EXECUTIVE SUMMARY

FOR OBTAINING

Environmental Clearance under EIA Notification – 2006
Schedule Sl. No. 1 (a) (i): Mining Project

"B1" CATEGORY (Cluster) – MINOR MINERAL – CLUSTER – PATTA LAND - FRESH QUARRY

THIRU.K. SUNDRAMOORTHY ROUGH STONE AND GRAVEL QUARRY

Cluster Extent – 11.50.08Ha

Lease Period/Mining Plan Period – 10 Years

Project Proponent

Thiru. K. Sundramoorthy,

S/o. Kanniyappan,
No.1/31, Lingamedu street, Manamai village,
Thirukazhukkundram Taluk,
Chengalpattu District.

PROJECT LOCATION	PROPOSED PRODUCTION
Block I- S.F. No **88/1, 88/2A and 88/4A** **Extent: 1.63.98 Ha** (Mining area) **Block-II S.F No:** **75/6, 75/7,75/8,75/9,85/1, 2** **Extent: 0.72.0 Ha** (Stocking the mined material or dumping the waste/reject material or for parking vehicles or establishing mine office) **Nelvaipalayam Village,** **Cheyyur Taluk, Chengalpattu District.**	**As per ToR obtained** **For First Five Year Production:** 66,025m^3 of Rough stone, 18,482m^3 of Gravel **For Second Five Year Production:** 24,955m^3 of Rough stone Peak Production = 13,705m^3 of Rough stone and 6,346 m^3 Gravel Proposed Depth = **22m Bgl.**

ToR obtained vide

Lr No. SEIAA-TN/F.No.10479/SEAC/ToR-1654/2024 Dated: 08.02.2024

Environmental Consultant

GEO EXPLORATION AND MINING SOLUTIONS

Old No. 260-B, New No. 17,
Advaitha Ashram Road, Alagapuram,
Salem – 636 004, Tamil Nadu, India

Accredited for sector 1 Cat 'A', sector 31 & 38 Cat 'B'

Certificate No : NABET/EIA/2225/RA 0276

Phone: 0427-2431989,
Email: infogeoexploration@gmail.com
Web: www.gemssalem.com

Laboratory

EHS 360 LABS PRIVATE LIMITED

(Approved by ISO/IEC 17025:2017)
10/2, Ground Floor, 50th Street, 7th Avenue, Ashok Nagar,
Chennai – 600 083, Tamil Nadu, India.

Baseline Monitoring Period

March – May 2024

JULY 2024

1. INTRODUCTION

Project History: -

The project proponent **Thiru. K. Sundramoorthy** has applied for Tender cum Auction for Patta land and was successfully awarded to the Project Proponent for Rough stone and Gravel quarry over an extent of Block-1 S.F.No 88/1, 88/2A and 88/4A over an extent of 1.63.98Ha (Mining area) and Block-II S.F.No 75/6, 75/7,75/8,75/9,85/1,2 over an extent of 0.72.0 Ha (Green Belt & Dump), Nelvaipalayam Village, Cheyyur Taluk, Chengalpattu District.

- Proponent applied for Rough stone and Gravel quarry letter on 05.06.2023
- Precise area communication letter was issued by the Deputy Director, Department of Geology and Mining Chengalpattu vide RC.No. 0185/2023/Mines Dated 22.09.2023
- The Mining plan has been prepared by the Qualified person and got approval by the Assistant Director, Department of Geology and Mining Chengalpattu vide Letter Rc. No. 185/Mines/2023 Dated 25.09.2023.
- The Mining plan has been approved for the quantity of 90,980 m3 of rough stone and Gravel 18,482 m3 of up to the depth of 22m Bgl for first five years and Ten years.

As per the EIA Notification, 2006 and subsequent amendments and OM The proposal falls in the B1 Category (Cluster quarries - 2 proposal and 2 Existing quarries forming Cluster Category {Total Extent of the Cluster is 11.50.08 Ha}- Cluster area calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016).

- Proponent applied for Terms of Reference vide Proposal No. SIA/TN/MIN/448716/2023 Dated 13.10.2023 and the ToR was Granted vide Lr No. SEIAA-TN/F.No.10479/SEAC/ToR-1654/2024 Dated: 08.02.2024

As per Obtained ToR the depth was restricted up to 22m Bgl for first five years and 10 years and Revised Reserves for First Five Year Production is 66,025 m3 of rough stone and Second Five Year Production 24,955 m3 for ten years and 18,482m3 of gravel for first three years in the entire area.

The proponent has obtained necessary statutory clearances from the Department of Geology and Mining, Chengalpattu District, Tamil Nadu (Statutory Clearance Documents are enclosed along with Mining plan as Annexure No III). The total Extent of the quarries within the radius of 500m from this proposal is > 5Ha, hence the proposal falls under "B1" Category project as per the EIA notification, 2006 (As amended timely).

Proponent applied for Environmental Clearance to SEIAA, Tamil Nadu and obtained

CODE	Name of the proponent	Extent (Ha)	Terms of Reference (ToR)
P1	**Thiru. K. Sundramoorthy**	1.63.98	**Lr. No. SEIAA-TN/F.No.10479/SEAC/ToR-1654/2024 Dated: 08.02.2024**

for carrying out EIA and EMP studies for the rough stone and gravel quarry.

To carry out the EIA studies and to prepare EIA/ EMP studies the proposed & existing quarries of Rough Stone and Gravel Cluster Quarries have engaged a consultant M/s. Geo Exploration and Mining Solutions, Salem, Tamil Nadu. The Baseline Monitoring study has been carried out during Summer season (March 2024 to May2024) considering the provisions of MoEF & CC Office Memorandum Dated: 29.08.2017 and MoEF & CC Notification S.O. 996 (E) Dated: 10.04.2015.

"Draft EIA report prepared on the basis of ToR Issued for carrying out public hearing for the grant of Environmental Clearance from SEIAA, Tamil Nadu"

1.1 DETAILS OF PROJECT PROPONENT

Name of the Project Proponent	Thiru. K. Sundramoorthy Rough stone and Gravel Quarry
Address	S/o. Kanniyappan, No.1/31, Lingamedu Street, Manamai Village, Thirukazhukkundram Taluk, Chengalpattu District, Tamil Nadu State – 603 102
Mobile	+91 94432 43299
Email	ashokconstruction@yahoo.co.in
Status	Individual

The project proponent is an individual.

1.2 QUARRY DETAILS WITHIN 500 M RADIUS

PROPOSED QUARRIES					
CODE	**Name of the Owner**	**Mineral**	**S.F. Nos**	**Extent in Ha**	**Status**
P1	**Thiru. K. Sundramoorthy**	Rough stone and Gravel	88/1, 2A and 88/4A **(1.63.98 ha)** 75/6, 75/7,75/8, 75/9,85/1, 2 **(0.72.0 ha)**	**2.35.98**	Under processing Present application (ToR obtained Lr No.SEIAA-TN/F.No.10479/SEAC/ToR-1654/2024 Dated: 08.02.2024)
P2	**M/s.Naraj Blue Metals P Ltd.**	Rough stone and Gravel	264/2(P),264/3A(P),267/1B,267/2(P),267/3.	4.32.10	**EC Granted**
			TOTAL EXTENT	**6.68.08ha**	
EXISTING QUARRIES					
CODE	**Name of the Owner**	**Mineral**	**S.F. Nos**	**Extent in Ha**	**Status**
E-1	**Thiru.S. Balaji**	Rough stone and Gravel	**264/1A(P)**	**1.62.0**	**Lease Period 30.09.2020 – 29.09.2025**
E-2	**Tvl.Uma Blue Metals**	Rough stone and Gravel	**270/1, 2, 272/4, 5A**	**3.20.0**	**Lease Period 20.07.2023 – 19.07.2025 (18 months)**
			TOTAL EXTENT	**4.82.0**	
ABANDONED QUARRIES					
A-1	Tmt.S. Manonmani	Rough stone and Gravel	264/1A	2.83.50	17.10.2009 – 16.10.2014

A-2	Thiru.D. Venunathan	Rough stone and Gravel	272/5A	0.88.0	05.09.2013-04.09.2018
A-3	Thiru.R. Ranganathan	Rough stone and Gravel	268/1B1B	1.24.50	06.02.2014-05.02.2019
A-4	Tmt.S. Manonmani	Rough stone and Gravel	266/3	1.21.0	16.03.2015-15.03.2020
	TOTAL EXTENT			**6.17.0**	
	TOTAL CLUSTER EXTENT			**11.50.08 Ha**	

TABLE 1.3 SALIENT FEATURES OF THE PROPOSAL

Name of the Project	Thiru. K. Sundramoorthy Rough stone and Gravel Quarry	
S.F. No.	88/1, 88/2A and 88/4A	
Extent	2.35.98 ha (1.63.98 ha is Mining Area & 0.72 is Dump and Green belt Area)	
Village Taluk and District	Nelvaipalayam Village, Cheyyur Taluk, Chengalpattu District, Tamil Nadu State.	
Land Type	Patta Land	
Existing quarry operation	Nil, it is a Fresh area	
Toposheet No	66 D/03	
Latitude between	12°25'56.6724"N to 12°26'02.8961"N	
Longitude between	80°02'53.5538"E to 80°03'03.8121"E	
Elevation of the area	100m AMSL	
Water Level	49m bgl	
Lease period	10 Years	
Mining Plan period	10 years	
Proposed Depth for current mining plan	22m bgl	
Geological Resources	**Rough stone**	**Gravel in m^3**
	3,27,960	32,796
Mineable Reserves	90,980	18,482
For First Five Year Production	66,025	18,482
For Second Five Year Production	24,955	-
Peak Production	13,705	6,346
Ultimate Pit Dimension	Block-1: 99m (L) x 147m (W) x 22m(D) Bgl	
Method of Mining	Opencast Mechanized Mining Method involving small drilling and Controlled blasting using Slurry Explosives	
Topography	The lease applied area is exhibiting plain terrain. The area has gentle sloping towards Northeast side and altitude of the area is 100m above from Mean Sea Level. The area is covered by 2m thickness of Gravel and followed by Massive Charnockite which is clearly inferred from the outcrops.	
Machinery proposed	Jack Hammer	2Nos
	Compressor	1 No
	Excavator with Bucket and Rock Breaker	1 No
	Tipper	2 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough stone and Gravel.	

Proposed Manpower Deployment	20 Nos	
A. Operational Cost	Rs. 64,77,000/-	
B. EMP cost	Rs. 7,60,000/-	
Total Project cost	Rs.72,37,000/-	
CER Cost	Rs. 5,00,000/-	
Nearby Water Bodies	Tank	370m SE
	Tank	800m South
	Tank	810m SW
	Tank	850m North
	Tank	1km NE
	Canal	4.5km East
	Pallavankulam Lake	5.4km North
	odiyur Lake	6.8km South
	Palar River	7.3km NE
Greenbelt Development Plan	Proposed to plant 1200 Nos of trees considering 500 Nos of trees/ Ha criteria The plantation will be developed around the project site and nearby village roads	
Proposed Water Requirement	1.7 KLD	
Nearest Habitation	990m-SW	
Nearest Reserve Forest	Polavar Puriyambakkam II R.F – 14.03km (Source - TNGIS)	
Nearest Wild Life Sanctuary	Vedanthangal Birds Sanctuary -5km Belt = 19 Km - NW	

Source Approved Mining Plan

1.3 STATUTORY DETAILS

Project – P1 – Thiru. K. Sundramoorthy

- Proponent applied for Rough stone and Gravel quarry letter on 05.06.2023
- Precise area communication letter was issued by the Deputy Director, Department of Geology and Mining Chengalpattu vide RC.No. 0185/2023/Mines Dated 22.09.2023
- The Mining plan has been prepared by the Qualified person and got approval by the Assistant Director, Department of Geology and Mining Chengalpattu vide Letter Rc. No. 185/Mines/2023 Dated 25.09.2023
- The proposed project falls under "B1" Category as per Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018
- Proponent applied for ToR for Environmental Clearance vide online Proposal No. SIA/TN/MIN/448716/2023 Dated 13.10.2023.
- The proposal was placed in 436th SEAC meeting held on 29.12.2023 and the committee recommended for issue of ToR.
- The proposal was considered in 693rd SEIAA meeting held on 08.02.2024 and issued ToR vide Lr No.SEIAA-TN/F.No.10479/SEAC/ToR-1654/2024 Dated: 08.02.2024

2. PROJECT DESCRIPTION

The proposed project is site specific and there is no additional area required for this project. There is no effluent generation/discharge from the proposed quarries. Rough Stone is proposed to be excavated by opencast mechanized method involving splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and blasting, hydraulic excavators are used for loading the Rough Stone from pithead to the needy crushers and rock breakers to avoid secondary blasting.

2.1 SITE CONNECTIVITY TO THE PROJECT AREA

Nearest Roadway	Chennai – Puduchery (NH-332A) – 6.0km-E Cheyyur – Melmaruvathur (SH-115) – 10.0km-SW
Nearest Village	Akkinampattu – 1.0 km- SW
Nearest Town	Cheyyur – 10.0km – SW
Nearest Railway Station	Maduranthagam – 18.5km-NW
Nearest Airport	Chennai – 62.0km – NE
Seaport	Ennore Port–92km – NE

2.2 LAND USE PATTERN OF THE PROPOSED PROJECT

Description	Present area (Ha)	Area required during the first five year (Ha)	Area at the end of lease period (Ha)
Quarrying Pit	Nil	0.98.80	0.98.80
Infrastructure	Nil	0.02.00	0.02.00
Roads	Nil	0.02.00	0.02.00
Green Belt	Nil	0.29.00	0.58.60
Unutilized Area	2.35.98	1.04.18	0.74.58
Grand Total	**2.35.98**	**2.35.98**	**2.35.98**

2.3 OPERATIONAL DETAILS OF LEASE APPLIED AREA

PARTICULARS	DETAILS	
	Rough stone	Gravel in m^3
Geological Resources	3,27,960	32,796
Mineable Reserves	90,980	18,482
Production for first five-year plan period	66,025	18,482
Production for Second five-year plan period	24,955	-
Peak Production	13,705	6,346
Mining Plan Period / Lease Applied Period	10 Years	
Number of Working Days	300 Days	
Production per day (Period of ten years)	46	21
No of Lorry loads ($12m^3$ per load)	4	2
Proposed Depth of Mining as per ToR	22m bgl	

FIGURE – 1: GOOGLE IMAGE SHOWING PROJECT AREA

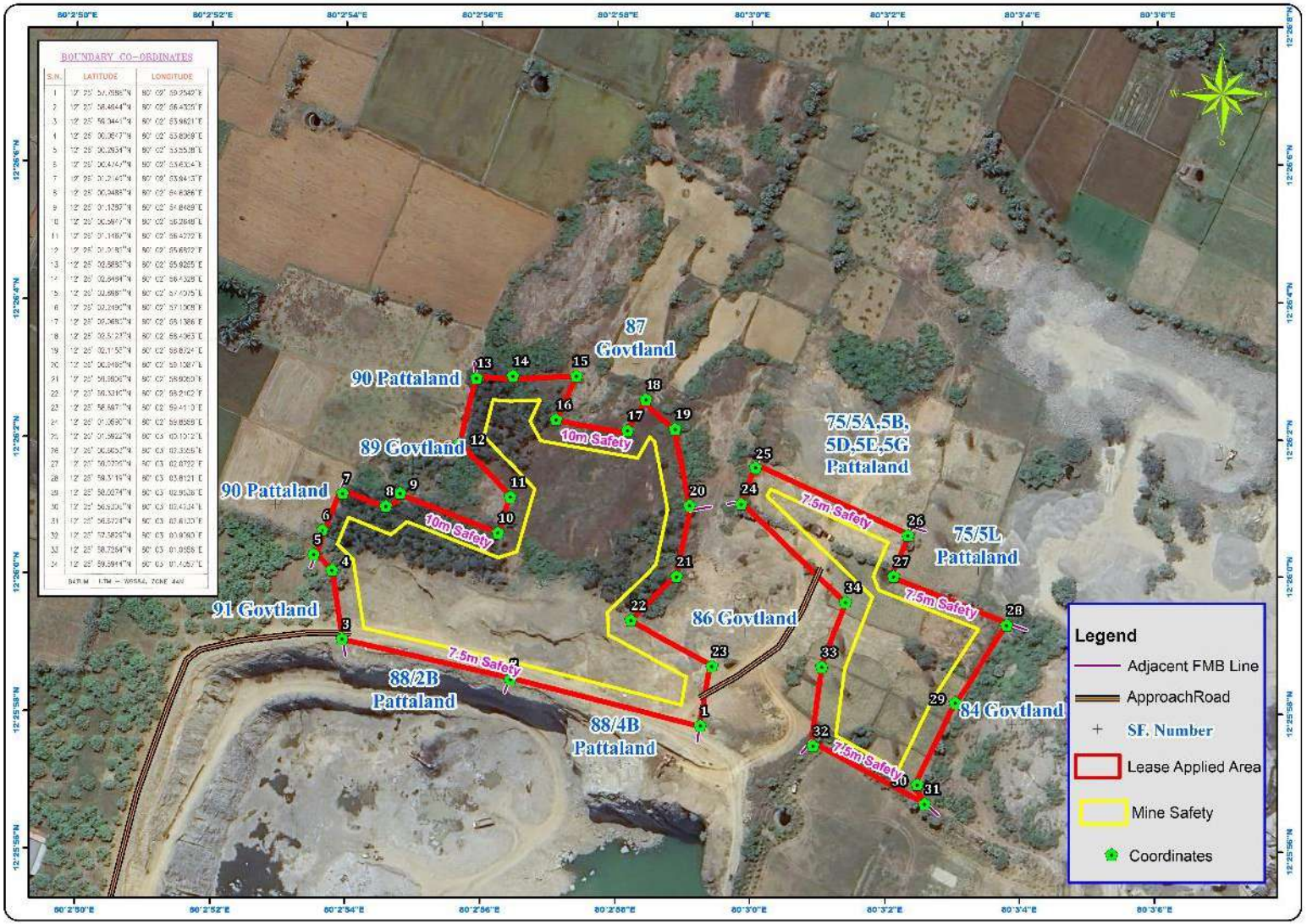


FIGURE – 2: GOOGLE IMAGE SHOWING CLUSTER (500 m QUARRIES)

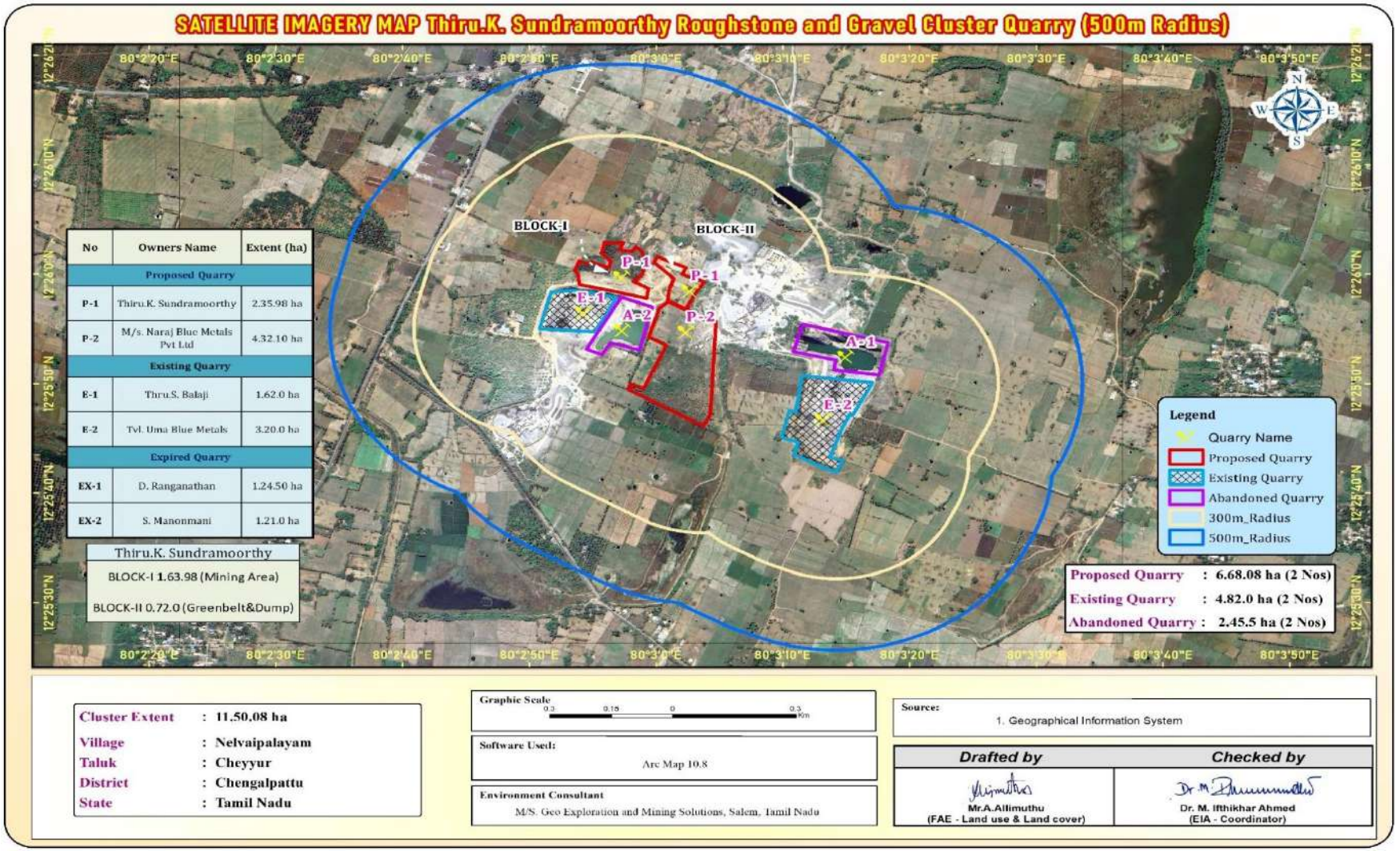


FIGURE – 3: TOPOSHEET MAP COVERING 10 KM RADIUS

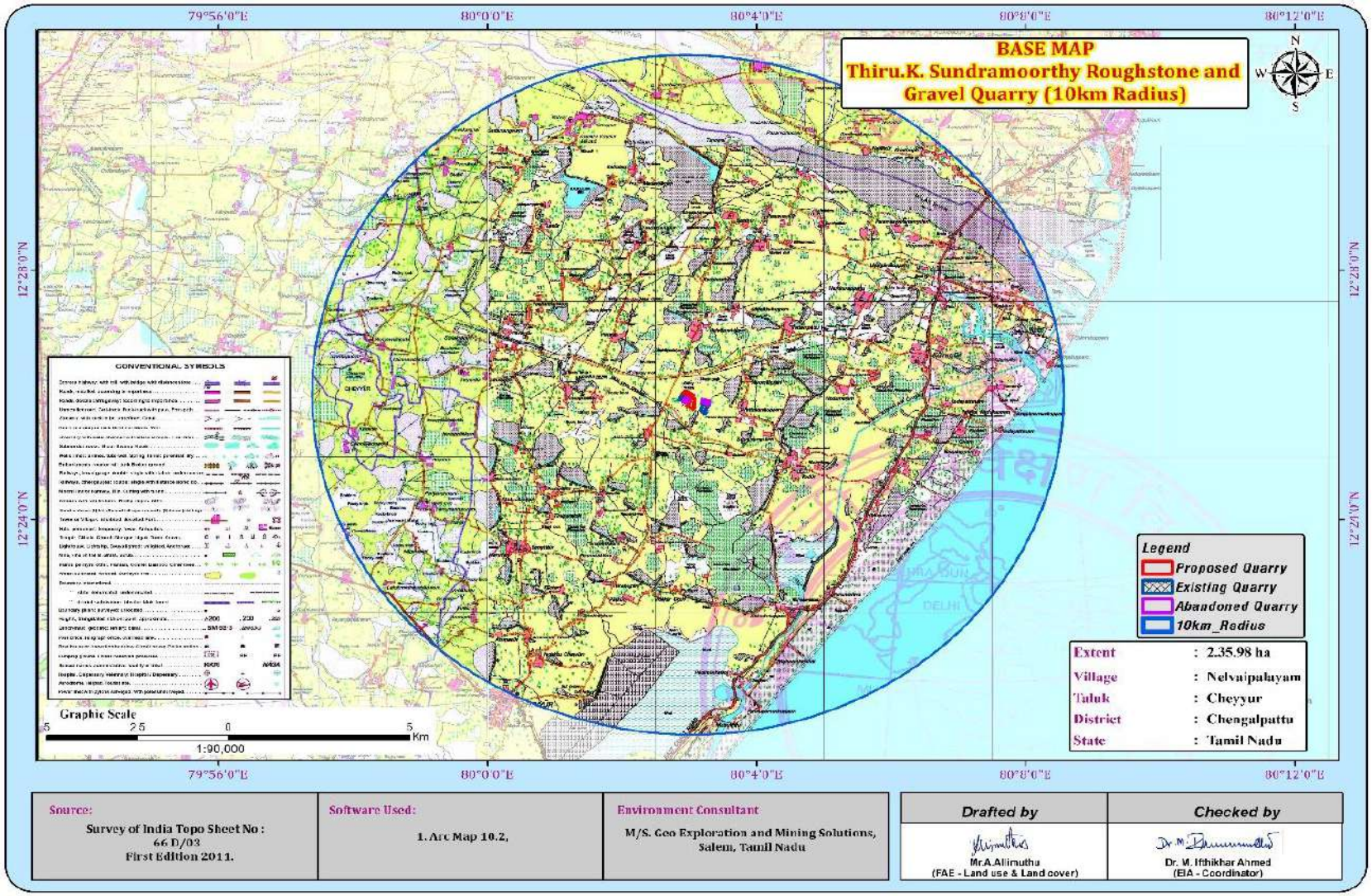
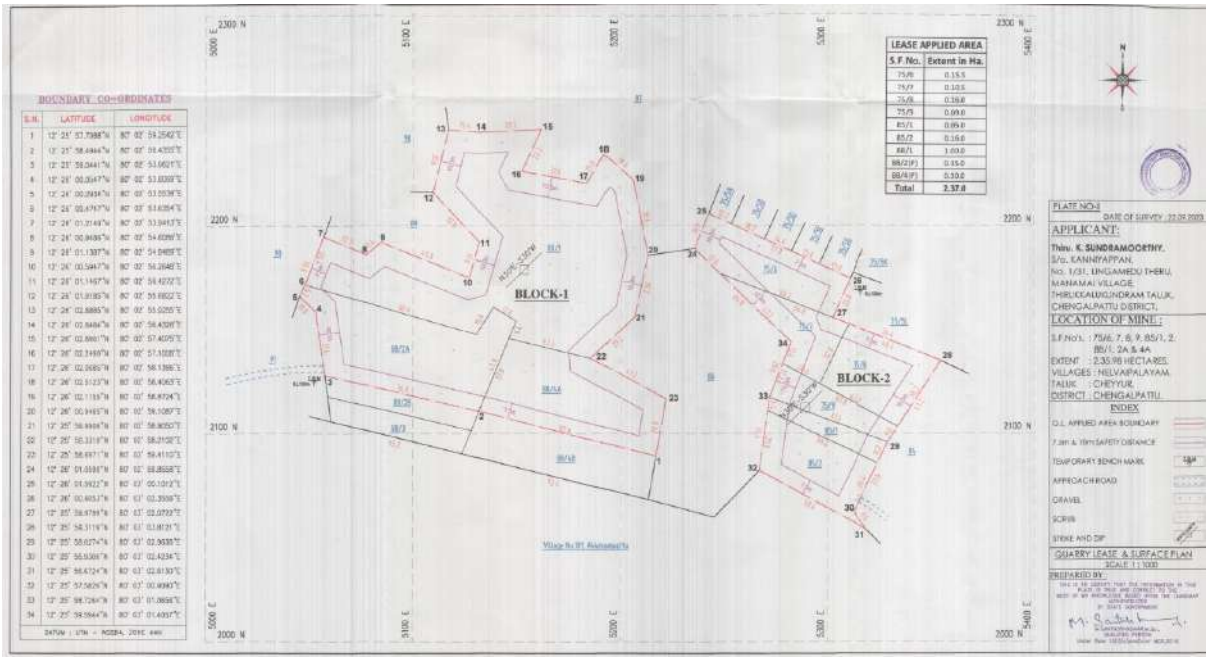


FIGURE – 4: QUARRY LEASE PLAN & SURFACE PLAN

P1- Thiru. K. Sundramoorthy



2.4 METHOD OF MINING

Opencast Mechanized Mining Method is being proposed by formation of 5.0-meter height bench with a bench width not less than the bench height. However, as far as the quarrying of Rough Stone is concerned, observance of the provisions of Regulation 106 (2) (b) as above is seldom possible due to various inherent petro genetic factors coupled with mining difficulties. Hence it is proposed to obtain relaxation to the provisions of the above regulation from the Director of Mines Safety for which necessary provision is available with the Regulation 106 (2) (b) of MMR-1961, under Mine Act – 1952.

The top layer of Topsoil will be Excavate directly by Hydraulic Excavators and preserved all along the safety barrier to facilitate greenbelt development during Mine Closure Stage. The Rough Stone is a batholith formation and the splitting of rock mass of considerable volume from the parent rock mass will be carried out by deploying jackhammer drilling and Slurry Explosives will be used for blasting. Hydraulic Excavators attached with Rock Breakers unit will be deployed for breaking large boulders to required fragmented sizes to avoid secondary blasting and hydraulic excavators attached with bucket unit will be deployed for loading the Rough Stone into the tippers and then the stone is transported from pithead to the nearby crushers.

2.5 PROPOSED MACHINERY DEPLOYMENT

S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammers	2	1.2m to 2.0m	Compressed air
2	Compressor	1	400psi	Diesel Drive
3	Excavator with Bucket and Rock Breaker	1	300 HP	Diesel Drive
4	Tippers	1	20 Tonnes	Diesel Drive

2.6 CONCEPTUAL MINING PLAN/ FINAL MINE CLOSURE PLAN

The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc.,

2.7 ULTIMATE PIT DIMENSION

Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max) Bgl
Block-I	99	147	22

3.0 DESCRIPTION OF THE ENVIRONMENT

The baseline status of the project environment is described section wise for better understanding of the broad-spectrum conditions. The baseline environment quality represents the background environmental scenario of various environmental components such as Land, Water, Air, Noise, Biological and Socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering Mar2024 to May2024 as per CPCB & MoEF & CC guidelines.

3.1 ENVIRONMENT MONITORING ATTRIBUTES

Attribute	Parameters	Frequency of Monitoring	No. of Locations	Protocol
Land-use Land cover	Land-use Pattern within 10 km radius of the study area	Data's from census handbook 2011 and from the satellite imagery	Study Area	Satellite Imagery Primary Survey
*Soil	Physio-Chemical Characteristics	Once during the study period	6 (1 core & 5 buffer zone)	IS 2720 Agriculture Handbook - Indian Council of Agriculture Research, New Delhi
*Water Quality	Physical, Chemical and Bacteriological Parameters	Once during the study period	6 (2 surface water & 4 ground water)	IS 10500& CPCB Standards
Meteorology	Wind Speed Wind Direction Temperature Cloud cover Dry bulb temperature Rainfall	1 Hourly Continuous Mechanical/Automatic Weather Station	1	Site specific primary data& Secondary Data from IMD Station
*Ambient Air Quality	PM10 PM2.5 SO2 NOX Fugitive Dust	24 hourly twice a week (March 2024 – May 2024)	7 (2 core & 5 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
*Noise Levels	Ambient Noise	Hourly observation for 24 Hours per location	8 (2 core & 6 buffer zone)	IS 9989 As per CPCB Guidelines
Ecology	Existing Flora and Fauna	Through field visit during the study period	Study Area	Primary Survey by Quadrate & Transect Study Secondary Data – Forest Working Plan
Socio Economic Aspects	Socio–Economic Characteristics, Population Statistics and Existing Infrastructure in the	Site Visit & Census Handbook, 2011	Study Area	Primary Survey, census handbook & need based assessments.

	study area			

Source: On-site monitoring/sampling by EHS360 Labs Private Limited in association with GEMS
* All monitoring and testing have been carried out as per the Guidelines of CPCB and MoEF & CC

3.2 LAND ENVIRONMENT

To study the land use pattern of the core as well as a buffer zone, land use/land cover details have been identified/ maps have been prepared in accordance with the Standard ToR point**.** A visual interpretation technique has been adopted for land use supervised classification based on training site by Level III classification with 1:50,000 scale for the preparation of land use mapping. Land use pattern of the area was studied through **LISSIII, Bhuvan, NRSC**. The 10 km radius map of study area was taken for analysis of **Land use/Landcover.**

TABLE 3.1: LAND USE / LAND COVER TABLE 10 KM RADIUS

S.No	CLASSIFICATION	AREA_HA	AREA_%
	BUILTUP		
1	URBAN	62.36	0.19
2	RURAL	932.66	2.89
3	MINING	95.80	0.30
	AGRICULTURAL LAND		
4	CROP LAND	18313.01	56.74
5	AGRICULTURAL PLANTATION	2375.86	7.36
6	FALLOW LAND	412.52	1.28
	BARREN/WASTE LANDS		
7	RAVINOUS LAND	133.97	0.42
8	SCRUB LAND	412.10	1.28
9	SAND AREA	632.63	1.96
	WETLANDS/ WATER BODIES		
10	WATER BODIES/RIVER	5175.74	16.04
11	COASTAL WEDTLAND	1213.26	3.76
12	OCEAN	2514.94	7.79
TOTAL		32274.87	100.00

LU/LC Interpretation:

- From the above table, pie diagram and land use map it is inferred that the majority of the land in the study area is Agriculture and fallow land (includes crop land) 65.3% followed by Built-up Lands (Rural and Urban) – 3.08%, Scrub land – 1.28%, and Water bodies including Ocean 23.83%, Coastal wet land is 3.76% in the study area.
- The total mining area within the study area is 95.80 ha i.e., 0.30%. This small percentage of Mining Activities shall not have any significant impact on the environment.

3.3 SOIL ENVIRONMENT

The samples were analysed as per the standard methods prescribed in “Soil Chemical Analysis (M.L. Jackson, 1967) & Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India”. The important properties analysed for soil are bulk density, porosity, infiltration rate, pH and Organic matter, kjeldahi Nitrogen, Phosphorous and Potassium

Physical Characteristics –

The physical properties of the soil samples were examined for texture, bulk density, porosity and water holding capacity. The soil texture found in the study area is Clay (28.6 % 33.9%) to Sandy Loam Soil and Bulk Density of Soils in the study area varied between 0.98-1.11 g/cc. The Water Holding Capacity of the soil samples is found to be medium i.e., ranging from 45.7– 48.0 %.

Chemical Characteristics –

- The nature of soil is slightly alkaline to strongly alkaline with pH range 8.06 – 8.95
- The available Nitrogen content range between 6.54 – 473.5 mg/kg
- The available Phosphorus content range between 1.56 – 6.88 mg/kg
- The available Potassium range between 5.51mg/kg to 39.0 mg/kg

Observation:

The pH of the Soil indicates that the soil is Neutral and arid region and ideal for plant growth

3.4 WATER ENVIRONMENT

The study area is studded with few tanks that serve as the source of drinking water and also their surplus feeds adjoining tanks. The rainfall over the area is moderate, the rainwater storage in open wells and trenches are in practice over the area and the stored water acts as source of freshwater for couple of months after rainy season.

Surface Water

The pH varied from 7.26 – 7.86 while turbidity found within the standards (Optimal pH range for sustainable aquatic life is 6.5 to 8.5 pH).

Total Dissolved Solids:

Total Dissolved Solids varied from 454-566mg/l, the TDS mainly composed of carbonates, bicarbonates, Chlorides, phosphates and nitrates of calcium, magnesium, sodium and other organic matter.

Other parameters:

Chloride content is 72.6-100 mg/l, sulphates varied from 40.0 – 55.3mg/l.

Ground Water

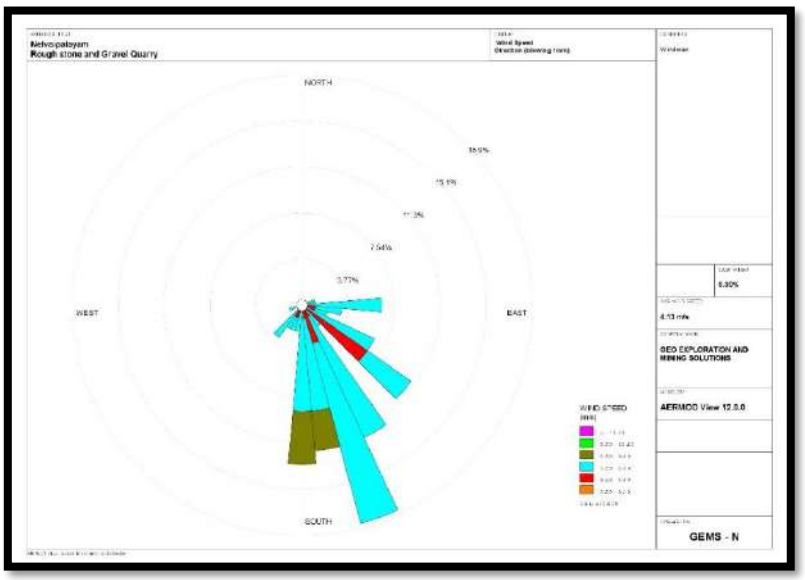
The pH of the water samples collected ranged from 6.96 – 7.75 and within the acceptable limit of 6.5 to 8.5. pH, Sulphates and Chlorides of water samples from all the sources are within the limits as per the Standard. On Turbidity, the water samples meet the requirement. Total Dissolved Solids were found in the range of 517-628 mg/l mg/l in all samples. Total hardness varied between 189.43- 230.22 mg/l for all samples.

On Microbiological parameters, the water samples from all the locations meet the requirement. The parameters thus analysed were compared with IS 10500:2012 and are well within the prescribed limits.

3.5 AIR ENVIRONMENT

The baseline studies on air environment include identification of specific air pollution parameters and their existing levels in ambient air. The ambient air quality with respect to the study zone of 10 km radius around the proposed quarry forms the baseline information.

FIGURE – 6: WIND ROSE DIAGRAM



3.6 SUMMARY OF AMBIENT AIR QUALITY

As per monitoring data, PM_{10} ranges from 38.3 µg/m^3 to 48.6 µg/m^3, $PM_{2.5}$ data ranges from 18.6 µg/m^3 to 24.9 µg/m^3, SO_2 ranges from 4.1 µg/m^3 to 8.7 µg/m^3 and NO_2 data ranges from 21.3 µg/m^3 to 28.4 µg/m^3. The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB.

3.7 NOISE ENVIRONMENT

Ambient noise levels were measured at 8 (Eight) locations around the proposed project area. Noise levels recorded in core zone during day time were from 40.8 - 42.9 dB (A) Leq and during night time were from 34.7 – 36.4 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 37.2 – 39.7 dB (A) Leq and during night time were from 34.2 – 40.2 dB (A) Leq. Thus, the noise level for Industrial and Residential area meets the requirements of CPCB.

The values of noise observed in some of the areas are primarily owing to quarrying activities due to cluster of quarries within 500m radius, movement of vehicles and other anthropogenic activities.

3.8 ECOLOGICAL ENVIRONMENT

The study involved in the collection of primary data by conducting a survey in the field, examination of floral and faunal records in previously published reports and records. Analysis of the information is the view of the possible alteration in the environment of the project site. For the survey of fauna, both direct and indirect observation methods were used.

There is no schedule I species of animals observed within study area as per Wildlife Protection Act 1972 as well as no species is in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area. Hence this small operation over short period of time will not have any significant impact on the surrounding flora and fauna.

3.9 SOCIO ECONOMIC ENVIRONMENT

It includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as feature like temples, historical monuments etc., at the baseline level. This will help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project.

The socio-economic study of surveyed villages gives a clear picture of its population, average household size, literacy rate and sex ratio etc. It is also found that a part of population is suffering from lack of permanent job to run their day-to-day life. Their expectation is to earn some income for their sustainability on a long-term basis.

The proposed project will aim to provide preferential 13 persons to the local people there by improving the indirect employment opportunity for 50 persons and in turn the social standards will improve.

4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

In order to maintain the environmental commensuration with the mining operation, it is essential to undertake studies on the existing environmental scenario and assess the impact on different environmental components. This would help in formulating suitable management plans sustainable resource extraction.

4.1 LAND ENVIRONMENT:

ANTICIPATED IMPACT

- 1.63.98Ha of the land will be under mining sine the Permanent or temporary change on land use and land cover will occur.
- Movement of heavy vehicles sometimes cause problems to agricultural land, human habitations due to dust, noise and it also causes traffic hazards.
- Due to degradation of land by pitting the aesthetic environment of the core zone may be affected.
- Earthworks during the rainy season increase the potential for soil erosion and sediment laden water entering the water ways.
- If no due care is taken wash off from the exposed working area may choke the water course & can also causes the siltation of water course.

MITIGATION MEASURES

- The 1.63.98Ha of the land will be converted into temporary reservoir which will full fill the water scarcity in the drought season and the nearby agriculture land will benefitted by the supply of water.
- About 1200 Nos of trees will be planted in the lease area and approach road will retain the eco system.
- The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigative measures like phase wise development of greenbelt etc.,
- Construction of garland drains all around the quarry pits and construction of check dam at strategic location in lower elevations to prevent erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area
- Green belt development along the boundary within safety zone. The small quantity of water stored in the mined-out pit will be used for greenbelt.
- Thick plantation will be carried out on unutilized area, top benches of mined out pits, on safety barrier, etc.,
- At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir.
- In terms of aesthetics, natural vegetation surrounding the quarry will be retained (such as in a buffer area i.e., 7.5 m safety barrier and other safety provided) so as to help minimise dust emissions.
- Proper fencing will be carried out at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle.

4.2 SOIL ENVIRONMENT

IMPACT ON SOIL ENVIRONMENT

Erosion and Sedimentation (Removal of protective vegetation cover; Exposure of underlying soil horizons that may be less pervious, or more erodible than the surface layers; Reduced capacity of soils to absorb rainfall; Increased energy in storm-water runoff due to concentration and velocity; and Exposure of subsurface materials which are unsuitable for vegetation establishment).

MITIGATION MEASURES FOR SOIL CONSERVATION

- Run-off diversion – Garland drains will be constructed all around the project boundary to prevent surface flows from entering the quarry works areas. And will be discharged into vegetated natural drainage lines, or as distributed flow across an area stabilised against erosion.
- Sedimentation ponds - Run-off from working areas will be routed towards sedimentation ponds. These trap sediment and reduce suspended sediment loads before runoff is discharged from the quarry site. Sedimentation ponds should be designed based on runoff, retention times, and soil characteristics. There may be a need to provide a series of sedimentation ponds to achieve the desired outcome.
- Retain vegetation – Retain existing or re-plant the vegetation at the site wherever possible.

- Monitoring and maintenance – Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season

4.3 WATER ENVIRONMENT

ANTICIPATED IMPACT

- The major sources of water pollution normally associated due to mining and allied operations are:
    - Generation of waste water from vehicle washing.
    - Washouts from surface exposure or working areas
    - Domestic sewage
    - Disturbance to drainage course in the project area
    - Mine Pit water discharge
- Increase in sediment load during monsoon in downstream of lease area
- This being a mining project, there will be no process effluent. Waste from washing of machinery may result in discharge of Oil & grease, suspended solids.
- The sewage from soak pit may percolate to the ground water table and contaminate it.
- Surface drainage may be affected due to Mining
- Abstraction of water may lead to depletion of water table

MITIGATION MEASURES

- Garland drain, settling tank will be constructed along the project area. The Garland drain will be connected to settling tank and sediments will be trapped in the settling traps and only clear water will be discharged out to the natural drainage
- Rainwater will be collected in sump in the mining pits and will be allowed to store and pumped out to surface settling tank of 15 m x 10m x 3m to remove suspended solids if any. This collected water will be judiciously used for dust suppression and such sites where dust likely to be generated and for developing green belt. The proponent will collect and judicially utilize the rainwater as part of rainwater harvesting system.
- Providing benches with inner slopes and through a system of drains and channels, allowing rain water to descent into surrounding drains, so as to minimize the effects of erosion & water logging arising out of uncontrolled descent of water
- Reuse the water collected during storm for dust suppression and greenbelt development within the mines
- Installing interceptor traps/oil separators to remove oils and greases. Water from the tipper wash-down facility and machinery maintenance yard will pass through interceptor traps/oil separators prior to its reuse;
- Using flocculating or coagulating agents to assist in the settling of suspended solids during monsoon seasons;
- Periodic (every 6 month once) analysis of quarry pit water and ground water quality in nearby villages
- Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits
- Waste water discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes

- De-silting will be carried out before and immediately after the monsoon season
- Regular monitoring (every 6 month once) and analysing the quality of water in open well, bore wells and surface water.

4.4 AIR ENVIRONMENT

ANTICIPATED IMPACT

- During mining, at various stages activities such as excavation, drilling, blasting, and transportation of materials, particular matter (PM), gases such as Sulphur dioxide, oxides of Nitrogen from vehicular exhaust are the main air pollutants.
- Emissions of noxious gases due to incomplete detonation of explosive may sometimes pollute the air.
- The fugitive dust released from the mining operations may cause effect on the mine workers who are directly exposed to the fugitive dust.
- Simultaneously, the air-borne dust may travel to longer distances and settle in the villages located near the mine lease area.

MITIGATION MEASURES

Drilling – To control dust at source, wet drilling will be practiced. Where there is a scarcity of water, suitably designed dust extractor will be provided for dry drilling along with dust hood at the mouth of the drill-hole collar.

Advantages of Wet Drilling: -

- In this system dust gets suppressed close to its formation. Dust suppression become very effective and the work environment will be improved from the point of occupational comfort and health.
- Due to dust free atmosphere, the life of engine, compressor etc., will be increased.
- The life of drill bit will be increased.
- The rate of penetration of drill will be increased.
- Due to the dust free atmosphere visibility will be improved resulting in safer working conditions.

Blasting –

- Establish time of blasting to suit the local conditions and water sprinkling on blasting face
- Avoid blasting i.e., when temperature inversion is likely to occur and strong wind blows towards residential areas
- Controlled blasting includes Adoption of suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone and restricting blasting to a particular time of the day i.e., at the time lunch hours, controlled charge per hole as well as charge per round of hole
- Before loading of material water will be sprayed on blasted material
- Dust mask will be provided to the workers and their use will be strictly monitored

Haul Road & Transportation –

- Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation.
- Transportation of material will be carried out during day time and material will be covered with taurpaulin.
- The speed of tippers plying on the haul road will be limited below 20 km/hr to avoid generation of dust.
- Water sprinkling on haul roads & loading points will be carried out twice a day.
- Main source of gaseous pollution will be from vehicle used for transportation of mineral; therefore, weekly maintenance of machines improves combustion process & makes reduction in the pollution.
- The un-metalled haul roads will be compacted weekly before being put into use.
- Over loading of tippers will be avoided to prevent spillage.
- It will be ensured that all transportation vehicles carry a valid PUC certificate
- Grading of haul roads and service roads to clear accumulation of loose materials.

Green Belt –

- Planting of trees all along main mine haul roads and regular grading of haul roads will be practiced to prevent the generation of dust due to movement of dumpers/trucks
- Green belt of adequate width will be developed around the project areas.

Occupational Health –

- Dust mask will be provided to the workers and their use will be strictly monitored.
- Annual medical check-ups, trainings and campaigns will be arranged to ensure awareness about importance of wearing dust masks among all mine workers & tipper drivers.
- Ambient Air Quality Monitoring will be conducted six months once to assess effectiveness of mitigation measures proposed.

4.5 NOISE ENVIRONMENT

ANTICIPATED IMPACT

Noise pollution poses a major health risk to the mine workers. Following are the sources of noise in the existing open cast mine project are being observed such as Drilling, & Blasting, Loading and during movement of vehicles.

MITIGATION MEASURES

- Usage of sharp drill bits while drilling which will help in reducing noise;
- Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders;
- Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained;

- The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system;
- Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise;
- Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise;
- Silencers / mufflers will be installed in all machineries;
- Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise;
- Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured though training and awareness.
- Regular medical check–up and proper training to personnel to create awareness about adverse noise level effects.

4.6 BIOLOGICAL ENVIRONMENT

ANTICIPATED IMPACT

The developmental programs, policies, and projects operated or managed by government or private bodies can cause potentially significant changes in the physical, biological, and socio-economic environment. In some cases, the changes may be beneficial while in others it may be detrimental to the environment. Accordingly, environmental impact studies are required for systematic identification, qualification, and interpretation of the anticipated changes. The main environmental problems associated with mining activities are deforestation, land degradation (change in topography, soil erosion), visual intrusion, disturbance to the hydrological system, and water, air, and noise pollution which ultimately impact upon the floral and faunal status of the project area.

MITIGATION MEASURES

Keeping all this in mind the mitigations have been suggested under environmental management plan. With the understanding of the role of plant species as bio-filter to control air pollution, appropriate plant species (mainly tree species) have been suggested conceding the area/site requirements and needed performance of specific species. The details of year wise proposed plantation program are given in Table 4.13.

The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas

In order to compensate the loss of vegetation cover, it is suggested to carry out afforestation program mainly in proposed areas falls in the cluster earmarked for plantation program as per Approved Mining Plan in different phases. This habitat improvement program would ensure the faunal species to re-colonize and improve the abundance status in the core zone.

The objectives of the green belt cover will cover the following:

- Noise abatement
- Ecological restoration
- Aesthetic, biological and visual improvement of area due to improved vegetative and plantations cover.

GREENBELT DEVELOPMENT PLAN

Year	No. of tress proposed to be planted	Area to be covered in m^2	Name of the species
I	1200	The safety zone along the boundary barrier has been identified to be utilized for Greenbelt development.	Neem, Pongamia Pinnata etc.,

4.7 SOCIO ECONOMIC ENVIRONMENT

ANTICIPATED IMPACT

- No. of people will get employment during the construction stage resulting in the ancillary development and growth. Nearby Local people will be given preference for employment on the basis of their skill and experience.
- Further due to proposed project, influx of working community will also generate an indirect employment through development of nearby market/ shops, trade centers, activities, transportation etc.
- Population influx during the construction phase can introduce various water and vector borne diseases which can lead to various unhygienic health problems in the area by disturbing the existing sanitation infrastructure.
- Rapid diverse population influx at the project site can create unusual behavioural activity such as worker-community conflicts, increase violence such as theft/stabbing, and increased consumption of drugs/alcohol within the area.
- Impacts on the health of nearby villagers can be envisaged due to the transportation activities leading to short term exposure of fugitive dust, resulting in various acute diseases such as increased eye irritation, nausea, headache etc.

MITIGATION MEASURES

- Good maintenance practices will be adopted for all machinery and equipment, which will help to avert potential noise problems.
- Green belt will be developed in and around the project site as per Central Pollution Control Board (CPCB) guidelines.
- Air pollution control measure will be taken to minimize the environmental impact within the core zone.

- For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices will be provided as per mines act and rules.
- Benefit to the State and the Central governments through financial revenues by way of royalty, tax, duties, etc.., from this project directly and indirectly.
- From above details, the quarry operations will have highly beneficial positive impact in the area.

Table 4.6.3 Impact Evaluation Impact evaluation is given in table below.

Impact Evaluation Element	Impact on socio economics due to the proposed for rough stone and Gravel quarry over an extent of 1.63.98ha of Patta lands in S.F.Nos. 88/1, 2A and 4A of Nelvaipalayam Village, Cheyyur Taluk, Chengalpattu District, Tamil Nadu State.			
Potential Effect/ Concern	Proposed project will provide direct & indirect employment opportunities to the local residents, which will help to increase their earning and better living standard as well as further up-liftment of socio-economic status of the area.			
Characteristics of Impacts				
Nature	Positive		Nagative	Neutral
	✓			
Type	Direct	Indirect	Cumulative	
			✓	
Extent	Project area	Local	Zonal	Regional
	✓			
Duration	Short time		Long term	
			✓	
Intensity	Low		Medium	High
			✓	
Frequency	Remote (R)	Occasional (O)	Periodic (P)	Continuous (C)
			✓	
Significance of Impact				
Significance	Insignificant	Minor	Moderate	Major
			✓	

5. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

No alternatives are suggested as all the mine sites are mineral specific.

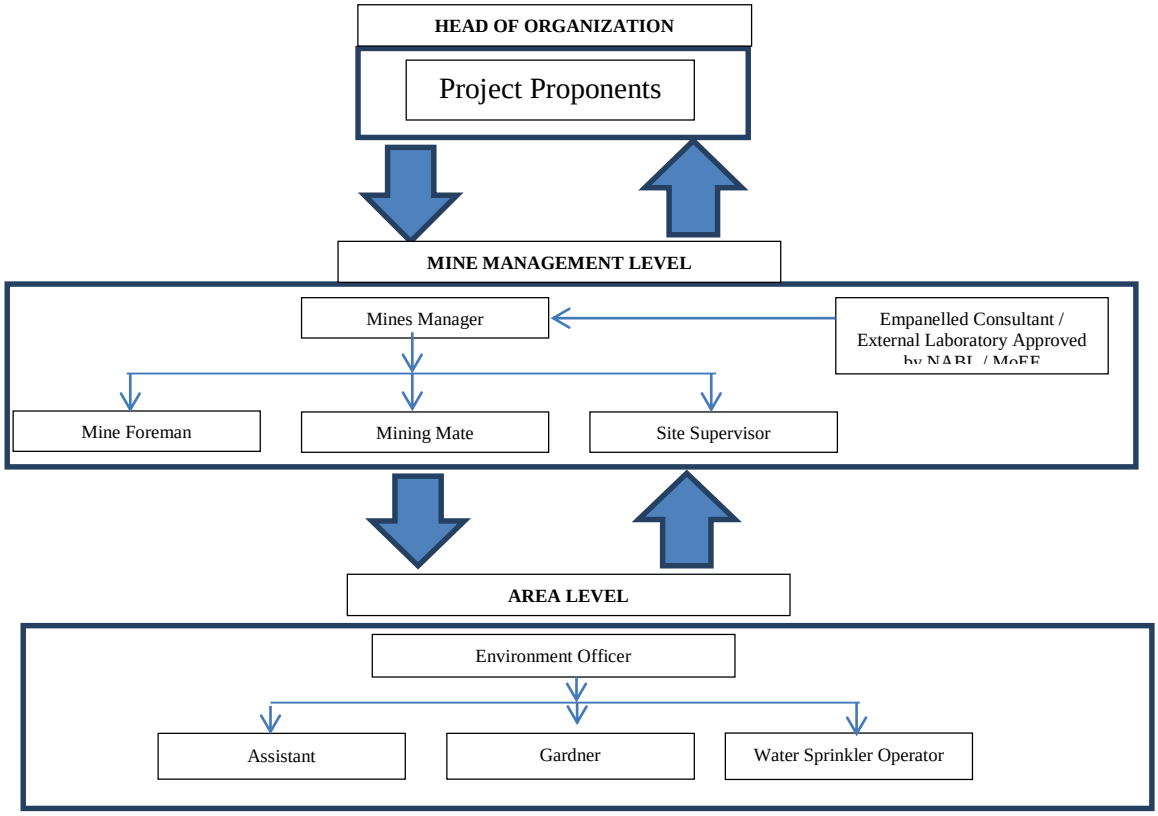
6. ENVIRONMENT MONITORING PROGRAM

An Environment monitoring cell (EMC) will be constituted to monitor the implementation of EMP and other environmental protection measures in all the proposed quarries.

The responsibilities of this cell will be:

- Implementation of pollution control measures
- Monitoring programme implementation
- Post-plantation care
- To check the efficiency of pollution control measures taken
- Any other activity as may be related to environment
- Seeking expert's advice when needed.

6.1 ENVIRONMENTAL MONITORING CELL



6.2 POST ENVIRONMENTAL CLEARANCE MONITORING SCHEDULE

S. No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	8 Locations (2 Core & 6 Buffer)	24 hours	Once in 6 months	Fugitive Dust, $PM_{2.5}$, PM_{10}, SO_2 and NO_x.
2	Meteorology	At mine site before start of Air Quality Monitoring & IMD Secondary Data	Hourly / Daily	Continuous online monitoring	Wind speed, Wind direction, Temperature, Relative humidity and Rainfall
3	Water Quality Monitoring	6 Locations (2SW & 4 GW)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms
4	Hydrology	Water level in open wells in buffer zone around 1 km at specific wells	-	Once in 6 months	Depth in bgl

5	Noise	8 Locations (2 Core & 6 Buffer)	Hourly – 1 Day	Once in 6 months	Leq, Lmax, Lmin, Leq Day & Leq Night
6	Vibration	At the nearest habitation (in case of reporting)	–	During blasting Operation	Peak Particle Velocity
7	Soil	6 Locations (1 Core & 5 Buffer)	–	Once in six months	Physical and Chemical Characteristics
8	Greenbelt	Within the Project Area	Daily	Monthly	Maintenance

7. ADDITIONAL STUDIES

7.1 RISK ASSESSMENT

The methodology for the risk assessment has been based on the specific risk assessment guidance issued by the Directorate General of Mine Safety (DGMS), Dhanbad, vide Circular No.13 of 2002, dated 31st December, 2002. The DGMS risk assessment process is intended to identify existing and probable hazards in the work environment and all operations and assess the risk levels of those hazards in order to prioritize those that need immediate attention. Further, mechanisms responsible for these hazards are identified and their control measures, set to timetable are recorded along with pinpointed responsibilities.

The whole quarry operation will be carried out under the direction of a Qualified Competent Mine Manager holding certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad for proposed project. Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening.

7.2 DISASTER MANAGEMENT PLAN

Natural disasters like Earthquake, Landslides have not been recorded in the past history as the terrain is categorized under seismic zone III. The area is far away from the sea hence the disaster due to heavy floods and tsunamis are not anticipated.

The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities.

The objective of the Disaster Management Plan is to make use of the combined resources of the mine and the outside services to achieve the following:

- Rescue and medical treatment of casualties;
- Safeguard other people;
- Minimize damage to property and the environment;
- Initially contain and ultimately bring the incident under control;
- Secure the safe rehabilitation of affected area; and
- Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency.

7.3 CUMULATIVE IMPACT STUDY

CUMULATIVE PRODUCTION LOAD OF ROUGH STONE IN CLUSTER

Quarry	Production for five/Ten year plan period	Per Year Production in m^3	Per Day Production in m^3	Number of Lorry Load Per Day
P1	90,980	9,098	30	3
Total	**90,980**	**9,098**	**30**	**3**
E1	3,31,500	66,300	221	18
E2	7,63,760	1,52,752	509	42
Total	**10,95,260**	**2,19,052**	**730**	**60**
Grand Total	**11,86,240**	**2,28,150**	**760**	**63**

CUMULATIVE PRODUCTION LOAD OF GRAVEL IN CLUSTER

Quarry	Production for one, two- three-year plan period	Per Year Production in m^3	Per Day Production in m^3	Number of Lorry Load Per Week
P1	18,482	6,161	21	2
Total	**18,482**	**6,161**	**21**	**2**
E1	3,400	3,400	11	1
E2	37,022	18,511	62	5
Total	**40,422**	**21,911**	**73**	**6**
Grand Total	**58,904**	**28,072**	**94**	**8**

PREDICTED NOISE INCREMENTAL VALUES FROM CLUSTER

Location ID	N1	N2	N3	N4	N5	N6	N7	N8
Maximum Monitored Value (Day) dB(A)	47.2	46.7	47.3	46.6	46.2	47.10	45.10	45.90
Incremental Value dB(A)	66.1	60.1	54.1	36.6	28.5	24.3	29.2	26.1
Total Predicted Noise level dB(A)	66.2	60.3	54.9	47.0	46.3	47.1	45.2	45.9

SOCIO ECONOMIC BENEFITS

Location ID	Project Cost	CER
P1	Rs. 77,24,000/-	Rs.5,00,000/-
E1	Rs.76,92,360/-	Rs. 1,61,500/-
E2	Rs. 52,50,000/-	Rs 5,00,000/-
Total	**Rs 2,06,66,360/-**	**Rs. 11,61,500/-**

A total of 20 people will get employment due to this cluster, in this already 48 people employed in the existing quarries. Allocation for Corporate Environment Responsibility (CER) shall be made as per Government of India, MoEF & CC Office Memorandum F.No.22-65/2017-IA.III, Dated: 01.05.2018 by all the mines.

8. PROJECT BENEFITS

The Proposed Project for Quarrying Rough stone and Gravel at Nelvaipalayam Village aims to produce 90,980 m3 rough stone over a period of 10 Years and Gravel 18,482 m3 for period of 3 years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits.

- Increase in Employment Potential
- Improvement in Socio-Economic Welfare
- Improvement in Physical Infrastructure

- Improvement in Social infrastructure

9. ENVIRONMENT MANAGEMENT PLAN

The Environment Monitoring cell discussed formed by the mine management will ensure effective implementation of environment management plan and to ensure compliance of environmental statutory guidelines through Mine Management Level.

The said team will be responsible for:

- Monitoring of the water/ waste water quality, air quality and solid waste generated
- Analysis of the water and air samples collected through external laboratory
- Implementation and monitoring of the pollution control and protective measures/ devices which shall include financial estimation, ordering, installation of air pollution control equipment, waste water treatment plant, etc.
- Co-ordination of the environment related activities within the project as well as with outside agencies.
- Collection of health statistics of the workers and population of the surrounding villages.
- Green belt development.
- Monitoring the progress of implementation of the environmental monitoring programme.
- Compliance to statutory provisions, norms of State Pollution Control Board, Ministry of Environment and Forests and the conditions of the environmental clearance as well as the consents to establish and consents to operate.

10. CONCLUSION

Various aspects of mining activities were considered and related impacts were evaluated. Considering environmental impacts are associated, EMP will be under regular review. Senior Management responsible for the project will conduct a review of EMP and its implementation to ensure that the EMP remains effective and appropriate. Thus, the proper steps will be taken to accomplish all the goals mentioned in the EMP and the project will bring the positive impact in the study area. All the possible ways to mitigate the environmental concerns Environmental Management Plan was prepared and fund has been allocated for the same. The EMP is dynamic, flexible and subjected to periodic review.

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