

**Executive Summary**  
**Kundiyanthandalam Rough Stone and Gravel Cluster**  
**quarries**  
**Total Extent of the quarries in Cluster 25.37.3 Ha**

Total No of Proposed quarries = 5 Nos = 11.0 Ha

Proponent 1	Proponent 2	Proponent 3	Proponent 4
Thiru R. Nethaji Kancheepuram	Thiru. K. Chandrasekaran Tiruvannamalai	M/s. Bhuvaneswari Blue Metals Chennai	Thiru. A. William Chennai
2.45.0 Ha	1.97.5 Ha	2.05.5 Ha	2.88.0Ha
Status: ToR Obtained for Conduct Public Hearing			

Proponent 5	Status
Thiru. T. Bharath, Kancheepuram 1.64.0 Ha	File under Process in Department of Geology and Mining, Tiruvannamalai

Total No of Existing quarries = 7 Nos = 14.37.3 Ha

Proponent 1	Proponent 2	Proponent 3	Proponent 4	Proponent 5	Proponent 6	Proponent 7
Thiru. B.Sridevi Kancheepuram	Thiru. K. Kumar Kancheepuram	Thiru. Aron Samuvel Chennai	Thiru. M. Sudharsan Chennai	Thiru. E. Panneer selvam Kancheepuram	Thiru. R.Venkata Subramaniyan Kancheepuram	Thiru. S. Gunasekaran Kancheepuram
1.15.5 Ha	2.29.5 Ha	1.83.5 Ha	3.25.0 Ha	1.43.0 Ha	2.54.0 Ha	1.86.8 Ha

**“B1” Category**

**PREPARED BY**  
**M/s. Geo Exploration and Mining Solution,**

Accredited for Sector 1, 28 & 38 Category ‘A’  
Quality Council of India – National Accreditation Board for Education & Training, New Delhi  
Certificate No : NABET/EIA/1821/RA 0123

## 1. INTRODUCTION –

Rough Stone and Gravel are the major requirements for construction industry. This EIA report is prepared by considering Cumulative load of all proposed & existing quarries of Kundiyanthandalam Rough Stone and Gravel Cluster Quarries consisting of Six Proposed and Six Existing Quarries with total extent of Cluster of 25.37.3 ha in Kundiyanthandalam Village, Vembakkam Taluk, Tiruvannamalai District and Tamil Nadu State, cluster area calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1<sup>st</sup> July 2016.

**TABLE 1.0: ToR OBTAINED PROJECTS**

CODE	Name of the proponent	Terms of Reference (ToR)
P1	Thiru. R.Nethaji	Lr.No.SEIAA-TN.F.No. 6833/SEAC/ToR- 640/2019 Dated: 29.08.2019
P2	Thiru. K. Chandrasekaran	Lr No. SEIAA- TN/F.No.7131/SEAC/ToR- 685/2020 Dated: 31.01.2020
P3	M/s. Bhuvaneswari Blue Metals,	Letter No. SEIAA-TN/F.No.6911/SEAC/ToR- 660/2020 Dated: 23.10.2019
P4	Thiru. A. William	Letter No. SEIAA-TN/F.No.6824/SEAC/ToR- 745/2020 Dated: 10.09.2020 – A. William

This Cummulative EIA / EMP report is prepared to evaluate the environmental impacts of the project in line with the requirements of EIA notification SO 1533(E) dated 14.9.2006 and amendments made thereof

### Project Identification:-

#### Identification of Project

**TABLE 1.2: PROPOSED PROJECTS IN THE CLUSTER**

Description	P1	P2	P3	P4	P5*
Name of the Project	Thiru. R. Nethaji, Rough Stone & Gravel Quarry	Thiru. K.Chandrasekaran Rough Stone & Gravel Quarry	M/s. Bhuvaneswari Blue Metals Rough stone and Gravel quarry	Thiru. A. William, Rough Stone & Gravel Quarry	Thiru . T.Bharath Rough stone and Gravel quarry
S.F. No.	176/1A, 1B, 1C, 2A, 2B, 3A, 3B, 3C, 3D, 3E, 3F,3G & 176/4B	163/1A, 163/1B, 163/2, 163/3, 163/4, 163/7, 163/8A, 163/9, 163/10A, 163/10B & 163/11	181/1I1, 1I2, 1J1, 1J2, 1L1, 1L2, 1M1, 1M2,1N1, 1N2, 101, 102, 103, 104, 1P, 1Q1,1Q2, 1Q3	159, 160, 164/2 (P)	179/1, 2, 3, 180/3F, 3G, 4A, 4B, 4C, 4F
Extent	2.45.0 ha	1.97.5 Ha	2.05.5 Ha	2.88.0 ha	1.64.0 ha
Village Taluk and District	Kundiyanthandalam Village, Vembakkam Taluk and Tiruvannamalai District				

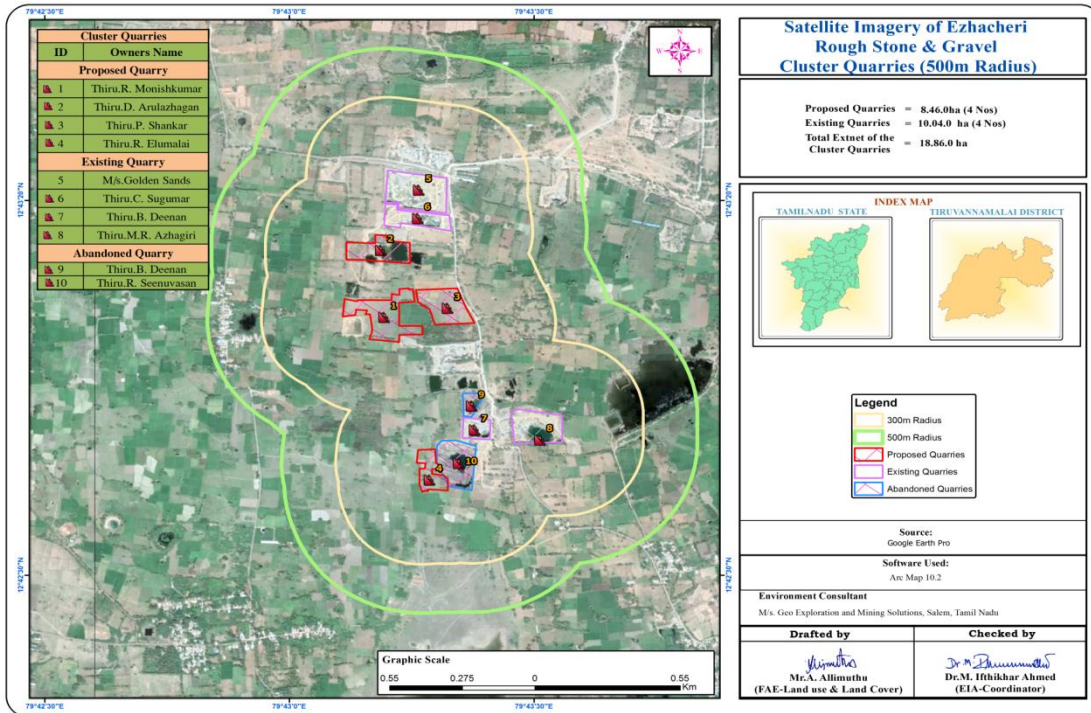
\*File process in Department of Geology and Mining, Tiruvannamalai

Identification of Project Proponent			
TABLE 1.3 DETAILS OF PROJECT PROPONENT			
Description	P1	P2	P3
<b>Name and address of the Project proponents</b>	R.Nethaji, S/o. R.Ramdoss, No.79,Jjain Road, Arapakkam, Walajabad Taluk, Kancheepuram – 631 609 Cell : 9791008145	K.Chandarasekaran, No.301, Mamandur Village, Vembakkam Cell: 8248412658	M/s. Bhuvaneswari Blue Metals, No. 37 B Ground Floor, Vembuliamman Koil Street, Palavanthangal, Chennai – 600 114 Cell : 9677155166 Email: bhuvaneswaribluemetals@2@gmail.com
<b>Status</b>	Individual	Individual	Partnership firm
Description	P4	P5	
<b>Name and address of the Project proponents</b>	Thiru. A.William, No.139, 4 <sup>th</sup> Main Road, Lakshmi Nagar Extension, Chennai 116 Cell : 9444505599	Thiru. T.Bharath S/o. Thiyagarajan, No.1/79, Jain Street, Arapakkam Village, Kancheipuram Taluk Cell: 88384 18524	
<b>Status</b>	Individual	Individual	
Source: Approved Mining Plan			
<b>2. PROJECT DESCRIPTION –</b>			
<b>Project profile and Salient Features</b>			
<b>TABLE 1.4: SALIENT FEATURES OF THE PROPOSED PROJECTS IN CLUSTER</b>			
SALIENT FEATURES OF PROPOSAL “P1”			
Name of the Mine	Thiru. R. Nethaji Rough Stone & Gravel Quarry		
Geological Resources	Rough Stone		Gravel
	13,26,400 m <sup>3</sup>		-
Mineable Reserves	Rough Stone		Gravel
	4,96,965 m <sup>3</sup>		40,610 m <sup>3</sup>
Mining Plan Period / Lease Period	5 Years		
Ultimate Pit Dimension	Pit I	138 m (L)	132 m (W)   22 m (D)
Toposheet No	57-P/10		
Latitude between	12°43'52.00"N to 12°43'57.88"N		
Longitude between	79°43'16.02"E to 79°43'23.25"E		
Highest Elevation	77 m AMSL		
Machinery proposed	Jack Hammer		4 Nos
	Compressor		1 No
	Hydraulic Excavator		1 No
	Tippers		2 Nos
Blasting	Usage of Slurry Explosive with MSD detonators		
Manpower Deployment	16 Nos		
Total Project Cost	Land Cost		Rs 15, 25,000/-
	Machinery Cost & Others		Rs 20, 00,000/-
	EMP Cost		Rs 6, 40,000/-
	Total		Rs 41, 65,000/-

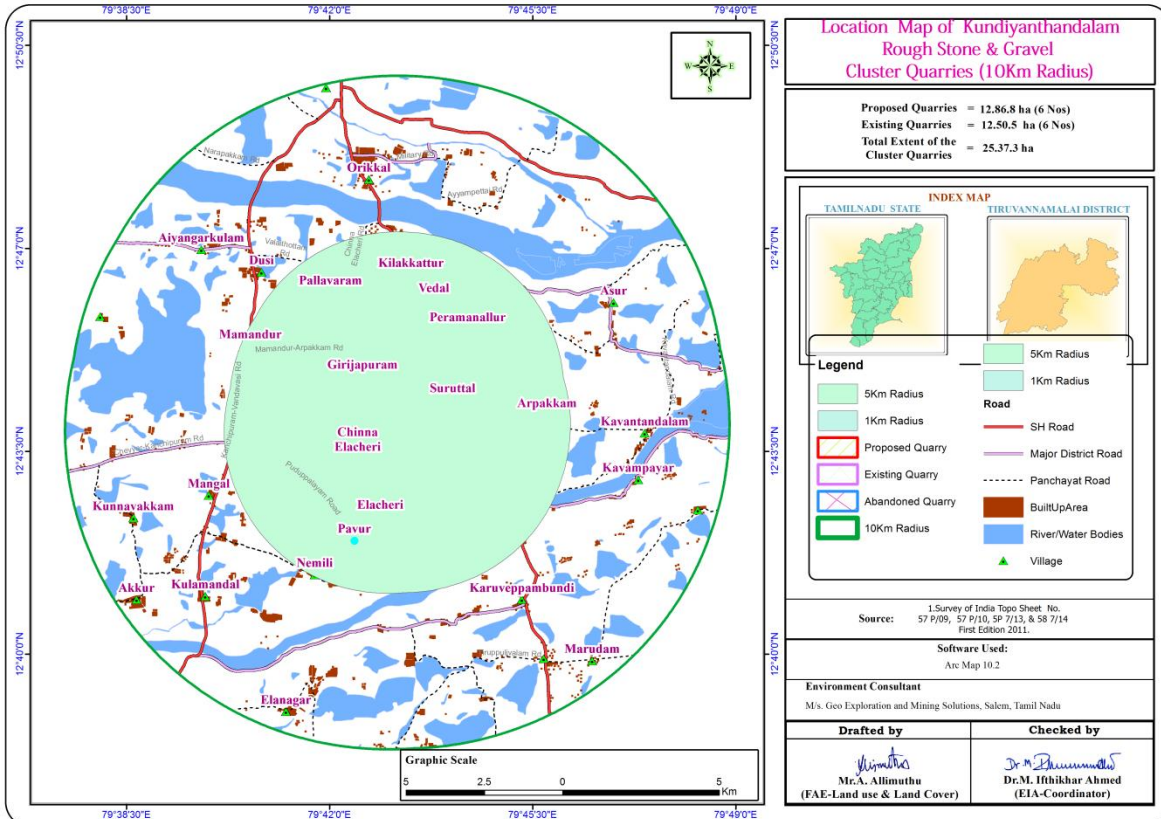
<b>SALIENT FEATURES OF PROPOSAL "P2"</b>		
Name of the Mine	Thiru. K.Chandrasekaran Rough Stone & Gravel Quarry	
Land Type	Patta Land	
S.F. Nos	163/1A, 163/1B, 163/2, 163/3, 163/4, 163/7, 163/8A, 163/9, 163/10A, 163/10B & 163/11	
Village	Kundiyanthandalam Village	
Extent	1.97.5 ha	
Geological Reserves	Rough Stone	Gravel
	7,66,160 m <sup>3</sup>	57,462 m <sup>3</sup>
Mineable Reserves	Rough Stone	Gravel
	1,54,025 m <sup>3</sup>	31,899 m <sup>3</sup>
Mining Plan Period / Lease Period	5 Years	
Ultimate Pit Dimension	Pit – I 127 m (L) * 105 m (W) * 43 m (D)	
Toposheet No	57 P/10	
Latitude	12°43'59.73"N 12°44'06.66"N	
Longitude	79°43'01.36"E 79°43'06.10"E	
Highest Elevation	97m AMSL	
Machinery proposed	Jack Hammer	8
	Compressor	2
	Hydraulic Excavator	1
	Tipper	3
Blasting	Usage of Slurry Explosive with MSD detonators	
Manpower Deployment	29 Nos	
Total Project Cost	Project Cost	Rs. 28, 86,825/-
	EMP Cost	Rs. 3,80,000/-
	Total	Rs. 32,66,825/-
<b>SALIENT FEATURES OF PROPOSAL "P3"</b>		
Name of the Mine	<b>M/s. Bhuvanewari Blue Metals</b>	
Land Type	Patta Land	
S.F. No.	181/1I1, 1I2, 1J1, 1J2, 1L1, 1L2, 1M1, 1M2, 1N1, 1N2, 1O1, 1O2, 1O3, 1O4, 1P, 1Q1, 1Q2, 1Q3	
Village	Kundiyanthandalam Village	
Extent	2.05.5 ha	
Geological Reserves	Rough Stone	Gravel
	7,66,840 m <sup>3</sup>	40,360 m <sup>3</sup>
Mineable Reserves	Rough Stone	Gravel
	3,02,309 m <sup>3</sup>	30,956m <sup>3</sup>
Mining Plan Period / Lease Period	5 Years	
Ultimate Pit Dimension	100 m (L) * 112 m (W) * 40 m (D)	
Toposheet No	57 P/10	
Latitude	12°43'48.1"N to 12°43'53.6"N	
Longitude	79°43'02.02"E to 79°43'08.09"E	
Machinery proposed	Jack Hammer	4 Nos
	Compressor	1 No
	Hydraulic Excavator	1 No
	Tipper	5 Nos
Blasting	Usage of Slurry Explosive with MSD detonators	
Manpower Deployment	15Nos	
Total Project Cost	Rs. 39, 80,250/-	

<b>SALIENT FEATURES OF PROPOSAL "P4"</b>		
Name of the Mine	<b>Thiru. A. William Rough Stone &amp; Gravel Quarry</b>	
Land Type	Patta Land	
S.F. No.	159, 160,164/2 Part	
Village	Kundiyanthandalam Village	
Extent	2.88.0 ha	
Geological Reserves	Rough Stone	Gravel
	6,92,200 m <sup>3</sup>	83,064m <sup>3</sup>
Mineable Reserves	Rough Stone	Gravel
	85,250 m <sup>3</sup>	28,686 m <sup>3</sup>
Proposal for five year plan period	Rough Stone	Gravel
	85,250 m <sup>3</sup>	28,686 m <sup>3</sup>
Mining Plan Period / Lease Period	5 Years	
Ultimate Pit Dimension	208 m (L) * 57 m (W) * 28 m (D)	
Toposheet No	57 P/10	
Latitude	12°44'06.24"N 12°44'21.05"N	
Longitude	79°43'01.47"E 79°43'05.11"E	
Water Level	57m – 60m bgl	
Machinery	Jack Hammer	2
	Compressor	1
	Hydraulic Excavator	1
	Tippers	1
Blasting	Usage of Slurry Explosive with MSD detonators	
Manpower Deployment	18 Nos	
Total Project Cost	Project Cost	Rs. 32, 30,720/-
	EMP Cost	Rs. 3,80,000/-
	Total	Rs. 36,10,720/-

**FIGURE 1.1: SATELLITE IMAGERY CLUSTER QUARRIES**



**FIGURE 1.2: IMAGE SHOWING SURFACE FEATURES AROUND 10 KM RADIUS FROM CLUSTER QUARRIES**



ENVIRONMENTAL SETTINGS		
1	Nearest Railway Station	Kancheepuram Railway Station – 11.5 km - North
2	Nearest Airport	Chennai Airport – 56 km – North East
3	Interstate boundary	Andhra Pradesh Interstate boundary – 56 km – North
4	Coastal zone	Bay of Bengal – 53 km –East
5	Reserved Forest	Nil within 10km
6	Wildlife Sanctuary	Pulicat lake Wildlife sanctuary – 99 km - NE
7	Notified Archaeologically important places, Monuments	Nil within 10km radius
8	Local Places of Historical and Tourism Interest	Nil within 10km radius
9	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
10	Defense installation	Nil within 10km radius
11	Seismic zone	Zone – II (Least Active)



### 3. DESCRIPTION OF THE ENVIRONMENT –

Baseline data was generated for various environmental parameters including Air, Water (surface and groundwater), Land and Soil, Ecology and Socio-economic status to determine quality of the prevailing environmental settings. The Base Line Study was conducted during post-monsoon (October - December) season in 2019.

#### 3.1 Land Environment

##### Core zone:

It is a dry barren land and agricultural activities are carried out by utilizing well water around the area (lift irrigation-seasonal vegetation is mostly practiced).

Table 1.5 Land use pattern of the study area

Sl.No	Classification	Area In Ha	Area in %
1	Urban	876.07	2.72
2	Rural	608.80	1.89
3	Mining	500.57	1.55
4	Agricultural Plantation	793.03	2.46
5	Crop Land	21654.23	67.18
6	Barren Rocky	92.39	0.29
7	Deciduos	261.79	0.81
8	Scrub Forest	22.90	0.07
9	Scrub Land	266.14	0.83
10	Salt Affected Land	115.74	0.36
11	Rivers Stream Canals	1954.72	6.06
12	Water Bodies	5086.62	15.78
<b>Total</b>		<b>32233.00</b>	<b>100.00</b>

##### Buffer zone

10km radius from the periphery of the cluster area is taken as buffer zone, Land use refers to “men activity and the various use which are carried on land.” Land Cover refers to “natural vegetation, water bodies, rock/ soil, artificial cover and others resulting due to land transformation.”

Majority of the land covered in the study area is Agriculture Land – 69.64%, barren rocky – 0.29%, Mining Area – 0.0077% from this Total Mining area the project area covers 1.55%. Existing land use pattern of the project area is Dry Barren Land, own patta Land, No Forest Land is involved.



### **3.2 Soil Environment**

The major part of the district is covered by black cotton soil. Loamy soil, Sandy loam and Sandy clay are the soil types found in the district.

Five soil samples were collected, one in core zone and another four samples collected in the buffer zone. pH ranges from 7.88 to 8.24 and found to be strongly alkaline in nature. The soils collected from different location in the study area are Clay loam in texture. Water holding capacity was found between 33.9 - 52 %.

The soils with low bulk density have favorable physical conditions whereas those with high bulk density exhibit poor physical conditions for agriculture crops. The bulk density of the soil in the study area ranged between 1.03 – 1.33 g/cc. Organic carbon and available nitrogen shows good trend and is suitable for plantation.

### **3.3 WATER ENVIRONMENT –**

The assessment of present status of water quality within the study area was conducted by collecting water from ground & surface water sources during the period of October - December.

There is no perennial source of surface water body in the core zone, Analysis of different Samples of ground water shows that all parameter are well within prescribed limit.

The water table in the area is 55m below the ground level, observed from the nearby borewells and geophysical resistivity survey. The proposed depth is well above the ground water table. Hence the quarrying operation will not intersect the ground water table

#### **Groundwater –**

- The pH was varying from 7.12 to 7.62.
- The TDS values is ranging from 599 - 875 mg/l
- Hardness values is ranging from 263- 397.1 mg/l

#### **Surface Water–**

- The pH was varying from 7.11 to 7.71.
- The TDS values is ranging from 488 to 679 mg/l
- Hardness values is ranging from 246.8 to 375.7mg/l

Analysis of different Samples of ground water shows that all parameter are well within prescribed limit.

### 3.4 Air Environment – Meteorology (Climate) –

The annual mean minimum and maximum temperatures are 23 and 42° C respectively. The relative humidity is on an average between 78 to 93% in the mornings.

#### Air quality Monitoring -

Ambient Air quality Stations were selected based on the Predominant downwind direction in respect to the project site. Seven Ambient Air Quality Monitoring (AAQM) Stations were selected by considering the wind rose pattern for pre-monsoon season and the accessibility of the selected sites.

The monitoring was carried out from October - December, 2019 for the parameters such as PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO, O<sub>3</sub>, NH<sub>3</sub>, As, Ni, Pb, Bap & C<sub>6</sub> H<sub>6</sub>. Ambient air quality monitoring was carried out at a frequency of two days per week at each location for three months at 24 hours continuously.

S.No	Parameter	Result in µg/m <sup>3</sup> (98 <sup>th</sup> percentile value)	CPCB Standard
1	PM <sub>10</sub>	61.4	100
2	PM <sub>2.5</sub>	45.2	60
3	SO <sub>2</sub>	11.8	80
4	NO <sub>2</sub>	20.6	80

From the table it can be seen that the existing Ambient Air Quality levels for SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> are within the prescribed CPCB limits.

### **3.5 Noise Environment –**

Noise level monitoring was carried out in 11 location (5 in core zone and 6 in buffer) Minimum and maximum noise levels recorded in core zone during day time were from 43.3 – 50.3 dB (A) Leq and during night time were from 33.4 – 37.6 dB (A) Leq.

Minimum and maximum noise levels recorded in buffer zone during day time were from 39.7 – 45.5 dB (A) Leq and during night time were from 33.2 – 36.1 dB (A) Leq. Thus the noise level for Industrial and Residential area meets the requirements of CPCB.

From the results, it can be seen that the Day equivalents and the Night equivalents were within the Ambient Noise Standards of Industrial / Commercial / Residential Area.

### **3.6 Biological Environment –**

Ecological survey has been carried out to understand baseline ecological status, important floristic elements and fauna structure. There are No Schedule – I Species listed as per The Indian Wildlife (Protection) Act, 1972 or Threatened Species as per IUCN Red List noticed within the Study Area.

### **3.7 Socio Economics –**

The buffer zone encompassing 10 km radius from the periphery of core zone consists of 106 villages within 10km radius from the study area.

The infrastructure and amenities available in the area denotes the economic well being of the region. The study area as a whole possesses an average level of infrastructural facilities. This area lacks higher level of amenities like higher education, health, drinking water and communication network. This area needs more medical facilities as it has not even one maternity and child care center. Though the area is well connected with road transport and communication facilities still more frequent bus service is required.

The socio-economic analysis of the Study Area shows that in terms of education and employment, the area is moderately developed. The overall socio-economic status of the target population is average in terms of literacy, Work Participation Rate etc., More attention and care should be given so that the needs and demand of the population of the study area can be fulfilled.

## **4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES –**

### **4.1 Land Environment:**

In the Opencast Mining method, the major impact is Land Environment. The existing land use pattern of the area is dry barren land, no forest land is involved in this project. After the quarrying activity for the entire period which will have the impacts due to the quarrying activity. After end of the quarry, the pit will be backfilled and utilized for plantation.

There are no major trees found in the project areas at present. No forest land is involved in this project. Due to Rough stone quarrying operation the degradation of land is insignificant, after completion of the quarrying operation the land will be allowed to collect rain water to act as temporary reservoir.

### **4.2 Water Environment**

The proposed depth for the mining operation is well above the water table, there is no intersection of surface water (streams, Canal, Odai etc.,) within the study area.

#### **Mitigation Measures –**

- Peripheral Garland drain with silt trap will be constructed around the project areas to divert the water flow into the natural gradient.
- The silt trap will be cleaned weekly in the monsoon period and monthly once in the non monsoon periods
- Internal garland drains around the quarry pit to prevent the rain water entering into the pit, the rain water will be collected in the lower part of the area and it will be used for afforestation and water sprinkling on haul roads
- Construction of check dams / gully plugs at strategic places to arrest silt wash off from broken up area.
- No toxic chemicals are involved. Domestic sewage will be collected in septic tank with soak pit.

### 4.3 Air Environment–

The air borne particulate matter is the main air pollutant by opencast mining. The quarrying operation will be carried out by adopting mechanized methods which involves Jack Hammer drilling and blasting, excavation, loading and transportation. The pollutants from moving vehicles, residential and commercial activities are the primary sources of air pollution at present.

As per monitoring data, PM10 ranges from 31.2  $\mu\text{g}/\text{m}^3$  to 62.6  $\mu\text{g}/\text{m}^3$ , PM2.5 data ranges from 19.1  $\mu\text{g}/\text{m}^3$  to 45.7  $\mu\text{g}/\text{m}^3$ , SO2 ranges from 5.3  $\mu\text{g}/\text{m}^3$  to 12.4  $\mu\text{g}/\text{m}^3$  and NO2 data ranges from 10.9  $\mu\text{g}/\text{m}^3$  to 21.1  $\mu\text{g}/\text{m}^3$ . The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB.

#### Mitigation Measures –

- Regular water sprinkling on haul roads, blasted heaps, service roads will help in reducing considerable dust pollution
- Use of Sharp drill bits for drilling, optimum charge for blasting
- The Machineries and vehicles will be kept in good condition so that emissions will minimize
- Provision of green belt all along the periphery of the project areas for control of dust
- Provisions of Dust mask to the workers working in high dust prone areas
- Regular health check-up of workers will be carried out, health checkup camps will be conducted in the nearby areas as per the Factories Act
- Ambient Air Quality Monitoring will be conducted on regular basis to assess the quality of ambient air.

### 4.4 Noise Environment

Noise pollution is one of the impact due to quarrying operation such as Drilling, Blasting. Loading and during movement of vehicles.

Ambient noise levels were measured at 11 (eleven) locations around the proposed quarry lease area. Noise levels recorded in core zone during day time were from 43.3 – 50.3 dB (A) Leq and during night time were from 34.4 – 37.6 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 39.7 – 45.5 dB (A) Leq and during night time were from 33.2 – 36.1 dB (A) Leq. Thus, the noise level for Industrial and Residential area meets the requirements of CPCB.

### **Mitigation Measures –**

- Use of personal protective devices i.e., earmuffs and earplugs by workers, who are working in high noise generating areas.
- Limiting time exposure of workers to excessive noise.
- Proper and regular maintenance of vehicles, machinery and other equipment's.
- Speed of trucks entering or leaving the mine will be limited to moderate speed to prevent undue noise from empty vehicles.
- Providing proper noise proof enclosure for the workers separated from the noise source and noise prone equipment
- Provision of Quiet areas, where employees can get relief from workplace noise.
- The development of green belt around the periphery of the mine to attenuate noise.
- Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects.

#### **4.5 Biological Environment**

The impact on biodiversity is minimal as there are no forest, wild life sanctuaries, and Eco sensitive zone within the radius of 10 KM.

The impact would be due to emission of gaseous pollutant from HEMM. Adequate dust control measures will be taken to control dust emission. Thick Greenbelt development will be carried out in the mine area and haul roads to control the dust emission. Besides the air quality standards for PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> and NO<sub>x</sub> are within the AAQ standards.

#### **4.6 Socio Economic Environment.**

It is proposed to provide employment to about 93 persons for carrying out mining operations and give preference to the local people in providing employment. In addition there will be opportunity for indirect employment to many people in the form of contractual jobs, business opportunities, service facilities etc. the economic status of the local people will be enhanced due to mining project. About 500 numbers of peoples will be get employment opportunities indirectly. Additional facilities such as medical, educational and infrastructural development will also take place under CSR/CER activities.

Considering the socio – economic and sociological impact it is concluded that the economic level and living standard of the people will generally increase.

## **5 ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)**

### **Site Alternatives –**

No alternative site has been proposed as Rough Stone and Gravel occurrence is site specific in nature and the location of the proposed project is restricted to the geology and mineral deposition of the area.

### **Mining Technology alternatives –**

Quarrying operation will be carried out through opencast mechanized method, as it is more economically viable, and preserves the conservation of minerals and environment. Unlike other industries, the project cannot be shifted to other sites.

The mining by opencast method will be highly productive & economical as compared to underground method.

## **6 ENVIRONMENT MONITORING PROGRAM –**

Usually an impact assessment study is carried over short period of time and the data cannot bring out all variations induced by natural or human activities. Hence regular monitoring program of Environmental parameters is essential to take into account the changes in the Environment. The Objective of Monitoring -

- To check or assess the efficiency of the controlling measures;
- To establish a data base for future impact assessment studies.

## **7 ADDITIONAL STUDIES - RISK ASSESSMENT & HAZARD –**

The components associated with risk and hazard in this mining case movement of heavy earth moving machineries and tippers. Measures to reduce and avoid any incidents occurring from the above-mentioned components shall be planned and implemented as soon as the mine starts commissioning; this includes measures to avoid the above discussed risk factors. Proper risk management plan will be proposed to avoid any kind of accident/ disaster.



## **8 PROJECT BENEFITS –**

This Rough Stone and Gravel quarry projects falls in the area of Tiruvannamalai District, Tamil Nadu where scanty agricultural activities are being carried out and the new industries are springing up in the district.

The cluster quarry area is devoid of major industries and agricultural activities. The earning source in the targeted area is limited, most of the people in and around the area depend upon the seasonal agriculture and much of the people migrate to nearby towns where good number of industries and factories are growing up.

Mineral Industries of the state of Tamil Nadu provides employment opportunities for the people of the state as well as in the specific project areas.

- Improvement in physical infrastructure
- Improvement in Social Infrastructure
- Employment Potential
- The Proponents will carry out CSR activities like community awareness program, health camps, Medical aid, family welfare camps etc.,
- A massive plantation will be carry out in the mine area to mitigate the ill-effects of mining and to improve the vicinity and environment of mine and its surrounding area.

## **9 ENVIRONMENTAL COST BENEFIT ANALYSIS.**

Environmental cost benefit analysis is not recommended.

## **10 ENVIRONMENT MANAGEMENT PLAN –**

The Proponents shall consolidate an Environment Monitoring Cell which is responsible for the management and implementation of the environmental control measures. Basically, this department shall supervise the monitoring of environmental pollution levels like Ambient Air quality, Water quality, Soil quality and Noise level by appointing approved external agencies.

Occupational Health and Safety:-

The working condition in the quarry is governed by the enactments of the Director General of Mines Safety (DGMS). Necessary precautions regarding health and safety of workers will be strictly followed as per the guidelines of the Mines Act, sanitary facilities will be provided within the project areas and periodic health check-up will be carried out to all the workers.

**11 CONCLUSION –**

It can be concluded from overall assessment of the impacts, in terms of positive and negative effects on various environmental components, that the mining activities will not have any adverse effect on the surrounding environment.

To mitigate any impacts due to the mining activities, a well-planned EMP and a detailed post project monitoring system is provided for regular monitoring and immediate rectification at site. Due to the mining activities, socio economic conditions in and around the project site will be improved substantially. Hence, the Prior Environmental Clearance shall be granted at the earliest.

