximum Temperature. : 2 4 $^0$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 5 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 $PM_{10}$ (59 – 34 µg/m³), $PM_{2.5}$ (32 - 15 µg/m³), $SO_2$ (21 – 15 µg/m³), $NO_2$ (43 -11µg/m³), all the parameters are well within the standards prescribed by National Ambient Air Quality during the study period from March to May 2023.

## 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 64 dB(A) and 50 dB(A) respectively in Government High School, Mangudi. The minimum Day Noise and Night noise were 44 dB(A) and 36 dB(A) respectively which was observed in Project Site.

## 13.4 Water Environment

- The average pH ranges from 6.34 - 7.85.
- TDS value varied from 375 mg/l to 656 mg/l
- Hardness varied from 129 to 518 mg/l
- Chloride varied from 79.3 to 259 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 5.61 to 8.76 with organic matter 1.1 % to 1.37 %. 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 component 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 lease boundary and avenues as well as over Non-active dumps at a rate of 213 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 |
|---|---|---|---|---|---|
| 2023 | Neem, Pungam, Poovarasu | North | 213 | 5m | 80% |
| 2024 | Naval, Mantharai, Arasa Maram | South | 213 | 5m | 80% |
| 2025 | Magizham, Vilvam, Vaagai, Marudha maram | East | 213 | 5m | 80% |
| 2026 | Usil, Aaththi, Panai | South | 213 | 5m | 80% |

| | | | | | |
|---|---|---|---|---|---|
| 2027 | Illuppai, Eachai, Vanni maram | West | 213 | 5m | 80% |
| **Total** | | | **1065** | | |

## 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. 47,54,000/-** 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 11 Project Cost details**

| S. No. | Description | Cost |
|---|---|---|
| 1 | Fixed Asset cost | 22,54,000 |
| 2 | Operational Cost | 25,00,000 |
| | **Total** | **47,54,000** |

**Table 12 EMP**

| S.No. | Categories | Capital Cost | Recurring cost |
|---|---|---|---|
| 1 | Air Environment | 491300 | 161400 |
| 2 | Noise Environment | 50000 | 749725 |
| 3 | Water Environment | 21300 | 5000 |
| 4 | Waste Management | 6000 | 7000 |
| 5 | Implementation of Ec, mining plan & DGMS condition | 659500 | 606260 |
| 6 | Green belt development | 276900 | 31950 |
| | Total | 1505000 | 1561335 |
| | **Total** | **3066335** | |

| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|---|---|---|---|---|
| 3066335 | 1639402 | 1721372 | 1807440 | 1897812 |

Environmental Management Plan Cost (for five years)– Rs.101,32,361=Rs.101 lakhs

## 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 Cost (Rs.) |
|---|---|---|
| 1. | Government Panchayat Union Middle School – Melur Village, Kulathur taluk, Pudukkottai District<br>Provision of<br>➢ R.O.water facility<br>➢ Bench and desks<br>➢ LCD Projector<br>➢ Planting trees in and around the periphery of the school campus<br>➢ Environmental books for library (in Tamil language),<br>➢ Basic amenities such as safe drinking water, furniture, Hygienic Toilet and maintenance of toilet upto lease period. | **5,00,000** |

## 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.