Application Form For Environmental Clearance (Public Hearing)

May 2023

Application Form
(Draft EIA Report)

For

Thiru.Joseph John Samuel

Proposed Rough stone, Jelly and Gravel Quarry – 0.55.0 Ha

at

S.F.No. 845/1B & 845/2B of Tharuvai Village, Palayamkottai Taluk, Tirunelveli District, Tamilnadu State

Sector No. 1(a) (Sector No. 1 as per NABET)

Category of the Project: B1 Cluster Mining

Baseline Period: December, January & February 2023

Environmental Consultant & Laboratory details:

Ecotech Labs Pvt Ltd,

No 48, 2nd Main road,
South extension Ram nagar,
Pallikaranai, Chennai -600100.

Proponent details:

Thiru.S.Joseph John Samuel,
S/O. G.Jebarajan(Late),
No. 54, Chellathai nagar,
Mahilchi Nagar
Perumalpuram ,

Virudhunagar District.

Thiru.Joseph John Samuel,

S/O. G.Jebarajan(Late)

No. 54, Chellathai nagar

Mahilchi Nagar,

Perumalpuram,

Tirunelveli District

UNDERTAKING

I, Thiru. Joseph John Samuel , undertaking that the Draft Environmental Impact Assessment (EIA) Report for Rough Stone, Jelly and Gravel Quarry over an extent of 0.55.0 Ha at S.F.No. 845/1B & 845/2B of Tharuvai Village, Palayamkottai Taluk, Tirunelvelii District, Tamilnadu State under project category B1 and Schedule S.No.1(a)

TOR issued by the State Expert Appraisal Committee, TN vide Letter No. SEIAA-TN/F. No. 8914/ SEAC/ToR-1117/2022 Dated: 23.03.2022.

I, hereby assure that all the information and data provided in the EIA report is accurate, true and correct and owns responsibility for the same.

Place: Tirunelveli

Date:

Yours faithfully

Thiru. Joseph John Samuel

Plot No.48A, 2nd Main Road,
Ram Nagar, South Extension,
Pallikkaranai, Chennai - 600 100
GST NO. 33AADCE6103A2ZH
PAN NO. AADCE6103A

Eco Tech Labs Pvt Ltd

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Email : info@ecotechlabs.in
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CIN : U74900TN2014PTC094895

UNDERTAKING

I, Dr. A. Dhamodharan, Managing Director confirms that this Draft EIA Report of Rough Stone and Gravel Quarry over an extent of 4.24.0 Ha at S.F.No. 10/12, 11/2A, 11/2C, 11/2D, 11/2E, 11/2F, 11/2G(P), 11/2H(P), 11/2I(P), 11/2J2B and 15/2B1 of Kottaiyur Village, Virudhunagar Taluk, Virudhunagar District, Tamilnadu State has been prepared at M/s. Ecotech Labs Pvt. Ltd., Chennai.

I also confirm that I shall be fully accountable for any misleading information mentioned in this Report.

Signature:

Name: Dr. A. Dhamodharan

Designation: Managing Director

Name of the EIA Consultant Organization: M/s. Ecotech Labs Pvt Ltd., Chennai.

NABET Certificate No: NABET/EIA/2124/SA 0147

Date: Place: Chennai

Declaration by Experts contributing to the EIA of Existing Rough Stone Quarry- 2.50.0 Ha by Thiru.Joseph John Samuel at S.F.No. 845/1A and 845/1B of Tharuvai Village, Palayamkottai Taluk, Tirunelveli District, Tamilnadu State

I, hereby, certify that I was a part of the EIA team in the following capacity that developed the above EIA.

EIA Coordinator: Dr. A. Dhamodharan

Dr. A. DHAMODHARAN
(NABET APPROVED EIA COORDINATOR)
NABET/EIA/2124/SA 0147
Environmental Consultant
Eco Tech Labs Pvt. Ltd
Plot No.48A, 2nd Main Road, Ram Nagar South Extn.
Pallikaranai, Chennai - 600 100.

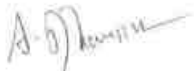
Signature:

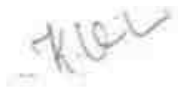
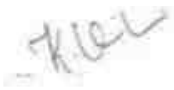
Period of involvement: 01.03.2022 to Till now

Contact information: M/s. Ecotech Labs Pvt Ltd.,
No. 48, 2nd Main road, Ram Nagar South Extension,
Pallikaranai

S. No.	Functional areas	Name of the experts	Involvement (period and task)	Signature and date
1	AP	Mrs. K. Vijayalakshmi	1. Selection of Baseline Monitoring stations based on the wind direction 2. Interpretation of Baseline data by comparing it with standards prescribed by CPCB against the type of area 3. Identification of sources of air pollution and suggesting mitigation measures to minimize impact ***Period: March 2022 – Till now***	

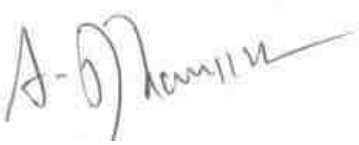
2	WP	Dr. A. Dhamodharan	1. Selection of baseline Monitoring Locations for Ground water analysis and also identifying nearest surface water to be studied. 2. Interpretation of baseline data collected 3. Identification of impacts based on the baseline study conducted and also to the ground water and nearby surface water due to the proposed project 4. Preparation of suitable and appropriate mitigation plan. ***Period: March 2022 – Till now***	
3	SHW	Dr. A. Dhamodharan	1. Identification of nature of solid waste generated 2. Categorization of the generated waste and estimating the quantity of waste to be generated based on the per capita basis. Identification of impacts of SHW on Environment 3. Suggesting suitable mitigation measures by recommending appropriate disposal method for each category of waste generated 4. Top soil and refuse management ***Period: March 2022 – Till now***	
4	SE	Mr. S. Pandian	1. Primary data collection through the census questionnaire 2. Obtaining Secondary data from authenticated sources and incorporating the same in EIA report. 3. Impact assessment & proposing suitable mitigation plan 4. CSR budget allocation by discussing with the local body and allotting the same for need based activity. ***Period: March 2022 – Till now*** ****Involves Public Hearing***	
5	EB	Dr. A. Dhamodharan	1. Primary data collection through field survey and sheet observation for ecology and biodiversity 2. Secondary Collection through various authenticated sources 3. Prediction of anticipated impacts and suggesting appropriate mitigation measures.	

			Period: March 2022 – Till now	
6	HG	Dr. T. P. Natesan	1. Study of existing surface drainage arrangements in the core and buffer zone, impact due to mining on these drainage courses and suggestion of mitigative measures 2. Determination of groundwater use pattern, development of rainwater harvesting program. Storm water management through garland drainage system. ***Period: March 2022 – Till now***	
7	GEO	Dr. T. P. Natesan	1. Field survey for assessing regional and local geology, aquifer distribution, Determination of groundwater use pattern, development of rainwater harvesting program. ***Period: March 2022 – Till now***	
8	SC	Dr. A. Dhamodharan	1. Interpretation of baseline report 2. Identification of possible impacts on soil, prediction of soil conservation and suggesting suitable mitigation measures. ***Period: March 2022 – Till now***	
9	AQ	Mrs. K. Vijayalakshmi	1. Collection of Meteorological data for the baseline study period 2. Plotting wind rose plot and thereby selecting the monitoring locations based on the wind pattern 3. Estimation of sources of air emissions and air quality modeling is done 4. Interpretation of the results obtained 5. Identification of the impacts and suggesting suitable mitigation measures. ***Period: March 2022 – Till now***	

10	NV	Mrs. K. Vijayalakshmi	1. Selection of monitoring locations 2. Interpretation of baseline data 3. Prediction of impacts due to noise pollution and suggestion of appropriate mitigation measures ***Period: May 2022 – Till now***	
11	LU	Dr. T. P. Natesan	1. Collection of Remote sensing satellite data to study the land use pattern. 2. Primary field survey and limited field verification for land categorization in the study area 3. Preparation of Land use map using Satellite data for 10km radius around the project site. ***Period: March 2022 – Till now***	
12	RH	Mrs. K. Vijayalakshmi	1. Identification of the risk 2. Interpreting consequence contours 3. Suggesting risk mitigation measures ***Period: March 2022 – Till now***	

Declaration by the Head of the accredited consultant organization/ authorized person

I, Dr. A. Dhamodharan, hereby, confirm that the above-mentioned experts prepared the EIA report of mining project at Survey Numbers. 845/1B & 845/2B of Tharuvai Village, Palayamkottai Taluk, Tirunelveli District, Tamilnadu State. I also confirm that the consultant organization shall be fully accountable for any misleading information mentioned in this statement.

Signature: 

Name: Dr. A. Dhamodharan

Designation: Managing Director

Name of the EIA consultant organization: M/s. Eco Tech Labs Private Limited

NABET Certificate No. & Issue Date: NABET/EIA/2124/SA 0147

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ABBREVIATION

LU –Land use

AP – Air Pollution monitoring, prevention and control

AQ- Meteorology, Air quality modeling and prediction

WP – Water pollution monitoring, prevention and control

EB- Ecology and Biodiversity

NV- Noise & Vibration

SE- Socio-economics

HG- Hydrology, ground water and water conservation

GEO –Geology

RH – Risk assessment and hazards management

SHW –Solid and Hazardous waste management

SC- Soil conservation

EXECUTIVE SUMMARY

1. Project Background:

The Proposed project total extent area is 0.55.0 Ha, It is a Patta land in 845/1B and 845/2B Tharuvai Village, Palayamkottai Taluk, Tirunelveli District. The category of project is B1, It is a Rough stone, Jelly and Gravel quarry in Tharuvai village. The area is situated on plain topography covered by Gravel formation which does not sustain any type of vegetation.

The quarry operation is proposed to carry out with open cast mechanized mining with 5.0 meter bench for Top soil & Gravel followed by 5.0 meter vertical bench with a bench width not less than the bench height. The quarry operation involves shallow jack hammer drilling, slurry blasting, Loading and transportation of Rough stone and Gravel to the needy nearby crusher units / road formation works.

The quarry operation is proposed up to depth of 17m from the below ground level. Geological Resources is estimated at 81,840 Cum of Rough stone and 10,912 Cum of Gravel. Mineable Reserves is estimated as 23,808 Cum of Rough stone and after leaving necessary safety distance from the lease boundary as indicated in the precise area letter and relevant mining laws in force. Production Schedule is production of 23,808 Cum of Rough Stone for the period of Five years. Mining Plan was approved by The Assistant Director, Geology & Mining, Tirunelveli vide letter Rc.No.M1/21631/2017 dated 28.12.2020. Precise area communication letter received from Assistant Director, Department of Geology and Mining; Tirunelveli vide letter Rc.No.M1.21631/2017 dated 18.12.2020

The project area does not fall in Hill Area Conservation Authority region. There is no interstate boundary, CRZ zone, Western Ghats, notified Bird sanctuaries, wild life sanctuaries as per Wild life protection Act 1972, within the radius of 15Km.

2. Nature & Size of the Project

The Existing Rough Stone Quarry over an extent of 0.55.0 Hectares land is located at Tharuvai Village, Palayamkottai Taluk, Tirunelveli District.

Mineral intends to quarry : Rough stone, Jelly and Gravel Quarry
District : Tirunelveli
Taluk : Palayamkottai
Village : Tharuvai
S. F. Nos. : 845/1B and 845/2B
Extent : 0.55.0 Hectares

Table 1: Brief Description of the Project

S. No	Particulars	Details
1	Latitude	Latitude : 08^0 38' 10" to 08^0 38' 16" N
2	Longitude	Longitude : 77^0 41' 25" to 77^0 41' 27" E
3	Site Elevation above MSL	118 m MSL
4	Topography	Plain Terrain
5	Land use of the site	Patta Land
6	Extent of lease area	0.55.0 Ha
7	Nearest highway	NH- 44 (Srinagar - Kaniyakumari) – 1.05km, E SH-40 (Tirunelveli- Shencottai road)- 3.91 km, NW
8	Nearest railway station	Melappalaiyam Railway Station – 7.42 km, N Tirunelveli Railway Junction- 11.02 km, NNE
9	Nearest airport	Tuticorin Domestic Airport – 38.17km
10	Nearest town / city	Town - Palayamkottai- 10.32 Km -NE City - Palayamkottai -10.32 km, NE District - Tirunelveli – 11km, NE
11	Rivers / Canal	❖ Pachaiyar river-4.17 km, NW ❖ Thamirabarani river-4.84 km, NNW ❖ Suthamalli reservoir dam-8.51 km, NW ❖ Seeniappan pond-12.04 km, NNE
12	Lake	

		❖ Brothers lake-1.38 km, ENE
13	Hills / valleys	Nil in 15 km radius
14	Archaeologically places	Nil in 15 km radius
15	National parks / Wildlife Sanctuaries	❖ Veinthankulam birds sanctuary-8.66 km, NE
16	Reserved / Protected Forests	Nil
17	Seismicity	Proposed Lease area come under Seismic zone-II(low risk area)
18	Defense Installations	Nil in 15 Km radius

3. Need for the Project

- The mining activities as proposed are the backbone of all construction and infrastructure projects as the raw material for construction is available only from such mining. The Rough stone and Gravel 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.

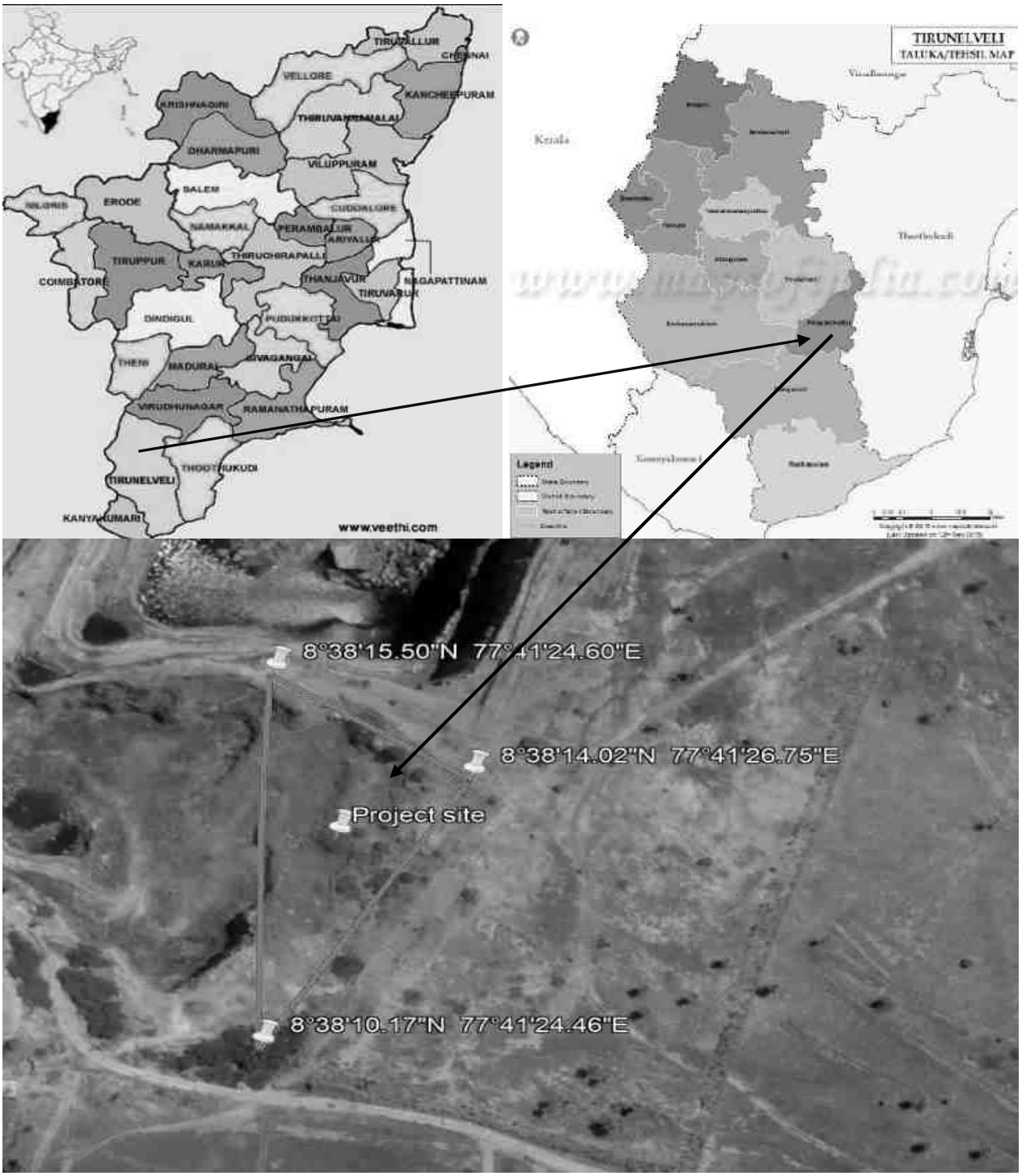


Figure 1: Location Map of the Project Site

Figure 2: Google Image of the Project Site

4. Charnockite

Charnockite is extensively quarried as rough stone which is used as aggregates for construction of building, laying of roads and for preparation of value added products likehollow blocks, M-sand etc. Charnockite is exposed as discontinuous body in NW-SE to WNW-ESE direction from Tenkasi in the west to Gangaikondan in the east and from Tiruvenkadanathapuram in the north to Vijayapathi in the south.

An isolated Charnockite hills is exposed for a length of 5 km and 1 to 1.5 km width in Valliyur-Nanguneri-Radhapuram area and in the eastern slope of Western Ghats hills of Tirunelveli district. The nature of occurrence of charnockite is ubiquitous, often in two modes. One type of ccurrence is in the form of profuse enclaves as lensoid bodies etc; within granitoid gneiss and leptynite and other as massive crystalline variety as seen in large isolated hills (Western Ghats

massifs). Basic nature of the charnockite has been preserved only at few places where in it contains occasionally noritic/pyroxene granulite patches and calc granulite pockets. Retrogression of mafics – pyroxenes to hornblende and biotite aggregates and granitisation with intercalations of quartzofeldspathic veinations are the common features that characterise these enclaves. This retrograde hornblende biotite gneiss is also extensively quarried in Piranchery, Gangaikondan, and north of Manur and Rasta areas for road metals and earth fillings.

5. Geological Resources

The Geological reserves have been calculated based on the cross section method. The available geological reserve is estimated as 81,840 m3 of Rough Stone and 10,912 m3 of Gravel respectively. Availability of Resources is given below. The quarrying is restricted up to a depth of 17m below ground level only. Availability of Resources is given below.

Table 2. Geological resources

SECTION	LENGTH (M)	WIDTH (M)	HEIGHT (M)	VOLUME in M^3	GRAVEL FORMATION in M^3	GEOLOGICAL RESOURCES OF ROUGH STONE IN M^3
XY-AB	124	44	2	10912	10912	
	124	44	15	81840		81840
Total					**10912**	**81840**

Table 3. Mineable Resources

SECTION	BENCH	LENGTH IN (M)	WIDTH IN (M)	DEPTH IN (M)	VOLUME IN M^3	MINEABLE RESERVES OF ROUGH STONE IN M^3
XY-AB	II	105	27	4.5	12758	12758
	III	95	17	5	8075	8075
	IV	85	7	5	2975	2975
Total						**23808**

The Available mineable reserve is computed as 23,808m^3 of Rough stone upto a depth of 17m below ground level only.

Table 4.Year wise Production Plan

The applicant has proposed to carry out 23,808m^3 of Rough stone at the rate of 100% recovery upto a depth of 17m below ground level for the period of five years only.

YEAR	SECTION	BENCH	LENGTH IN (M)	WIDTH IN (M)	DEPTH IN (M)	VOLUME IN M^3	MINEABLE RESERVE OF ROUGH STONE IN M^3
I	XY-AB	II	39	27	4.5	4739	4739
	Total						**4739**
II	XY-AB	II	39	27	4.5	4739	4739
	Total						**4739**
III	XY-AB	II	27	27	4.5	3281	3281
		III	17	17	5	1445	1445
	Total						**4726**
IV	XY-AB	III	56	17	5	4760	4760
	Total						**4760**
III	XY-AB	III	22	17	5	1870	1870
		IV	85	7	5	2975	2975
	Total						**4845**
Grand Total							**23808**

6. Mining

Opencast mining

Open cast Semi-Mechanized Mining with one 5.0 meter bench for Top soil & Gravel followed by 5.0 meter vertical bench with a bench width not less than the bench height.

The Quarry operation involves shallow jack hammer drilling, blasting, loading and transportation.

Process Description

- The reserves and resource are arrived based upon the Geological investigation
- Removal of Gravel by Excavators and directly Loaded into Tippers.
- Removal of Rough Stone by Excavators by Drilling and Blasting.
- Shallow Drilling With Jackhammer of 30-32 mm 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 1.5 KLD. Domestic water will be sourced from nearby Ponnakudi Village and other water will be source from nearby road tankers supply.

Table 5. Water Balance

Purpose	Quantity	Source
Drinking Water	0.5KLD	Packaged Drinking water vendors available in Ponnakudi village which is about 1.03 Km SSE of the area
Green belt	0.5KLD	Other domestic activities through road tankers supply
Dust suppression	0.5KLD	From road tankers supply
Total	**1.5 KLD**	

8. Manpower

Total manpower required for the project is approximately 16 persons. Workers will be from nearby villages.

Table 6. Man Power

1.	Skilled	Operator	4No.
		Mechanic	1 No.
		Mines manager /Mate	1 No.
2.	Semi-Skilled	Driver	2 Nos
3.	Unskilled	Musdoor/ Labours	4 Nos
		Total =	12Nos

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

9. Solid Waste Management

Table 7 Solid Waste Management

S. No	Type	Quantity	Disposal Method
1	Organic	4.8 kg/day	Municipal bin including food waste
2	Inorganic	7.2 kg/day	TNPCB authorized recyclers

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

Table 8. 500m Radius Cluster Mine

1) Existing other quarries:

S. No.	Name of the Owner	Village & Taluk	S.F.Nos.	Extent in Hect.	Lease Period
1	Tmt.D.Mercy Mery, W/o.Jebarajan, 54, Sivan West car Street, Palayamkottai	Tharuvai (V)	851	2.51.5	25.10.2017 to 24.10.2022
2	Tmt.D.Mercy Mery, W/o.Jebarajan, 54, Sivan West car Street, Palayamkottai	Tharuvai (V)	847	1.62.5	17.07.2018 to 16.07.2023
3	Thiru.Sankaranarayanan@ Sankaran, S/o.Arunachalam, 24-B, Pillamar Street, Tisaiyanvilai, Radhapuram taluk, Tirunelveli.	Tharuvai (V)	844, 848 & 849/2	2.36.5	17.07.2018 to 16.07.2023
Total extent of abandoned quarries				6.50.5	

2) Details of abandoned /Old Quarries

S. No.	Name of the Owner	Village & Taluk	S.F.Nos.	Extent in Hect.	Lease Period
1.	A.S.Kumar, 52A/3, Thiruvanathapuram Road, Palayamkottai, Tirunelveli	Tharuvai(V)	855/2, 856, 857/1, 858/1,2,3, 859/2, 860/2	3.96.0	07.02.2012 to 06.02.2017
Total extent of abandoned quarries				**3.96.0**	

3) Details of Present Proposed quarries

S. No.	Name of the Owner	Village & Taluk	S.F.Nos.	Extent in Hect.	Lease Period
1.	Thiru.Joseph John Samuel, S/o.G.Jebarajan(late) 54, Chellathai Nagar, Mahilchi Nagar, Perumalpuram, Tirunelveli District.	Tharuvai(V)	S.F.No. 845/1B & 845/2B	Ext: 0.55.0 Hects	Under proposed quarry
2.	G.Jebarajan, No.54, Sivan west Car Street, Palayamkottai, Tirunelveli	Tharuvai(V)	S.F.No.1,2, 856/2, 858/1B, 2B, 3B	Ext: 2.63.0 Ha	Proposed quarry
3.	Thiru.K.Selvaraj, S.o.Kandasamy, 212A, Udankudi road, Tisayanvilai taluk, Tirunelveli District.	Tharuvai(V)	824/2, 825/2A, 825/2B, 826/1(P), 826/2(P), 842/2(P), 843, 845/1A and 845/2A(P),	4.45.20 Ha	Proposed quarry

10. Land Requirement

The total extent area of the project is 0.55.0 Ha, Patta Land in Tharuvai Village of Palayamkottai Taluk, Tirunelveli District.

Table 9 Land Use Breakup

Sl. No.	Land Use	Area in use during the quarrying period (Hect)
1.	Quarrying pit	0.31.0
2.	Infrastructure	0.01.0
3.	Mine Road	0.01.0
4.	Green belt	0.10.0
5.	Unutilized area	0.12.0
	Total	**0.55.0**

11. Human Settlement

There are no habitations within 300m radius. There are villages located in this area within 15 km radius of the quarry.

Table 10 Habitation

S.No	Name of the Village	Approximate distance & Direction from lease applied area	Approximate population
1.	Caussanelpuram	2.0km - NE	300
2.	Keelaomanallur	3.5km - NW	200
3.	Ponnakudi	1.0Km – SE	600
4.	Kandithankulam	1.5Km-SW	400

12. Power Requirement

The proposed Rough stone quarrying does not require any power supply for the quarrying operation.

16 Litre diesel per hour for excavator for mining and loading for Rough stone needed and **10 Litre** diesel per hour for excavator for mining and loading for Top soil.

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 : 31° C

ii) Average Maximum Temperature. : 34°C

iii) Average Annual Rainfall of the area : 792 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 (SO_2), Nitrogen Dioxide (NO_2) were monitored and the results are summarized below.

The baseline levels of PM_{10} (38- 65 µg/m³), $PM_{2.5}$ (16- 35 µg/m³), SO_2 (5-18 µg/m³), NO_2 (10-35 µg/m³), all the parameters are well within the standards prescribed by National Ambient Air Quality during the study period from December 2022 to February 2023.

13.3 Noise Environment

The maximum Day noise and Night noise were found to be 61 dB(A) and 47 dB(A) respectively in CSI St Thomas Church . The minimum Day Noise and Night noise were 43 dB(A) and 36 dB(A) respectively which was observed in project site. The observed values are all well within the Standards prescribed by CPCB.

13.4 Water Environment

- The average pH ranges from 7.55 – 8.02.
- TDS value varied from 452 mg/l to 1245 mg/l
- Hardness varied from 226 to 507 mg/l
- Chloride varied from 86 to 350 mg/l

13.5 Land Environment

The analysis results shows that the majority of soil in the project and surrounding area is slightly alkaline in nature and pH value ranges from 7.47 to 8.59 with organic matter 0.31 to 0.65 %. 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 a 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, Vilvam, Panai, etc will be planted along the lease boundary and avenues as well as over Non-active dumps at a rate of 275 trees per annum with interval 5m.
4. The rate of survival expected to be 70% in this area

Table.11Plantation/ Afforestation Program

Name of species proposed	Survival	No of species
Neem, Vilvam, Vaagai, Eachai, Naval, Mantharai, Magizha Maram, Vila Maram, Poo Marudhu, Panai, Marudha maram, Thandri, Sengondrai, Poovarasu, Thethankottai Maram, Pungam	70%	275
Total		**275**

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 46,20,000/-** for deployment of machinery and creation of infrastructural facilities like approach road, mine office / Workers Shed, First Aid Room etc., including electrifications and water supply

Table .12 Project Cost details

S. No.	Description	Cost (Rs.)
1	Fixed Asset Cost	5,20,000/-

2	Operational Cost	41,00,000 /-
	Total	**46,20,000/-**

20. Corporate Environmental Responsibility

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

Table 13 CER Cost

S.No.	CER Activity	CER value (Rs)
1.	Government Higher Secondary School Provision of ➢ Infrastructure, additional class room ➢ Environmental books for library (in Tamil language), ➢ Greenbelt facilities and ➢ Basic amenities such as safe drinking water, Hygienic Toilets facilities, furniture.	5,00,000
Total		**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.

1 Introduction

1.1 PREAMBLE

Environment Impact Assessment (EIA) is a process used to identify the environmental, social & economic impacts of a project prior to decision making. It aims to predict environmental impacts at an early stage of project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment and present the prediction options to the proponent. By using EIA, both environmental & economic benefits can be achieved. By considering environmental effects - prediction & mitigation, early benefits in project planning, protection of the environment, optimum utilization of resources, thus saving overall time & cost of the project.

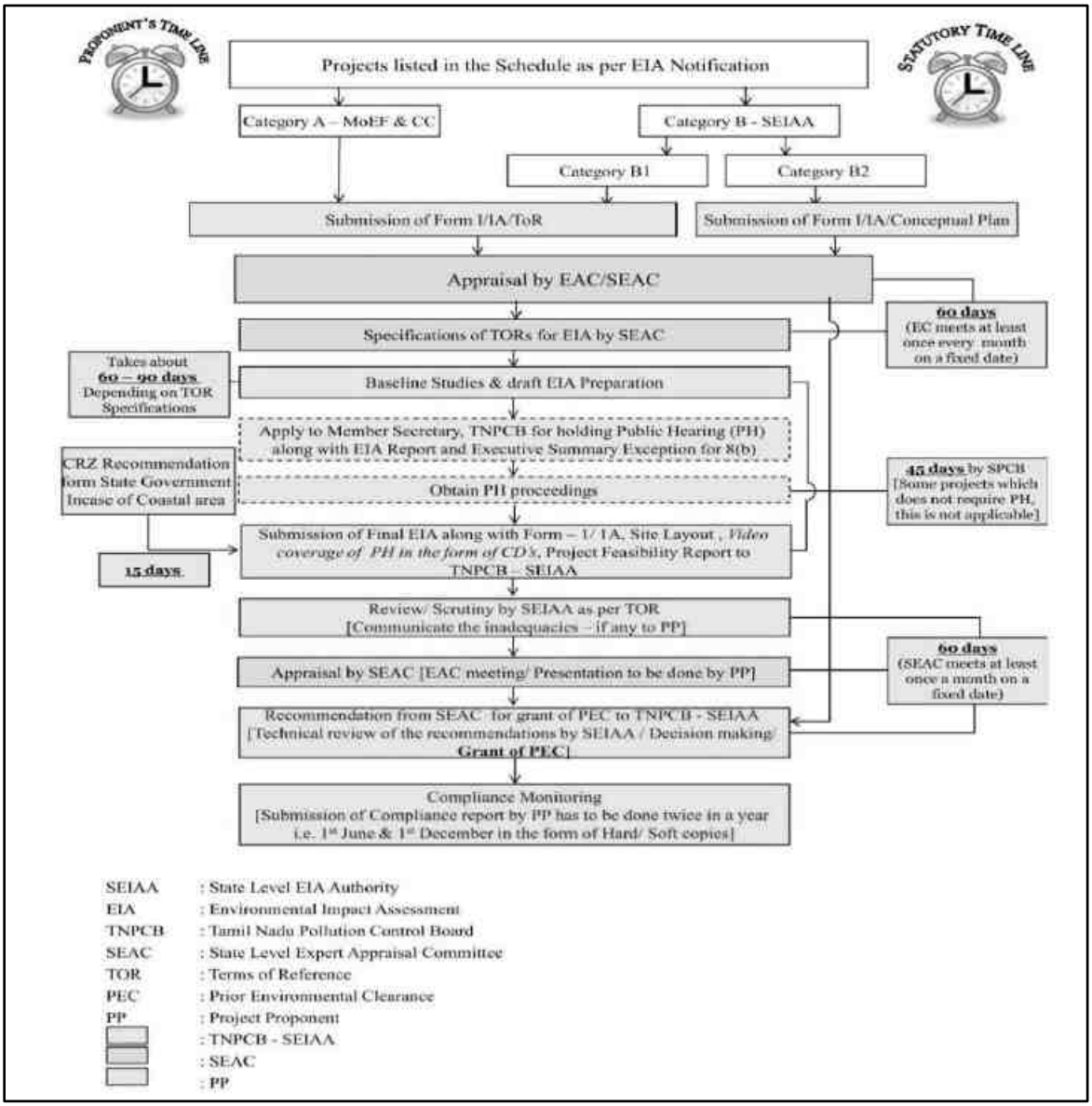
1.2 GENERAL INFORMATION ON MINING OF MINERALS

Mining activities based on rough stone (mostly charnockite) are majorly concentrated in Alangulam, Radhapuram, Nanguneri, Manur and Sankarankovil Taluks in the district under operation for production of construction materials and earth fill as gravel. Rough stone (mostly charnockite and Hbl-bt gneiss) are majorly concentrated in Alangulam, Radhapuram, Nanguneri, Manur and Sankarankovil Taluks in the district.

1.3 ENVIRONMENTAL CLEARANCE

As per EIA Notification, 2006 and its subsequent amendments (O.M vide No.F.No.L-11011/175/2018-IA-II(M) Govt of India MOEF&CC on December 12th 2018) project comes under category B1 cluster & schedule 1(a) under item 1

The proposed project is categorized under Category "B1" 1(a) (Cluster) - {Mining of Minerals} as the 500m radius area is more than 5 Ha including the mine lease area. Hence, the project will be considered at SEAC, Tamil Nadu.



1.4 TERMS OF REFERENCE (TOR)

The Terms of Reference have been issued by SEAC TN vide Letter No. SEIAA-TN/F. No. 8914/ToR-1117/2022 Dated: 23.03.2022. 44 additional ToR points were recommended by SEAC TN in addition to the Standard ToR Points. The replies for the same were addressed in this report.

1.5 POST ENVIRONMENTAL CLEARANCE MONITORING

1.5.1 *Methodology adopted*

Post project monitoring will be carried out as per conditions stipulated in environmental clearance letter issued by SEIAA, consent issued by SPCB as well as according to CPCB guidelines. The lease area is considered as core zone and the area lying within 10 km radius from the lease boundary is considered as buffer zone, where some impacts may be observed on physical and biological environment. In the buffer zone slight impact may be observed and that too is occasional.

Table 1-1: Post Environmental Clearance Monitoring

S. No.	Description	Frequency of Monitoring
1.	Ambient Air Quality Monitoring	Quarterly/ Half Yearly
2.	Water level & Quality Monitoring	Quarterly/ Half Yearly
3.	Noise Level Monitoring	Quarterly/ Half Yearly
4.	Soil Quality Monitoring	Yearly
5.	Medical Check-up	Yearly

1.6 GENERIC STRUCTURE OF THE EIA DOCUMENT

Chapter 1: **Introduction**. This chapter contains the general information on the mining of minerals, major sources of environmental impacts in respect of mining projects and details of environmental clearance process.

Chapter 2: **Project Description**. In this chapter the proponent should also furnish detailed description of the proposed project, such as the type of the project, need for the project, project location, layout, project activities during construction and operational phases, capacity of the project, project operation i.e., land availability, utilities (power and water supply) and infrastructure facilities such as roads, railways, housing and other requirements. If the project site is near a sensitive area it is to be mentioned clearly why an alternative site could not be considered. The project implementation schedule, estimated cost of development as well as operation etc should be also included.

Chapter 3: **Analysis of Alternatives (Technology and Site).** This chapter gives details of various alternatives both in respect of location of site and technologies to be deployed, in case the initial scoping exercise considers such a need.

Chapter 4: **Description of Environment**. This chapter should cover baseline data in the project area and study area.

Chapter 5: **Impact Analysis and mitigation measures**. This chapter describes the anticipated impacts on the environment and mitigation measures. The method of assessment of impacts including studies carried out, modelling techniques adopted to assess the impacts where pertinent should be elaborated in this chapter. It should give the details of the impacts on the baseline parameters, both during the construction and operational phases and suggests the mitigation measures to be implemented by the proponent.

Chapter 6: **Environmental Monitoring Program.** This chapter should cover the planned environmental monitoring program. It should also include the technical aspects of monitoring the effectiveness of mitigation measures.

Chapter 7: **Additional Studies**. This chapter should cover the details of the additional studies required in addition to those specified in the ToR and which are necessary to cater to more specific issues applicable to the particular project.

Chapter 8: **Project Benefits**. This chapter should cover the benefits accruing to the locality, neighborhood, region and nation as a whole. It should bring out details of benefits by way of improvements in the physical infrastructure, social infrastructure, employment potential and other tangible benefits.

Chapter 9: **Environmental Cost Benefit Analysis**. This chapter should cover on Environmental Cost Benefit Analysis of the project.

Chapter 10: **Environmental Management Plan.** This chapter should comprehensively present the Environmental Management Plan (EMP), which includes the administrative and technical setup, summary matrix of EMP, the cost involved to implement the EMP, both during the construction and operational phase and provisions made towards the same in the cost estimates of project construction and operation. This chapter should also describe the proposed post-monitoring scheme as well as inter-organizational arrangements for effective implementation of the mitigation measures.

Chapter 11: **Summary and Conclusions**. This chapter gives the summary of the full EIA report condensed to ten A-4 size pages at the maximum. It should provide the overall justification for implementation of the project and should explain how the adverse effects have been mitigated.

Chapter 12: **Disclosure of Consultants.** This chapter should include the names of the consultants engaged with their brief resume and nature of consultancy rendered.

1.7 DETAILS OF PROJECT PROPONENT

Project Proponent : Thiru.Joseph John Samuel
Status of the Proponent : Individual
Proponent's Name & Address : S/o. G.Jebarajan (Late),
54, Chellathai Nagar,
Mahilchi Nagar, Perumal Puram,
Tirunelveli District.
Pin Code: 627007.

1.8 BRIEF DESCRIPTION OF THE PROJECT

1.8.1 *Project Nature, Size & Location*

As per EIA Notification, 2006 and its subsequent amendments (O.M vide No.F.No.L-11011/175/2018-IA-II(M) Government of India MoEF & CC on December 12th 2018) project comes under category B1 cluster & schedule 1(a) under item 1.

Proposed proposal pertains to Rough stone mining project by open cast mechanized method on allotted mine lease area at Tharuvai Village, Palayamkottai Taluk of Tirunelveli District, Tamil Nadu. It is a plain terrain. The total allotted mine lease for the proposed project is 0.55.0 Ha with their maximum production capacity i.e. 23,808 m^3 of Rough stone for the period of Five years only.

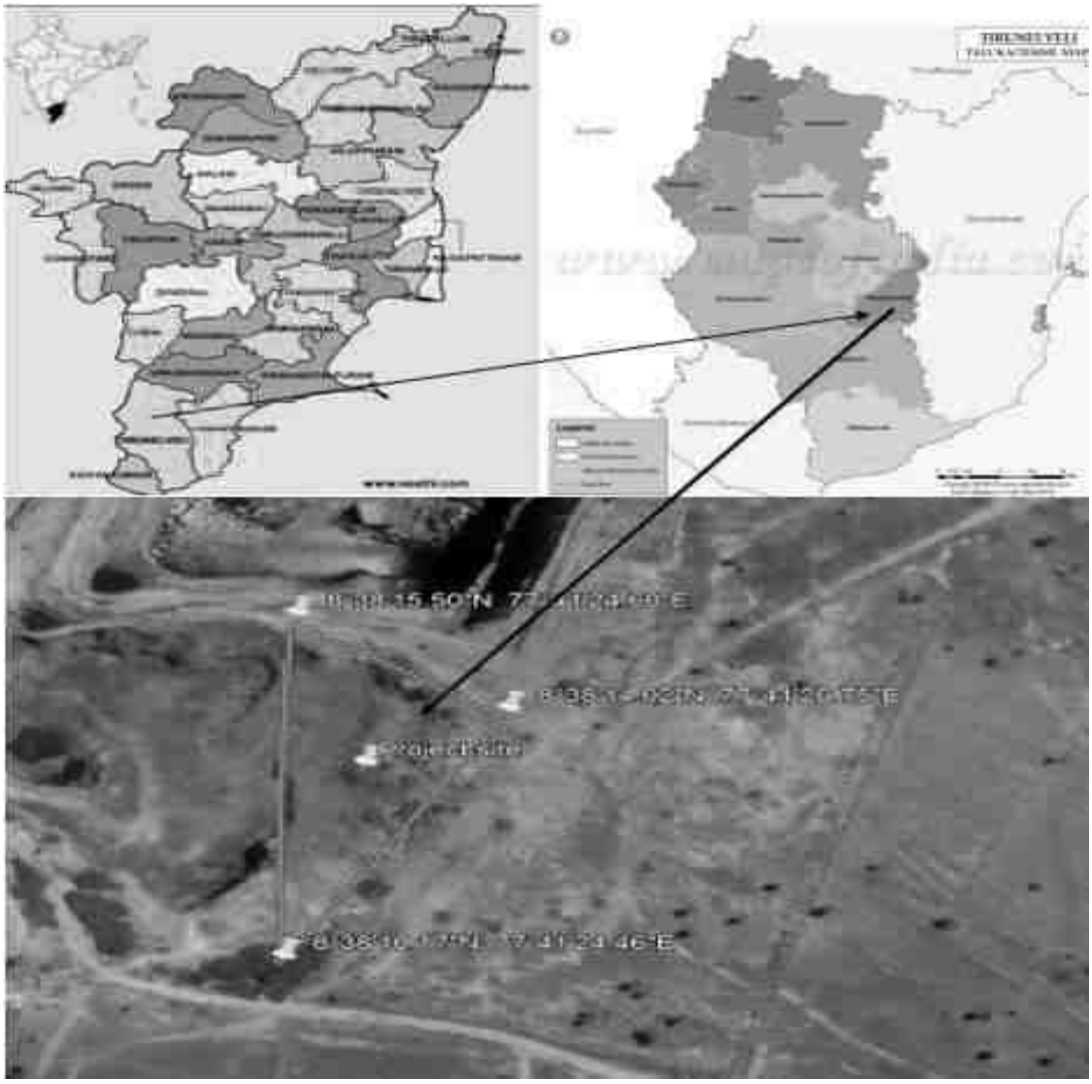


Figure 1.1: Location Map of the Project site

2 Project Description

This chapter furnishes detailed description of the proposed project, such as the type of the project, need for the project, project location, layout, project activities during mining, capacity of the project, project operation i.e., land availability, utilities (power and water supply) and infrastructure facilities such as roads, railways, housing and other requirements. The project implementation schedule estimated cost for carrying out entire mining activity is included.

2.1 GENERAL

Proposed proposal pertains to Rough stone mining project by open cast mechanized method on allotted mine lease area at Tharuvai Village, Palayamkottai Taluk of Tirunelveli District, Tamil Nadu. It is a Plain terrain. We have obtained fresh mining plan from 2024 to 2029 from Department of Geology and Mining, Tirunelveli District for 0.55.0 Ha land area in the S.F.Nos. 845/1B and 845/2B for a proposed mining depth of 17 m below ground level and five years production of 23,808 m^3 of Rough stone.

Type of the project:

As per EIA Notification, 2006 and its subsequent amendments (O.M vide No.F.No.L-11011/175/2018-IA-II(M) Government of India MoEF & CC on December 12th 2018) project comes under category B1 cluster & schedule 1(a) under item 1. The project required to be appraised at state level by State Environment Impact Assessment Authority, Tamil Nadu. Environment Clearance study will involve preparation of draft EIA report on the basis of baseline & impact assessment study is carried out. Also, before appraisal, under 7(III) of EIA notification 2006, the project involves the Public Consultation and the same will be conducted under SPCB (TN) in Virudhunagar District. The proceedings of the same will be incorporated in the Final EIA Report.

The mines within 500m radius from the project site is listed below.

Table 2-1: Quarry within 500m Radius

1) Existing other quarries:

1) Existing other quarries:

S. No.	Name of the Owner	Village & Taluk	S.F.Nos.	Extent in Hect.	Lease Period
1	Tmt.D.Mercy Mery, W/o.Jebarajan, 54, Sivan West car Street, Palayamkottai	Tharuvai (V)	851	2.51.5	25.10.2017 to 24.10.2022
2	Tmt.D.Mercy Mery, W/o.Jebarajan, 54, Sivan West car Street, Palayamkottai	Tharuvai (V)	847	1.62.5	17.07.2018 to 16.07.2023
3	Thiru.Sankaranarayanan@ Sankaran, S/o.Arunachalam, 24-B, Pillamar Street, Tisaiyanvilai, Radhapuram taluk, Tirunelveli.	Tharuvai (V)	844, 848 & 849/2	2.36.5	17.07.2018 to 16.07.2023
Total extent of abandoned quarries				6.50.5	

2) Details of abandoned /Old Quarries

S. No.	Name of the Owner	Village & Taluk	S.F.Nos.	Extent in Hect.	Lease Period
1.	A.S.Kumar, 52A/3, Thiruvanathapuram Road, Palayamkottai, Tirunelveli	Tharuvai(V)	855/2, 856, 857/1, 858/1,2,3, 859/2, 860/2	3.96.0	07.02.2012 to 06.02.2017

Total extent of abandoned quarries	**3.96.0**	

3) Details of Present Proposed quarries

S. No.	Name of the Owner	Village & Taluk	S.F.Nos.	Extent in Hect.	Lease Period
1.	Thiru.Joseph John Samuel, S/o.G.Jebarajan(late) 54, Chellathai Nagar, Mahilchi Nagar, Perumalpuram, Tirunelveli District.	Tharuvai(V)	S.F.No. 845/1B & 845/2B	Ext: 0.55.0 Hects	Under proposed quarry
2.	G.Jebarajan, No.54, Sivan west Car Street, Palayamkottai, Tirunelveli	Tharuvai(V)	S.F.No.1,2, 856/2, 858/1B, 2B, 3B	Ext: 2.63.0 Ha	Proposed quarry
3.	Thiru.K.Selvaraj, S.o.Kandasamy, 212A, Udankudi road, Tisayanvilai taluk, Tirunelveli District.	Tharuvai(V)	824/2, 825/2A, 825/2B, 826/1(P), 826/2(P), 842/2(P), 843, 845/1A and 845/2A(P),	4.45.20 Ha	Proposed quarry

2.1.1 *Need for the project:*

The said project plays a significant role in the domestic as well as infrastructural market. To achieve a huge infrastructure being envisaged by Government of India, particularly in road and housing sector, there is a need for basic building materials, the rough stone form the primary building material.

Rough stone is one of the most valuable natural building materials. Aggregates are mostly used for building roads and footpaths. Aggregates – stone used for its strong physical properties – crushed and sorted into various sizes for use in concrete, coated with bitumen to make asphalt or used 'dry' as bulk fill in construction.

Mostly used in roads, concrete and building products. Aggregates represent about 98% of quarry output, most of which is used in road construction, maintenance and repair. Much of this goes to the production of asphalt; the remainder is used 'dry' without the addition of other materials to provide a sturdy base for roads.

2.2 BRIEF DESCRIPTION OF THE PROJECT

Table 2-2 Salient Features of the Project

S. No.	Description	Details
1	Project Name	Thiru. Joseph John Samuel Rough Stone, Jelly and Gravel Quarry
2	Proponent	Thiru. Joseph John Samuel
3	Mining Lease Area Extent	0.55.0 Ha
4	Location	845/1B and 845/2B
5	Latitude	Latitude : 08^0 38' 10" to 08^0 38' 16" N
6	Longitude	Longitude : 77^0 41' 25" to 77^0 41' 27" E
7	Topography	Plain terrain
8	Site Elevation above MSL	118 m from MSL
9	Topo sheet No.	58 H/10 of Survey of India
10	Minerals of Mine	Rough Stone, Jelly and Gravel Quarry
11	Proposed production of Mine	23,808 m^3 of Rough stone
12	Ultimate depth of Mining	17 m below ground level
13	Method of Mining	Open cast mechanized mining
14	Water demand	1.5 KLD
15	Source of water	Water will be supplied through tankers supply

16	Man power	12Nos.
17	Mining Plan Approval	Mining Plan was approved by The Assistant Director, Geology & Mining, Tirunelveli vide letter Rc.No.M1/21631/2017 dated 28.12.2020.
18	Precise area communication letter	Precise area communication letter received from Assistant Director, Department of Geology and Mining; Tirunelveli vide letter Rc.No.M1.21631/2017 dated 18.12.2020
19	Production details	Geological reserves: 81,840 m^3 of Rough stone Proposed year wise reserves: 23,808 m^3 of Rough stone
20	Boundary Fencing	7.5 m barrier all along the boundary for adjacent patta lands and 10 m safety distance for Govt. Lands. Fencing will be provided.
21	Disposal of overburden	The overburden is in the form of Gravel formation, it has been removed earlier quarry operation. The excavated rough stone will be directly loaded into tipper to the needy crushers/ other buyers for road project and construction works for filling and levelling of low lying areas.
22	Ground water	Ground water table in this area is below 56 mts below ground level. The quarrying is up to a maximum depth of 17m below the ground level. Hence the quarry operation will not be affected by the ground water.
23	Habitations within 300m radius of the Project Site	There is no Habitation within 300m radius of the project site.
24	Drinking water	Water will be supplied through tankers from Ponnakudi village which is 1.03 Km SSE of the area

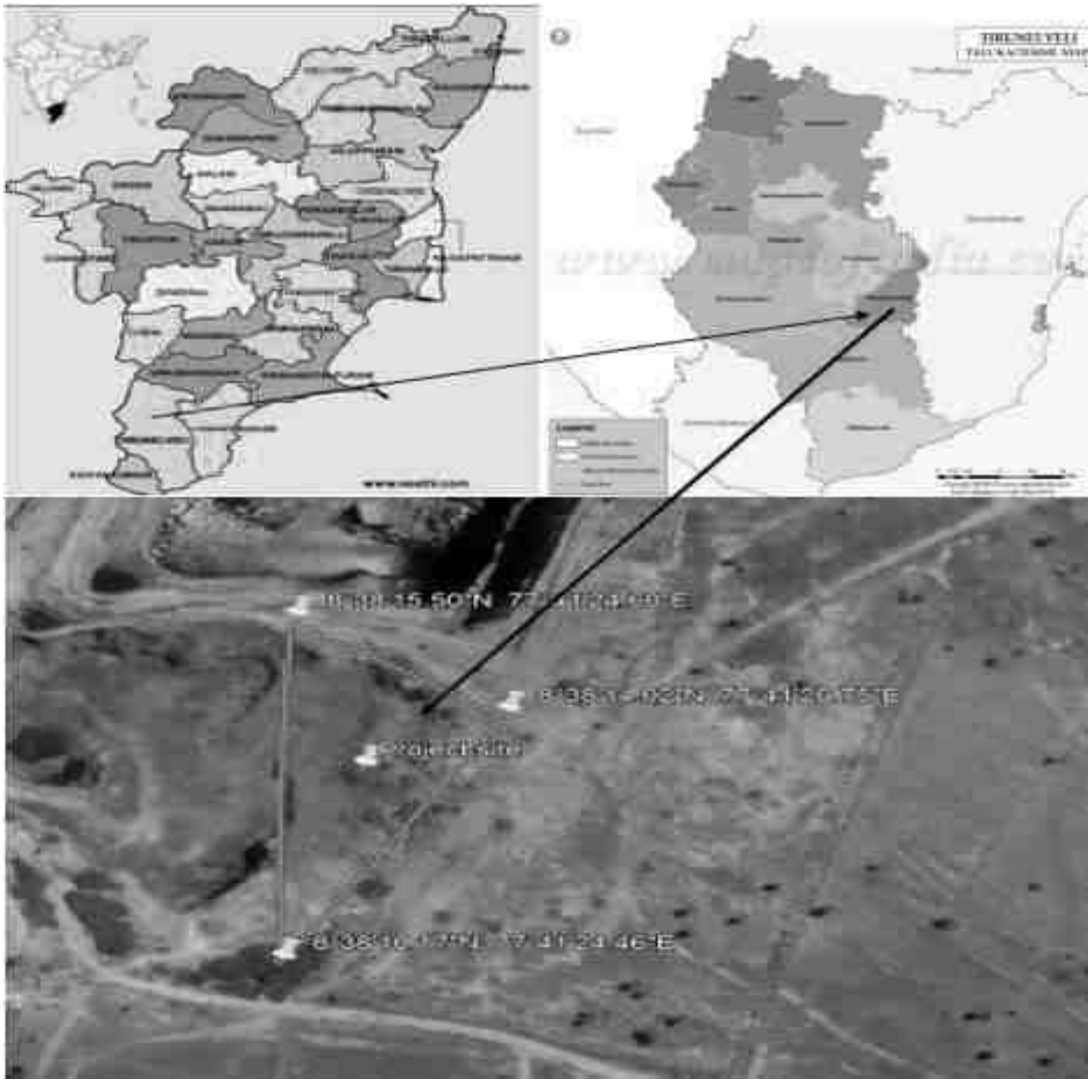


Figure 2.1: Location Map of the Project Site

Figure 2.2: Google Earth Image and Coordinates of the Project Site

2.2.1 *Site Connectivity:*

The site is connected to the roadways as follows.

NH 44 – Srinagar to Kanniyakumari – 1.05 km, E

Figure 2.3: Site Connectivity

2.3 LOCATION DETAILS:

Table 2-3: Location Details

S. No	Particulars	Details
1.	Latitude	Latitude : 08^0 38' 10" to 08^0 38' 16" N
2.	Longitude	Longitude : 77^0 41' 25" to 77^0 41' 27" E
3.	Site Elevation above MSL	118 m MSL
4.	Topography	Plain Terrain
5.	Land use of the site	Patta land
6.	Extent of lease area	0.55.0 Ha

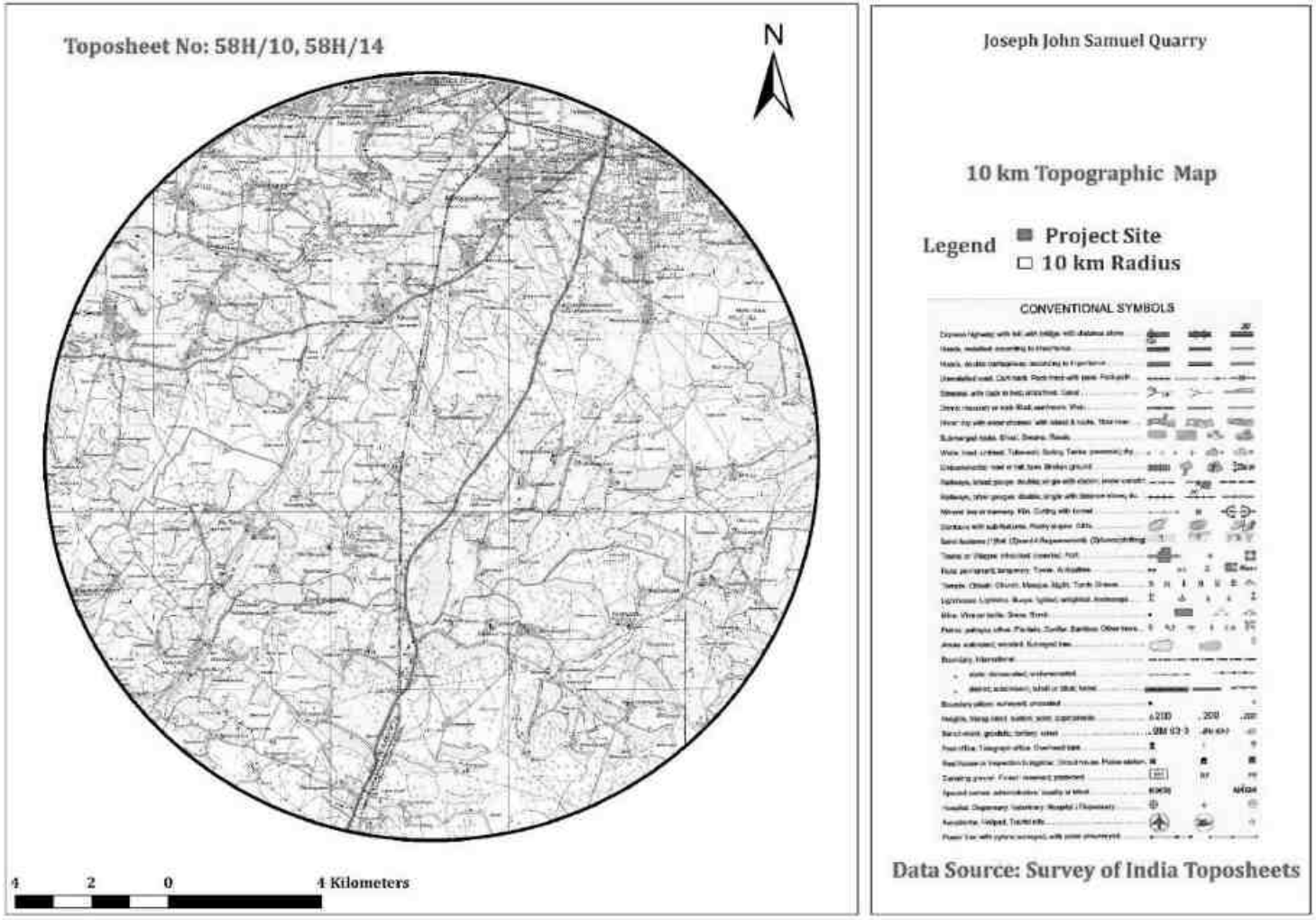


Figure 2.4: Topo Map of Project Site

Figure 2.5: Environmental Sensitivity within 15km radius

2.3.1 *Land Use Breakup of the Mine Lease Area*

The Mine Lease area is Plain terrain. The land use pattern of the mine lease area as follows.

Table 2-4: Land use pattern

Sl. No.	Land Use	Area in use during the quarrying period (Hect)
1.	Quarrying pit	0.31.0
2.	Infrastructure	0.01.0
3.	Mine Road	0.01.0
4.	Green belt	0.10.0
5.	Unutilized area	0.12.0
	Total	**0.55.0**

2.3.2 *Human Settlement*

There are no habitations within the radius of 300m. The nearby habitations are as follows

Table 2-5: Habitation

S.No	Name of the Village	Approximate distance & Direction from lease applied area	Approximate population
1.	Caussanelpuram	2.0km - NE	300
2.	Keelaomanallur	3.5km - NW	200
3.	Ponnakudi	1.0Km – SE	600
4.	Kandithankulam	1.5Km-SW	400

2.4 LEASEHOLD AREA

The Rough Stone Quarry mine of 0.55.0 Ha is a patta land. The lease area falls in S.F No: 845/1B and 845/2B of Tharuvai Village, Palayamkottai Taluk, Tirunelveli District. There is no reserve forest

or protected forest land within the lease area. There is neither human settlement within 300m radius from the lease area.

2.5 GEOLOGY

Southern Granulite Terrain (SGT) of Tamil Nadu lying south of Palaghat-Cauvery shear zone has been divided into two major tectonic blocks by the Madurai block and Nagercoil-Trivandrum Block in the south. It is separated by WNW-ESE trending Achankovil-Tambaraparani Lineament. Tirunelveli and Thothukudi are significantly the only districts in the state to witness the geology and structure of both the blocks. Tirunelveli district represents a well-developed lithopackage of meta-sedimentary sequence inter banded with charnockite Group of rocks. The rock types exposed are of quartzite, calc-granulite, garnet-biotite-sillimanite gneiss, garnet quartzo-feldspathic gneiss and garnetbiotite-cordierite gneiss belonging to Khondalite Group of rock. Charnockite and pyroxene granulite are the Charnockite Group. Hornblende-biotite gneiss belongs to Migmatitic Complex. Besides, basic intrusive (pyroxenite) and acid intrusive (granite) are noticed. The younger intrusive are represented by pegmatite and quartz veins. Evidence of development of incipient / patchy charnockite along the shear plane is noticed in the district along the Western Ghat high hills.

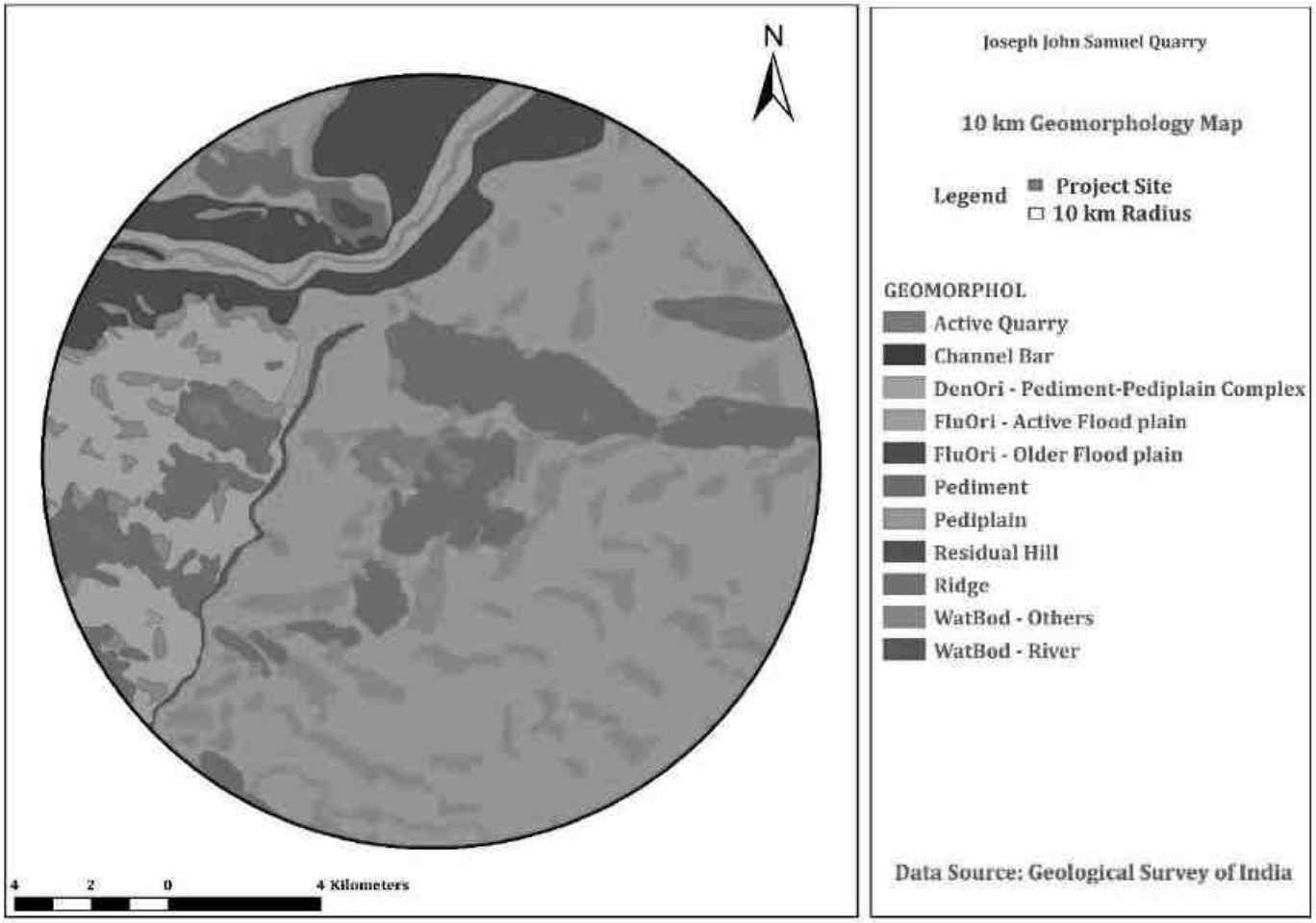


Figure 2.6: Geomorphology

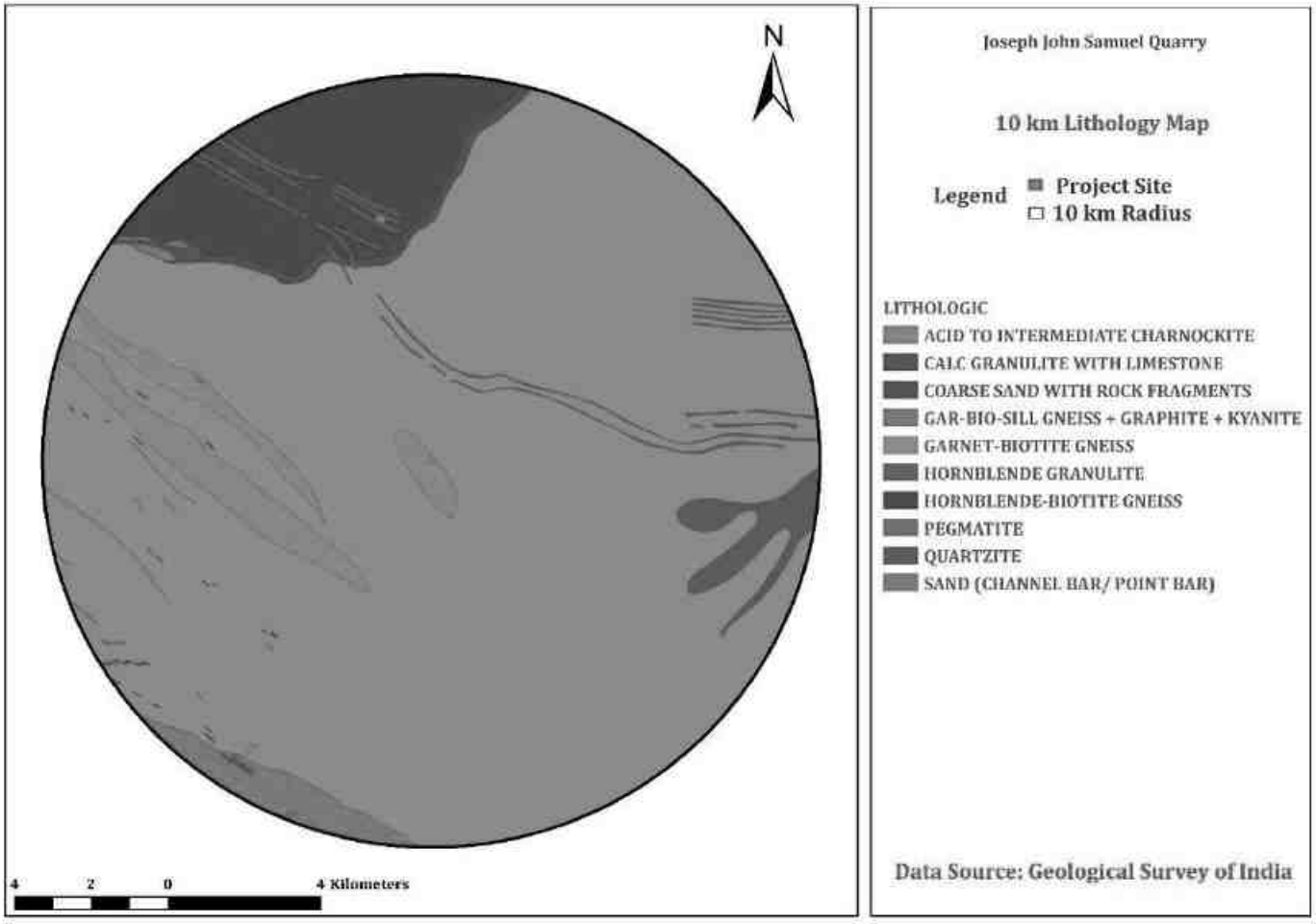


Figure 2.7 Lithology

2.6 QUALITY OF RESERVES:

The mining lease area is of 0.55.0 Ha, with production capacity of 23,808 m^3 of Rough Stone. Due to significant role in the domestic as well as infrastructural market, making the mining of Stone and gravel along with associated minor minerals is economically viable.

Table 2-6: Details of Mining

S. No	Particulars	Details
1	Method of Mining	Open Cast mechanized

2	Geological Reserves	81,840 m^3 of Rough stone
3	Recoverable Reserves	23,808 m^3 of Rough stone
4	Proposed Production	23,808 m^3 of Rough stone
5	Elevation Range of the Mine Site	118 m MSL

2.6.1 *Geological Reserves*

The Geological reserves have been calculated based on the cross section method. The available geological reserve is estimated as 81,840 m3 of Rough Stone and 10,912 m3 of Gravel respectively. Availability of Resources is given below. The quarrying is restricted up to a depth of 17m below ground level only. Availability of Resources is given below.

Table 2-7: Geological Reserves

SECTION	LENGTH IN (M)	WIDTH IN (M)	DEPTH IN (M)	VOLUME IN M^3	GRAVEL FORMATION IN M^3	GEOLOGICAL RESOURCES OF ROUGH STONE IN M^3
XY-AB	124	44	2	10912	10912	
	124	44	15	81840		81840
Total					**10912**	**81840**

2.6.2 *Mineable Reserves*

Table 2-8: Mineable Reserves

SECTION	BENCH	LENGTH IN (M)	WIDTH IN (M)	DEPTH IN (M)	VOLUME IN M^3	MINEABLE RESERVES OF ROUGH STONE IN M^3
XY-AB	II	105	27	4.5	12758	12758
	III	95	17	5	8075	8075
	IV	85	7	5	2975	2975

Total	**23808**

The Available mineable reserve is computed as 23,808m^3 of Rough stone upto a depth of 17m below ground level only.

2.6.3 *Year wise Production Plan*

The applicant has proposed to carry out 23,808m^3 of Rough stone at the rate of 100% recovery upto a depth of 17m below ground level for the period of five years only.

Table 2-9: Year wise Production Plan

YEAR	SECTION	BENCH	LENGTH IN (M)	WIDTH IN (M)	DEPTH IN (M)	VOLUME IN M^3	MINEABLE RESERVE OF ROUGH STONE IN M^3
I	XY-AB	II	39	27	4.5	4739	4739
	Total						**4739**
II	XY-AB	II	39	27	4.5	4739	4739
	Total						**4739**
III	XY-AB	II	27	27	4.5	3281	3281
		III	17	17	5	1445	1445
	Total						**4726**
IV	XY-AB	III	56	17	5	4760	4760
	Total						**4760**
III	XY-AB	III	22	17	5	1870	1870
		IV	85	7	5	2975	2975
	Total						**4845**
Grand Total							**23808**

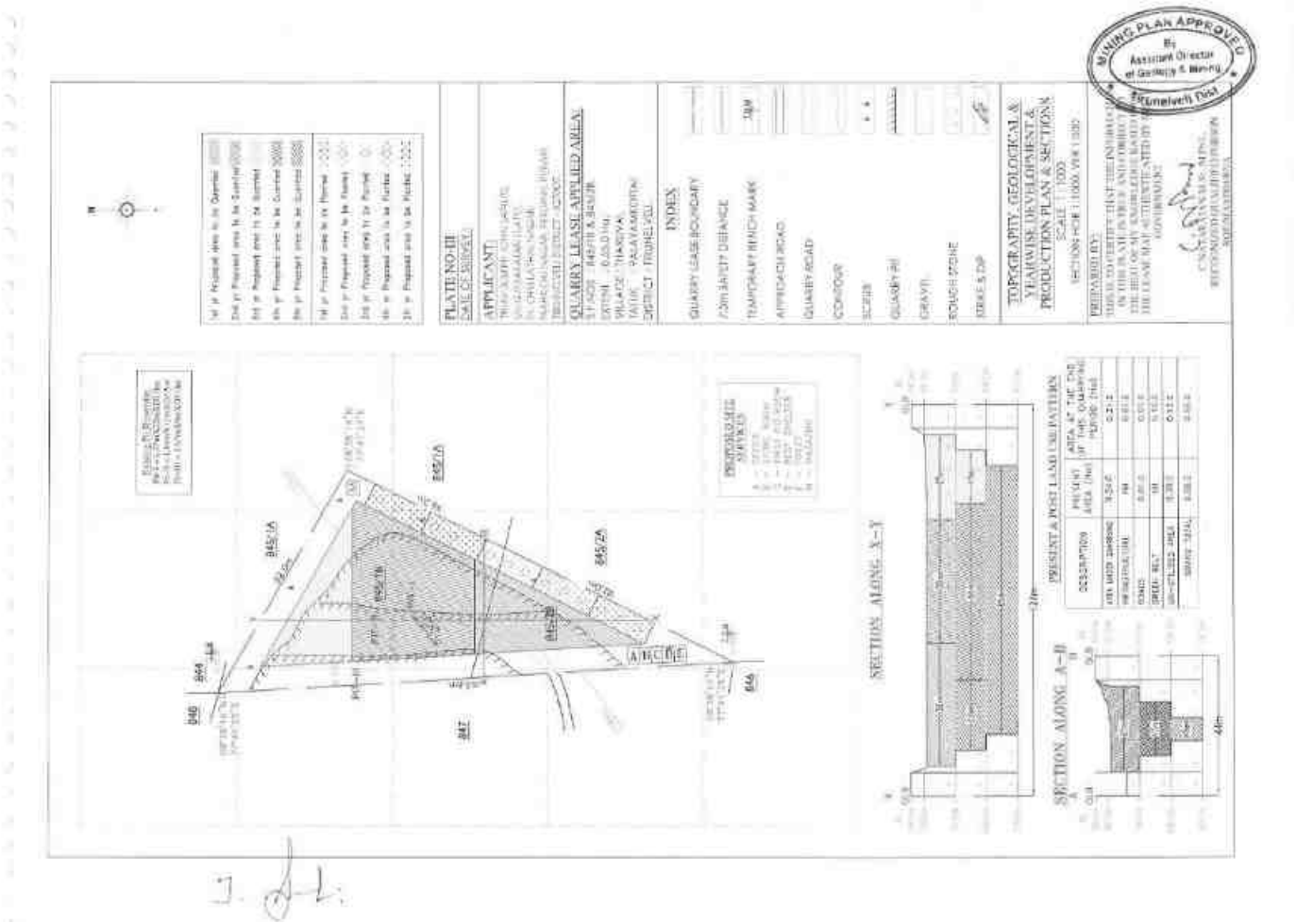


Figure 2.8 Year wise Production Plan

2.7 TYPE OF MINING

The proposed project is an open cast mechanized mining with one with 5.0 meter vertical bench with a bench width of 5.0 meter. However, as far as the quarrying of Rough Stone is concerned, observance of the provisions of regulations 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 Mines Act- 1952.

2.7.1 *Method of Working:*

The Rough stone is proposed to quarry at 5m bench height & 5m width with conventional Open cast mechanized method. The quarrying operation will be carried out in conjunction with conventional method of mining using Jack hammer drilling and blasting for shattering effect and loosen the Rough stone.

2.7.2 *Overburden*

The overburden is in the form of Gravel formation, it has been removed earlier quarry operation. The excavated rough stone will be directly loaded into tipper to the needy crushers/ other buyers for road project and construction works for filling and levelling of low lying areas.

2.7.3 *Machineries to be used*

Type of machineries proposed for quarrying operation for the entire project is listed below.

Table 2-10: List of Machineries used

For Mining operation	Excavator of 0.90 Cu.m bucket capacity Jack Hammer (30-32 mm dia) Tractor mounted compressor
Loading Equipment	Excavator of 0.9 Cu.m bucket capacity
Transportation	Tipper 2 No. of 5/10 Ts capacity

2.7.4 *Blasting:*

2.7.4.1 Blasting Pattern:

The quarrying operation will be carried out in conjunction with conventional method of mining using Jack hammer drilling and blasting for shattering effect and loosen the Rough stone.

2.7.4.2 Drilling & Blasting:

Drilling and Blasting Parameters are as follows

Table 2-11: Drilling and Blasting Parameters

Parameters	Details
Depth of each hole	1 m to 1.5m
Diameter of hole	32-36 mm
Spacing between holes	0.6 m
Pattern of hole	Zigzag
Inclination of holes	70° from horizontal
Use of delay detonators	25 milli seconds delays
Detonating fuse	"Detonating" Cord

2.7.4.3 Types of Explosives to be used:

Slurry Class 3 explosives, type of nitro compound are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling or primary blasting is proposed. Detonators of Class 3 and Safety fuse of Class 6 are used.

2.7.4.4 Measures to minimize ground vibration due to blasting:

The quarry is situated more than 1 km from the nearby villages. Controlled blasting measures will be adopted for minimizing the ground vibration and fly of rocks. Shallow depths jackhammer drilling & blasting is proposed to be carried out with minimum use of explosive mainly to give shattering effect in rough stone for easy excavation and to control fly of rock.

Table 2-12: Blasting Details

Parameters	Details
Diameter of holes	32-36mm
Spacing between holes	0.6 m
Depth	1 to 1.5 m
Charge/Hole	0.6kg
Pattern of hole	Zig Zag
Inclination of Hole	70^0 from the horizontal
Blasting time	4.30 P.M to 5.30 P.M

2.7.4.5 Storage & Safety measures taken during blasting:

The project proponent "Thiru Joseph John Samuel" will engage an authorized explosive agency to carry out the small amount of blasting and it will be supervised by Permit Mines Manager. The copy of the explosive certificate is attached as ***Annexure.***

2.8 MAN POWER REQUIREMENTS

The manpower requirement to meet out the production Schedule and the machinery strength envisaged in the mining plan and to comply with the statutory provisions of the Mines Safety Regulations is as follows.

Table 2-13: Man Power Requirements

1.	Skilled	Operator	4No.
		Mechanic	1 No.
		Mines manager /Mate	1 No.
2.	Semi-Skilled	Driver	2 Nos
3.	Unskilled	Musdoor/ Labours	4 Nos
		Total =	12Nos

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

2.8.1 *Water Requirement*

Total water requirement for the mining project is 1.5 KLD. Domestic water will be sourced from nearby Ponnakkudi village and other water will be source from nearby road tankers supply.

Table 2-14: Water Requirment

Purpose	**Quantity**	**Sources**
Drinking Water	0.5 KLD	Packaged Drinking water vendors available in Ponnakudi village which is about 1.03km SSE of the area
Green belt	0.5KLD	Other domestic activities through road tankers supply
Dust suppression	0.5KLD	From road tankers supply
Total	**1.5 KLD**	

2.9 PROJECT IMPLEMENTATION SCHEDULE

The implementation schedule of the proposed Mine Lease of Thiru Joseph John Samuel (0.55.0 ha) is as follows.

Table 2-15: Mining Schedule

MINING SCHEDULE					
Activity	Jan -24	Jan-25	Jan-26	Jan-27	Jan-28
Site Clearance					
Excavation – Rough stone/Overburden					
I Year Production – Cum – 4739 Rough Stone					
II Year Production – Cum – 4739 Rough Stone					
III Year Production – Cum – 4726 Rough Stone					
IV Year Production - Cum – 4760 Rough Stone					
V Year Production – Cum – 4845 Rough Stone					

2.10 SOLID WASTE MANAGEMENT

Table 2-15: Solid Waste Management

S. No	Type	Quantity	Disposal Method
1	Organic	4.8 kg/day	Municipal bin including food waste
2	Inorganic	7.2 kg/day	TNPCB authorized recyclers

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

2.11 MINE DRAINAGE

The quarry operation is proposed up to a depth of 17m below ground level. The water table is below 56 m from the ground level which is observed from the nearby bore wells and bore wells of this area. Hence the ground water will not be affected in any manner due to the quarrying operation during the entire lease period.

2.12 POWER REQUIREMENT

This 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 and **10 Litre** diesel per hour for excavation of Top soil needed.

2.13 PROJECT COST

1	**A. Fixed Asset Cost**: 1. Land Cost 2. Labour shed 3. Sanitary Facility 4. Fencing Cost	: : : :	 Rs.2,20,000 Rs.1,00,000 Rs. 1,00,000 Rs.1,00,000

	Total=	:	**Rs. 5,20,000/-**
2	**B.** Operational Cost: 1.Machineries	:	Rs.40,00,000/-
	Total Project Cost(A+B)	:	**Rs. 45,20,000/-**

I. EMP Cost :

Air quality sampling	Rs.40,000/-
Water quality sampling	Rs.40,000/-
Noise Monitoring	Rs.20,000/-
Ground vibration test	Rs.20,000/-

Expenditure

Drinking water facility	Rs.1,00,000/-
Sanitary arrangements	Rs.25,000/-
Safety kids	Rs.50,000/-
Water sprinkling	Rs.70,000/-
Cost towards charity	Rs.30,000/-
Total	Rs.4,30,000/-
Total Project cost(A+B+C)	Rs.50,50,000/-

2.14 GREENBELT

1. The development of greenbelt in the peripheral buffer zone of the mine area.
2. Green belt has been recommended as one of the major components of Environmental Management plan, which will improve ecology, environment and quality of the surrounding area.
3. Local trees like, Neem, Vilvam Vaagai, Naval etc will be planted along the lease boundary and avenues as well as over non-active dumps at a rate of 275 trees per annum with interval 5m.
4. The rate of survival expected to be 70% in this area

Table. 2-17 Plantation/ Afforestation Program

Name of species proposed	Survival	No of species
Neem, Vilvam Vaagai, Eachai, Naval, Mantharai, Magizha Maram, Vila maram, Poo Marudhu, Panai Maram, Marudha Maram, Thandri, Sengondrai, Poovarasu, Therthag kottai , Pungam	70%	275
Total		**275**

3 Description of the Environment

3.1 GENERAL:

The method of mining for extracting rough stone quarry and gravel is required to be selected in such a manner to ensure sustainable development. Mining activities invariably affect the existing environmental status of the site. It has both adverse and beneficial effects. 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 and sustainable resource extraction.

To understand the existing environmental scenario, Baseline data helps in identification, prediction and evaluation of impacts in Environmental Impact assessment. Through field study, baseline data are collected considering various factors of the project. This includes-

- Physical- the area, the soil properties, the geological characteristics, the topography, etc
- Chemical- water, air, noise and soil pollution levels, etc.
- Biological- the biodiversity of the area, types of flora and fauna, species richness, species distribution, types of ecosystems, presence or absence of endangered species and/or sensitive ecosystems etc.
- Socioeconomic- demography, social structure, economic conditions, developmental capabilities, displacement of locals, etc.

3.1.1 *Study Area:*

The study area for the mining projects is as follows:

- Mine lease area as the "core zone"
- A study area of 10 km radius from the project boundary is designated as buffer Zone and for the study of Socio-economic status, 10 km radius from the boundary limits of the mine lease area has been selected.

We have obtained Terms of Reference from SEIAA vide Letter No. SEIAA-TN/ F. No. 8914/ ToR-1117/2022 Dated: 23.03.2022. The baseline monitoring is carried out in December 2022 to February

2023 and the analysis is briefed in the EIA report. The proponent has engaged M/s. Ecotech labs Pvt. Ltd for carrying out the existing baseline study.

3.1.2 *Instruments Used*

The following instruments were used at the site for baseline data collection.

1. Respirable Dust Sampler with attachment for gaseous Pollutants, Envirotech APM 460, APM411.
2. Fine Particulate Matter (FPM) Sampler, APM 550
4. Sound Level Meter Model SL–4010
5. 2000 series watchdog automatic weathering monitoring station

3.1.3 *Baseline Data Collection Period:*

The baseline data is collected in accordance with the CPCB Guidelines. The Baseline study is carried out from January to March 2023.

3.1.4 *Frequency of Monitoring*

Table 3-1: Frequency of Sampling and Analysis

Attributes	Sampling	Frequency
Air environment – Meteorological (wind speed, wind direction, rainfall, humidity, temperature)	Project site	1 hourly continuous
Air environment – Pollutants PM 10 PM 2.5 SO_2 NO_X Lead in PM	5 locations	24 hourly twice a week 4 hourly. Twice a week, One non-monsoon season 8 hourly, twice a week 24 hourly, twice a week
Noise	5 locations	24 hourly Once in 5 locations
Water (Ground water)	5 locations	Once in 5 locations

pH, Temperature, Turbidity, Magnesium Hardness, Total Alkalinity, Chloride, Sulphate, Fluoride, Nitrate, Sodium, Potassium, Salinity, Total nitrogen, Total Coliforms, Fecal Coliforms		
Water (surface water) pH, Temperature, Turbidity, Magnesium Hardness, Total Alkalinity, Chloride, Sulphate, Fluoride, Nitrate, Sodium, Potassium, Salinity, Total nitrogen, Total Coliforms, Fecal Coliforms	Sample from nearby lakes/river	One-time Sampling
Soil (Organic matter, Texture, pH, Electrical Conductivity, Permeability, Water holding capacity, Porosity)	5 locations	Once in 5 locations
Ecology and biodiversity Study	Study area covering 10 km radius	One-time Sampling
Socio- Economic study (Population, Literacy Level, employment, Infrastructure like school, hospitals & commercial establishments)	Villages around 10 km radius	One-time Sampling

3.1.5 *Secondary data Collection*

Apart from the primary data, Secondary data is also used for the collection; collation; synthesis and interpretation

- Flora & Faunal Study
- Land use study
- Demography and socio-economic analysis
- Meteorological data, from Indian Meteorological Department (IMD)

3.1.6 *Study area details*

Table 3-2 Study area details

S. No	Description	Details	Source
1.	Project Location	S.F.No. 845/1B and 845/2B - 0.55.0 Ha, Tharuvai Village, Palayamkottai Taluk, Tirunelveli District, Tamil Nadu State	Field Study
2.	Latitude & Longitude	Latitude : 08^0 38' 10" to 08^0 38' 16" N Longitude : 77^0 41' 25" to 77^0 41' 27" E	Topo Sheet
3.	Topo Sheet No.	58 H/10	Survey of India Toposheet
4.	Mine Lease Area	0.55.0 Ha	--
Demography in the study area (as per Census 2011)			
5.	Total Population	6126	Census Survey of India
6.	Total Number of Households	1574	
7.	Maximum Temperature (°C)	34	IMD
8.	Minimum Temperature (°C)	31	

<table>
<tr><td>9.</td><td>Ecological Sensitive Areas - Wetlands, watercourses or other waterbodies, coastal zone, biospheres, mountains, forests</td><td>❖ Brothers lake-1.38 km, ENE
❖ Pachaiyar river-4.17 km, NW
❖ Thamirabarani river-4.84 km, NNW
❖ Suthamalli reservoir dam-8.51 km, NW
❖ Veinthankulam birds sanctuary-8.66 km, NE
❖ Seeniappan pond-12.04 km, NNE</td><td>Google Earth/Field Study</td></tr>
<tr><td>10.</td><td>Densely Populated area</td><td>Palayamkottai - 10.30 Km -NE</td><td></td></tr>
<tr><td>11.</td><td>Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)</td><td>
<table>
<tr><th>S. No.</th><th>Places</th><th>Dist. From Project Site</th></tr>
<tr><td colspan="3">Schools & Colleges</td></tr>
<tr><td>1</td><td>Christhu Jyothi higher secondary school</td><td>2.06 km, NE</td></tr>
<tr><td>2</td><td>Holy Angels BCV International School</td><td>2.14 km, NE</td></tr>
<tr><td>3</td><td>TDTA Chelliah Nadar Middle school</td><td>3.12 km, ENE</td></tr>
<tr><td>4</td><td>Ponnakudi Rosemarry college</td><td>0.68 km, NE</td></tr>
<tr><td>5</td><td>Rose Marry arts & science college</td><td>1.21 km, ENE</td></tr>
<tr><td>6</td><td>Ithaya Jyothi college of nursing</td><td>2.86 km, NE</td></tr>
<tr><td colspan="3">Hospitals</td></tr>
</table>
</td><td>Google Earth/ Field Study</td></tr>
</table>

			1	Leela Clinic	7.66 km, NE		
			2	CSI Jayaraj Annapackiam Hospital	10.33 km, NE		
			3	Rose Mary Mission hospital	10.19 km, NE		

3.1.7 *Site Connectivity:*

The site is connected to (NH-44 -Srinagar to Kanniyakumari road) – 1.05 km, E

Figure 3.1: Site Connectivity

3.2 LAND USE ANALYSIS

3.2.1 *Land Use Classification*

Land Use / Land Cover - Land Use refers to man's activity and the various uses, which are carried on land. Land Cover refers to natural vegetation, water bodies, rock/soil, artificial cover and others, resulting due to land transformation. The present Land Use/Land Classification map is developed with following objectives. The main objective of the study is to classify the different land use within 10 km from the project boundary.

3.2.2 *Methodology*

Information of land use and land cover is important for many planning and management activities concerning the surface of the earth (Agarwal and Garg, 2000). Land use refers to man's activities on land, which are directly related to land (Anderson et al., 1976). The land use and the land cover determine the infiltration capacity. Barren surfaces are poor retainers of water as compared to grasslands and forests, which not only hold water for longer periods on the surface, but at the same time allow it to percolate down.

The terms 'land use' and 'land cover' (LULC) are often used to describe maps that provide information about the types of features found on the earth's surface (land cover) and the human activity that is associated with them (land use). Satellite remote sensing is being used for determining different types of land use classes as it provides a means of assessing a large area with limited time and resources. However, satellite images do not record land cover details directly and they are measured based on the solar energy reflected from each area on the land. The amount of multi spectral energy in multi wavelengths depends on the type of material at the earth's surface and the objective is to associate particular land cover with each of these reflected energies, which is achieved using either visual or digital interpretation. In the present study the task is to study in detail the land use and land cover in and around the project site. The study envisages different LULC around the proposed project area and the procedure adopted is as below.

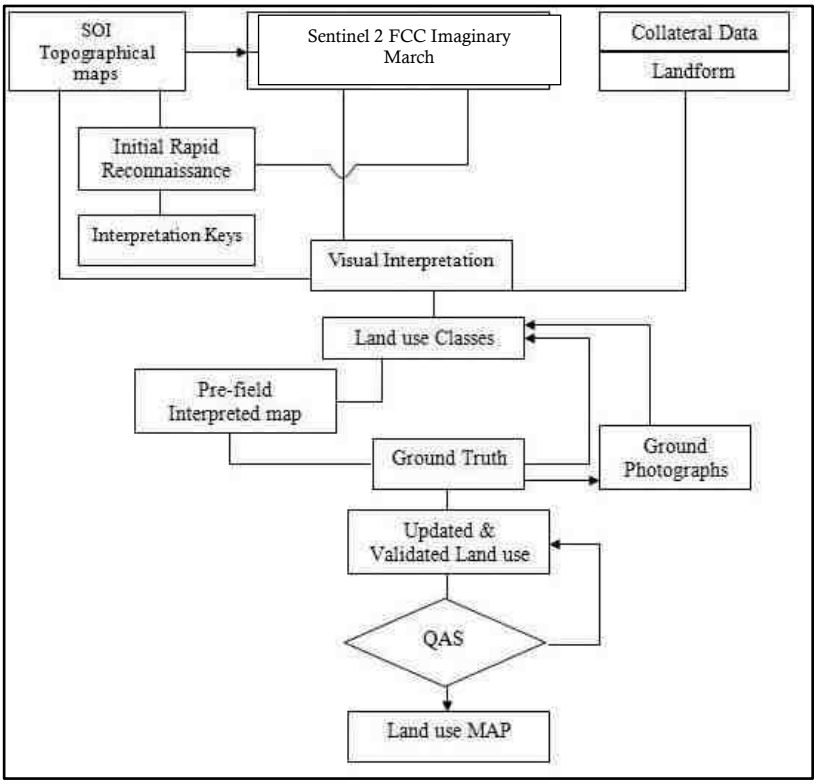


Figure 3.2 Flow Chart showing Methodology of Land use mapping

3.2.3 *Satellite Data*

Sentinal 2 multispectral satellite data of 2020 was utilized for the present study. Details of satellite data is given below. The rectification of imagery was carried out on to bring the digital data on the earth coordinate system by means of ground control point (GCP) assignments/SOI topo sheets.

3.2.4 *Scale of mapping*

Considering the user defined scale of mapping, 1:50000 Sentinal 2 data was used for Land use / Land cover mapping of 10 km radius for proposed site. The description of the land use categories for 10 km radius and the statistics are given for 10 km radius.

3.2.5 *Interpretation Technique*

Standard on screen visual interpretation procedure was followed. The various Land use / Land cover classes interpreted along with the SOI topographical maps during the initial rapid reconnaissance of the

study area. The physiognomic expressions conceived by image elements of color, tone, texture, size, shape, pattern, shadow, location and associated features are used to interpret the FCC imagery. Image interpretation keys were developed for each of the LU/LC classes in terms of image elements.

June 2016 FCC imagery (Digital data) of the study area was interpreted for the relevant land use classes. On screen visual interpretation coupled with supervised image classification techniques are used to prepare the land use classification.

1. Digitization of the study area (10 km radius from the proposed site) from the topo maps
2. In the present study the sentinal satellite image and SOI topo sheets of 58J/10, 58J/11, 58J/14, 58J/15 have been procured and interpreted using the ERDAS imaging and ARC-GIS software adopting the necessary interpretation techniques.
3. Satellite data interpretation and vectorization of the resulting units
4. Adopting the available guidelines from manual of LULC mapping using Satellite imagery (NRSA, 1989)
5. Field checking and ground truth validation
6. Composition of final LULC map

The LULC Classification has been done at three levels where level -1 being the broad classification about the land covers that is Built-up land, agriculture land, waste land, wet lands, and water bodies. These are followed by level –II where built-up land is divided into towns/cities as well villages. The Agriculture land is divided into different classes such as cropland, Fallow, Plantation, while wastelands are broadly divided into, Land with scrub and without Scrub and Mining and Industrial wasteland. The wetlands are classified into inland wetlands, coastal wetlands and islands. The water bodies are classified further into River/stream, Canal, Tanks and bay. In the present study level II classification has been undertaken. The SOI Topo map is presented in Annexure and Satellite imagery of 10 km radius from the project site is presented Annexure

3.2.6 *Field Verification*

Field verification involved collection, verification and record of the different surface features that create specific spectral signatures / image expressions on FCC. In the study area, doubtful areas identified in course of interpretation of imagery is systematically listed and transferred on to the corresponding SOI topographical maps for ground verification. In addition to these, traverse routes were

planned with reference to SOI topographical maps to verify interpreted LU/LC classes in such a manner that all the different classes are covered by at least 5 sampling areas, evenly distributed in the area. Ground truth details involving LU/LC classes and other ancillary information about crop growth stage, exposed soils, landform, nature and type of land degradation are recorded and the different land use classes are taken the Land use map is presented in Annexure

3.2.7 *Description of the Land Use / land cover classes*

3.2.7.1 Water

Areas where water was predominantly present throughout the year; may not cover areas with sporadic or ephemeral water; contains little to no sparse vegetation, no rock outcrop nor built up features like docks; examples: rivers, ponds, lakes, oceans, flooded salt plains.

3.2.7.2 Trees

Any significant clustering of tall (~15-m or higher) dense vegetation, typically with a closed or dense canopy; examples: wooded vegetation, clusters of dense tall vegetation within savannas, plantations, swamp or mangroves (dense/tall vegetation with ephemeral water or canopy too thick to detect water underneath).

3.2.7.3 Grass

Open areas covered in homogenous grasses with little to no taller vegetation; wild cereals and grasses with no obvious human plotting (i.e., not a plotted field); examples: natural meadows and fields with sparse to no tree cover, open savanna with few to no trees, parks/golf courses/lawns, pastures.

3.2.7.4 Flooded vegetation

Mix of small clusters of plants or single plants dispersed on a landscape that shows exposed soil or rock; scrub-filled clearings within dense forests that are clearly not taller than trees; examples: moderate to

sparse cover of bushes, shrubs and tufts of grass, savannas with very sparse grasses, trees or other plants.

3.2.7.5 Crops

Human planted/plotted cereals, grasses, and crops not at tree height; examples: corn, wheat, soy, fallow plots of structured land.

3.2.7.6 Scrub/Shrub

Mix of small clusters of plants or single plants dispersed on a landscape that shows exposed soil or rock; scrub-filled clearings within dense forests that are clearly not taller than trees; examples: moderate to sparse cover of bushes, shrubs and tufts of grass, savannas with very sparse grasses, trees or other plants

3.2.7.7 Built Area

Human made structures; major road and rail networks; large homogenous impervious surfaces including parking structures, office buildings and residential housing; examples: houses, dense villages / towns / cities, paved roads, asphalt.

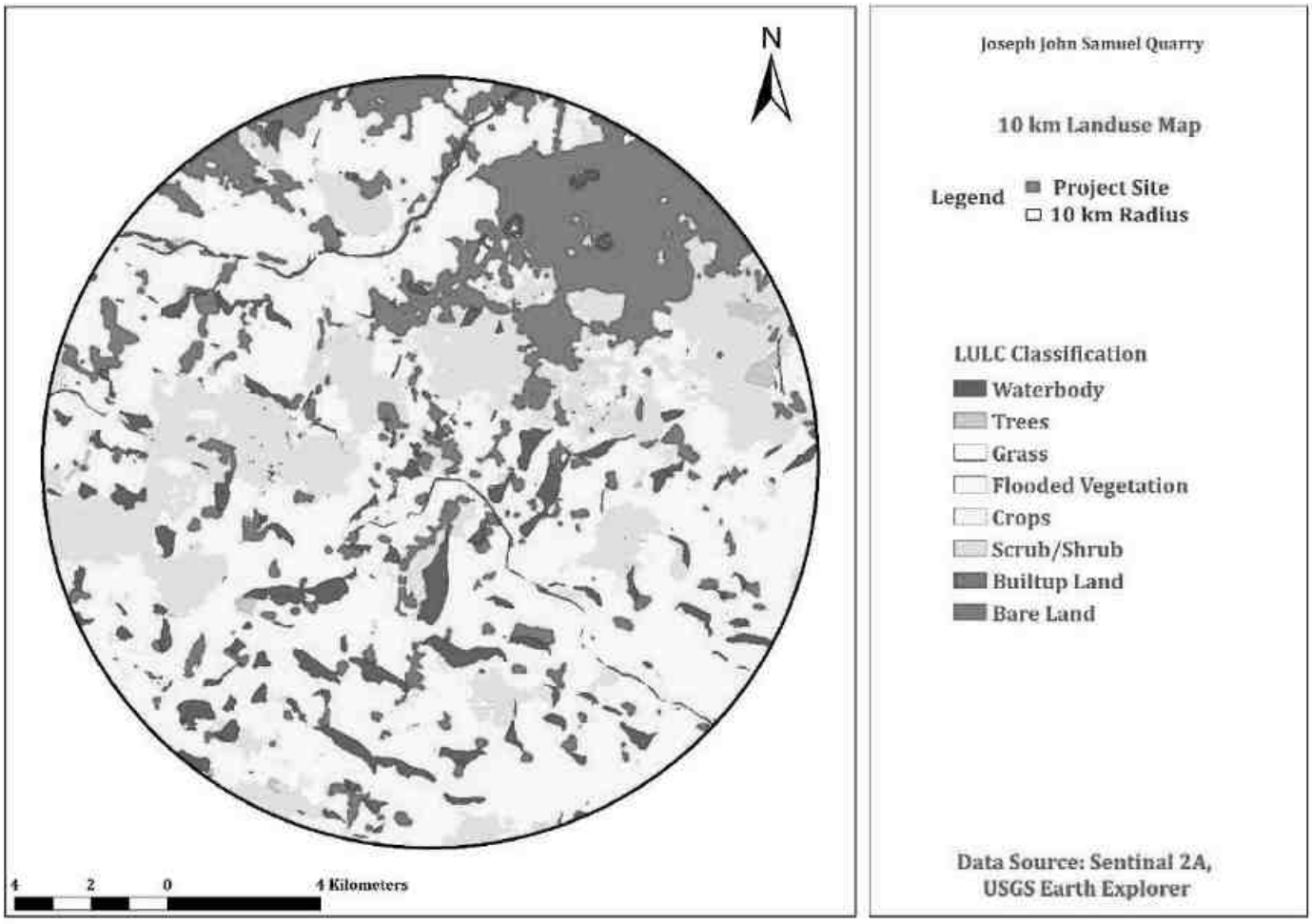


Figure 3.3 Land use classes around 10 km radius from the project site

3.2.7.8 Different Land use classes around 10 km radius from the project site

Table 3-3 Land use pattern

Sl.No	Categories	Area in Sq.m
1	Water Body	22.27
2	Trees	2.24
3	Grass	1.31
4	Flooded vegetation	0.79
5	Crops	177.26
6	Scrub/Shrub	59.1
7	Built-up Area	53.37

8	Barren Land	0.02

3.3 WATER ENVIRONMENT

3.3.1 *Contour & Drainage*

The project site is 118 m MSL.

3.3.2 *Geomorphology*

Tirunelveli district is bordered by Western Ghats (Ridge and valley complex) in the West. A major part of the district constitutes a plain terrain with a gentle slope toward East and Southeast, except for the hilly terrain in the west The general elevation of the area varies from less than 10 to 1408 m amsl (Tulukkaparai hill range) The prominent geomorphic units identified in the district through interpretation of Satellite imagery are Structural Hill, Bazada Zone, Valley Fill, Flood Plain, Pediment, Shallow buried pediment, Deep buried pediment and Coastal Plain.

Soils

Soils in the area have been classified into i) Deep Red soil ii). Red Sandy Soil. iii) Block Cotton Soil. iv) Saline Coastal Alluvium, and v) River Alluvium. Major parts of the area are covered by Deep Red soil and are found in Sivakasi, Tenkasi, Senkottai and Sankarankoil blocks and it is suitable for cultivating coconut and palmyrah trees. Red sandy soil also in reddish yellow in colour and are found in Nanguneri, Ambasamudram, and Radhapuram blocks and it is suitable for cultivating groundnut, millets and pulses etc., The Block Cotton Soil is found in Tirunelveli, Palayankottai and Sankarankoil blocks, and it is suitable for cultivating Paddy, Ragi, and Cholam etc., The Saline Coastal Alluvium are dark grey to deep brown in colour and spread over the Nanguneri and Radhapuram blocks. The River alluvial soils occur along the river courses of Tamrabarani and Chittar river covering in the blocks Tirunelveli and Palayankottai and it is suitable for cultivating Groundnut, Chillies and Cumbu.

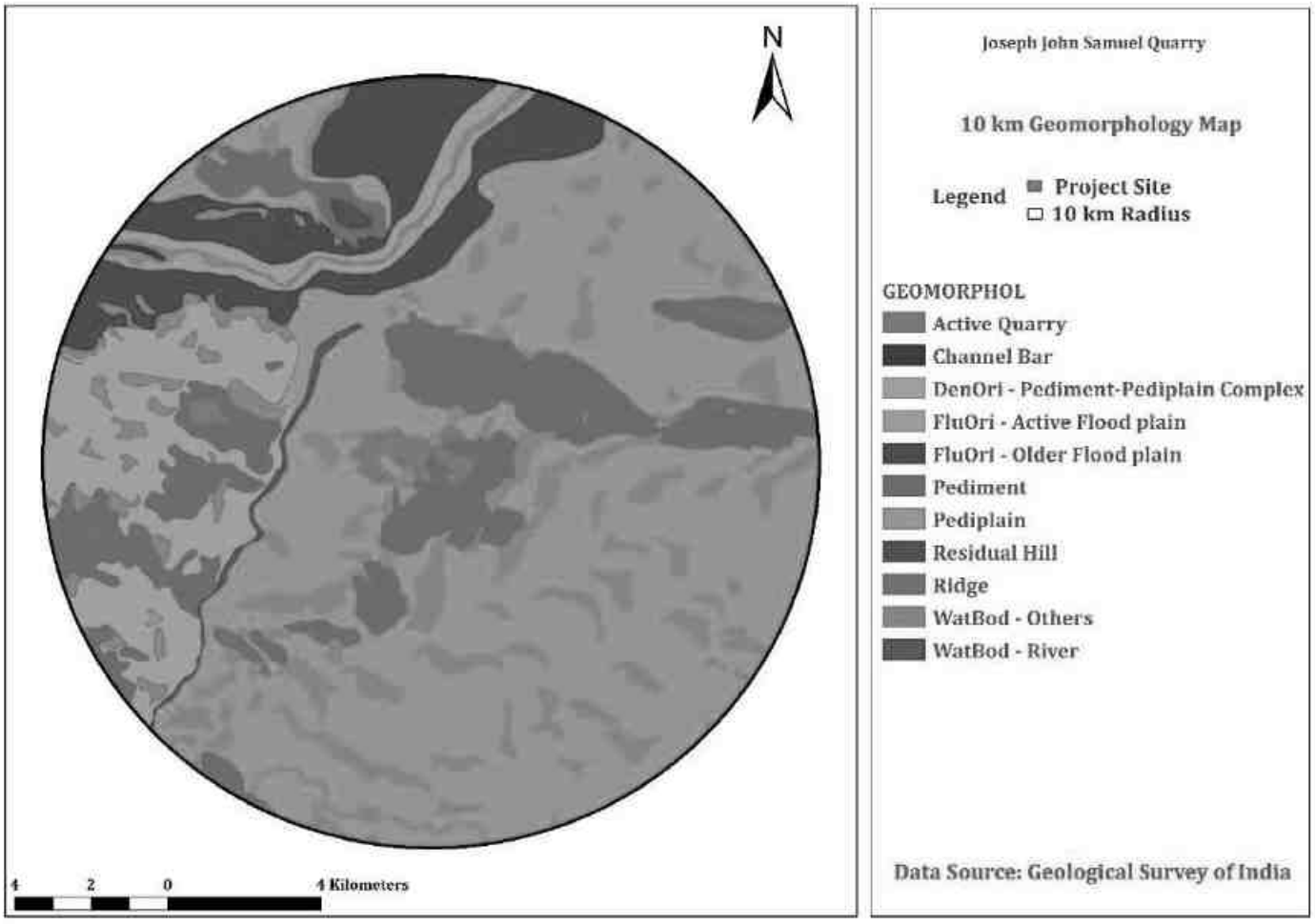


Figure 3.4 Geomorphology within 10km from the project site

3.3.3 *Geology:*

Southern Granulite Terrain (SGT) of Tamil Nadu lying south of Palaghat-Cauvery shear zone has been divided into two major tectonic blocks by the Madurai block and Nagercoil-Trivandrum Block in the south. It is separated by WNW-ESE trending Achankovil-Tambaraparani Lineament. Tirunelveli and Thothukudi are significantly the only districts in the state to witness the geology and structure of both the blocks. Tirunelveli district represents a well-developed lithopackage of meta-sedimentary sequence inter banded with charnockite Group of rocks. The rock types exposed are of quartzite, calc-granulite,

garnet-biotite-sillimanite gneiss, garnet quartzo-feldspathic gneiss and garnetbiotite-cordierite gneiss belonging to Khondalite Group of rock. Charnockite and pyroxene granulite are the Charnockite Group. Hornblende-biotite gneiss belongs to Migmatitic Complex. Besides, basic intrusive (pyroxenite) and acid intrusive (granite) are noticed. The younger intrusive are represented by pegmatite and quartz veins. Evidence of development of incipient / patchy charnockite along the shear plane is noticed in the district along the Western Ghat high hills.

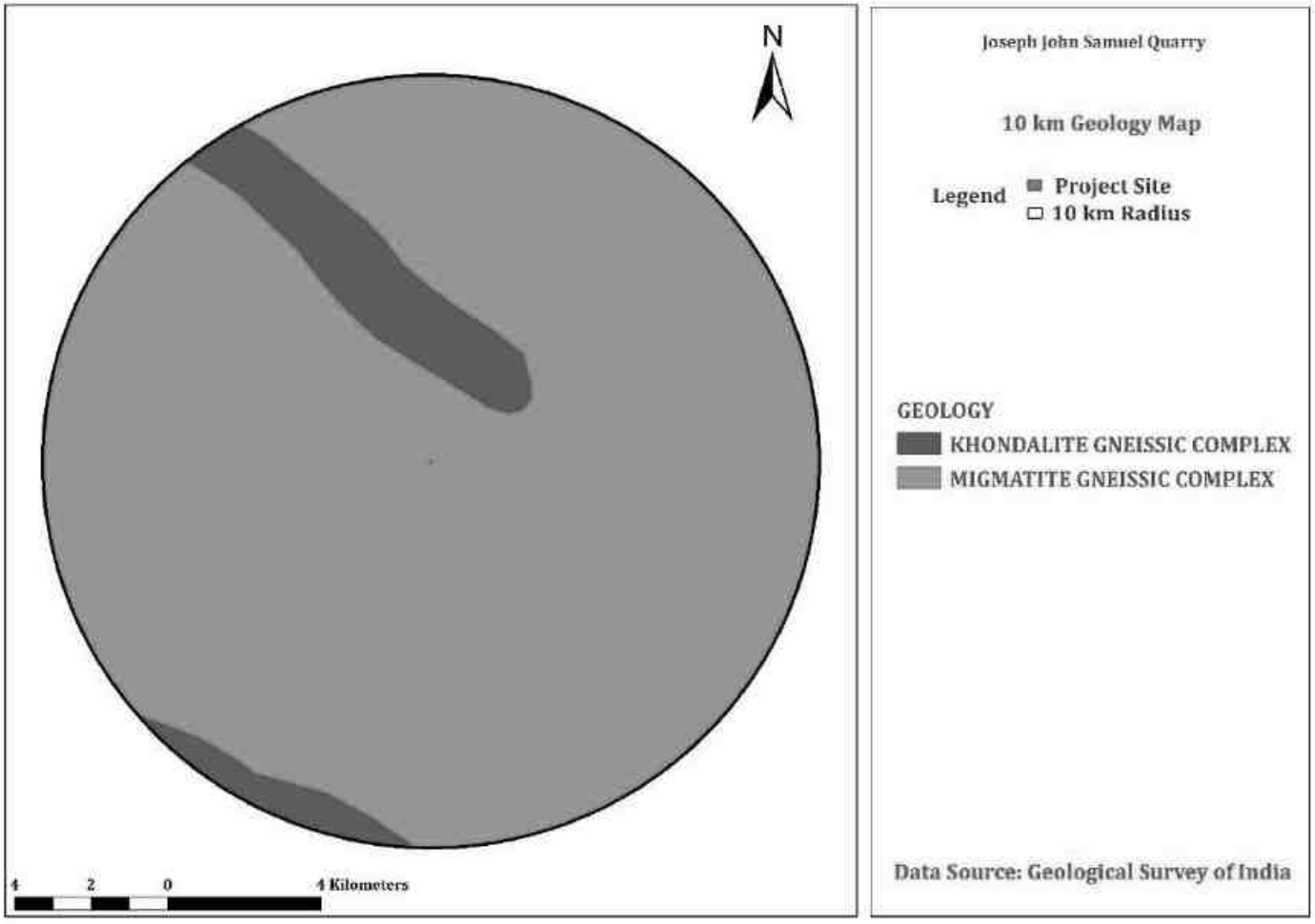


Figure 3.5 Geology within 10km from the project site

3.3.4 *Hydrogeology*

The district is underlain by both porous and fissured formations. The important aquifer systems in the district are constituted by i) Weathered and fractured hard rock formations of Archaean age. ii) Porous sedimentary formations ranging in age from Tertiary and Recent. The porous formations are found as small patch in the southeastern part of the district and include sandstones, Limestones, Laterite and Clays from Tertiary to Quaternary. Isolated occurrence of calcareous sandstone and fossiliferous limestone are seen in coastal area on the southeastern side. The fossiliferous limestone is found south west of Kudankulam covering an area of 3 sq.km. Laterites are exposed as patches along Radhapuram-Edakkadu, Vijayanarayanam-Kumarapuram, Ittamoli, Nanguneri and Uramozi area. Beach sand occurs as a patch along the coast with a width varying from 50-250m in Idindakarai-Ovari Belt. The river alluvium is found along the river courses and the thickness of alluvium is restricted to 5-6m. The exploration in sedimentary tract has revealed that the depth to basement occurs at a depth of 120m bgl and granular zones are encountered between the depths of 20 to 92 m bgl. The yield of bore wells varies from 1-4.5 lps. The aquifer at the shallow depth is under unconfined condition and aquifer at depth is under semi-confined to confined condition. The shallow aquifer is developed through dug wells and deeper aquifer through tube wells. The dug well can sustain a pumping of 4 to 6 hours while the tube wells can sustain a pumping of 6-8 hours. The water-bearing properties of crystalline formations, which lack primary porosity, depend on the extent of development of secondary intergranular porosity. These aquifers are highly heterogeneous in nature due to variation in lithology, texture and structural features even within short distances. Ground water generally occurs under phreatic conditions in the weathered mantle and under semi-confined conditions in the fissured and fractured zones at deeper levels. The thickness of weathered zone in the district is in the ranges up to 30m bgl.

The yield of large diameter wells in the district, tapping the weathered mantle of crystalline rocks ranges from 50 to 250 lpm and are able to sustain pumping for 3 to 5 hours per day. The Specific capacity of large diameter wells tested in crystalline rocks ranges from 25 to 300 lpm / m. of drawdown. The yield characteristics of wells vary considerably depending on the topographic set-up, lithology and nature of weathering. The groundwater exploration in the district down to a depth of 200m bgl has revealed that in the western part of the district potential fractures are encountered beyond 100m bgl while in the rest of the area, potential fractures are restricted to 100m bgl. The yield of the wells varies from 1 to 3.6 lps. In general, the wells drilled by various State agencies mainly for domestic purposes have yield in the

range of 63 to 270 lpm. The depth to water level in the district varied between 1.19 to 13.35 m bgl during premonsoon depth to water level (May 2006) and varied between 0.18 to 7.97 m bgl during post monsoon depth to water level (Jan 2007). The seasonal fluctuation shows a fall in water level, which ranges from –0.12 to –2.14 m bgl, and rise in water level, which ranges from 0.33 to 11.24 m bgl. The piezometric head varied between 1.72 to 13.65 m bgl (May 2006) during pre monsoon and 0.47 to 13.25 m bgl during post monsoon.

Aquifer Parameters:

Formation	**Yield of wells (lps)**	**Transmissivity (m2 /day)**	**Hydraulic Conductivity (m/day)**	**Specific Yield (%)**	**Storativity**
Porous Formation	1.0-4.5	50-250	20-65	3-6	$1.98X10^{-4}$
Weathered Rock	<1-4.0	25-150	<1-15	1.5	-
Fractured Rock	1.0-3.6	25-250	<1-25	-	$1.87X10^{-5}$ to $4.8X10^{-3}$

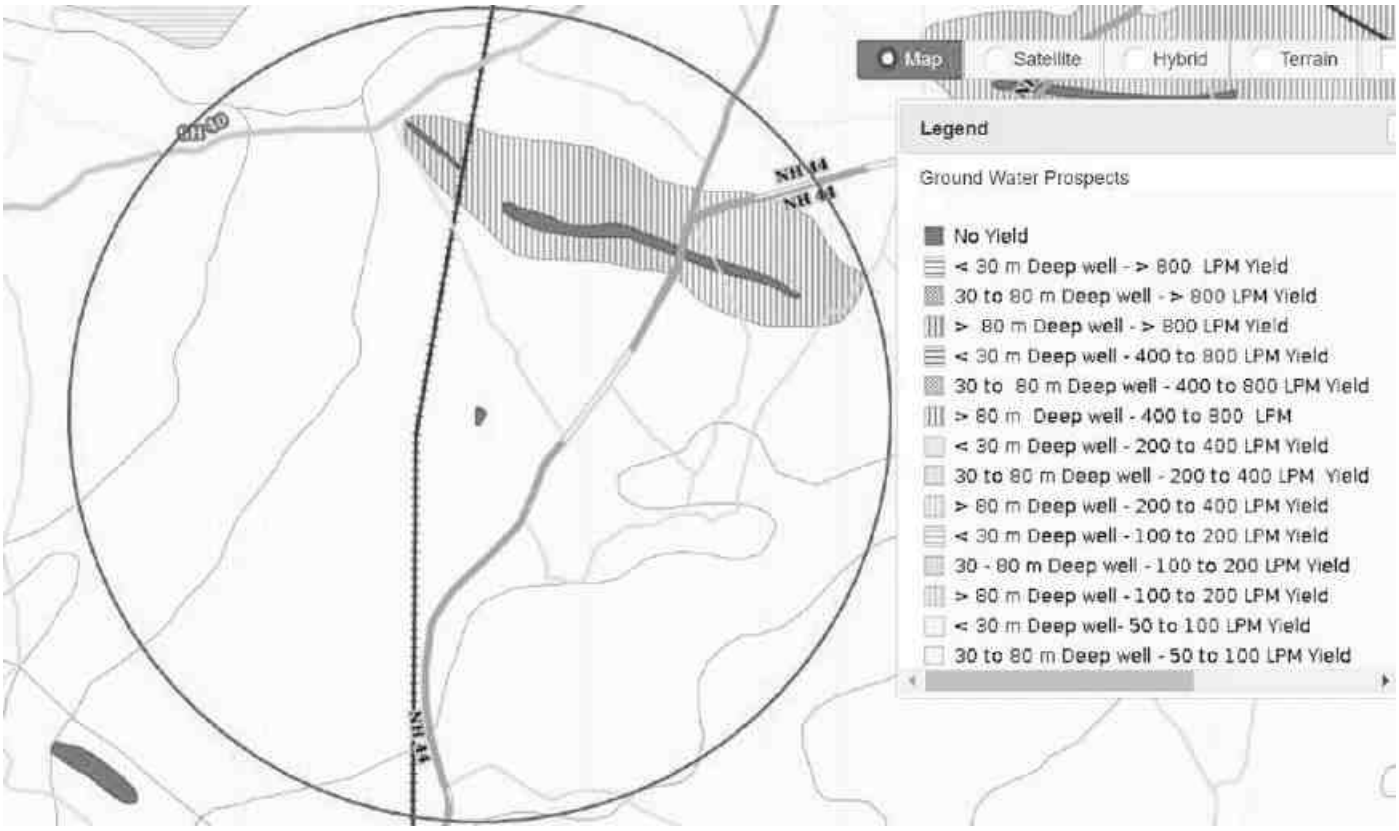


Figure 3.6 Ground water prospects within 5 km radius of the project site

3.3.5 *Ground water quality monitoring*

Ground water quality monitoring is done in the following locations and analysis will be done for physical, chemical & Biological parameters.

Table 3-4 Ground water Quality Analysis

Environmental Parameters: Ground water Quality Analysis	
Monitoring Period	January to March 2023
Design Criteria	Based on the Environmental settings in the study area
Monitoring Locations	Project Site -GW 1 Samudhaya nala koodam -GW2 CSI St.thomas church - GW 3 E-service center - GW 4

	Joe Suresh Engineering college - GW 5
Methodology	Water Samples were collected in 5 Litre fresh cans as per IS 3025 Part I and transported to the laboratory in Iceboxes
Frequency of Monitoring	Once in a season

3.3.5.1 Sampling Procedure

Quality of ground water was compared with IS: 10500: 1991 (Reaffirmed 1993 With Amendment NO -3 July 2010) for drinking purposes. Water samples were collected as Grab sample from five sampling locations in a 5-liter plastic jerry can and 250 ml sterilized clean glass/pet bottle for complete physico-chemical and bacteriological tests respectively. The samples were analyzed as per standard procedure / method given in IS: 3025 (Revised Part) and standard method for examination of water and wastewater Ed. 21st, published jointly by APHA.

Table 3-5: Standard Procedure

S. No	Parameters	Test Method
1	pH (at 25°C)	IS:3025(P -11)1983 RA: 2012
2	Electrical Conductivity	IS:3025(P -14) 2013
3	Colour	IS:3025 (P -4)1983 RA: 2012
4	Turbidity	IS:3025(P -10)1984 RA: 2012
5	Total Dissolved Solids	APHA 22nd Edn.2012-2540-C
6	Total Suspended Solids	IS:3025(P-17)-1984 RA:2012
7	Total Hardness as $CaCO_3$	APHA 22nd Edn.2012-2340-C
8	Calcium as Ca	APHA 22nd Edn2012.3500 Ca-B
9	Magnesium as Mg	APHA 22nd Edn.2012-3500 Mg-B
10	Chloride as Cl	IS:3025(P -32)-1988 RA: 2014
11	Sulphate as SO_4	APHA 22nd Edn.2012-4500 SO_4^--E
12	Total Alkalinity as $CaCO_3$	APHA 22nd Edn.2012-2320-B
13	Iron as Fe	IS:3025(P -53):2003 RA: 2014
14	Silica as SiO_2	IS:3025(P -35)1988 RA: 2014
15	Fluoride as F	APHA 22nd Edn.2012-4500-F-D
16	Nitrate as NO_3	IS:3025(P -34):1988 RA: 2014
17	Sodium as Na	IS:3025(P -45):1993 RA: 2014
18	Potassium as K	IS:3025(P -45):1993 RA: 2014
19	Coliform	IS:1622:1981:RA:2014

20	E.coli	IS:1622:1981:RA:2014

Table 3-6 Ground water sampling results

S. No	Parameters	Units	Project Site – GW 1	Samudhaya nala koodam GW 2	CSI St.thomas church GW 3	E-service center GW 4	Joe Suresh Engineering college GW 5
1	pH (at 25°C)	-	7.59	7.55	7.55	8.02	7.43
2	Electrical Conductivity	µS/cm	969	794	794	2250	1120
3	Colour	Hazen Unit	1	5	5	1	1
4	Turbidity	NTU	BQL(LOQ:1)	2	BQL(LOQ: 1)	BQL(LOQ:1)	BQL(LOQ:1)
5	Total Dissolved Solids	mg/L	532	452	965	1245	676
6	Total Suspended Solids	mg/L	BQL(LOQ:2)	4	BQL(LOQ: 2)	BQL(LOQ:2)	BQL(LOQ:2)
7	Total Hardness as $CaCO_3$	mg/L	330	226	507	497	367
8	Calcium as Ca	mg/L	72.7	44.2	128	67	80.9
9	Magnesium as Mg	mg/L	36.2	28.2	44.6	80.3	40.1
10	Chloride as Cl	mg/L	91.3	86	281	350	168
11	Sulphate as SO_4	mg/L	165	54.2	79.2	125	93.1
12	Total Alkalinity as $CaCO_3$	mg/L	98.9	177	178	297	128
13	Iron as Fe	mg/L	BQL(LOQ:0. 1)	BQL(LOQ:0. 1)	BQL(LOQ: 0.1)	BQL(LOQ:0. 1)	BQL(LOQ:0 .1)
14	Silica as SiO_2	mg/L	17.5	12.3	30.4	45.2	20.3
15	Potassium as K	mg/L	5.19	4.3	25.8	21.7	10.2
16	Sodium as Na	mg/L	78.2	77.2	220	328	150

3.3.6 *Interpretation of results:*

3.3.6.1 Physical parameters of water:

The basic physical parameters of water include

Colour:

Value observed in Project Site (True/Apparent Color): 1 Hazen unit.

Acceptable and permissible limits: 5 Hazen units and 15 Hazen units respectively. The value in the project site is as same as the acceptable limits prescribed by IS 10500: 2012 (referred as "*Standards*" from herein).

pH:

Value observed in the Project Site: 7.59

Acceptable and permissible limits: 6.5-8.5. The pH value is the measure of acid – base equilibrium. The value of pH in the project site clearly indicates that water is slightly neutral in nature.

Turbidity:

Value observed in the Project Site: <1

Acceptable and permissible limits: 1 NTU & 5 NTU respectively. The value of turbidity generally indicates the presence of phytoplanktons and other sediments. The value in the project site indicates the water is slightly turbid.

Total Dissolved Solids:

Value observed in the Project Site: 532 mg/L.

Acceptable and permissible limits: 500 mg/L and 2000 mg/L respectively.

The TDS is the presence of the inorganic salts and small amounts of organic matter present in the water. This is mainly due to the result of surface runoff as the cations and anions in the top soil is carried away by the water. The value in the project site indicates the water is less turbid.

3.3.6.2 Chemical parameters of water:

The chemical parameters of the drinking water include,

Calcium:

Value observed in the Project Site: 72.7 mg/L.

Acceptable and permissible limits: 75mg/L and 200 mg/L respectively.

Calcium is the essential macronutrient. The value of the calcium is within the prescribed permissible standards. The higher level of calcium may cause hardening in domestic equipment and will also reduce the detergent efficiency. Higher levels of calcium will lead to constipation, gas, and bloating. Apart from that, extra calcium may also increase the risk of kidney stones. If the calcium deposit in blood is high, it may lead to hypercalcemia.

Magnesium:

Value observed in the Project Site: 36.2 mg/L.

Acceptable and permissible limits: 30 mg/L and 100 mg/L respectively.

The value of Magnesium in the project site is higher than acceptable limit and less than the permissible limit. The increase in the level of magnesium will cause diarrhea and vomiting in children.

Chloride

Value observed in the project site: 91.3 mg/L.

Acceptable and permissible limits: 250 mg/L and 1000 mg/L respectively.

The chloride level in the project site is within the acceptable and permissible limit. If the level of chloride is more, it may cause galvanic and pitting corrosion, increases level of metals. It imparts bitter taste to the water.

Total Alkalinity as $CaCO_3$:

Value observed in the project site: 98.9 mg/L.

Acceptable and permissible limits: 200 mg/L and 600 mg/L respectively.

Total Alkalinity is the measure of the concentration of all alkaline substances dissolved in the water which includes carbonates, bicarbonates and hydroxides. The value of the total alkalinity is slightly greater in the project site, which will impart soda taste to the water.

Hardness:

Value observed in the Project Site: 330 mg/L.

Acceptable and permissible limits:200 mg/L and 600 mg/L respectively.

The value of Hardness in the project site is higher than acceptable limit but within the permissible limit. The increase in the level of hardness may cause corrosion and scaling problems, increased soap consumption and it also contributes to the salty taste of water.

3.3.7 *Surface Water Analysis*

Surface water samples were taken from **Thamirabharani river**. The results are summarized below.

Table 3-7 Surface Water Sample Results

S. No	Parameters	Units	Thamirabharani river
1	pH (at 25°C)	-	8.05
2	Electrical Conductivity	µS/cm	152
3	Colour	Hazen Unit	15
4	Turbidity	NTU	12
5	Total Dissolved Solids	mg/L	83.6
6	Total Suspended Solids	mg/L	18
7	Total Hardness as $CaCO_3$	mg/L	66.3
8	Calcium as Ca	mg/L	16.3
9	Magnesium as Mg	mg/L	6.2
10	Chloride as Cl	mg/L	17.3
11	Sulphate as SO_4	mg/L	6.27
12	Total Alkalinity as $CaCO_3$	mg/L	32
13	Iron as Fe	mg/L	1.16
14	Silica as SiO_2	mg/L	2.76
15	Potassium as K	mg/L	1.19
16	Sodium as Na	mg/L	14.5
17	BOD	mg/L	12.1
18	COD	mg/L	43.8
19	DO	mg/L	4.7

Inference: The surface water quality is compared with the CPCB Water Quality Criteria against A, B, C, D & E class of water. From the test result, it is found that the both the water does not fit Class A (Drinking Water Source without conventional treatment but after disinfection). But they can be used for outdoor bathing as it meets the requirements shown for class B water.

3.3.7.1 Climatology & Meteorology:

Climate and meteorology of a place can play an important role in the implementation of any developmental project. Meteorology is also the key to understand local air quality as there is an essential relationship between meteorology and atmospheric dispersion involving wind in the broadest sense of the term.

The year may broadly be divided into four seasons:

Winter season	:	December to February
Pre-monsoon season	:	March to May
Monsoon season	:	June to September
Post-monsoon season	:	October to November

i) Climate

Eastern part of the district experiences hot climate and Western part has a contrasting pleasant cold climate. The district is hot and dry in summer i.e., from March to June. From July to November is rainy season and between December to February winter prevails with very cold and misty.

ii) Temperature

The maximum temperature is around 34^0C and minimum temperature is 31^0C.

iii) Rainfall

Tirunelveli receives rainfall from both the northeast and the southwest monsoons. Monsoon season is from the months of July to November. During this time, temperature is mild and pleasant. Heavy rainfall is expected in short intervals during this period. December to February are winter months**.**

This district gets maximum rainfall in November (274.7mm).

TIRUNELVELI DISTRICT -NORMAL AND ACTUAL RAINFALL

Unit in mm.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	R/F	R/F	R/F	R/F	R/F	R/F	R/F	R/F	R/F	R/F	R/F	R/F
2016	3	0.0	1.7	3.1	77.6	6.9	60.0	24.0	25.7	72.5	42.9	57.9
2017	23.2	6.2	38.1	14.2	92.4	10.0	24.1	122.5	137.0	125.7	67.6	139.0
2018	0.1	28.4	26.3	62.7	149.0	8.0	52.5	58.5	108.4	182.7	75.2	7.5
2019	8.1	3.5	6.8	0.5	6.0	29.3	12.8	89.7	178.7	203.5	111.9	62.8
2020	7.7	0.0	0.0	32.6	80.4	24.0	78.8	47.9	79.4	127.6	284.0	97.9

Source: District survey report

Meterological Data

The meteorological data – Temperature, rainfall, Wind Speed, Wind direction are recorded through AWS by setting it up in the site.

vi) Wind Rose Diagram

The wind rose denotes a class of diagrams designed to display the distribution of wind direction at a given location over a period of time. Wind roses are also useful as they project a large quantity of data in a simple graphical plot.

The wind speed & wind direction data are taken and wind rose is plotted for December 2022 to February 2023.

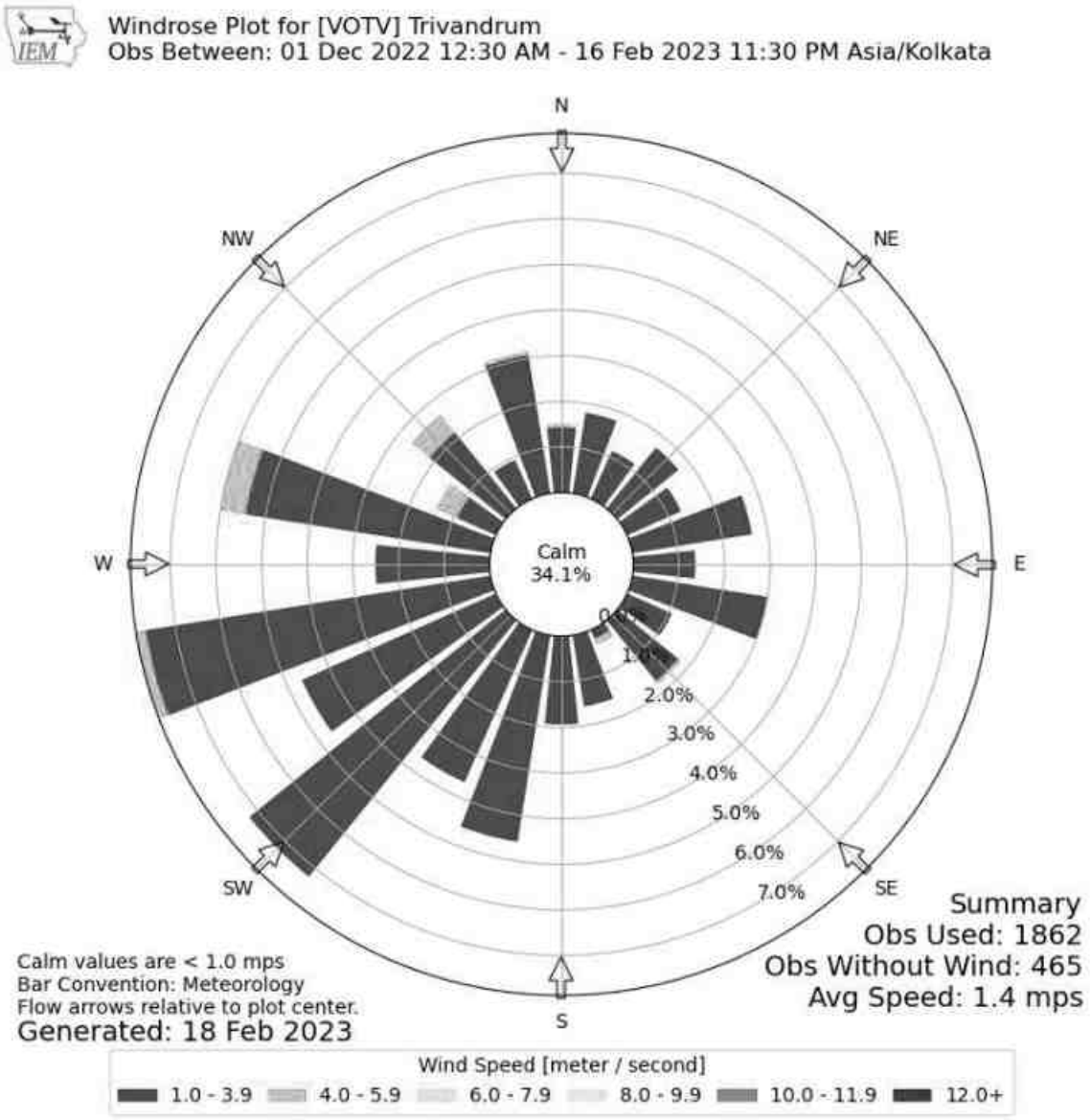


Figure 3.7 Wind rose

3.3.8 *Selection of Sampling Locations:*

Four Monitoring locations along with the project site is selected based on Wind Direction & Wind Speed. All the monitoring locations are chosen in the downwind direction.

3.4 AMBIENT AIR QUALITY

Table 3-8: Selection of Sampling Location

<table>
<tr><td colspan="2">Environmental Parameters: Ambient Air</td></tr>
<tr><td>Monitoring Period</td><td>December 2022 to February 2023</td></tr>
<tr><td>Design Criteria</td><td>The monitoring stations are selected based on factors like topography/terrain, prevailing meteorological conditions like predominant wind direction (December 2022 to February 2023), etc, play a vital role in the selection of air sampling stations. Based on these criteria, 5 air sampling station were selected in the area as shown below.</td></tr>
<tr><td>Monitoring Locations</td><td>
<table>
<tr><th>Location & Code</th><th>Distance (km)</th><th>Direction</th></tr>
<tr><td>Project Site</td><td>--</td><td>--</td></tr>
<tr><td>Samudhaya Nalakodam</td><td>5.78 Km</td><td>Crosswind S</td></tr>
<tr><td>CSI St Thomas church</td><td>3.57 Km</td><td>Upwind WSW</td></tr>
<tr><td>E-service center</td><td>3.27 Km</td><td>Downwind ENE</td></tr>
<tr><td>Joe suresh Engineering college</td><td>5.02 Km</td><td>Crosswind S</td></tr>
</table>
</td></tr>
<tr><td>Methodology</td><td>Respirable Particulate Matter (PM10) - Gravimetric (IS 5182: Part 23:2006)
Particulate Matter PM2.5 - Gravimetric (Fine particulate matter)
Sulphur Dioxide - Calorimetric (West & Gaeke Method) (IS 5182: Part 02: 2001)
Nitrogen Dioxide - Calorimetric (Modified Jacob & Hocheiser Method) (IS 5182: Part 06:2006)</td></tr>
<tr><td>Frequency of Monitoring</td><td>2 days in a week, 4 weeks in a month for 3 months in a season.</td></tr>
</table>

3.4.1 *Ambient Air Quality: Results & Discussion*

The test results of the ambient air quality monitored in project site and other four locations is summarized below.

Table 3-9 Ambient Air Quality

Code	Location	PM 10 (µg/m³)				PM 2.5 (µg/m³)				SO2 (µg/m³)				NOx (µg/m³)			
		Min	Max	Avg	98 percentile	Min	Max	Avg	98 percentile	Min	Max	Avg	98 percentile	Min	Max	Avg	98 percentile
AAQ 1	Project Site	38	52	46	52	16	22	19	22	5	9	7	9	10	20	15	20
AAQ 2	Samudhaya Nalakodam	43	54	49	54	19	25	22	25	6	13	9	12	12	26	18	25
AAQ 3	CSI St Thomas church	53	63	58	62	24	35	29	34	10	17	12	17	20	31	24	30
AAQ 4	E-service center	47	57	53	57	22	30	26	30	7	14	10	14	15	25	20	25
AAQ 5	Joe suresh Engineering college	54	65	59	65	27	33	30	33	11	18	14	18	21	35	28	35
NAAQ Standards - Residential Area		100 (µg/m³)				60(µg/m³)				80 (µg/m³)				80 (µg/m³)			

3.4.2 *Interpretation of ambient air quality:*

To assess the impact, AAQ were monitored in project site and four locations.

Observation:

The Maximum value of PM10 (65(µg/m^3), PM 2.5 (35 (µg/m^3), SOx (18(µg/m^3), NOx (35(µg/m^3) is observed in different places.

Inference:

The monitoring results for PM10, PM2.5, Sox, NOx was found to be high in Joe Suresh Engineering college which is due to the movement of vehicles .

The observed values are all well within the Standards prescribed by NAAQ.

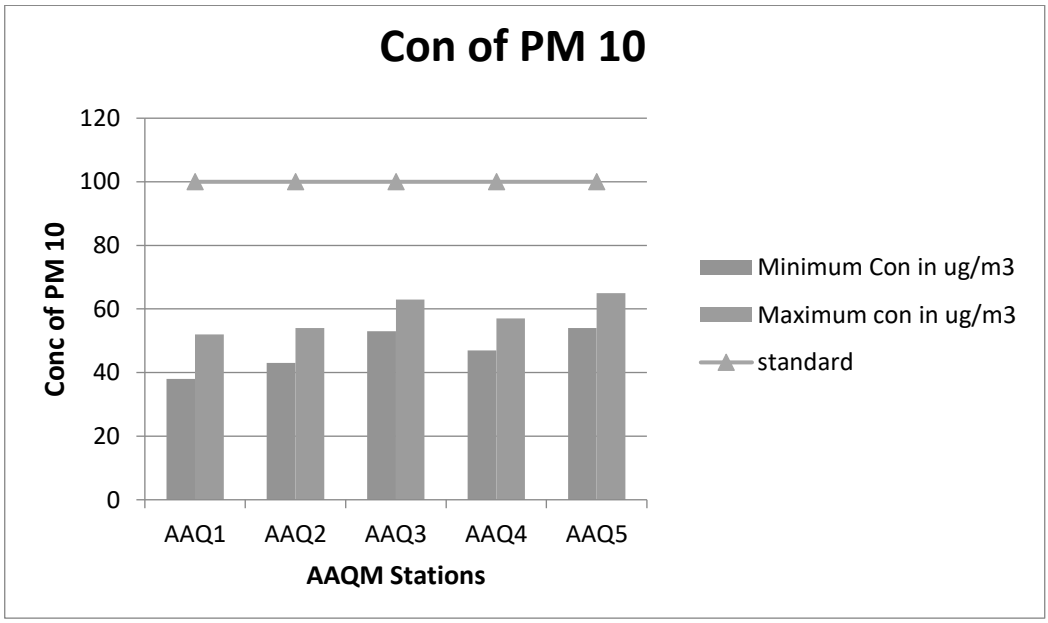


Figure 3.8 Concentration of PM10 (µg/m^3) in Study Area

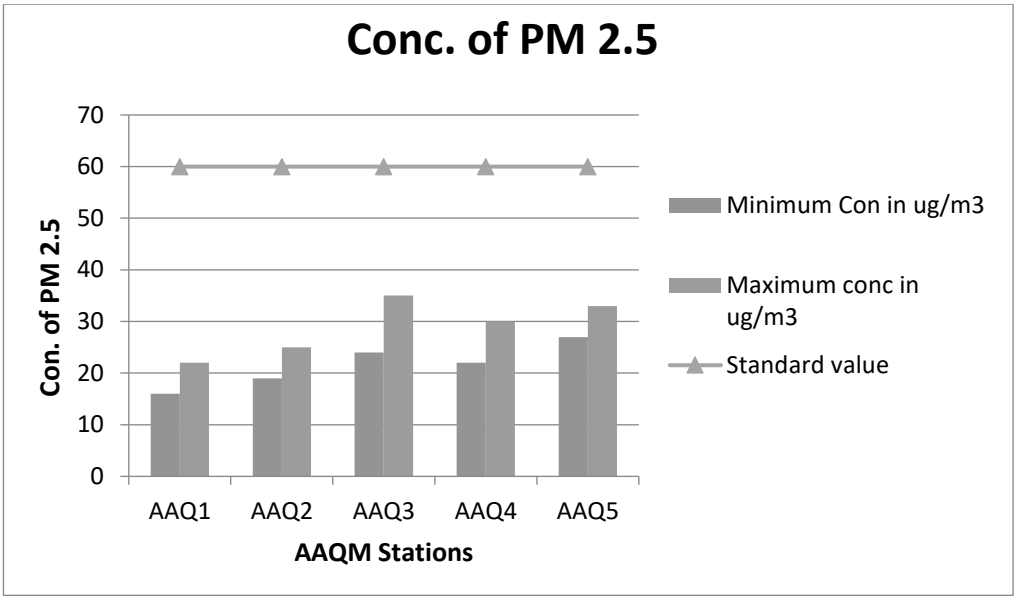


Figure 3.9 Concentration of PM2.5 (µg/m^3) in Study Area

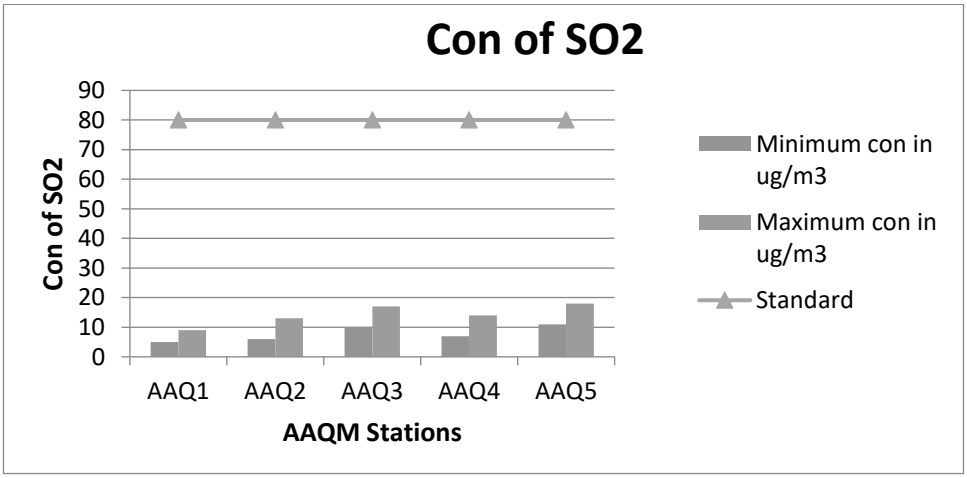


Figure 3.10 Concentration of SOx (µg/m^3) in Study Area

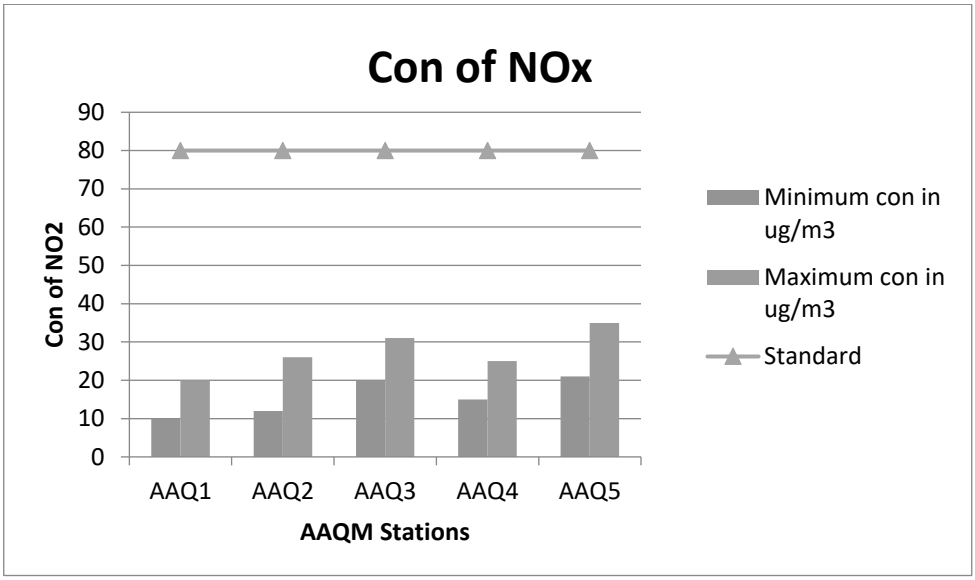


Figure 3.11 Concentration of NOx (µg/m3) in Study Area

3.5 NOISE ENVIRONMENT:

Table 3-10 Noise Analysis

Environmental Parameters*: Noise Analysis*	
Monitoring Period	December 2022 to February 2023
Design Criteria	Based on the Sensitivity of the area
Monitoring Locations	Project Site – N 1 Samudhaya Nalakodam- N 2 CSI St Thomas Church- N3 E-service center -N 4 Joe Suresh Engineering college - N5
Methodology	Noise level measurements were taken at the selected locations using noise level meter both during day and night time. Noise level measurements were taken continuously for 24 hours at hourly intervals
Frequency of Monitoring	Noise samples were collected from 5 locations - Once in a season

Ambient Noise Levels are monitored in the chosen 5 Locations including the project Site and the monitoring results are summarized below

3.5.1 *Day Noise Level (Leq day)*

Table 3-11 Day Noise Level (Leq day)

Location	Leq day in dB(A)		
	Max	Min	Average
Project Site	56	43	49
Samudhaya Nalakodam	56	45	51
CSI St Thomas Church	61	49	55
E-service center	54	44	49
Joe Suresh Engineering college	57	48	53

3.5.2 *Night Noise Level (Leq Night)*

Table 3-12 Night Noise Level (Leq Night)

Location	Leq Night in dB(A)		
	Max	Min	Average
Project Site	42	36	40
Samudhaya Nalakodam	43	38	41
CSI St Thomas Church	47	40	44
E-service center	42	39	40
Joe Suresh Engineering college	46	36	41

Observation:

The maximum Day noise and Night noise were found to be 61 dB(A) and 47 dB(A) respectively in CSI St Thomas Church. The minimum Day Noise and Night noise were 43 dB (A) and 36 dB(A) respectively which was observed in Project site. The observed values are all well within the Standards prescribed by CPCB.

3.6 SOIL ENVIRONMENT

Soil environment is studied for 10 km radius from the project site. The 5 km radius image shows that the soil is not affected by any kind of erosion.

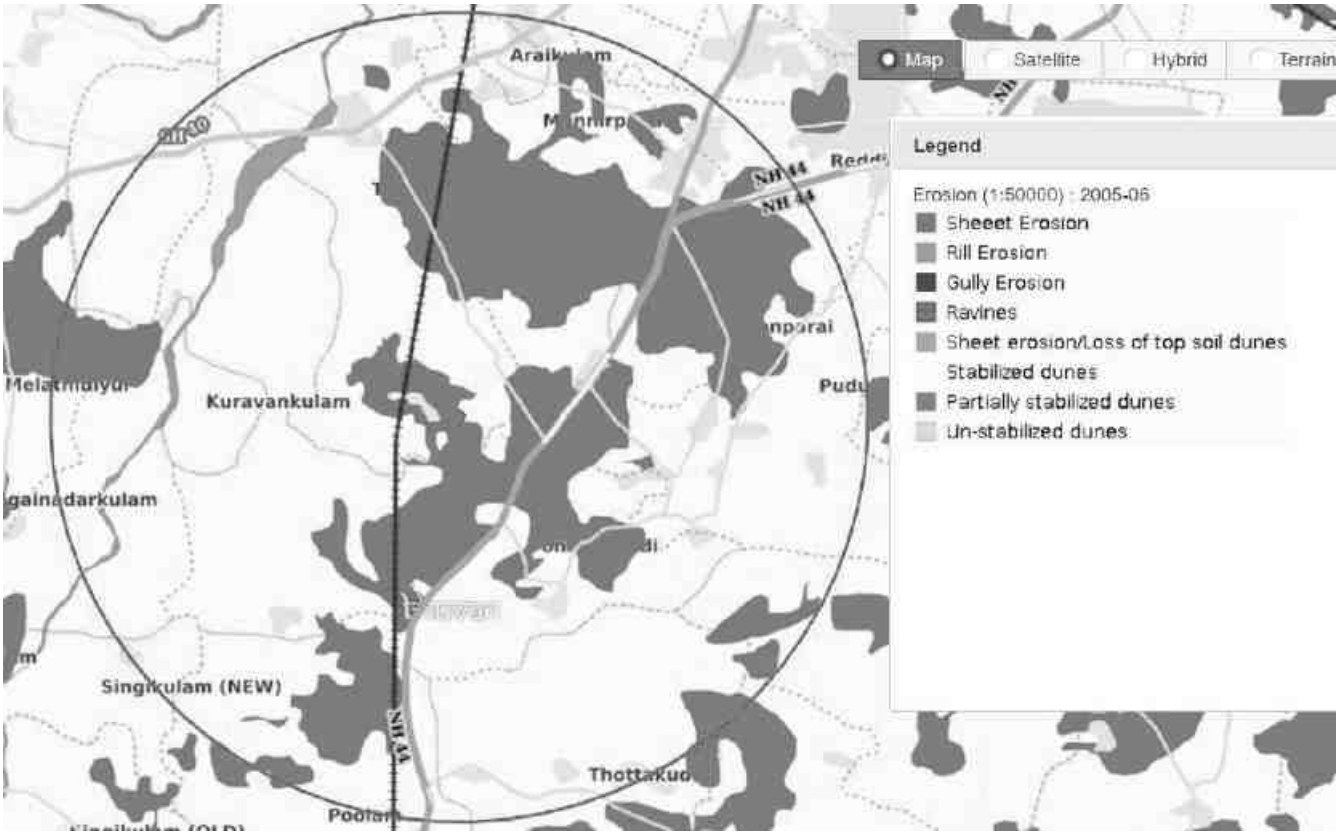


Figure 3.12 Soil Erosion pattern within 5 km radius of the project site

3.6.1 *Baseline Data:*

The present study of the soil quality establishes the baseline characteristics which will help in future in identifying the incremental concentrations if any, due to the operation Phase of the proposed project. The sampling locations have been identified with the following objectives:

- To determine the impact of proposed project on soil characteristics and

- To determine the impact on soils more importantly from agricultural productivity point of view.

Table 3-13 Soil Quality Analysis

Environmental Parameters*: Soil Quality Analysis*	
Monitoring Period	December 2022 to February 2023
Design Criteria	Based on the environmental settings of the study area
Monitoring Locations	Project Site – SQ 1 Samudhaya Nalakodam-SQ 2 CSI St Thomas Church–SQ 3 E-service center- SQ 4 Joe suresh Engineering college- SQ 5
Methodology	Composite soil samples using sampling augers and field capacity apparatus
Frequency of Monitoring	Soil samples were collected from 5 locations Once in a season

To assess the soil quality of the study area, 5 monitoring stations were selected and the results are summarized below.

Table 3-14 Soil Quality Analysis

Parameters	**Unit**	**Project Site SQ 1**	**Samudhaya Nalakodam-SQ 2**	**CSI St Thomas Church–SQ 3**	**E-service center- SQ 4**	**Joe suresh Engineering college-SQ 5**
pH (at 25°C)	-	7.79	8.59	7.62	8.4	7.47
Specific Electrical Conductivity	mS/cm	0.1	0.25	0.19	0.49	0.48
Water Holding Capacity	ml/l	7.5	8.41	7.82	8.25	7.14

Chloride	g/cm^3	141	135	101	219	80.3
Soluble Calcium	mg/kg	54.1	28.3	20.1	56.7	50.7
Soluble Sodium	mg/kg	139	157	123	138	109
Soluble Potassium	mg/kg	165	175	187	172	182
Organic matter	%	0.65	0.58	0.31	0.35	0.46
Sulphates	%	166	90	214	253	390
Cation Exchange Capacity	mg/kg	7.1	8.2	7.4	9.9	9.4
Total Nitrogen	%	0.42	0.34	0.28	0.24	0.31
Bulk Density	meq/100g	1.28	1.31	1.26	1.24	1.31
Phosphorous	meq/kg	136	104	175	207	320
Sand	%	33	45	48	45	40
Clay	mg/kg	2	3	1	6	2
Silt	mg/kg	65	52	51	49	58
SAR	mg/kg	14.9	18.1	8.4	9.7	25.8
Silicon	%	9.1	6.82	6.34	7.63	8.12

3.6.1.1 Physical Properties:

Regular cultivation practices increase the bulk density of soils thus inducing compaction. This results in reduction in water percolation rate and penetration of roots through soils. 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 1.24 to 1.31 meq/100g which indicates favorable physical condition for plant growth. The water holding capacity was found in the range of 7.5ml/l to 8.41 ml/l.

3.6.1.2 Chemical Properties:

Chemical characteristics of soils include pH, exchangeable cations and fertility status in the form of NPK values and organic matter. The value of the pH ranges from 7.47 to 8.59, which it indicates majority of pH of the soil is slightly alkaline. The soil in the project site is sodic in nature, which challenges because they tend to have very poor structure which limits or prevents water infiltration and drainage. The organic matter varies from 0.31 to 0.65 %, which indicates the soil is slightly unfertile.

3.7 ECOLOGY AND BIODIVERSITY

Ecology and Biodiversity is studied for 10 km radius around the project site. Project site and 2 km around the project site is considered as core zone and from 2 km to 10 km radius, it is considered as buffer zone.

- Primary field survey is carried out for the assessment of flora and fauna in the core zone
- Secondary data from Journals/Literature were studied and compiled to understand the species present in the buffer zone

3.7.1 *Methods available for floral analysis:*

3.7.1.1 Plot Sampling Methods

- Quadrat – 2D shape (e.g. square or rectangle, or other shape) used as a sampling unit
- Transect
    - Line transects feature only a length dimension, usually defined by a tape stretched across the area to be sampled.
    - Belt transects have a width as well as length.
    - Pace-transects are established when the observer strides along an imaginary line across the sample site and uses their foot placement to determine specific sampling points.

3.7.1.2 Plot less Sampling Methods

- Closest individual method - Distance is measured from each random point to the nearest individual.
- Nearest neighbour method - Distance is measured from an individual to its nearest neighbour.

- Random pairs method - Distance is measured from one individual to another on the opposite side of the sample point.
- Point-centered quarter (PCQ) method - Distance is measured from the sampling point to the nearest individual in each quadrat.

3.7.2 *Field study & Methodology adopted:*

To assess the suitability of the methodology, random field survey was done. Field survey was conducted around 2 km radius from the project site and five locations were chosen based on the species density. Quadrat method is chosen for the proposed study as compared to other sampling methods, because they are relatively simple to use. Quadrat plots are uniform in size and shape and distributed randomly throughout the sample area, which makes the study design straightforward. They are also one of the most affordable techniques because they require very few materials.

3.7.3 *Study outcome:*

Phyto-sociological parameters, such as ***Density, Frequency, Basal Area, Abundance and Importance Value Index*** of individual species (Trees) were determined in randomly placed quadrate of different sizes in the study area. Relative frequency, relative basal area and relative density were calculated and the sum of these three represented Importance Value Index (IVI) for various species. For shrubs, herbs and grasses, ***Density, Frequency, Relative Density & Relative Frequency were found***.

Sample plots were selected in such a way to get maximum representation of different types of vegetation and plots were laid out in different part of the study area of 2 km radius. Analysis of the vegetation will help in determining the relative importance of each species in the study area and to reveal if any economically valuable species is threatened in the process.

Table 3-15 Calculation of Density, Frequency (%), Dominance, Relative Density, Relative Frequency, Relative Dominance & Important Value Index

Parameters	Formula
Density	Total No. of individuals of species/ Total No. of Quadrats used in sampling
Frequency (%)	(Total No. of Quadrats in which species occur/ Total No. of Quadrats studied) * 100
Dominance	Total Basal Area /Total area sampled
Abundance	Total No. of individuals of species/ No. of Quadrats in which they occur
Relative Density	(Total No. of individuals of species/Sum of all individuals of all species) * 100

Relative Frequency	(Total No. of Quadrats in which species occur/ Total No. of Quadrats occupied by all species) * 100
Relative Dominance	Dominance of a given species/Total Dominance of all species
Important Value Index	Relative Density + Relative Frequency + Relative Dominance

Table 3-16 Tree Species in the core Zone

S. No.	Scientific Name	Local Name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Dominance	Relative Density	Relative Frequency	Relative Dominance	IVI	IUCN Conservation Status
1	Ficus Carica	Athi Maram	2	2	6	0.33	33.33	1	0.28	1.68	2.17	4.45	8.31	Least Concern
2	Cocos nucifera	Thennai	10	6	6	1.67	100.0	1.67	0.15	8.40	6.52	2.39	17.32	Not assessed
3	Azadirachta indica	Veppam	17	6	6	2.83	100.0	2.83	0.13	14.29	6.52	1.98	22.79	Not assessed
4	Tamarindus indica	Puli	10	6	6	1.67	100.0	1.66	0.20	8.40	6.52	3.09	18.02	Not assessed
5	Mangifera indica	Mamaram	7	6	6	1.17	100.0	1.16	0.07	5.88	6.52	1.11	13.52	Data insufficient
6	Morinda pubescens	Nuna	6	6	6	1.00	100.0	1	0.24	5.04	6.52	3.74	15.31	Not assessed
7	Couroupita guianensis	Nagalingam	5	3	6	0.83	50.00	1.67	0.14	4.20	3.26	2.18	9.64	Not assessed
8	Bombax ceiba	Sittan	4	4	6	0.67	66.67	1	0.08	3.36	4.35	1.27	8.98	Not assessed
9	Acacia nilotica	Karuvelai	4	4	6	0.67	66.67	1	0.28	3.36	4.35	4.45	12.16	Least Concern
10	Bambusa vulgaris	Moongil	4	4	6	0.67	66.67	1	0.50	3.36	4.35	7.92	15.63	Not assessed
11	Syzygium cumini	naval	5	1	6	0.83	16.67	5	0.11	4.20	1.09	1.79	7.07	Not assessed
12	Carica papaya	Papaya	3	3	6	0.50	50.00	1	0.09	2.52	3.26	1.43	7.21	Not assessed
13	Psidium guajava	Guava	3	3	6	0.50	50.00	1	0.23	2.52	3.26	3.61	9.39	Not assessed
14	Cassia siamea	ManjalKonrai	3	2	6	0.50	33.33	1.5	0.07	2.52	2.17	1.11	5.81	Least Concern
15	Ficus religiosa	Arasa maram	3	3	6	0.50	50.00	1	0.09	2.52	3.26	1.35	7.13	Not assessed

16	Musa paradise	Vaazhai	3	3	6	0.50	50.00	1	0.08	2.52	3.26	1.19	6.97	Not assessed
17	Prosopis juliflora	Vaelikaruvai	3	3	6	0.50	50.00	1	0.21	2.52	3.26	3.34	9.13	Not assessed
18	Tectona grandis	Thekku	3	3	6	0.50	50.00	1	0.12	2.52	3.26	1.88	7.66	Not assessed
19	Thespesia populnea	Poovarasam	3	3	6	0.50	50.00	1	0.15	2.52	3.26	2.39	8.18	Not assessed
20	Causuarina equisetifolia	Savukku	2	2	6	0.33	33.33	1	0.21	1.68	2.17	3.34	7.20	Not assessed
21	Alstonia scholaris	Elilaipalai	2	2	6	0.33	33.33	1	0.27	1.68	2.17	4.31	8.16	Least Concern
22	Anacardium occidentale	Cashew	1	1	6	0.17	16.67	1	0.44	0.84	1.09	6.96	8.88	Not assessed
23	Artocarpus heterophyllus	Palaa	2	2	6	0.33	33.33	1	0.18	1.68	2.17	2.85	6.70	Not assessed
24	Aegle marmelos	Vilvam	1	1	6	0.17	16.67	1	0.16	0.84	1.09	2.50	4.43	Not assessed
25	Delonix elata	Perungondrai	1	1	6	0.17	16.67	1	0.17	0.84	1.09	2.62	4.54	Least Concern
26	Pithecellobium dulce	Kodukapuli	1	1	6	0.17	16.67	1	0.14	0.84	1.09	2.18	4.11	Not assessed
27	Citrus medica	Elumichai	2	2	6	0.33	33.33	1	0.23	1.68	2.17	3.61	7.46	Not assessed
		Total	110	83					5.02					

Table 3-17 Shrubs in the Core Zone

S. No.	Scientific Name	Local Name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IUCN Conservation Status
1	Jatropagossypifolia	Kaatamanaku	32	17	24	1.17	0.71	1.65	14.43	17.17	Not Assessed
2	Calotropis gigantea	Erukam	16	12	24	0.58	0.50	1.17	7.22	12.12	Not Assessed
3	Tabernaemontanadivaricata	Crepe Jasmine	4	3	24	0.13	0.13	1	1.55	3.03	Not Assessed
4	Catharanthus roseus	Nithyakalyani	4	3	24	0.13	0.13	1	1.55	3.03	Not Assessed
5	Datura metal	Ummattangani	7	4	24	0.21	0.17	1.25	2.58	4.04	Not Assessed
6	Robiniapseudoacacia	Black locust	15	5	24	0.71	0.21	3.4	8.76	5.05	Least Concern
7	Acalypha indica	Kuppaimeni	18	8	24	0.83	0.33	2.5	10.31	8.08	Not Assessed
8	Stachytarpheaurticifolia	Rat tail	13	9	24	0.63	0.38	1.67	7.73	9.09	Not Assessed
9	Woodfordiafruiticosa	Velakkai	4	3	24	0.13	0.13	1	1.55	3.03	Least Concern
10	Hibiscus rosa sinensis	Sembaruthi	3	2	24	0.13	0.08	1.5	1.55	2.02	Not Assessed
11	Lantana camara	Unnichedi	8	6	24	0.38	0.25	1.5	4.64	6.06	Not Assessed
12	Parthenium hysterophorous	Vishapoondu	45	13	24	2.08	0.54	3.85	25.77	13.13	Not Assessed
13	Euphorbia geniculata	Amman Pacharisi	5	3	24	0.13	0.13	1	1.55	3.03	Not Assessed

Table 3-18 Herbs & Grasses in the core zone

S. No.	Scientific Name	Local Name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IUCN Conservation status
1	Helicteresisora	Valampuri	4	2	30	0.07	0.07	1	0.79	2.15	Not assessed
2	Tridax procumbens	Vettukaayathalai	7	4	30	0.17	0.13	1.25	1.98	4.30	Not assessed
3	Heraculem spondylium	Hog Weed	19	10	30	0.67	0.33	2	7.94	10.75	Not assessed
4	Tridax procumbens	Cuminipachai	18	4	30	0.50	0.13	3.75	5.95	4.30	Not assessed
5	Senna occidentalis	Nattamsakarai	30	4	30	0.83	0.13	6.25	9.92	4.30	Not assessed
6	Plumbago zeylanica	Chittiramoolam	12	3	30	0.10	0.10	1	1.19	3.23	Not assessed
7	Scrophularia nodosa	Sarakkothini	18	7	30	0.50	0.23	2.14	5.95	7.53	Not assessed
8	Viburnum dentatum	Viburnum	7	5	30	0.17	0.17	1	1.98	5.38	Least concern
9	Cynodondactylon	Arugu	15	6	30	0.40	0.20	2	4.76	6.45	Not assessed
10	Euphorbia hirta	Amman Pacharisi	7	4	30	0.17	0.13	1.25	1.98	4.30	Not assessed
11	Sida cordifolia	Maanikham	50	4	30	1.50	0.13	11.25	17.86	4.30	Not assessed
12	Sida acuta	Malaidangi	12	3	30	0.33	0.10	3.33	3.97	3.23	Not assessed
13	Laportea canadensis	Peruganchori	28	20	30	1.00	0.67	1.5	11.90	21.51	Not assessed
14	Sporobolus fertilis	Giant Parramatta Grass	10	4	30	0.30	0.13	2.25	3.57	4.30	Not assessed
15	Tephrosia purpurea	Kavali	23	4	30	0.67	0.13	5	7.94	4.30	Not assessed

3.7.4 *Calculation of species diversity by Shannon – wiener Index, Evenness and richness by Margalef:*

Biodiversity index is a quantitative measure that reflects how many different type of species, there are in a dataset, and simultaneously takes into account how evenly the basic entities (such as individuals) are distributed among those types of species. The value of biodiversity index increases both when the number of types increases and when evenness increases. For a given number of type of species, the value of a biodiversity index is maximized when all type of species are equally abundant. Interpretation of Vegetation results in the study area is given below.

Table 3-19 Calculation of species diversity

Description	**Formula**
Species diversity – Shannon – Wiener Index	$H=\Sigma[(p_i)*\ln(p_i)]$ Where p_i : Proportion of total sample represented by species i:number of individuals of species i/ total number of samples
Evenness	H/H_{max} H_{max} = ln(s)= maximum diversity possible S=No. of species
Species Richness by Margalef	RI = S-1/ln N Where S = Total Number of species in the community N = Total Number of individuals of all species in the community

3.7.5 *Calculation of species diversity by Shannon – wiener Index, Evenness and richness by Margalef for trees*

i. Species Diversity

Scientific Name	**Common Name**	**No. of Species**	**Pi**	**ln (Pi)**	**Pi x ln (Pi)**
Ficus Carica	Athi Maram	2	0.018182	-4.00733	-0.07286
Cocos nucifera	Thennai	10	0.090909	-2.3979	-0.21799

Azadirachta indica	Veppam	17	0.154545	-1.86727	-0.28858
Tamarindus indica	Puli	10	0.090909	-2.3979	-0.21799
Mangifera indica	Mamaram	7	0.063636	-2.75457	-0.17529
Morinda pubescens	Nuna	6	0.054545	-2.90872	-0.15866
Couroupita guianensis	Nagalingam	5	0.045455	-3.09104	-0.1405
Bombax ceiba	Sittan	4	0.036364	-3.31419	-0.12052
Acacia nilotica	Karuvelai	4	0.036364	-3.31419	-0.12052
Bambusa vulgaris	Moongil	4	0.036364	-3.31419	-0.12052
Syzygium cumini	naval	5	0.045455	-3.09104	-0.1405
Carica papaya	Papaya	3	0.027273	-3.60187	-0.09823
Psidium guajava	Guava	3	0.027273	-3.60187	-0.09823
Cassia siamea	ManjalKonrai	3	0.027273	-3.60187	-0.09823
Ficus religiosa	Arasa maram	3	0.027273	-3.60187	-0.09823
Musa paradise	Vaazhai	3	0.027273	-3.60187	-0.09823
Prosopis juliflora	Vaelikaruvai	3	0.027273	-3.60187	-0.09823
Tectona grandis	Thekku	3	0.027273	-3.60187	-0.09823
Thespesia populnea	Poovarasam	3	0.027273	-3.60187	-0.09823
Causuarina equisetifolia	Savukku	2	0.018182	-4.00733	-0.07286
Alstonia scholaris	Elilaipalai	2	0.018182	-4.00733	-0.07286
Anacardium occidentale	Cashew	1	0.009091	-4.70048	-0.04273
Artocarpus heterophyllus	Palaa	2	0.018182	-4.00733	-0.07286
Aegle marmelos	Vilvam	1	0.009091	-4.70048	-0.04273
Delonix elata	Perungondrai	1	0.009091	-4.70048	-0.04273
Pithecellobium dulce	Kodukapuli	1	0.009091	-4.70048	-0.04273
Citrus medica	Elumichai	2	0.018182	-4.00733	-0.07286
Total		110			-3.02215005

H (Shannon Diversity Index) =3.02

Shrubs

Scientific Name	Common Name	No. of Species	Pi	ln (Pi)	Pi x ln (Pi)
Jatropagossypifolia	Kaatamanaku	32	0.183908	-1.69332	-0.31142
Calotropis gigantea	Erukam	16	0.091954	-2.38647	-0.21945
Tabernaemontanadivaricata	Crepe Jasmine	4	0.022989	-3.77276	-0.08673
Catharanthus roseus	Nithyakalyani	4	0.022989	-3.77276	-0.08673
Datura metal	Ummattangani	7	0.04023	-3.21315	-0.12926
Robiniapseudoacacia	Black locust	15	0.086207	-2.45101	-0.21129
Acalypha indica	Kuppaimeni	18	0.103448	-2.26868	-0.23469
Stachytarpheaurticifolia	Rat tail	13	0.074713	-2.59411	-0.19381
Woodfordiafruiticosa	Velakkai	4	0.022989	-3.77276	-0.08673
Hibiscus rosa sinensis	Sembaruthi	3	0.017241	-4.06044	-0.07001

Lantana camara	Unnichedi	8	0.045977	-3.07961	-0.14159
Parthenium hysterophorous	Vishapoondu	45	0.258621	-1.35239	-0.34976
Euphorbia geniculata	Amman Pacharisi	5	0.028736	-3.54962	-0.102
Total		174			-2.2234

H (Shannon Diversity Index) =2.22

Herbs

Scientific Name	Common Name	No. of Species	Pi	ln (Pi)	Pi x ln (Pi)
Helicteresisora	Valampuri	4	0.015385	-4.17439	-0.06422
Tridax procumbens	Vettukaayathalai	7	0.026923	-3.61477	-0.09732
Heraculem spondylium	Hog Weed	19	0.073077	-2.61624	-0.19119
Tridax procumbens	Cuminipachai	18	0.069231	-2.67031	-0.18487
Senna occidentalis	Nattamsakarai	30	0.115385	-2.15948	-0.24917
Plumbago zeylanica	Chittiramoolam	12	0.046154	-3.07577	-0.14196
Scrophularia nodosa	Sarakkothini	18	0.069231	-2.67031	-0.18487
Viburnum dentatum	Viburnum	7	0.026923	-3.61477	-0.09732
Cynodondactylon	Arugu	15	0.057692	-2.85263	-0.16457
Euphorbia hirta	Amman Pacharisi	7	0.026923	-3.61477	-0.09732
Sida cordifolia	Maanikham	50	0.192308	-1.64866	-0.31705
Sida acuta	Malaidangi	12	0.046154	-3.07577	-0.14196
Laportea canadensis	Peruganchori	28	0.107692	-2.22848	-0.23999
Sporobolus fertilis	Giant Parramatta Grass	10	0.038462	-3.2581	-0.12531
Tephrosia purpurea	Kavali	23	0.088462	-2.42519	-0.21454
Total		260			-2.51

H (Shannon Diversity Index) =2.51

i. Species diversity calculation

Details	H	Hmax	Evenness	Species Richness (Margalef)
Trees	3.02	3.36	0.89	5.95
Shrubs	2.22	2.56	0.86	2.32
Herbs	2.51	2.70	0.92	2.51

From the above, it can be interpreted that herb community has higher diversity. While the tree community shows less diversity. It is also observed that most of the quadrates have controlled generation of plant species with older strands. Higher herb species diversity can be interpreted as a greater number of successful species and a more stable ecosystem where more ecological niches are available, environmental change is less likely to be damaging to the ecosystem. Species richness is high for herb community when compared with tree and shrubs.

3.7.6 *Floral study in the Buffer Zone:*

Economically important Flora of the study area

Agricultural crops: The important crops of this district are Paddy, Maize, Ragi, Banana, Sugarcane, Cotton, Tamarind, Coconut, Mango, Groundnut, Vegetables and Flowers also grown by the local people.

Medicinal species: The nearby area is also endowed with the several medicinal species which are commonly available in the shrub forest and waste lands. The common medicinal species of the region are Asparagus racemosus (satamulli), Azadirachta indica (Neem) etc.

Rare and endangered floral species: There are no rare or endangered or threatened (RET) species of in the study area. During the vegetation survey, there are no any species which are endangered or threatened under IUCN (International Union for Conservation of Nature and Natural resources) guidelines.

3.7.7 *Faunal Communities*

Both direct and indirect observation methods were used to survey the fauna.

- Point Survey Method: Observations were made in each site for 15 minutes duration.

Roadside Counts: The observer traveled by motor vehicles from site to site, all sightings were recorded (this was done both in the day and night time). An index of abundance of each species was also established.

Pellet and Track Counts: All possible animal tracks and pellets were identified and recorded (South Wood, 1978).

Additionally, survey of relevant literature was also done to consolidate the list of fauna distributed in the buffer zone.

Based on the Wildlife Protection Act, 1972 (WPA 1972, Anonymous. 1991, Upadhyay 1995, Chaturvedi and Chaturvedi 1996) species were short-listed as Schedule II or I and considered herein as endangered species. Species listed in Ghosh (1994) are considered as Indian Red List species.

Methodology Adopted:

Point Survey method was adopted for this development project where observations were made in each site for 15 minutes duration (10 times).

Study in the core zone:

Point Survey method was adopted for the study within 2 km radius and the following species were observed.

Mammals: No wild mammalian species was directly sighted during the field survey. Discussion with local villagers located around the study area also could not confirm presence of any wild animal in that area. Three stripped Palm Squirrel, Common Indian Hare, Common mongoose, Common Mouse etc were observed during primary survey.

Avifauna: Since birds are considered to be the indicators for monitoring and understanding human impacts on ecological systems (Lawton, 1996) attempt was made to gather quantitative data on the avifauna by walk through survey within the entire study area and surrounding areas. From the primary survey, a total of 26 species of avifauna were identified and recorded in the study area. The diversity of avifauna from this region was found to be quite high and encouraging.

The list of fauna species found in the study area is mentioned in Table below.

Table 3-20 List of fauna species

Scientific Name	Common Name	Schedule of wild life protection act	IUCN conservation status
Mammals			
Funambulus pennanti	Palm Squirrel	IV	Least Concern
Mus rattus	Indian rat	IV	Not listed
Bandicota bengalensis	Indian mole rat	IV	Least Concern
Funambulus palmarum	Three stripped palm squirrel	IV	Least Concern
Herestes edwardsii	Common Mangoose	IV	Not listed
Mus musculus	Common Mouse	IV	Least Concern
Bandicota indica	Rat	IV	Least Concern
Lepus nigricollis	Indian Hare	IV	Least Concern
Felis catus	Cat	Not listed	Not listed
Canis lupus familiaris	Indian dog	Not listed	Not listed
Bos Indicus	Indian Cow	Not listed	Not listed
Bubalus bubalis	Buffalo	I	Not listed
Sus scrofa domesticus	Domestic pig	Not listed	Not listed
Birds			
Milvus migrans	Black kite	IV	Least concern
Saxicoloides fulicatus	Indian Robin	IV	Least concern
Pycnonotus cafer	Red vented Bulbul	IV	Least concern
Phragamaticola aedon	Thick billed warbler	IV	Least concern
Pericrocotus cinnamomeus	Small Minivet	IV	Least concern
Eudynamys scolopaceus	Koel	IV	Least concern
Psittacula krameni	Rose ringed parakeet	IV	Least concern
Dicrurus marcocercus	Black drongo	IV	Least concern
Columba livia	Rock pigeon	IV	Least concern
Corvus splendens	House crow	IV	Least concern

Alcedo atthis	Small blue kingfisher	IV	Least concern
Cuculus canorus	Common Cukoo	IV	Least concern
Reptiles & Amphibians			
Chameleon zeylanicum	Chameleon	IV	Not listed
Calotes versicolor	Common garden lizard	II	Not listed
Bungarus caeruleus	Common krait	IV	Not listed
Ophisops leschenaultia	Snake eyed lizard	--	Not listed
Bufo melanostictus	Toad	IV	Least concern
Ptyas mucosa	Rat snakes	IV	Least concern
Hemidactylus sp.	House lizard	--	Not listed
Butterflies			
Danaus chrysippus	Plain Tiger	--	Not listed
Papilio demoleus	Common lime	--	Not listed
Euploea core	Common crow	--	Least concern
Danaus genutia	Common tiger	--	Not listed
Eurema brigitta	Small grass yellow	--	Least concern

3.8 DEMOGRAPHY AND SOCIO ECONOMICS

The demography survey study is done within 10km radius from the project site.

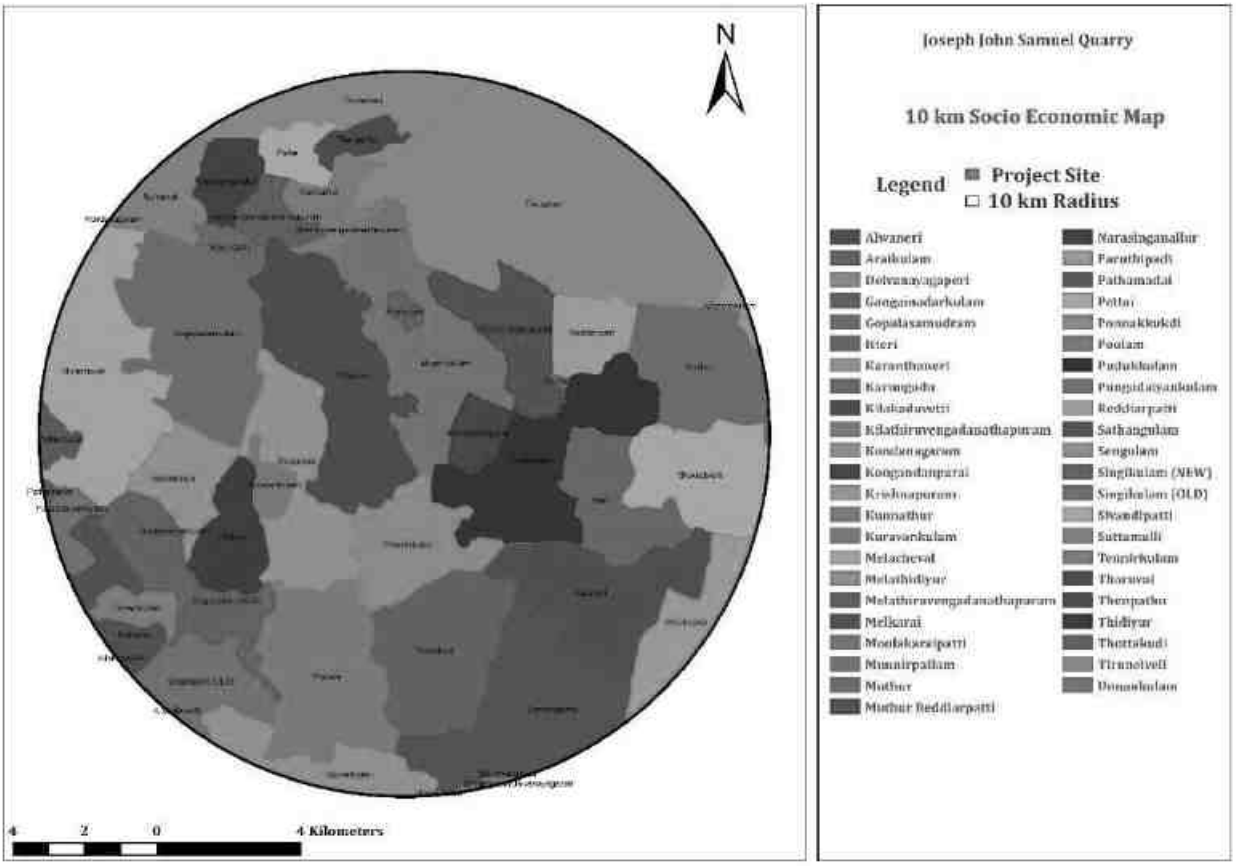


Figure 3.13 Socio Economic map surrounding the project site.

The population, Household, Sex ratio, Literacy rate, SC, ST details for all the villages in the study area is listed below:

Table 3-21: Demography Survey Study

Source: Census of India, 2011

Villages	Household	Population	Sex Ratio		Literacy Rate		SC	ST
			Male	Female	Male	Female		
Kondanagaram	563	2055	1022	1033	759	603	527	2
Suttamalli	3017	10954	5441	5513	4527	4165	1823	13
Karungadu	186	686	331	355	248	196	376	0
Narasinganallur	854	3183	1611	1572	1235	996	993	68

Pettai	603	2345	1182	1163	1036	958	260	0
Thenpathu	458	1766	901	865	759	673	1186	0
Kunnathur	558	2067	1020	1047	768	621	1153	0
Tharuvai	1574	6126	3054	3072	2298	2003	1818	184
Araikulam	239	827	409	418	340	301	7	0
Muthur	823	3173	1547	1626	1158	1004	1722	0
Kuravankulam	17	75	43	32	34	19	0	0
Melathidiyur	266	3040	1876	1164	1780	1002	221	0
Gangainadarkulam	25	73	31	42	21	29	0	0
Thidiyur	493	2007	994	1013	769	685	77	0
Sengulam	682	2692	1336	1356	1106	985	380	0
Itteri	226	824	391	433	262	227	433	171
Sivandipatti	906	3454	1703	1751	1258	1071	1751	468
Pathamadai (TP)	4166	16625	8106	8519	6559	6086	2179	26
Melacheval (TP)	2181	8435	4196	4239	3424	3000	2496	21
Gopalasamudram (TP)	2890	10694	5338	5356	4355	3914	2593	15

3.9 TRAFFIC IMPACT ASSESSMENT

Traffic data collected continuously for 24 hours by visual observation and counting of vehicles under three categories, viz., heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads are high, two skilled persons were deployed simultaneously at each station during each shift- one person on each of the two directions for counting the traffic. At the end of each hour, fresh counting and recording was undertaken. Total numbers of vehicles per hour under the three categories were determined.

Figure 3.14: Site Connectivity

Table 3-22: No. of Vehicles per Day

S. No	Vehicles Distribution	Number of Vehicles Distribution/Day	Passenger Car Unit (PCU)	Total Number of Vehicle in PCU
		NH-44	**-**	**NH-44**
1	Cars	631	1	631
2	Buses	251	3	753
3	Trucks	296	3	888
4	Two wheelers	618	0.5	309
5	Three wheelers	207	1.5	310
Total		**2003**	**-**	**2891**

Table 3-23: Existing Traffic Scenario and LOS

Road	V (Volume in PCU/hr)	C (Capacity in PCU/hr)	Existing V/C Ratio	LOS
NH44	2891/24=120	253	0.38	**B**

Note: The existing level may be "Very Good" for MDR=937.

V/C	LOS	Performance
0.0-0.2	A	Excellent
0.2-0.4	B	Very Good
0.4-0.6	C	Good/ Average/ Fair
0.6-0.8	D	Poor
0.8-1.0	E	Very Poor

4 Anticipated Environmental Impacts & Mitigation Measures

This chapter describes the anticipated impacts on the environment and mitigation measures. The method of assessment of impacts including studies carried out, modeling techniques adopted to assess the impacts where pertinent should be elaborated in this chapter. It should give the details of the impacts on the baseline parameters, both during the construction and operational phases and suggests the mitigation measures to be implemented by the proponent.

4.1 INTRODUCTION

An environmental impact is defined as any change to the environment, whether adverse or beneficial, resulting from a facility's activities, products, or services. The anticipation of the possible & potential Environmental impact due to the proposed project is a key step in EIA. Based on the impacts assessed, appropriate mitigation measures should be adopted to maintain the environment with less or no damage.

Environmental Impacts can be group into Primary impacts & Secondary Impacts

Primary Impacts: These impacts are directly attributed by the project

Secondary Impacts: These are those which are induced by primary impacts and include the associated investments and changed patterns of the social and economic activities by the action.

Assessment of impacts is done for the following Environmental Parameters:

- Land Environment
- Water Environment
- Air Environment
- Noise Environment
- Biological Environment
- Socio Economic Environment

4.2 LAND ENVIRONMENT:

<table>
<tr><th>Aspect</th><th>Impact</th><th>Mitigation Measures</th></tr>
<tr>
<td>Mining of rough stone and Gravel</td>
<td>The proposed 0.55.0 Ha mine located in Tharuvai Village having 23,808 m^3 of Rough stone. The quarry operation is proposed to carry out with conventional open cast mechanized mining with 5.0 meter vertical bench and bench width of 5.0 meter. At the end of 5 years, mining lease area will be converted into ultimate pit.
<table>
<tr><th>Pit No.</th><th>Length (Max) (m)</th><th>Width (Max) (m)</th><th>Depth (Max) (m)</th></tr>
<tr><td>I</td><td>109</td><td>29</td><td>17</td></tr>
</table>
The main impact of open cast mining on land-use is land degradation. The land is bound to be excavated for mining of Rough Stone Quarry.

Impact on soil of the study area will be minimal as there are no wastewater generated, heavy metal infusion, stack emissions.</td>
<td>The proposed project site is not prone to any kind of soil erosion (Source: Bhuvan).

In addition, garland drainage of 1m x 1m will be provided to avoid storm water run- off.

It is proposed to plant 275 No’s of local tree species (Neem, Vilvam Vaagai, Pungam, Magizha maram, Eachai, etc.,) along the roads, outer periphery of the mining area which enhances the binding property of the soil.

It is proposed to improve the affected land wherever possible for better land use, so as to support vegetation and creation of water reservoir in the ultimate pit after quarrying.

The source of dust generation is majorly due to drilling, blasting, loading & unloading of the mined out mineral, the impact will be mitigated by water sprinkling regularly once in 3hrs.</td>
</tr>
</table>

	Impact due to transformation of terrain characteristics over the large area results in soil degradation. Solid waste will be generated from the mining activity as there will be refuse also generation of domestic waste. If it is not properly managed, may cause odor and health problem to the workers.	The proposed mining activity is carried out in hilly terrain. After removal of minerals, undulating portion will be created. Excavated area or ultimate pit at the end of the mine period will be converted into water reservoir. Two tier tree belts will be planted along the safety distance. The 100% recovery is achieved by extracting the entire mineable reserve. Hence there will be no refuse generation due to the mining activity. Apart from that, a very meagre quantity of domestic waste will be generated in the project, which will be handed over to the local body on daily basis.

4.3 WATER ENVIRONMENT:

Aspect	Impact	Mitigation Measures
Drilling, Blasting, Loading and unloading, Transportation of the excavated mineral.	The mining in the area may cause ground water contamination due to intersection of the water table and mine runoff.	The water table will not be intersected during mining, as the ultimate depth is limited upto 17 m (below ground level), whereas the ground water table is at 56 m below the ground level. The municipal wastewater will be disposed into

		septic tanks of 5 cum and soak pit. No chemicals consisting of toxic elements will be used for carrying out mining activity.
	The ground water depletion may occur due to mining activity	The ground water table is at a depth of 56 m BGL, the mining operation will not affect the aquifer. The ultimate pit at the end of the mining operation will be used for rain water storage, the stored water will be used for green belt development and further the stored water will be used for domestic purposes (other than drinking) after proper treatment.
	Chemicals consisting of nitrate used for blasting may pollute the surface run off.	Further, the run-off water will be stored in sumps and after proper treatment; water will be used in the mining operation for dust suppression.
	Improper management of Domestic wastewater in the Mine lease may create unhygienic conditions in the site thereby causing health impacts to the labours.	Provision of urinals/Latrines along with septic tank followed by soak pit arrangement will be provided in the Mine Lease area for the proper management of wastewater

4.4 AIR ENVIRONMENT:

Aspect	Impact	Mitigation Measures
Drilling, Blasting, Loading and unloading, Transportation of the excavated mineral.	***Impacts during Operation Phase*** During mining operation, fugitive dust and other air pollutants like particulate matter (PM10 & PM 2.5) will be generated. The main source of pollutants arises due to drilling and blasting. 2 Nos of Tipper will be used for loading and unloading, 1 Nos of Excavator (0.90 m^3 bucket capacity, and 1 Nos Jack Hammer will be used for excavation of the mineral which contributes to the generation of fugitive dust. In addition, blasting will be done using explosives leading to the generation of dust.	***Mitigation Measures during Operation Phase*** It is proposed to plant 275 Nos of local species along the haul roads, outer periphery within the lease area to prevent the impact of dust in consultation with Forest department for the plantation of trees (Neem, Magizham, Tamarind, Elandhai and Vilvam) in two tier to combat air pollution and with herbs (Nerium) in between the tree species. Planning transportation routes of the mined out mineral, so as to reach the nearest paved roads (an approach road) by shortest route connecting to NH 44. Alternatively, gravelled road may be constructed between mine lease area and nearest paved road connectivity. The speed of trucks plying on the haul road will be limited to 20km/hr to avoid generation of dust.

	Effect on Human • Adverse effect on human health of working labourers and neighbouring villagers like effect on breathing and respiratory system, damage to lung tissue, influenza or asthma. • Dust generation due to loading and unloading of mineral and due to transportation can also affect the workers as well as nearby villagers. *Effect on Plants* • Stomatal index may be minimized due to dust deposit on leaf.	The trucks will be covered by tarpaulin. Overloading will be avoided. Personal Protective Equipments (PPEs) like eye goggles, dust mask, leather gloves, safety shoes & boots will be provided to the workers engaged at dust generation points like excavation and loading points. 0.5 KLD of water will be proposed for sprinkling on unpaved roads to avoid dust generation during transportation.

Air Quality Modeling:

The AERMOD is actually a modeling system with three separate components:

- AERMOD (AERMIC Dispersion Model),
- AERMAP (AERMOD Terrain Preprocessor)
- AERMET (AERMOD Meteorological Preprocessor)

4.4.1 *Source Characterization*

A detailed listing of all emission sources and their corresponding modelling input release parameters and emission rates is listed this report. A general description of how each source type was treated is presented below.

The emission Sources from the proposed operation are

Point Sources:

Point sources for mining operations are typically include dust collectors, hot water heaters, and emergency generator(s). Since at the present project the following sources are anticipated.

1. Hydraulic excavator – 0.90 Cum Bucket Capacity (with Rock Breaker Attachment)
2. Jack Hammer 32 mm Dia
3. Tipper
4. Tractor Mounted - Compressor
5. Drilling and excavation with Accessories

Road Sources:

A road network was developed to depict the anticipated haul truck routes and truck discharge locations during the mine operations. The anticipated emissions from the road sources and corresponding anticipated impact during the monitoring period of May to August 2022 emissions were estimated. Emissions due to haul road and general plant traffic on the unpaved road network were modelled as volume sources. The model volume source parameter for the haul roads initially utilized USEPA developed emission factors for hauling trucking. The haul road sources utilized source to source spacing of 6 meters along the simulated haul roads. The initial lateral dimension of the sources were set to 3 m were used as an input to replicated a 2 truck travel adjacent for a typical mining scenario.

The parameters considered for the hauling operation include the following,

- size of haul trucks commonly used
- degree of dust control/compaction of permanent haul roads

Other fugitive particulate emission sources:

Other fugitive particulate emission sources that were modelled as volume sources include the following:

- Fugitive emissions from trucks unloading at the primary crusher were represented by a single volume source. The release height was set to 0 meters (dump pocket is at grade level).
- Fugitive emissions due to wind erosion is not considered as the mining area is predominately rocky surface with minimal wind erosion. If an wind erosion is anticipated to occur, it would be localized.
- Fugitive emissions from transfer points were represented by single volume sources. The release heights for these sources were set to the actual height of the truck transfer process.

Post Project Scenario

Emissions from operations will result from process equipment and mining operations. Process equipment was modeled at maximum capacity. Emissions from mining were based upon the mining rate and haul truck travel necessary to transport the stones and waste from the pit to the storage area.

Predicted maximum ground level concentrations considering micro meteorological data of December 2022 to February 2023 are superimposed on the maximum baseline concentrations obtained during the study period to estimate the post project scenario, which would prevail at the post operational phase. The overall scenario with predicted concentrations over the maximum baseline concentrations is shown in the following table along with isopleths.

Table 4-1 Emission Factors for uncontrolled mining

Activity	Emission Factor		References	
Topsoil handling	Scraper	0.029 Kg TSPM/ average time between spray application	**USEPA (2008)**	Jose I. Huertas & Dumar A. Camacho & Maria E. Huertas, Standardized emissions inventory methodology for open-pit mining areas, Environmental Science Pollution Research, 2012.
	Bulldozing	15.048 kg PM10/ Hr excavation	**USEPA (2008)**	
	Loading	2.3237E-04 kg PM10/ average time between spray application	**USEPA (2006a)**	
	Haulage	0.69718 kg PM10/VKT	**USEPA (2006a) Cowherd (1988)**	
Rough stone mining	Wet drilling	8.00E-5 lbs PM10/ Ton produce	**EPA. August, 2004. Section 11.19.2, Crushed Stone Processing and Pulverized Mineral Processing. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.**	
	Loading	1.00E-4 lbs PM10/ Ton produce		

4.5 NOISE ENVIRONMENT:

Aspect	Impact	Mitigation Measures
Drilling, Blasting, Loading and unloading, Transportation of the excavated mineral.	Usage of Equipments (Excavator, Tipper, Jack Hammer), Machinery and trucks used for transportation will generate noise. Noise from the machinery can cause hypertension, high stress level, hearing loss, sleep disturbance etc due to prolonged exposure. Number of vehicles will be increased due to the proposed mining activity hence vehicle may collate which may result in unwanted sound and can also cause impact on human health like breathing and respiratory system, damage to lung tissue, influenza or asthma.	• The machinery will be maintained in good running condition so that noise will be reduced to minimum possible level. • Awareness will be imparted to the workers once in six months about the permissible noise level and effect of maximum exposure to those levels. Adequate silencers will be provided in all the diesel engines of vehicles. • It will be ensured that all transportation vehicles carry a valid PUC Certificates. • Speed of trucks entering or leaving the mine will be limited to moderate speed (20km/hr) to prevent undue noise from empty vehicles. The noise generated by the machinery will be reduced by proper lubrication of the machinery and other equipments. • It is proposed to plant 275 Nos. of local species (Neem, Mandharai, Athi, Tamarind, Ashoka, Casuarinas and Villam) to reduce the

		impact of noise in the study area. The development of green belts around the periphery of the mine will be implemented to attenuate noise. • The trucks will be diverted on two roads viz. NH 44 and a District Road to avoid traffic congestion. • Health check-up camps will be organized once in six month. • Use of personal protective devices i.e., earmuffs and earplugs by workers, who are working in high noise generating areas. • Provision of quiet areas, where employees can get relief from workplace noise.

4.6 BIOLOGICAL ENVIRONMENT:

Aspect	Impacts	Mitigation Measures
Site Clearance	Loss of habitat due to site clearance which may lead to ecological disturbance.	The proposed mining lease is already a dry land hence no site clearance is required. Only few shrubs and herbs like parthenium sp., prosopis juliflora were present.

Planting of trees	Development of afforestation in the mine lease area will have a positive impact as the land was initially a barren.	safety distance will be provided all along the boundary of the mine lease area and safety. Around 0.10 Ha of land is utilized for greenbelt development (275 Nos – 5 years). This will attract avifauna thus enhancing the existing ecological environment.

4.7 SOCIO ECONOMIC ENVIRONMENT:

Aspect	Impact	Mitigation Measures
Proposed implementation of Mining activity	Land acquisition for the implementation of the project may result in loss of assets, which in return will make the PAP to shift, losing their normal routine and livelihood	The proposed project is a patta land of **Thiru Joseph John Samuel** and the land is vacant where there are no human settlement within 300m radius. Hence the project does not involve Rehabilitation and resettlement
Drilling, Blasting, Loading and Transportation of the mined out mineral	The mining activities may cause dust emission, noise pollution thereby causing disturbance to the local habitat	No human activity is envisaged near the project site. The nearest human settlement is observed in Ponnakudi village which is 1.03 km, SSE from site
Grazing and Rearing activities in the nearby villages	The Grazing and rearing of local animals like Sheep, Goat and cows is observed in the nearby villages, which may be affected due to the project as the	It is proposed to use gravelled road and nearest paved road and preferred not to use unpaved roads. In addition to that, the speed of trucks will be limited to 20km/hr to avoid any accidents.

	movement of the vehicles may affect/injure the animals	
Employment opportunity	The project will improve the livelihood of the local people	After the development of the proposed mine, it will improve the livelihood of local people and also provide the direct and indirect employment opportunities. The rough stone for the infrastructural development in the area will be made available from the local markets at reasonably lower price.
Corporate Environmental Responsibility	The proposed project will help in natural resource augmentation & Community resource development.	As a part of CER i.e, 5 Lakhs will be allocated. Developing sports facilities, providing hygienic toilet, R.O Water facilities to Government Higher Sec. School

4.8 OTHER IMPACTS:

S. No	Aspect	Impact	Mitigation measure
1.	Risk due to the proposed mining	Accidents may occur in the mine area	Proper PPE kit (Safety jacket, Helmet, Safety Shoes, Gloves) etc will be provided to each and every employee in the mine lease concerning the safety of each labour
2.	Blasting	Injury to the labours due to the blasting activity	Alarm system in the form of Siren will be engaged in the project site to caution the blasting activity. In addition to that, the blasting activity will be scheduled at particular time – 5 P.M to 6 P.M (or whenever required) so that the employees will be aware of the activity. Smoking will be banned in the site and sign boards will be displayed in various places at site.
3.	Screening of Labors	Labors will be checked for health condition before employing them in mining activity	All the labors will be checked and screened for health before employing them. After employing them, periodical medical checkups will be held once in every six months.

5 Analysis Of Alternatives

5.1 GENERAL

Analysis of alternative is a significant aspect in planning and designing any project. Cost benefit analysis should be work out along with other parameters while choosing an alternative in such a way that the production is maximum and the mining operation is environment friendly and cost effective. The mine plan and mine closure plan Mining Plan was approved by The Assistant Director , Geology & Mining, Tirunelveli District prior to submission of the Form-1 and PFR. ToR issued by the SEIAA-TN vide Letter No. SEIAA-TN/ F. No. 8914/ ToR-1117/2022 Dated: 23.03.2022. The study for alternative analysis involves in-depth examination of site and technology.

5.1.1 *Analysis for Alternative Sites and Mining Technology*

5.1.1.1 Alternative Site

The proposed project is the mining of Rough Stone Quarry and is proposed after prospecting the area. In other words, these can be implemented in the mineral available zone. Since the mining block has been allotted in principal by the State Government, there is no case for studying and exploring any other site as an alternative.

5.1.1.2 Alternative Technology

The open cast mining could be manual/mechanized depending upon the geological and topographical setup of the mineral (ROM) to be won and the daily/annual targeted production.

Table 5-1: Alternative for Technology and other Parameters

S. No.	Particular	Alternative Option 1	Alternative Option 2	Remarks

1.	Technology	Opencast semi mechanized mining	Opencast mechanized mining	Opencast semi mechanized Involving drilling and blasting are preferred. Benefits: Material is hard so to make it loose and to bring it to
2.	Employment	Local employment.	Outsource employment	Local employment is preferred Benefits: Provides employment to local people along with financial benefits No residential building/
3.	Labour transportation	Public transport	Private transport	Local labours will be deployed from Ponnakudi village so they will either reach mine site by bicycle or by foot. Benefits: Cost of transportation of labors
4.	Material transportation	Public transport	Private transport	Material will be transported through trucks/trolleys on the contract basis Benefits: It will give indirect employment.
5.	Water	Tanker supplier	Ground water/	Tanker supply will be preferred. Water will be sourced from Ponnakudi village which is 1.03 km, SSE from site.

6 Environmental Monitoring Program

6.1 GENERAL:

This chapter covers the planned environmental monitoring program. It also includes the technical aspects of monitoring the effectiveness of mitigation measures.

Monitoring is important to measure the efficiency of control measures. Post project monitoring of environmental parameters is of key importance to assess the status of environment. The monitoring program will serve as an indicator for identifying environmental degradation due to operation of the project and help in selection of appropriate mitigation measures to safeguard the environment.

Regular monitoring is as important as control of pollution since the efficacy of control measures can only be determined by monitoring. The project proponent has awarded **M/s. Ecotech Labs Pvt Ltd** for carrying out the post project environmental monitoring (PPM) and timely compliance report submission to various regulatory authorities.

Therefore, regular monitoring programme of the environmental parameters is essential to take into account the changes in the environmental quality. The objectives of monitoring are to:-

- Verify effectiveness of planning decisions;
- Measure effectiveness of operational procedures;
- Confirm statutory and corporate compliance; and
- Identify unexpected changes.

Table 6-1: Environmental Monitoring Programme

Parameters	Sampling	Frequency	Location
Air environment – Pollutants PM 10 PM 2.5 SO_2	5 locations	24 hourly twice a week 4 hourly. Twice a week, One non monsoon season	Project Site, Samudhaya Nalakodam CSI St Thomas Church E-service center Joe Suresh Engineering college

NO_x		8 hourly, twice a week 24 hourly, twice a week	
Noise	5 locations	24 hourly Once in 5 locations	Project Site, Samudhaya Nalakodam CSI St Thomas Church E-service center Joe Suresh Engineering college
Water (Ground water) • pH • Temperature • Turbidity • Magnesium Hardness • Total Alkalinity • Chloride • Sulphate • Fluoride • Nitrate • Sodium • Potassium • Salinity • Total nitrogen • Total Coliforms • Fecal Coliforms	5 locations	Once in 5 locations	Project Site, Samudhaya Nalakodam CSI St Thomas Church E-service center Joe Suresh Engineering college

Water (surface water) • pH • Temperature • Turbidity • Magnesium Hardness • Total Alkalinity • Chloride • Sulphate • Fluoride • Nitrate • Sodium • Potassium • Salinity • Total nitrogen • Total Coliforms • Fecal Coliforms	Sample from nearby lakes/river	One time Sampling	Thamirabharani river
Soil (Organic matter, Texture, pH, Electrical Conductivity, Permeability, Water holding capacity, Porosity)	5 locations	Once in 5 locations	Project Site, Samudhaya Nalakodam CSI St Thomas Church E-service center Joe Suresh Engineering college
Ecology and biodiversity Study	Study area covering 5 km radius	One time Sampling	

Socio- Economic study (Population, Literacy Level, employment, Infrastructure like school, hospitals & commercial establishments)	Villages around 5 km radius	One time Sampling	

Table 6-2: Monitoring Schedule during Mining

S. No.	Attributes	Parameters	Frequency	Location
1.	Ambient Air Quality at Mine Site & Fugitive Dust Sampling	PM 10 PM 2.5 SO_2 NO_x	Once in a Month	Project Site
2.	Ground water Quality	Drinking Water Parameters, As per IS - 10500: 2012	Half yearly	Project Site
3.	Surface Water Quality	Class will be assessed as per the CPCB Guidelines	Half yearly	Project Site
4.	Soil Quality	(Organic matter, Texture, pH, Electrical Conductivity, Permeability, Water holding capacity, Porosity)	Half yearly	Project Site
5.	Noise Level Monitoring	Noise level in dB(A) Quaterly/half yearly	Half yearly	Project Site

7 Additional Studies

7.1 GENERAL

This chapter covers the details of the additional studies viz. Risk assessment, Disaster Management, Public Hearing, Rehabilitation and Resettlement.

7.1.1 *Public Hearing:*

As the proposed mining project falls under 1(a), Category B1 – Cluster Mining (includes **Existing Quarries**- Tmt.D.Mercy Mery -2.51.5 Ha, Tmt.D.Mercy Mery-1.62.5 Ha, Thiru.Sankaranarayanan @Sankaran- 2.36.5 Ha

Abandoned /Old Quarries – A.S.Kumar- 3.96.0 Ha

Proposed Quarries – Thiru.Joseph John Samuel -0.55.0 Ha, G.Jebarajan- 2.63.0 Ha, Thiru.K.Selvaraj- 4.45.20 Ha

Hence under 7(III) of EIA notification 2006 and its subsequent amendments, the project involves the Public Consultation and the same will be conducted under SPCB (TN) in Virudhunagar District. The proceedings of the same will be incorporated in the Final EIA Report.

7.1.2 *Risk assessment:*

For mining projects to be successful, it should meet not only the production requirements, but also maintain the highest safety standards for all the workers. The industry has to identify the hazards, assess the associated risks and bring the risks to tolerable level regularly. Mining has considerable safety risk to miners. Unsafe conditions and practices in mines lead to a number of accidents and causes loss and injury to human lives, damages the property, interrupt production etc. Risk assessment is a systematic method of identifying and analyzing the hazards associated with an activity and establishing a level of risk. The hazards cannot be completely eliminated, and thus there is a need to define and estimate an accident risk level possible to be presented either in quantitative or qualitative way.

7.1.3 *Identification of Hazard*

7.1.3.1 Blasting Pattern:

The quarrying operation will be carried out in conjunction with conventional method of mining using Jack hammer drilling and blasting for shattering effect and loosen the Rough stone.

7.1.3.2 Drilling and Blasting:

Drilling and Blasting parameters are as follows:

Parameters	Details
Depth of each hole	1 m to 1.5m
Diameter of hole	32-36 mm
Spacing between holes	0.6 m
Pattern of hole	Zigzag
Inclination of holes	70° from horizontal
Use of delay detonators	25 milli seconds delays
Detonating fuse	"Detonating" Cord

a. Types of explosives to be used:

Slurry Class 3 explosives, type of nitro compound are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling or Primary blasting is proposed. Detonators of Class 3 and Safety fuse of Class 6 are used.

b. Measures proposed to minimize ground vibration due to Blasting:

The quarry is situated more than 1.0 km from the nearby villages. Controlled blasting measures will be adopted for minimizing ground vibration and fly of rock. Shallow depths jackhammer drilling & blasting is proposed to be carried out with minimum use of explosive mainly to give the shattering effect in rough stone for easy excavation and to control fly of rocks.

Diameter of Holes = 32-36mm

Depth = 1 to 1.5 m

Storage and safety measures to be taken while blasting: The proponent will engage an authorized explosive agency to carry out the small amount of blasting and it will be supervised by competent and statutory Foreman/Permit Mines Manager.

Heavy Machineries: The following heavy machineries will be used in the proposed area:

- For Mining – Excavator of 0.90 Cum Bucket capacity , Jack Hammers (30-32 mm Dia) of 4 Nos.
- Loading Equipment – Excavator of 0.9 Cum Bucket Capacity
- Transportation (includes within the mine and mine to destination) – Tipper 2 No of 10 M.T capacity (from quarry to needy peoples and local crushers)

a. Risk:

Most of the accidents during transport of mined out mineral using other heavy vehicles are often attributed to mechanical failures and human errors.

b. Mitigation measures to minimize the risk

- At the time of loading no person will be allowed within the swing radius of the excavation.
- The dumpers/ trucks will stand near the loading equipment and fully braked when the muck is filled in it.
- The truck would be brought to a lower level so that the loading operation suits to the ergonomic condition of the workers.
- The workers will be provided with helmets, gloves and safety boots; loading and unloading operations will be carried out only during daylight
- All the mining machineries will be regularly maintained and checked such as brakes, lights and horns to keep in the efficient working order.

7.1.4 *General Precautionary measures for the Risk involved in the proposed mine:*

- In order to take care of above hazard/disaster, the following control measures will be adopted:

- All safety precautions and provisions of Mine Act,1952, Metalliferous Mines Regulation, 1961 and Mines Rules, 1955 will be strictly followed during all mining operations;
- Entry of unauthorized persons will be prohibited;
- Firefighting and first-aid provisions in the ECC and mining area;
- Provisions of all the safety appliances such as safety boot, helmets, goggles etc. will be made available to the workers (18 Nos.) and regular inspection for their use;
- In case of eventuality, first aid will be given by the senior safety office in the mine area initially to the injured person. The safety officer will give notice of accident as per Rule-23 of Mines Act-1952;
- The safety officer (common for 3 mines within 500m radius) will be responsible for coordination between management district authorities/DGMS etc. Regarding general safety as per Rule-181 of MMR 1961, "No person shall negligently or will fully do anything likely to endanger life or limb in the mine, or negligible or will fully omit to do anything necessary for the safety of the mine or of the persons employed there in". The workers will be provided with protective foot wear and safety helmets;
- Cleaning of mine faces will be regularly done;
- Handling of explosives, charging and blasting will be carried out by highly skilled labors only;
- Regular maintenance and testing of all mining equipment as per manufacturer's guidelines;
- Suppression of dust by sprinkling water on the haulage roads;

7.1.5 *Safety Team:*

The effective implementation of compliance of Safety Rules/ Statutory Provisions will be ensured. The safety officer will be engaged, meeting the requirement of Mines Act and their duties and responsibilities. The safety officer will be responsible for identification of the hazardous conditions and unsafe acts of workers and advice on corrective actions, conduct safety audit, organize training programs and provide professional expert advice on various issues related to occupational safety and health. Organizing safety training will be conducted to employees and contractor labors periodically.

7.1.6 *Emergency Control Centre*

The emergency control center will be provided to handle the emergency. The site main controller, key personnel and the senior officers of the fire and police services will attend it. The center will be equipped to receive and transmit information and directions from and to the incident controller and other areas of the works, as well as outside. The emergency control center will be sited in an area of minimum risk. This common Emergency control centre will be used for the mines around the 500m radius

7.2 DISASTER MANAGEMENT

The possible risks in the case of stone along with associated minor minerals mining projects are fly rock, vibration failure of pit, slope and waste dump, accidents due to transportation. Mining and allied activities are associated with several potential hazards to both the employees and the public at large. Safety of the mine and the employees is taken care of by the mining rules & regulations, which are well defined with laid down procedure for safety, which when scrupulously followed, safety is ensured not only to manpower but also to machines & working environment.

7.2.1 Emergency Management Plan For Proposed Mines On Site- Offsite Emergency Preparedness Plan:

The emergency plan delineates the procedures for dealing with accidents or unexpected events and natural calamities arising from mining activity. An experience of any accidents that have occurred in other manufacturing/mining projects is considered to prepare this plan. This Emergency plan should be periodically reviewed and modified. It should also be changed based on the observations of emergency mock drills and experience of handling actual emergencies.

Major objectives of this onsite – offsite emergency plan are:

- To take necessary proactive and preventive actions to avoid the emergency.

The main aim of any emergency plan should be to prevent emergency situations.

To train the manpower to handle the emergencies of the following nature:

• Onsite (Within ML boundary)

• Offsite (Outside ML boundary)

7.2.1 *Onsite off-site emergency Plan:*

1- Emergency on account of:

- Fire
- Explosion
- Major accidents involving man-made collapse of the mining edges.
- Snake bites, attack by honey bees or attack by wild animals.

2- Disaster due to natural calamities like:

- Flood/ heavy rains which can involve natural landslides.
- Earth quake
- Cyclone
- Lightening

7.2.2 *Emergency Plan:*

- The mining operations should be immediately stopped in case of any emergency. A siren will be sounded during emergency time.
- An emergency assembly point will be created and all the workers will guide visitors or contractors to approach assembly point.
- Emergency vehicle (Ambulance) will be available in the nearby place, in proximity to the three mines and will rush to the emergency control centre at the blowing of emergency siren. The driver of emergency vehicle will follow the instructions of Incident Controller/Site Main Controller.
- Workers will be trained for the precautions to be taken during natural disasters like heavy rain, floods, earthquake and cyclone.
- All escape routes from mines to the assembly point or any other safe location will be made and the escape plan will be displayed in many places in the mine area

7.2.3 *Emergency Control:*

- Shut down of mining operations: Raising the alarm or siren followed by immediate safe shut down of the power supply, and isolation of affected areas.
- Treatment of injured: First aid and hospitalization of injured persons
- Protection of environment and property: During mitigation, efforts will be made to prevent impacts on environment and property to the extent possible.
- Preserving all evidences and records: This will be done to enable a thorough investigation of the true causes of the emergency.
- Ensuring safety of personnel prior to restarting of operations: Efforts required will be made to ensure that work environment is safe prior to restarting the work.

7.3 NATURAL RESOURCE CONSERVATION

There are no natural resources within the premises. The conservation strategies for energy will be followed in the proposed mine lease area. The pollutants of the mine will be minimized by adopting appropriate mitigation measures as mentioned Chapter 5 to prevent the effects on nearest water bodies. No surface runoff from the project site will be let into the nearest water bodies.

7.4 RESETTLEMENT AND REHABILITATION:

The proposed Mine lease area is a patta land. There is no displacement of the population within the project area and adjacent nearby area and hence Rehabilitation & Resettlement is not applicable.

8 Project Benefits

8.1 GENERAL

This chapter covers the benefits accruing to the locality, neighborhood, region and nation as a whole. It brings out the details of benefits by way of improvements in the physical infrastructure, social infrastructure, employment potential and other tangible benefits.

8.1.1 *Physical Benefits*

The opening of the proposed project will enhance the following physical infrastructure facilities in the adjoining areas:

Market: Generating useful economical resource for construction. Due to demand supply chain, excavated mineral (Rough stone) will sold in the market in the affordable price.

Infrastructure: The excavated rough stone will be used for ***Laying Roads, Building & Construction Projects, Bridges*.**

Enhancement of Green Cover & Green Belt Development: As a part of reclamation plan, native tree species will be planted along the safety boundary of the mine lease area. A suitable combination of trees that can grow fast and also have good leaf cover will be adopted to develop the green belt. It is proposed to plant 275 numbers of native species along with some fruit bearing and medicinal trees during the mining plan period.

8.2 SOCIAL BENEFITS

The mining in the area will create rural employment. During site visit, it has been observed that the economic conditions of the villages in the study area is quite normal. After the development of the proposed mine, it will improve the livelihood of local people and also provide the indirect employment opportunities. The rough stone for the infrastructural development in the area will be made available from the local markets at reasonably lower price.

As a part of CER, i.e., 5 Lakhs will be allocated. The detailed agenda, which is to be executed has been framed. The salient features of the programmes are as follows:

Construction of Infrastructure, additional class room, Environmental books for library (in Tamil language), Greenbelt facilities and basic amenities such as safe drinking water, Hygienic Toilets facilities, furniture to Government higher secondary School.

8.3 PROJECT COST / INVESTMENT DETAILS

1	**C. Fixed Asset Cost**: 5. Land Cost 6. Labour shed 7. Sanitary Facility 8. Fencing Cost Total=	: : : : :	 Rs.2,20,000 Rs.1,00,000 Rs. 1,00,000 Rs.1,00,000 **Rs. 5,20,000/-**
2	**D.** Operational Cost: 1.Machineries	:	Rs.40,00,000/-
	Total Project Cost(A+B)	:	**Rs. 45,20,000/-**

EMP Cost:

	Mitigation Measure	Provision for Implementation	Capital	Recurring
Air Environment	Compaction, gradation and drainage on both sides for Haulage Road	Rental Dozer & drainage construction on haul road @ Rs. 10,000/- per hectare; and yearly maintenance @ Rs. 10,000/- per hectare	5500	5500
	Fixed Water Sprinkling Arrangements + Water sprinkling by own water tankers	Fixed Sprinkler Installation and New Water Tanker Cost for Capital; and Water Sprinkling (thrice a day) Cost for recurring	400000	25000
	Air Quality will be regularly monitored as per norms within ML area & Ambient Area	Yearly Compliance as per CPCB norms	0	40000

	Muffle blasting – To control fly rocks during blasting	Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts	0	0
	Wet drilling procedure / latest eco-friendly drill machine with separate dust extractor unit	Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500 per unit recurring cost for maintenance	25000	2500
	No overloading of trucks/tippers/tractors	Manual Monitoring through Security guard	0	5000
	Stone carrying trucks will be covered by tarpaulin	Monitoring if trucks will be covered by tarpaulin	0	10000
	Enforcing speed limits of 20 km/hr within ML area	Installation of Speed Governers @ Rs. 5000/- per Tipper/Dumper deployed	5000	0
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes by Manual Labour	0	5000
	Regular sweeping and maintenance of approach roads for at least about 200 m from ML Area	Provision for 2 labours @ Rs.10,000/labour (Contractual) per Hectare	0	11000
	Installing wheel wash system near gate of quarry	Installation + Maintenance + Supervision	40000	10000
Noise Environment	Source of noise will be during operation of transportation vehicles, HEMM for this proper maintenance will be done at regular intervals.	Provision made in Operating Cost	0	0
	Oiling & greasing of Transport vehicles and HEMM at regular interval will be done	Provision made in Operating Cost	0	0
	Adequate silencers will be provided in all the diesel engines of vehicles.	Provision made in Operating Cost	0	0
	It will be ensured that all transportation vehicles carry a fitness certificate.	Provision made in Operating Cost	0	0

	Safety tools and implements that are required will be kept adequately near blasting site at the time of charging.	Provision made in OHS part	0	0
	Line Drilling all along the boundary to reduce the PPV from blasting activity and implementing controlled blasting.	Provision made in Operating Cost	0	0
	Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured.	Blowing Whistle by Mining Mate / Blaster / Compentent Person	0	0
	Provision for Portable blaster shed	Installation of Portable blasting shelter	50000	2000
	NONEL Blasting will be practiced to control Ground vibration and fly rocks	Rs. 30/- per 6 Tonnes of Blasted Material	0	119040
Water Environment	Water management	Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance of Rs. 5,000/- per annum	5500	5000
Waste Management	Waste management (Spent Oil, Grease etc.,)	Provision for domestic waste collection and disposal through authorized agency	1000	5000
		Installation of dust bins	5000	2000
	Bio toilets will be made available outside mine lease on the land of owner itself	Provision made in Operating Cost	0	0
Implementation of EC, Mining Plan & DGMS Condition	Size 6' X 5' with blue background and white letters as mentioned in MoM Appendix II by the SEAC TN	Fixed Display Board at the Quarry Entrance as permanent structure mentioning Environmental Conditions	7000	1000
	Workers will be provided with Personal Protective Equipment's	Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee)	48000	12000
	Health check up for workers will be provisioned	IME & PME Health check up @ Rs. 1000/- per employee	0	12000

	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	1100
	Mine will have safety precaution signages, boards.	Provision for signages and boards made	10000	2000
	Barbed Wire Fencing to quarry area will be provisioned.	Per Hectare fencing Cost @ Rs. 2,00,000/- with Maintenance of Rs 10,000/- per annum	110000	10000
	No parking will be provided on the transport routes. Separate provision on the south side of the hill will be made for vehicles /HEMMs. Flaggers will be deployed for traffic management	Parking area with shelter and flags @ Rs. 50,000/- per hectare project and Rs. 10,000/- as maintenance cost	27500	10000
	Installation of CCTV cameras in the mines and mine entrance	Camera 4 Nos, DVR, Monitor with internet facility	2000	5000
	Implementation as per Mining Plan and ensure safe quarry working	Mines Manager (1st Class / 2nd Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116 of MMR,1961 @ 40,000/- for Manager & @ 25,000/- for Foreman / Mate	0	780000
Green Belt Development	Green belt development - 500 trees per one hectare (200 Inside Lease Area & 300 Outside Lease Area)	Site clearance, preparation of land, digging of pits / trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring)	22000	3300

		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	49500	4950
			813000	**1108390**
		Total	**6937554**	

Year 1	Year 2	Year 3	Year 4	Year 5
1921390	1163810	1222000	1283100	1347255

Total EMP Cost -69 (Lakhs)

9 Environmental Management Plan

9.1 INTRODUCTION

This chapter comprehensively presents the Environmental Management Plan (EMP), which includes the administrative and technical setup, summary matrix of EMP, the cost involved to implement the EMP, during various Mining activities and provisions made towards the same in the cost estimates of project. This chapter describes the proposed monitoring scheme as well as inter-organizational arrangements for effective implementation of the mitigation measures.

9.2 SUBSIDENCE

Mining will be carried out by opencast mechanized mining method with drilling & blasting as per mining plan approved by Department of Mining and Geology, Tirunelveli. Subsidence/slope failures are not envisaged because there are no loose strata overlying the deposit (mineral to be excavated). The bench height will be 5m. The individual bench slope has been proposed to be kept at 60^0 from horizontal. Moreover, all safety standards/ safeguards will be implemented as per guidelines prescribed by Director General of Mines Safety.

9.3 MINE DRAINAGE

9.3.1 *Storm water Management*

The following measures will be taken with respect to the prevailing site conditions.

- Storm water drains with silt traps of size 1m x 1m will be suitably constructed all along the periphery of the pit area to collect the run-off from the mine area and divert into the pit.
- All measures will be taken not to disturb the existing drainage pattern adjacent to the mine lease area.
- The storm water collected from the mine area will be utilized for dust suppression on haul roads, plantation within the premises, etc.,

9.3.2 *Drainage*

Local workers will be deployed for the project. But, urinals and Latrines will be provided and the same will be connected to septic tank followed by soak pit arrangement. No domestic waste will be deposited into the nearby area. Regular checking will be carried out to find any

blockage due to silting or accumulation of loose materials. The drains will also be checked for any damage in lining / stone pitching, etc.

9.3.3 *Administrative and Technical Setup*

The Environment Management Plan (EMP) will consist of all mitigation measures for each component of the environment due to the activities increased during mining operation to minimize adverse environmental impacts resulting from the activities of the project.

To carry out the above activities, Thiru. Joseph John Samuel will work in association with M/s. Ecotech Labs Pvt Ltd.

Table 9-1: Impacts and mitigation measures

S. No	Impacts on Environment	Activity /Aspect	Anticipated impacts	Mitigation measures
1.	Air	Fugitive Emission	During mining operation, fugitive dust and other air pollutants like particulate matter (PM10 & PM 2.5) will be generated.	Planting of trees along the safety distance of the Mine Lease Area Water will be sprinkled in the site as dust suppression measure.
2.	Water	Wastewater Generation	Improper management of Domestic wastewater in the Mine lease may create unhygienic conditions in the site thereby causing health impacts to the labors	Provision of urinals/Latrines along with septic tank followed by soak pit arrangement will be provided in the Mine Lease area for the proper management of wastewater.
3.	Noise	Mining activities like drilling, blasting, loading and transportation	Noise from the machinery can cause hypertension, high stress level, hearing loss, sleep disturbance etc due to prolonged exposure. Apart from Mining activities like drilling, blasting may generate noise	Use of personal protective devices i.e., earmuffs and earplugs by workers, who are working in high noise generating areas.
4.	Land	Improper management of Storm water Runoff	Storm water Runoff may result in Soil Erosion	Garland drainage of 1m x 1m will be provided to avoid storm water run-off.
5.	Social Responsibility	Mining workers	Unhygienic site sanitation facilities may cause health damage to workers.	The objective is to ensure health and safety of the workers with effective provisions for the basic facilities of sanitation, drinking water, safety of equipments or machinery etc. The following will be done in the site

				✓ By complying with the safety procedures, norms and guidelines (as applicable) as outlined in the National Building Code of India, Bureau of Indian Standards. ✓ Provide adequate number of decentralized latrines and urinals ✓ Providing Septic tank along with Soak pit arrangement ✓ Providing First Aid room, conducting frequent health checkups to labor and conducting free medical camps ✓ Providing safety helmet, Gloves, Jacket & Boots ✓ Providing measures to prevent fires. Fire fighting extinguishers and buckets of sand will be provided in the construction site
6.	Building materials resource conservation	Building Material consumption	Use of farfetched construction materials than the locally available construction materials may lead to over exploitation of natural resources & increase in carbon footprint.	• Use of locally available construction materials.

10 Summary & Conclusion

This chapter summarizes the overall justification for implementation of the project and explains how the potential impacts are mitigated.

10.1 INTRODUCTION

Thiru.Joseph John Samuel site is a cluster of four mining project. Total cluster area is 18.09Ha. The individual mine lease area is 0.55.0 Ha of Rough Stone Quarry located at S.F.Nos.845/1B, 845/2B of Tharuvai Village, Palayampatti Taluk, Tirunelveli District.

10.2 PROJECT OVERVIEW

Table 10-1: Project Overview

S. No.	Description	Details
1	Project Name	Thiru. Joseph John Samuel Rough Stone Quarry
2	Proponent	Thiru.Joseph John Samuel
3	Mining Lease Area Extent	0.55.0 Ha
4	Location	845/1B and 845/2B
5	Latitude	Latitude : 08^0 38' 10" to 08^0 38' 16" N
6	Longitude	Longitude : 77^0 41' 25" to 77^0 41' 27" E
7	Topography	Plain terrain
8	Site Elevation above MSL	118 m from MSL
9	Topo sheet No.	58 H/10 of Survey of India
10	Minerals of Mine	Rough Stone and Gravel Quarry
11	Proposed production of Mine	23,808 m^3 of Rough stone
12	Ultimate depth of Mining	17 m below ground level
13	Method of Mining	Open cast mechanized mining
14	Water demand	1.5 KLD
15	Source of water	Water will be supplied through tankers supply
16	Man power	12Nos.

17	Mining Plan Approval	Mining Plan was approved by The Assistant Director, Geology & Mining, Tirunelveli vide letter Rc.No.M1/21631/2017 dated 28.12.2020.
18	Production details	Geological reserves: 81,840 m^3 of Rough stone Proposed year wise reserves: 23,808 m^3 of Rough stone
19	Boundary Fencing	7.5 m barrier all along the boundary for adjacent patta lands and 10 m safety distance for Govt. Lands. Fencing will be provided.
20	Disposal of overburden	The overburden is in the form of Gravel formation, it has been removed earlier quarry operation. The excavated rough stone will be directly loaded into tipper to the needy crushers/ other buyers for road project and construction works for filling and levelling of low lying areas.
21	Ground water	Ground water table in this area is below 56 mts from ground level. The quarrying is up to a maximum depth of 17m below the ground level. Hence the quarry operation will not be affected by the ground water. There are few agricultural wells within 1 km radius of the project area.
22	Habitations within 300m radius of the Project Site	There is no Habitation within 300m radius of the project site.
23	Drinking water	Water will be supplied through tankers from Ponnakudi village which is 1.03 Km SSE of the area

10.3 JUSTIFICATION OF THE PROPOSED PROJECT

The said project plays a significant role in the domestic as well as infrastructural market. To achieve a huge infrastructure being envisaged by Government of India, particularly in road and housing sector, there is a need for basic building materials. The rough stone form the primary building material.

Rough stone is one of the most valuable natural building materials. Aggregates are mostly used for building roads and footpaths Aggregates – stone used for its strong physical properties – crushed and sorted into various sizes for use in concrete, coated with bitumen to make asphalt or used 'dry' as bulk fill in construction. Mostly used in roads, concrete and building products. Aggregates represent about 98% of quarry output, most of which is used in road construction, maintenance and repair. Much of this goes to the production of asphalt; the remainder is used 'dry' without the addition of other materials to provide a sturdy base for roads.

Southern Granulite Terrain (SGT) of Tamil Nadu lying south of Palaghat-Cauvery shear zone has been divided into two major tectonic blocks by the Madurai block and Nagercoil-Trivandrum Block in the south. It is separated by WNW-ESE trending Achankovil-Tambaraparani Lineament. Tirunelveli and Thothukudi are significantly the only districts in the state to witness the geology and structure of both the blocks. Tirunelveli district represents a well-developed lithopackage of meta-sedimentary sequence inter banded with charnockite Group of rocks. The rock types exposed are of quartzite, calc-granulite, garnet-biotite-sillimanite gneiss, garnet quartzo-feldspathic gneiss and garnetbiotite-cordierite gneiss belonging to Khondalite Group of rock. Charnockite and pyroxene granulite are the Charnockite Group. Hornblende-biotite gneiss belongs to Migmatitic Complex. Besides, basic intrusive (pyroxenite) and acid intrusive (granite) are noticed. The younger intrusive are represented by pegmatite and quartz veins. Evidence of development of incipient / patchy charnockite along the shear plane is noticed in the district along the Western Ghat high hills

Table 10-2: Anticipate Impacts & Appropriate Mitigation Measures

S. No.	Potential Impact	Mitigation Measure
1	The main impact in the air environment is dust emission during various mining activities such drilling, blasting, excavation, loading and transportation. The dust emission may affect the quality of ambient air in the and around the mine area. The increased emission may cause respiratory & Cardiovascular problems in human health	Proper mitigation measures like water sprinkling on haul roads will be adopted to control dust emissions. To control the emissions regular preventive maintenance of equipments will be carried out on contractual basis. Plantation will be carried out along approach roads & mine premises.
2	Waste water will be generated due to mining activity and from other domestic activities. These may contaminate the ground water leading to ground water. The mining activity may affect the ground water table	No waste water will be generated from the mining activity of minor minerals as the project only involves lifting of over burden from mine site. The wastewater generated from the domestic activity will be disposed off safely through the proposed septic tank. Mining will not intersect ground water table. Hence the water table will not be impacted due to the proposed project
3	Noise will be generated in the mine area during various mining activities such as blasting, drilling, excavation. During transportation of the mined out mineral, there may be noise generation due to the movement of vehicles. This may impact the health condition of the workers by creating headache	Periodical monitoring of noise will be done. No other equipments except the transportation vehicles and Excavator (as & when required) for loading will be allowed at site.

		Noise generated by these equipments shall be intermittent and does not cause much adverse impact. Plantation will be carried out along approach roads. The plantation minimizes propagation of noise and also arrest dust.
4	Solid waste will be generated from the mining activity as there will be refuse after 95% recovery and also generation of domestic waste	The 100% recovery is achieved by extracting the entire mineable reserve. Hence there will be no refuse generation due to the mining activity. Apart from that, a very meagre quantity of domestic waste will be generated in the project, which will be handed over to the local body on daily basis.
5	During mining activities, there are chances of workers getting health issues or may be prone to accidents	Dust masks will be provided as additional personal protection equipment to the workers working in the dust prone area. Periodical trainings will be conducted to create awareness about the occupational health hazards due to activities like blasting, drilling, excavation Workers health related problem if any, will be properly addressed.

11 Disclosure of Consultant

11.1 INTRODUCTION

This chapter presents the details of the environmental consultants engaged, their background and the brief description of the key personnel involved in the project. Specific studies on the mining project have been carried out by engaging engineers/experts of Ecotech Labs Pvt. Ltd, Chennai. Ecotech Labs Pvt. Ltd (ETL), Chennai is NABET accredited consultancy organization. ETL is equipped with in-house, spacious laboratory, accredited by NABL (National Accreditation Board for Testing & Calibration Laboratories), Department of Science & Technology, Government of India and MoEF & CC.

11.2 ECO TECH LABS PVT. LTD – ENVIRONMENT CONSULTANT

Eco Tech Labs Pvt. Ltd is a multi-disciplinary testing and research laboratory in India. Eco Tech labs provides high quality services in environmental consultancy, engineering solution, chemical and microbiological laboratory analysis of food, water and environment (Air, Water, Soil) with highest accuracy.

The Quality policy

•We at Eco Tech Labs Pvt. Ltd. engaged in providing Environmental consulting services and we are committed to strengthen our capabilities in all areas of our operations in line with customer requirements &expectations, applicable legal requirements & stakeholders expectations.

•We are committed to establish and maintain Quality Management System (QMS) for continual improvement in processes and Services

•We are committed to provide customized solutions in realistic, time bound and cost effective to achieve highest degree of customer satisfaction and Environmental improvement.

•We shall establish, maintain & periodically review our documented management systems, objectives and performance in consultation with our employees and prevailing best practices.

•Effective communication of organization's policy and objectives to employees and seeking feedbacks from all our employees and concerned stakeholders for continual improvement.

COMPLIANCE OF TOR CONDITIONS

Point wise compliance of ToR points issued by SEIAA, TN vide letter No. SEIAA-TN/F. No. 8914/ToR-1117/2022 Dated: 23.03.2022 for Mining of Minor Minerals in the Mine of "Proposed Rough stone, Jelly & Gravel Quarry Over an Extent of 0.55.0 Ha at S.F.No. 845/1B and 845/2B of Tharuvai Village, Palayamkottai Taluk, Tirunelveli District, Tamilnadu State.

ToR Ref.	Description	Response	Page Ref. in EIA Report
1	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification, 1994 came into force w.r.t. the highest production achieved prior to 1994.	Precise Area Communication Letter received from Assistant Director, Department of Geology and Mining; Tirunelveli vide letter Rc.No.M1/21631/2017 dated 18.12.2020. Mining Plan was approved by the Assistant Director, Geology & Mining, Tirunelveli vide letter Rc.No.M1/21631/2017 dated 28.12.2020 As area is being exploited for the first time hence Year-wise production details since 1994 and before 1994 are not relevant or applicable. Proposed Production of Rough Stone & Gravel for five years is proposed in the	Chapter-2 Table No.2.2 Page No.38

		<table><tr><th>Year</th><th>Rough stone (m^3)</th></tr><tr><td>I</td><td>4739</td></tr><tr><td>II</td><td>4739</td></tr><tr><td>III</td><td>4726</td></tr><tr><td>IV</td><td>4760</td></tr><tr><td>V</td><td>4845</td></tr><tr><td>Total</td><td>23808</td></tr></table> EIA/EMP in chapter no-2.	
2.	A copy of document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	The mine lease area of 0.55.0 hectare in Tharuvai Village for Rough stone, Jelly and Gravel quarry approved by Assistant Director, Dept. of Geology & Mining, Tirunelveli vide Rc.No.M1/21631/2017 dated 28.12.2020.	Annexure-III
3	All documents including approved mine plan, EIA and public hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management and mining technology and should be in the name of the lessee.	All the documents i.e., Mining Plan, EIA and public hearing are compatible with each other in terms of ML area production levels, waste generation and its management and mining technology are compatible with one another. The mining plan of the project site has been submitted to The Assistant Director, Dept. of Geology & Mining, Tirunelveli	Annexure-VI Chapter-II
4	All corner coordinates of the mine lease area, superimposed on a	Details of coordinates of all corners of proposed mining lease area have been	Chapter-2,

	High-Resolution Imagery/toposheet should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	incorporated in mining plan and Chapter 2 of EIA/ EMP Report.	Fig no. 2.2 Page. no. 42
5	Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, important water bodies, streams and rivers and soil characteristics	Topo map as attached in Chapter-2	Chapter-2, Fig no. 2.4 Page. no. 44
6.	Details about the land proposed for mining activities should be given with information as to whether conforms to the land use policy of the state; land diversion for mining should have approval from State land use board or the concerned authority	Details about the land proposed for mining activities should be given Chapter 2.	Chapter-2 Page 43
7	It should be clearly stated whether the proponent company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or	Noted.	

	forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large may also be detailed in the EIA report.		
8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	It is an open cast mining project. Blasting details are incorporated in chapter 2	Chapter-2, Page no.56
9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc should be for the life of the mine / lease period.	Study area comprises of 10 km radius from the mine lease boundary. Key Plan showing core zone (ML area).	Chapter-2 Fig no. 2.5 Page no.45
10	Land use of the study area delineating forest area,	Land Use of the study area delineating forest area, agricultural land, grazing	Chapter-2, Table

	agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	land, wildlife sanctuary, National park, migratory routes of fauna, water bodies, human settlements and other ecological features has been prepared and incorporated in Chapter-3 of EIA/ EMP Report. There is no wildlife sanctuary and national park, migratory routes of fauna in the study area.	no. 2.4 Page no.47
11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.	The Overburden in the form of gravel formation it has been removed earlier quarry operation. The excavated rough stone will be directly loaded into tipper to the needy crusher for road project and construction works for filling and levelling of low lying areas.	Chapter-2, Page no.53
12	A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be	Complied. The proposed mining lease area is not falling under forest land.	

	inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.		
13	Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	The proposed mining lease area is not falling under forest land.	
14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not Applicable. There is no involvement of forest land in the project area.	
15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	Details of flora have been discussed in Chapter-3 of the EIA/EMP Report.	Chapter-3 Pg No. 64

16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly detailed mitigative measures required, should be worked out with cost implications and submitted.	There is a relatively poor sighting of animals in the core and buffer areas of the mining lease. No significant impact is anticipated	
17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Tiger/Elephant Reserves/ (existing as well as proposed), if any, within 10km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	There is no National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Tiger / Elephant Reserves / Critically Polluted areas within 10 km radius of the mining lease area.	

18	A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	Details biological study (flora & fauna) within 10 km radius of the project site have been incorporated in Chapter-3 of EIA/ EMP Report. No flora & fauna listed in scheduled I have been found in study area so there is no need of conservation plan. However, all care will be taken for protection of flora & fauna, if any in the lease hold area.	Chapter – 3 Pg No. 98
19	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities	The proposed mining lease area is not falling under critically polluted area.	

	could be considered.		
20	Similarly, for coastal projects, A CRZ map duly authenticated by one of the authorized agencies Similarly, for coastal projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority)	There is no Coastal Zone within 15km radius of the project site.	
21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line	There is no Rehabilitation and resettlement is involved. Land classified as Patta land	

	departments of the State Government. It may be clearly brought out whether the village located in the mine lease area will be shifted or not. The issues relating to shifting of Village including their R&R and socio-economic aspects should be discussed in the report.		
22	One season (non-monsoon) and (Summer Season), (Post monsoon) primary baseline data on ambient air quality CPCB Notification of 2009 water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500m of the mine lease in the pre-dominant downwind direction.	Baseline data collected during Pre-Monsoon Season and Monsoon (December 2022 to February 2023) has been incorporated in EIA/EMP report. The key plan of monitoring station has been discussed in Chapter-4. Locations of the monitoring stations have been selected keeping in view the pre-dominant downwind direction and location of the sensitive receptors and also that they represent whole of the study area.	Chapter 3

	The mineralogical composition of PM10, particularly for free silica, should be given.		
23	Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing predominant wind direction may also be indicated on the map.	Air quality modelling & Impact of Air quality will be furnished in Final EIA report Transportation of mineral during operation of mines will be done by road & MDR-937 through dumpers and the impact of movement of vehicles are incorporated in EIA/EMP report. Air quality modelling & Impact of Air quality will be furnished in Final EIA report	Chapter-4 Page No.116
24	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.	Total water requirement: 1.5 KLD Dust Suppression: 0.5 KLD Domestic Purpose: 0.5 KLD Plantation :0.5 KLD Domestic Water will be sourced from nearby Ponnakudi village which is about 1.03 Km-SSE of the area.	Chapter-2 Page no.59
25	Necessary clearance from	Not Applicable	

	the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Water will be taken from nearby villages	
26	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	At the last stage of mining operation, almost complete area will be worked to restore the land to its optimum reclamation for future use as water reservoir.	
27	Impact of the project on the water quality, both surface and groundwater should be assessed and necessary safeguard measures, if any required, should be provided.	Impact of the project on the water quality & its mitigation measures has been incorporated in Chapter-4 of EIA/EMP report.	Chapter-4 Page No.117
28	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.	Maximum working depth: 17 m BGL The ground water table is reported as 56m below surface ground level in nearby wells of this area. Now, the present quarry shall be proposed above the water table and hence, quarrying may not affect the ground water So mine working will not be intersecting the ground water table.	Chapter-2 Page no. 40
29	Details of any stream, seasonal or	There is no any stream crossing in the	Executive

	otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	proposed quarry	Summary
30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.	Highest elevation: 118 MSL Depth: 56 m Below Ground Level	Chapter-2 Table no. 2.2 Page no. 40
31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the	Green Belt Development plan is proved given in Chapter 2.	Chapter-2

	species which are tolerant to pollution		
32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project proponent shall conduct impact of Transportation study as per Indian Road Congress Guidelines	Impact on local transport infrastructure due to the project has been assessed. There shall not be much impact on local transport. Traffic density from the proposed mining activity has been incorporated in EIA/EMP report.	Chapter-3 Page No.114
33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.	Adequate infrastructure & other facilities shall be provided to the mine workers. Details are given in chapter-2 of EIA/EMP	Chapter-2
34	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	Conceptual post mining land use and Reclamation and restoration sectional plates are given in Mining Plan followed by Scheme of mining.	Mining plates Annexure VII
35	Occupational Health impacts of the Project should be anticipated and the	Suitable measure will be adopted to	Chapter-10

	proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project in the mining area may be detailed.	minimize occupational health impacts of the project. The project shall have positive impact on local environment. Details are given in chapter-10 of EIA/EMP.	Pg No. 151
36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	Suitable measure will be adopted to minimize occupational health impacts of the project.	Chapter-10 Pg No. 143
37	Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	Suitable measures has been discussed in Chapter 4	Chapter-4 Pg No. 116
38	Detailed environmental management plan to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.	Environment Management Plan has been described in detail in Chapter-9 of the EIA/EMP Report.	Chapter-9 Pg No. 145

<table>
<tr><td>39</td><td>Public hearing points raised and commitment of the project proponent on the same along with time bound action plan to implement the same should be provided and incorporated in the final EIA/EMP Report of the Project.</td><td>Public Hearing proceedings will be furnished in Final EIA report</td><td></td></tr>
<tr><td>40</td><td>Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the project should be given.</td><td>Not applicable

No. litigation is pending against the project in any court.</td><td></td></tr>
<tr><td>41</td><td>The cost of the project (capital cost and recurring cost) as well as the cost towards implementation of EMP should clearly be spelt out.</td><td><table><tr><th>S. No</th><th>Description</th><th>Cost</th></tr><tr><td>1</td><td>Fixed Asset Cost</td><td>5,20,000</td></tr><tr><td>2</td><td>Operational Cost</td><td>41,00,000</td></tr><tr><td></td><td>Total</td><td>46,20,000/-</td></tr></table></td><td>Chapter-8
Pg No. 151</td></tr>
<tr><td>42</td><td>Disaster Management Plan shall be prepared and included in the EIA/EMP Report.</td><td>Disaster Management and Risk Assessment has been incorporated in Chapter-7</td><td>Chapter-7
Pg No. 136</td></tr>
<tr><td>43</td><td>Benefits of the project if the project is implemented should be spelt out. The benefits of the project shall clearly indicate environmental, social economic, employment potential etc.</td><td>Benefits of the project has incorporated</td><td>Chapter-8
Pg No. 143</td></tr>
<tr><td>44</td><td>Besides the above, the below mentioned general points are also to be followed:</td><td></td><td></td></tr>
</table>

(a)	Executive Summary of the EIA/EMP report	Executive Summary of EIA Report is given from page No.10-25	
(b)	All documents to be properly referenced with index and continuous page numbering.	Complied	
(c)	Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.	Complied	
(d)	Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF & CC NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the project.	Complied	
(e)	Where the documents provided are in a language other than English, an English translation should be provided.	Complied	
(f)	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	The complete questionnaire has been prepared	
(g)	While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF vide O.M. No. J-	The EIA report has been prepared and complying with the circular issued by MoEF vide O.M. No. J-11013/41/2006-IA. II(I) dated 4th August 2009.	

	11013/41/2006-IA. II(I) dated4th August 2009, which are available on the website of this Ministry, should also be followed.		
(h)	Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation	There are no changes in prepared EIA as per submitted Form-1 & PFR	
(i)	As per the circular no. J-11011/618/2010-IA. II(I) dated 30.5.2012, report on the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project by the Regional Office of Ministry of Environment & Forest and climate change as may be applicable.	Will be complied after grant environment clearance from SEIAA, Tamilnadu	
(j)	The EIA report should also include (i) surface plan of the area indicating		

	contours of main topographic features, drainage and mining area, (ii) geological maps and sections (iii) sections of mine pit and external dumps, if any clearly showing the features of the adjoining area.	All Sectional Plates of Quarry is enclosed in Mining Plan.	

Additional TOR by SEAC

S.No.	Condition	Compliance
1.	The Proponent shall carry out the Cumulative & comprehensive impact study due to mining operations carried out in the quarry cluster specifically with reference to the environment in terms of air pollution, water pollution & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	Noted. Agree to comply.
2.	The certified existing EC compliance report shall be included in the EIA Report.	
3.	The entire cluster of mine lease area along with green belt shall be video graphed through Drone and submit the same along with EIA report.	
4.	If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines, a. What was the period of the operation and stoppage of the earlier mines with the last work permit issued by the AD/DD mines? b. Quantity of minerals mines out. c. Highest production achieved in any one year. d. Details of approved depth of mining. e. Actual depth of the mining achieved earlier. f. Name of the person already mined in that leases area.	Agreed to comply

	g. If EC and CTO already obtained, the copy of the same shall be submitted. Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.	
5.	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological feature of the study area (core and buffer zone)	Complied. All corners with coordinates of the mine lease area has attached with EIA report in chapter 2
6.	The Project Proponent shall furnish photographs of adequate fencing, green belt along periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	Complied. The photographs of fencing and green belt attached as per SEAC recommendation.
7.	The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justification, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same	The details of Geological reserves, Mineable reserves and Yearwise production reserves are tabulated in Chapter 2. The mining methodology and impacts are follow as on prescribed norms by Government.
8.	The PP shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act'1952	Complied. Manpower requirements table attached in EIA report chapter 2

	and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.	
9.	The PP shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface Water bodies such as rivers, tanks, canals, ponds etc., within 1km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD/TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.	Hydro geological study report will be submitted along final EIA report.
10.	The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.	The proponent has furnished the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study details attached in EIA report chapter 3
11.	A tree survey study shall be carried out (nos.,name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	
12.	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	Noted. The mine plan and mine closure plan has been approved by the Assistant Director, Department of

		Mining and Geology, Tirunelveli District
13.	The Public hearing advertisement shall be published in on major National daily and one most circulated vernacular daily	Noted. Agree to comply.
14.	The recommendation for the issue of "Terms of Reference" is subjected to the outcome of the Hon'ble NGT, Principal Bench, New Delhi in O.A.No.186 of 2016(M.A.No.350/2016) and O.A.No.200/2016 and O.A.580/2016 (M.A.No.1182/2016) and O.A.No.102/2017 and O.A.No.404/2016 (M.A.No.758/2016, M.A.No.920/2016, M.A.No.1122/2016, M.A.No.12/2017 & M.A.No.843/2017) and O.A.No.405/2016 and O.A.No.520 of 2016 (M.A.No.981/2016, M.A.No.982/2016 & M.A.No.384/2017).	
15.	The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University and local school/college authorities. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.	Noted. Agree to comply
16.	Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be	The green belt plan enclosed with

	planted as per the advice of local forest authorities/ botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt arca with GPS coordinates all along the boundary of the project site with at least 3 meter wide and in between blocks in an organized manner.	mining plates in Annexure VII
17.	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	Disaster management plan has prepared and enclosed in Chapter 7.
18.	A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report fir the complete life of the proposed quarry (or) till the end of the lease period.	Risk assessment and management plan has prepared and enclosed in chapter 7.
19.	The Socio-economic studies should be carried out within a 5km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	The socio-economic study has been discussed in chapter 3.
20.	If any quarrying operations were caried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB	Agree to comply. The certified compliance report will be submitted in Final EIA report.
21.	concealing any factual information or submission of false/fabricated data and failure to comply with any of the Condition mentioned above may result	Noted.

	in withdrawal of this Terms of conditions besides attracting penal provisions in the Environment (Protection) Act, 1986	

Additional TOR by SEIAA

1.	As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.	Noted and public hearing details will be included along with final EIA report.
2.	The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks, and temperature reduction including control of other emission and climate mitigation activities.	Noted and will be complied in Final EIA report.
3.	The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.	The biodiversity has been studied and discussed in chapter 3 – Pg No. 113.
4.	Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	Noted. Agree to comply.
5.	The project proponent shall study impact on fish habitats and the food WEB/food chain in the water body and reservoir.	There is no water bodies within 1km radius, The seasonal pond located 50m south from the project site. Water gets stagnant only during rainy season.

		Hence there won't be much impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
6.	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.	The soil erosion map 5km surrounding the project site has been given in chapter 3. The soil samples have been collected surrounding the project site and physical, chemical components and microbial components study has been carried out and the results are tabulated in chapter 3
7.	The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.	The biological environment impacts, and its mitigation measures has been given in Chapter 4
8.	The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.	There is no existing trees in the project site and surrounding the project site. Only thorny shrubs were present.
9.	The Environmental Impact Assessment should study on wetlands, water bodies, river streams, lakes and farmer sites.	The water environment impacts and its mitigation measures has been given in Chapter 4
10	The EIA should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.	The EMP details has been given in Chapter 8
11.	The EIA should study impact on climate change, temperature rise, pollution and above soil carbon stock.	Noted and will be complied in Final EIA report.

12.	The EIA should study impact on protected areas, Reserve forests, National parks, Corridors and Wildlife pathways, near project site.	There is no Reserve Forest within 1 km radius of the Project Site. Hence our project will not cause any damage to reserve forest. Also, we have received letter from DFO indicating the nearest reserve forest and attached with Annexures. There is no protected areas, National Parks, Corridors and Wildlife pathways near project site.
13.	The PP shall study and furnish the impact of project on plantations in adjoining Patta lands, Horticulture, Agriculture and livestock.	There is no plantation surrounding 500m from project site. Hence there won't be any impact in adjoining patta lands, Horticulture, Agriculture and livestock.
14.	The PP shall study and furnish the details on potential fragmentation impact of natural environment, by the activities.	Noted and will be complied in Final EIA report.
15.	The PP shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site and archaeological sites possible landform changes visual and aesthetic impacts	Noted. Agree to comply.
16.	The PP shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impact of plastic & microplastic on aquatic environment and fresh water systems due to activities,	There will not be any plastic and microplastic pollution due to mining activity. Also, we ensure that we won't use any single use plastics in the project site.

	contemplated during mining may be investigated and reported.	
17.	The PP shall detailed study on impact of mining on Reserve forests free ranging wildlife.	There is no Reserve Forest within 1 km radius of the Project Site. Hence our project will not cause any damage to reserve forest. Also, we have received letter from DFO indicating the nearest reserve forest and attached with Annexures.

ANNEXURE-II

PRECISE AREA COMMUNICATION LETTER

Rc.No.M1/21631/2017

Office of the Assistant Director
Dept. of Geology and Mining
Tirunelveli.

Dated 18.12.2020.

MINING PLAN APPROVED By Assistant Director of Geology & Mining

NOTICE

Sub: **Mines and Quarries** – Minor Minerals – Roughstone, Jelly and Gravel – Tirunelveli District – Palayamkottai Taluk – Tharuvai Village – S.F.Nos. 845/1B & 845/2B – over an extent of 0.55.0 hectares of patta land – Quarry lease application preferred by Thiru G.Jebarajan – Precise Area communicated to the applicant – applicant Thiru G.Jebarajan expired – Revised Precise Area Communicated in the name of Thiru Joseph John Samuel – Reg.

Ref:

1. Quarry lease application preferred by Thiru G.Jebarajan dated: 26.05.2017
2. The Revenue Divisional Officer, Tirunelveli Letter No. A5/2506/2018, dated. 20.08.2018.
3. Inspection report of the Assistant Geologist of Geology and Mining, Tirunelveli Dated: 22.06.2019.
4. G.O (Ms) No. 169, Industries (MMC-1) Department dated. 04.08.2020.
5. District Collector, Tirunelveli Notice Even No. dated 04.01.2020.
6. This office letter even No. dated 18.02.2020.
7. Letter dated 10.12.2020 of Thiru Joseph John Samuel, S/o Thiru G.Jebarajan, (deceased applicant.)
8. This office letter even No. dated 14.12.2020 addressed to the Government Pleader, Hon'ble Madurai Bench of Madras High Court, Madurai.
9. Letter dated 15.12.2020 received from

J.

Village, Palayamkottai Taluk, Tirunelveli District subject to certain conditions:

In the meantime, Thiru Joseph John Samuel, has informed that the applicant Thiru G.Jebarajan has expired on 27.08.2020 at Madurai Apollo Hospitals on 27.08.2020 and enclosing a copy of the will executed by his father cum deceased applicant and registered vide document No.B.K.III 56/17 dated 22.06.2017, sub Registrar, Melapalayam and requested to issue the precise area communication to him for the area applied for lease.

In this regard, the Government Pleader, Hon'ble Madurai Bench of Madras High Court was requested to offer the opinion and the Additional Government Pleader, Hon'ble Madurai Bench of Madras High Court in the letter under reference cited has opined that there is no legal impediment for transferring the said quarry lease application for issuance of precise area in the name of Thiru Joseph John Samuel son of the late (G.Jebarajan). Accordingly, the authorities may take appropriate action to process further and to issue the quarry license I the name of the present title owner namely Thiru Joseph John Samuel.

Since the applicant Thiru S.Jebarajan has passed away, the precise area already communicated by the District Collector, Tirunelveli to him vide reference 5th cited become void.

Based on the recommendation of the Revenue Divisional Officer, Tirunelveli, the Assistant Geologist, Dept. of Geology and Mining, Tirunelveli and the Additional Government Pleader, Hon'ble Madurai Bench of Madras

MINING PLAN APPROVED By Assistant Director of Geology & Mining Tirunelveli Dist

Roughstone, Jelly and Gravel in respect of the precised area communicated.

Joint Director
Assistant Director, (i/c)
Geology and Mining,
Tirunelveli.

18/12/20

To

Thiru Joseph John Samuel,
S/o G.Jebarajan (Late)
54, Chellathai Nagar,
Mahilchi Nagar,
Perumal Puram,
Tirunelveli-7

ANNEXURE-III

MINING PLAN APPROVED LETTER

From

Thiru.A.Arumuganainar, M. Sc.,
Joint Director/
Assistant Director(i/c),
Geology and Mining,
Tirunelveli.

To

Thiru J.Joseph John Samuel,
S/o. G Jebarajan,
54, Chellathai Nagar,
Mahilchi nagar, Perumal Puram,
Tirunelveli 627007

Rc.No.M1/21631/2017, dated 28 .12.2020

Sir,

Sub: **Mines and Minerals** - Minor Minerals - Roughstone and Gravel - Tirunelveli District – Palayamkottai Taluk – Tharuvai Village - SF. Nos. 845/1B & 845/2B over an extent of 0.55.0 hectares of patta land - Quarry lease application preferred by Thiru J.Joseph John Samuel S/o. G Jebarajan - precise area communicated - draft mining plan submitted - Approval accorded - Reg.

Ref :

1. Quarry lease application preferred by Thiru G Jebarajan dated. 26.05.2017.
2. Precise area communication Notice in Rc. No. M1/21631/2017, dated. 18.12.2020
3. Letter dated. 20.12.2020 received from the applicant.

*****

Thiru G.Jebarajan of Tirunelveli applied for the grant of a quarry lease to quarry and transport Roughstone Jelly and Gravel, over an extent of 0.55.0 Hectares of Patta Land in S.F.No.845/1B and 845/2B of Tharuvai village, Palayamkottai Taluk of Tirunelveli District under Rule 19 (1) of Tamil Nadu Minor Mineral Concession Rules. 1959 vide reference 1st cited. The application was processed under the provisions of the aforesaid rules, the applicant Thiru G.Jebarajan expired on 27.08.2020,

One of the Legal heir of the deceased applicant Thiru Joseph John Samuel has requested to issue the precise area communication to him for the area applied for lease.

2. based on the recommendations of the Assistant Collector, Tirunelveli and the Assistant Geologist of Geology and Mining, Tirunelveli and the Additional Government Pleader, Hon'ble Madurai Bench of Madras High Court the request made by Thiru Joseph John Samuel for grant of quarry lease for quarrying and transportation of Roughstone and Gravel over extent of 0.55.0 Hectares of Patta Land in S.F.No.845/1B and 845/2B of Tharuvai village, Palayamkottai Taluk Tirunelveli Taluk, for a period of 5 years was considered and precise area has been communicated vide reference 2nd cited, above

3. In response to the precise area communicated, the applicant has submitted three copies of draft Mining Plan duly prepared by a Qualified Person and requested for approval of the same vide reference 6th cited.

4. The contents of the draft Mining Plan submitted in respect of the precise area communicated have been verified with reference to field conditions. The co-ordinates of all the corners of the lease applied area were verified with the Global Positioning System (GPS) and the same are found to be correct. All the conditions stipulated in the precise area communicated have been incorporated in the Mining Plan. The required safety distance of 7.5 meters for the adjacent patta lands have been clearly demarcated.

5. In exercise of the powers vested under sub rule (2) and (5) of Rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959, I hereby approve the mining plan subject to the following conditions:-

i. The mining plan is approved without prejudice to any other order or direction from any court of contempt jurisdiction.

ii. The mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.

iii. The approval of the mining plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development and Regulation) Act 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Indian Explosives Act, 1884 (Central Act IV of 1884) and the Rules made there under and the Tamil Nadu Minor Mineral Concession Rules, 1959.

iv. Quarrying operations should be carried out in accordance with the Approved Mining Plan.

v. A safety distance of 7.5 meters should be provided to the adjoining patta lands.

vi. Necessary a safety distance of should be provided to the nilaviyal odai (is not found in the field) western side of the applied area.

vii. No hindrance shall be caused to the adjacent pattadars, lands and public while carrying out quarrying operations.

viii. No dimensional blocks with a size of 30c.m x 30c.m x 30cm suitable for polishing shall be produced.

ix. Environmental Clearance should be obtained from the State Level Environment Impact Assessment Authority.

6. As directed by the Assistant Director (i/c) of Geology and Mining, Tirunelveli in the reference 2nd cited, you are hereby requested to produce Environmental Clearance obtained from the State Level Environment Impact Assessment Authority (SEIAA), Chennai as applicable under Rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 for grant of quarry lease, in respect of the precise area communicated.

Encl: Approved Mining plan.

Joint Director/
Assistant Director (i/c),
Geology and Mining,
Tirunelveli.

Copy submitted to:

The Chairman
State Level Environmental
Impact Assessment Authority,
Chennai.

ANNEXURE-IV

500M Radius letter

From

Thiru.A.Arumuganainar, M. Sc.,
Joint Director/
Assistant Director(i/c),
Geology and Mining,
Tirunelveli.

To

The Chairperson,
SEIAA, Tamil Nadu,
3rd, Floor, Panagal Maligai,
No. 1, Jeenis Road,
Saidapet, Chennai - 15.

Rc. No.M1/21631/2017, dated: 28.12.2020

Sir,

Sub: **Mines and Minerals** - Minor Mineral - Roughstone, Jelly and Gravel - Tirunelveli District - Palayamkottai Taluk - Tharuvai Village - SF. Nos. 845/1B & 845/2B - over an extent of 0.55.0 hectares of patta land - Quarry lease application preferred by Thiru.J.Joseph John Samuel, S/o.G.Jebarajan - Certain Particulars requested - for obtaining Environmental Clearance - furnished - reg.

Ref:

1. Quarry lease application preferred by Thiru.G.Jebarajan, dated. 26.05.2017.
2. Ministry of Environment and Forest, Government of India, Office Memorandum No. L-11011/47/20112 - IA - 11(M), dated. 18.05.2012.
3. Precise area communication Notice in Rc. No. M1/21631/2017, dated. 18.12.2020.
4. Mining Plan Approval letter No. M1/21631/2017, dated. 28.12.2020.
5. Letter dated. 20.12.2020 received from the applicant Thiru.J.Joseph John Samuel.

******

Thiru.G.Jebarajan has preferred an application for grant of quarry lease for quarrying Roughstone, Jelly and Gravel over an extent of 0.55.0 hectares of patta land in SF. Nos. 845/1B & 845/2B of Tharuvai

Village, Palayamkottai Taluk, Tirunelveli District for a period of 5 years under Rule 19 (1) of Tamil Nadu Minor Mineral Concession Rules, 1959 vide reference 1st cited.

2. Based on the recommendations of the Assistant Collector, Tirunelveli and the Assistant Geologist of Geology and Mining, Tirunelveli and the Additional Government Pleader, Hon'ble Madurai Bench of Madras High Court the request made by Thiru.Joseph John Samuel for grant of quarry lease for quarrying and transportation of Roughstone and Gravel over an extent of 0.55.0 hectares of patta land in SF. No. 845/1B and 845/2B of Tharuvai Village, Palayamkottai Taluk, Tirunelveli District for a period of 5 years was considered and precise area has been communicated vide reference 2nd cited above.

3. The Mining Plan submitted by the lessee, Thiru.J.Joseph John Samuel, S/o.G.Jebarajan for quarrying roughstone has been approved vide this office letter No.M1/21631/2017, dated.28.12.2020 for obtaining Environmental Clearance as per the newly introduced Rule Number 41 and 42 of Mineral Concession Rules 1959.

4. In the reference 5th cited, Thiru.J.Joseph John Samuel, S/o.G.Jebarajan has requested to furnish certain particulars such as existing / proposed / abandoned mines within a radial distance of 500 meters from the periphery of the existing mining lease hold area for obtaining environmental clearance from the State Level Environment Impact Assessment Authority, Chennai.

5. The details of quarry leases granted for Roughstone falling within a radial distance of 500 meters from the subject leasehold area are furnished below:-

Sl. No	Name of the Lessee	Village & SF. No.	Extent - Hects	Lease details
1. Existing quarries				
1.	Tmt.D.Mercy Mery, W/o.Jebarajan, 54, Sivan West Car Street, Palayamkottai.	Tharuvai (V), 851	2.51.5	Proceedings in Rc.No.M1/54558/2014, dt.16.10.2017, for a period 5 years from 25.10.2017 to 24.10.2022
2.	Tmt.D.Mercy Mery, W/o.Jebarajan, 54, Sivan West Car Street, Palayamkottai.	Tharuvai (V), 847	1.62.5	Proceedings in Rc.No.M1/3939/2017, dt.13.07.2018 for a period of 5 years from 17.07.2018 to 16.07.2023
3.	Thiru.Sankaranarayanan @ Sankaran, S/o.Arunachalam, 24-B, Pillamar Street, Tisaiyanvilai, Radhapuram Taluk, Tirunelveli.	Tharuvai (v), 844, 848 & 849/2	2.36.5	Proceedings in Rc. No. M1/27262/2016, dt.13.07.2018 for a period of 5 years from 17.07.2018 to 16.07.2023
Total extent of existing quarries			6.50.5	
2. Abandoned quarries				
1.	A.S.Kumar, 52A/3, Thiruvanathapuram Road, Palayamkottai, Tirunelveli.	Tharuvai (v), 855/2, 856, 857/1, 858/1,2,3, 859/2, 860/2	3.96.0	Proceedings in Rc. No. M1/18559/2010, dt. 06.01.2012 for a period of 5 years from 07.02.2012 to 06.02.2017
Total extent of abandoned quarries			**3.96.0**	

3. proposed quarries				
1.	Thiru.Joseph John Samuel, S/o.G.Jebarajan (Late) 54, Chellathai Nagar, Mahilchi Nagar, Perumalpuram, Tirunelveli District. 627 007.	Tharuvai (V) 845/1B & 845/2B	0.55.0	Under Proposed quarry
2.	G.Jebarajan, No.54, Sivan West Car Street, Palayamkottai, Tirunelveli. 2.	S.F.No.857/ 1, 2, 856/2, 858/1B, 2B, 3B Tharuvai village.	2.63. 0 ha	Proposed quarry
3.	Thiru.K.Selvaraj, S/o.Kandasamy, 212A, Udankudi Road, Tisayanvilai Taluk, Tirunelveli District.	S.F.No.824/ 2, 825/2A, 825/2B, 826/1(P), 826/2 (P), 842/2(P), 843, 845/1Aand 845/2A(P). Tharuvai village.	4.45.20 ha	Proposed Quarry
Total extent of proposed quarries			**7.63.2**	

6. In view of the above it is recommended that Environmental Clearance may be issued in favour of the applicant subject to the usual terms and conditions.

Joint Director/
Assistant Director(i/c),
Geology and Mining,
Tirunelveli.

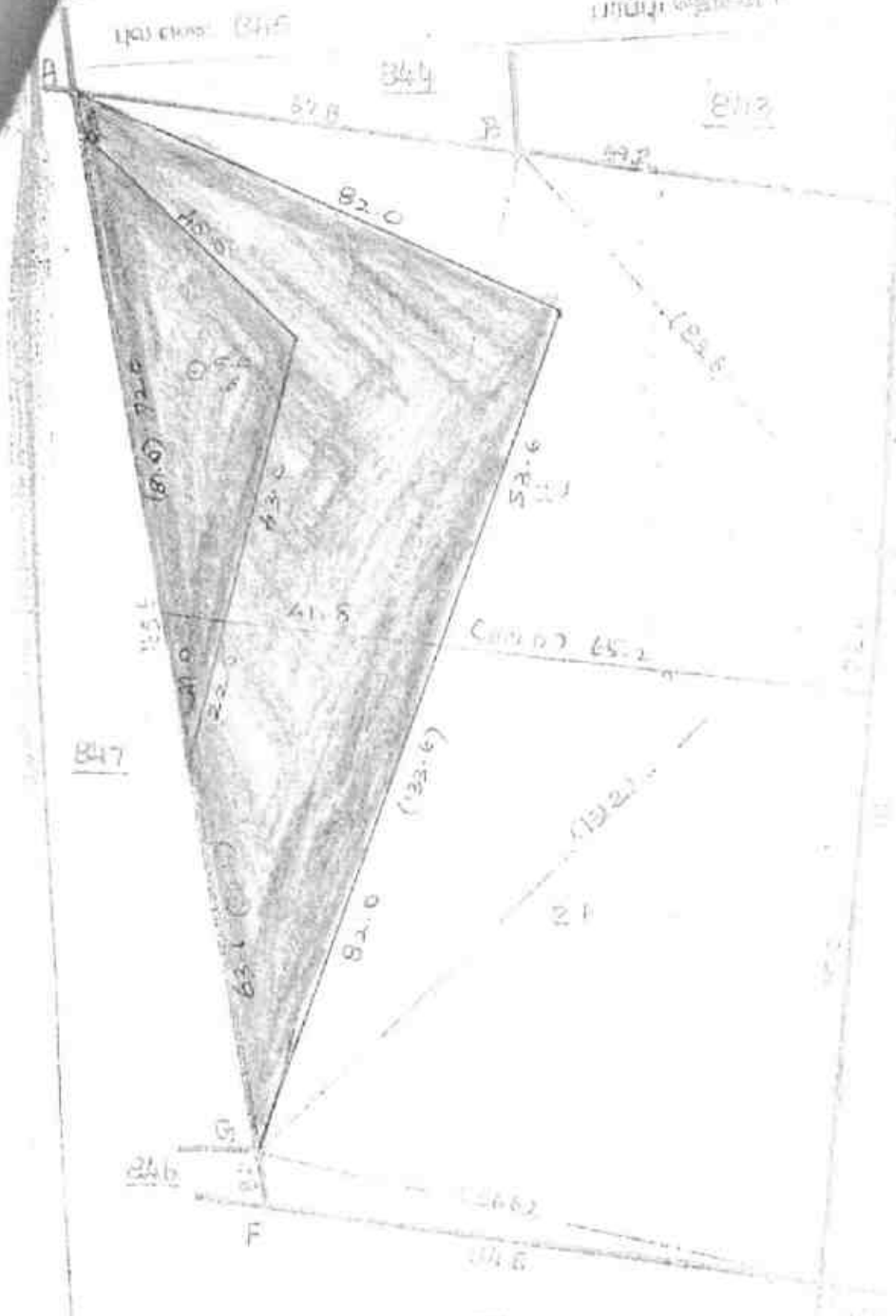
28/12/20

ANNEXURE-V

FMB, A REGISTER, VILLAGE MAP AND DEED OF AGREEMENT

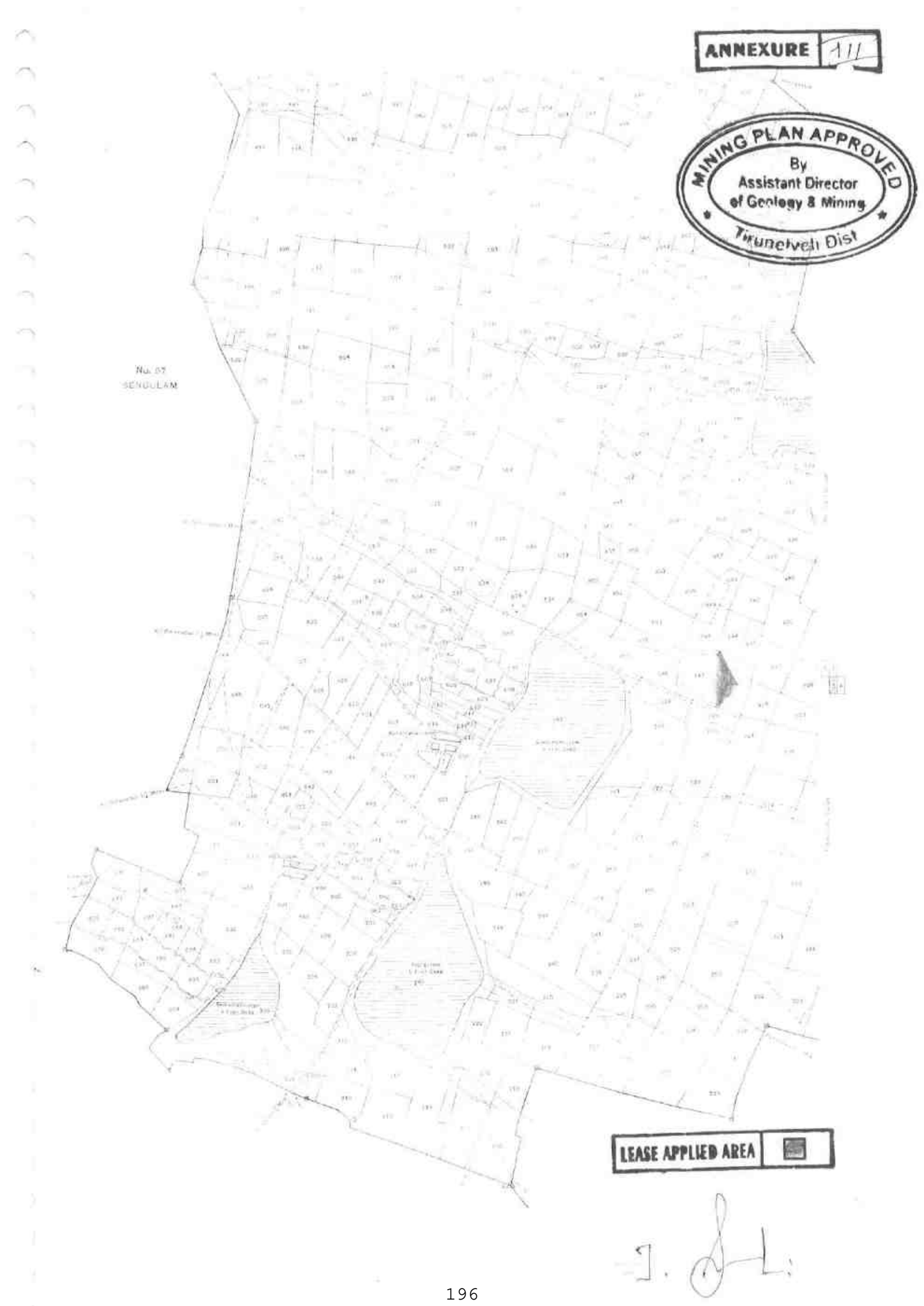
ANNEXURE II

MINING PLAN APPROVED
By
Assistant Director
of Geology & Mining
Tirunelveli Dist



LEASE APPLIED AREA

5400 h.a


ANNEXURE III
MINING PLAN APPROVED
By
Assistant Director
of Geology & Mining
Tirunelveli Dist
No. 57
SENGULAM
LEASE APPLIED AREA

ANNEXURE-VI MINING PLAN REPORT & PLATES

MINING PLAN APPROVED
By
Assistant Director
of Geology & Mining
Tirunelveli Dist.

MINING PLAN FOR THARUVAI ROUGH STONE, JELLY AND GRAVEL QUARRY

(PREPARED UNDER RULE 19(1), 41 and 42 OF TNMMCR 1959)

LOCATION OF THE QUARRY LEASE APPLIED AREA

STATE	:	TAMIL NADU
DISTRICT	:	TIRUNELVELI
TALUK	:	PALAYAMKOTTAI
VILLAGE	:	THARUVAI
S.F.NOS	:	845/1B AND 845/2B
EXTENT	:	0.55.0Ha

For

APPLICANT

Thiru. Joseph John Samuel,
S/o. G.Jebarajan (Late),
54, Chellathai Nagar,
Mahilchi Nagar, Perumal Puram,
Tirunelveli District-627 007.

PREPARED BY

C.NATARAJAN, M.Sc.,M.Phil.,
RQP/MAS/004/87/A
(Valid Upto-22.10.2021)
93/36-E2, Subramaniyar Kovil Street,
Omalur Taluk, Salem District,
Tamil Nadu, PIN-636 455.
Mobile: 97502 23535 – 94446 54520.
Email: geoprabu@gmail.com,
infoglobalmining@gmail.com.

MINING PLAN APPROVED By Assistant Director of Geology & Mining Tirunelveli Dist

Joseph John Samuel,
S/o. G.Jebarajan (Late),
54, Chellathai Nagar,
Mahilchi Nagar, Perumal Puram,
Tirunelveli District-627 007.

CONSENT LETTER FROM THE APPLICANT

The Mining Plan in respect of **Rough Stone, Jelly and Gravel** quarry over an extent of 0.55.0Ha of **(Patta land)** in S.F.Nos.845/1B and 845/2B of Tharuvai Village, Palayamkottai Taluk, Tirunelveli District, Tamil Nadu State has been prepared by

C.Natarajan, M.Sc.,M.Phil.,
RQP/MAS/004/87/A

I request the Joint Director, Assistant Director(i/c), Department of Geology and Mining, Tirunelveli District to make further correspondence regarding modifications of the Mining Plan with the said Recognized Qualified Person on this following address.

C.Natarajan, M.Sc.,M.Phil.,
RQP/MAS/004/87/A
No.93/36E2, Subramaniyar Kovil Street,
Omalur Taluk, Salem District,
Tamil Nadu, Pin-636 455.
Mobile: 97502 23535 & 94446 54520.

I hereby undertake that all modifications so made in the Mining Plan by the Recognized Qualified Person may be deemed to have been made with my knowledge and consent and shall be acceptable to me and building on me in all respects.

Signature of the Applicant

J. [signature]

Joseph John Samuel,

Place: Tirunelveli
Date:

J. [signature]

MINING PLAN APPROVED
By
Assistant Director
of Geology & Mining
Tirunelveli

Joseph John Samuel,
S/o. G.Jebarajan (Late),
54, Chellathai Nagar,
Mahilchi Nagar, Perumal Puram,
Tirunelveli District-627 007.

DECLARATION

The Mining Plan in respect of **Rough Stone, Jelly and Gravel** quarry over an extent of 0.55.0Ha of **(Patta land)** in S.F.Nos.845/1B and 845/2B of Tharuvai Village, Palayamkottai Taluk, Tirunelveli District, Tamil Nadu State has been prepared with my consultation and I have understood the contents and agree to implement the same in accordance with the Mining Laws.

Signature of the Applicant

J. [signature]

Joseph John Samuel,

Place: Tirunelveli
Date:

J. [signature]

C.Natarajan, M.Sc.,M.Phil.,
RQP/MAS/004/87/A
No.93/36E2, Subramaniyar Kovil Street,
Omalur Taluk, Salem District,
Tamil Nadu, Pin-636 455.
Mobile:97502 23535 & 94446 54520.

MINING PLAN APPROVED By Assistant Director of Geology & Mining Tirunelveli

CERTIFICATE

This is to certify that, the provisions of Minor Minerals Conservation and Development Rules, 2010 (MMCDR) have been observed in the Mining Plan for the grant of **Rough Stone, Jelly and Gravel** quarry lease over an extent of 0.55.0Ha of **(Patta land)** in S.F.Nos.845/1B and 845/2B of Tharuvai Village, Palayamkottai Taluk, Tirunelveli District, Tamil Nadu State applied by Thiru.Joseph John Samuel, for fresh quarry lease.

Wherever specific permission / exemptions / relaxations or approvals are required, the applicant will approach the concerned authorities of State and Central Governments for granting such permissions etc.

Certified

Signature of Recognized Qualified Person.

C.Natarajan, M.Sc.,M.Phil.,
RQP/MAS/004/87/A

Place: Salem
Date:

C. NATARAJAN, M.Sc.,M.Phil.,
RECOGNISED QUALIFIED PERSON,
RQP / MAS / 004 / 87 / A

C.Natarajan, M.Sc.,M.Phil.,
RQP/MAS/004/87/A
No.93/36E2, Subramaniyar Kovil Street,
Omalur Taluk, Salem District,
Tamil Nadu, Pin-636 455.
Mobile:9750223535 & 94446 54520.

MINING PLAN APPROVED By Assistant Director of Geology & Mining Tirunelveli Dist.

CERTIFICATE

Certified that, in preparation of Mining Plan for **Rough Stone, Jelly and Gravel** quarry over an extent of 0.55.0Ha of **(Patta land)** in S.F.Nos.845/1B and 845/2B of Tharuvai Village, Palayamkottai Taluk, Tirunelveli District, Tamil Nadu State for Thiru.Joseph John Samuel, covers all the provisions of Mines Act, Rules, and Regulations etc., made there under and whenever specific permission are required, the applicant will approach the Director General of Mines Safety, Chennai. The standards prescribed by DGMS in respect of Mines Health will be strictly implemented.

Certified

Signature of Recognized Qualified Person.

C.Natarajan, M.Sc.,M.Phil.,
RQP/MAS/004/87/A

C. NATARAJAN, M.Sc.,M.Phil.,
RECOGNISED QUALIFIED PERSON,
RQP / MAS / 004 / 87 / A

Place: Salem
Date:

MINING PLAN APPROVED By Assistant Director of Geology & Mining Tirunelveli Dist

CONTENTS

Annexure

S. No.	Description	
1.0	Precise Area Communication letter issued by the District Collector	I
2.0	Copy of FMB	II
3.0	Copy of village map	III
4.0	Copy of Patta	IV
5.0	Copy of Adangal	V
6.0	Copy of A Register	VI
7.0	Copy of Death certificate	VII
8.0	Copy of Identity Proof	VIII
9.0	Copy of RQP Certificate	IX

LIST OF PLATES

S. No.	Description	Plate No.
1.0	Location Plan	I
2.0	Environmental Plan	I-A
3.0	Satellite imagery map	I-B
4.0	Topo sketch of Quarry lease applied area for 10Km Radius	I-C
5.0	Key Plan	I-D
6.0	Quarry lease & Surface plan	II
7.0	Topography, Geological, Year wise Development and Production Plan & Section	III
8.0	Conceptual Plan & Section	IV

MINING PLAN APPROVED By Assistant Director of Geology & Mining Tirunelveli Dist

MINING PLAN FOR MINOR MINERALS

ROUGH STONE, JELLY AND GRAVEL

Over an extent of 0.55.0hectares of Patta land in S.F.Nos.845/1B and 845/2B of Tharuvai Village, Palayamkottai Taluk, Tirunelveli District, Tamil Nadu State

(PREPARED UNDER RULE 19(1), 41 and 42 OF TNMMCR 1959)

1.0 Introduction and Executive Summary;

1. The present Mining plan is prepared for Thiru.Joseph John Samuel, S/o. G.Jebarajan (Late), 54, Chellathai Nagar, Mahilchi Nagar, Perumal Puram, Tirunelveli District-627 007.
2. The application was processed by the Joint Director, Assistant Director(i/c), Department of Geology and Mining, Tirunelveli and passed an order vide Rc.No. M1/21631/2019 dated 18.12.2020. directing the applicant to produce approved Mining Plan under Rule 41 (5) of the Tamil Nadu Minor Mineral Concession Rules, 1959 and Environmental Clearance Certificate under Rule 42 from the State Level Environmental Impact Assessment Authority (SEIAA) for the grant of quarry lease to quarry **Rough Stone, Jelly and Gravel** over an extent of 0.55.0hectares of Patta lands in S.F.Nos.845/1B and 845/2B of Tharuvai Village, Palayamkottai Taluk, Tirunelveli District of Tamil Nadu State for a period of Five years only.
3. Accordingly, Mining Plan is prepared under the provisions of Rule 19(1), Rule 41 (1) and 41 (3) (i) of the Tamil Nadu Minor Mineral Concession Rules, 1959 by incorporating the conditions imposed in the precise area communication letter.
4. Geological Resources is estimated at 81,840m^3 of Rough stone and 10,912m^3 of gravel formation and Mineable Reserves is estimated at 23,808m^3 of Rough Stone after leaving necessary safety distance from the lease boundary as indicated in the precise area letter and relevant mining laws in force.
5. Production Schedule is proposed production of 23,808m^3 of Rough Stone for the period of Five years.

6. Environmental parameters,

i) The area does not attract the Forest Conservation Act, 1980 as there is no forest around 8Kms radius.

ii) There is no interstate boundary around 10Kms radius.

iii) There is no wild life animal sanctuary within 10Kms radius from the project site area under the Wildlife (Protection) Act, 1972.

Therefore the project seeks clearance only from State Level Environmental Impact Assessment Authority (SEIAA), under B2 Category.

7. Environmental measures to be adopted shall be,

i) Dust Control at source while drilling and blasting,

ii) Dust suppression at loading point and transport haul roads,

iii) Noise Control in blasting, control of fly rock missiles and vibration by doing peak particle velocity with in standard as prescribed by the DGMS and MOEF.

iv) Unnecessary land degradation should be avoided or damaged land should be reclaimed or rehabilitated.

v) Avoid uneven rat hole mining and follow scientific and systematic mining by safe bench system of open cast mining.

vi) Mining near major fracture zones if any should be avoided to control ground water fluctuation in the adjacent agricultural lands.

vii) Emission test of vehicles should be in tack to maintain minimum emission level of flue gases.

viii) Noise level should not exceed 80db and the vehicles should use only permitted Air Horn while on road near residential areas.

ix) Safety zones as prescribed by the Department of Geology and Mining from adjacent infrastructures should be strictly adhere to.

x) And any other conditions as stipulated by the concerned authorities should be followed to protect the environment.

EXECUTIVE SUMMARY:

a.	Name of the Village Panchayat	:	Tharuvai
b.	Name of the Panchayat Union	:	Palayamkottai
c.	The proposed total Minable Reserves	:	23,808m³ of Rough Stone,
d.	The proposed quantity of reserves (level of production) for Five years to be mined is (Recoverable reserves)	:	23,808m³ of Rough Stone,
e.	Total extent of the area	:	0.55.0Ha
f.	Proposed Period of mining	:	Five Years
g.	Existing depth	:	5m (Max) below ground level
h.	Proposed Depth of mining	:	17m below ground level
i.	Method of mining/level of mechanization	:	Opencast, Semi-mechanized Mining with a bench height of 5m and bench width of 5m is proposed.
j.	Types of Machineries used in the quarry	:	Machineries like Tractor mounted compressor attached with Jack hammers, Excavators are proposed to deploy for quarrying operation.
k.	Cost of the Project A. Fixed Assets Cost B. Operational Cost C. EMP Cost		Rs. 5,20,000/- Rs.41,00,000/- Rs. 4,30,000/- Total Project cost (A+B+C)=**Rs. 50,50,000/-**

l. The area applied for lease is bounded by Three corners and the coordinates are clearly marked in plate no II.

Corners	Co- ordinates		Distance between the corners		
	Latitude	Longitude			
1	08°38'10"N	77°41'25"E	1-2	=	165.6m
2	08°38'16"N	77°41'25"E	2-3	=	82.0m
3	08°38'14"N	77°41'27"E	3-1	=	138.2m

2.0 General Information:

2.1	a.	Name of the Applicant	:	Thiru. Joseph John Samuel,
	b.	Address of the Applicant with phone No and e-mail id if any	:	S/o. G.Jebarajan (Late), 54, Chellathai Nagar, Mahilchi Nagar, Perumal Puram, Tirunelveli District-627007. Cell No.: 9629729501.
	c.	Status of the Applicant	:	Individual
2.2	a.	Mineral Which the applicant intends to mine	:	Rough Stone, Jelly and Gravel.
	b.	Precise area communication letter No.	:	Precise area communication letter of the Joint Director, Assistant Director(i/c), Department of Geology and Mining, Tirunelveli Rc.No. M1/21631/2019 dated 18.12.2020.
	c.	Period of permission / lease granted	:	The applicant has applied permission for Five years and the Joint Director, Assistant Director(i/c), Department of Geology and Mining, Tirunelveli considered grant of lease for **Five years**.
	d.	Name and Address of the RQP preparing Mining Plan	:	**C.Natarajan, M.Sc.,M.Phil.,** **RQP/MAS/004/87/A** No.93/36E2, Subramaniyar Kovil Street, Omalur Taluk, Salem District, Tamil Nadu, Pin-636 455. Mobile: 9750223535 &94446 54520.
	e.	RQP Registration. No.	:	RQP/MAS/004/87/A Valid Til. 22.10.2021.

3.0 Location:

Details of the Area:

State	*District*	*Taluk*	*Village*	*S.F.Nos.*	*Extent in hectares*
Tamil Nadu	*Tirunelveli*	*Palayamkottai*	*Tharuvai*	*845/1B and 845/2B*	*0.55.0*

a.	Classification of the Area (Ryotwari / poramboke / others)	:	Patta land
b.	Ownership / Occupancy of the Applied area (Surface rights)	:	It is patta land registered in the name of Applicant vide patta No.3821, Please refer annexure No. IV.
c.	Toposheet No. with Latitude and Longitude	:	Topo Sheet No: 58 H /10
		:	Latitude : 08°38'10"N to 08°38'16"N
		:	Longitude : 77°41'25"E to 77°41'27"E
d.	Existence of Public Road / Railway line if any nearby the area and approximate distance	:	There is an existing road from the area leads to Adaimithipankulam - Ponnakudi village road on Eastern side of the area. The Nearest Railway line is Tirunelveli to Nanguneri line which is about 770m on Western side of the area.

PART - A

4.0 Geology and Mineral Reserves:

4.1	a.	Topography	:	1. The area applied for quarry lease exhibits almost plain topography covered by Gravel formation. The massive Charnockite formation is noticed below 2m (Avg) Gravel and sloping towards Southeastern side of the area, the altitude of the area is above 118m (maximum) from MSL. 2. No major river is found nearby the lease applied area. 3. Water table is found at a depth of 56m in summer and 53m in rainy seasons. 4. Temperature of the area is reported to be 18°C to a maximum of 42°C during summer. 5. Rainfall of this area is about 800mm to 900 mm during the both NE & SW monsoons.

<table>
<tr><td></td><td>b.</td><td>General Geology of the Area</td><td>:</td><td>The area is underlain by the wide range of metamorphic rocks of peninsular, gneissic complex. These rocks are extensively weathered and overlain by the recent valley fills and alluvium at places. The geological formations found in the district are Archaean rocks like Gneisses, Granites, Charnockites basic granulites and calc-gneisses. The younger formations are Quartz veins and pegmatite.
The rock type noticed in the area for lease is Charnockite which contains mostly Quartz and Feldspar with some ferromagnesian minerals. The Charnockite is part of peninsular Gneisses, a high grade metamorphic rock.
The strike of the Charnockite formation is N45°E –S45°W with dipping towards SE60°.
The general geological succession of the area is given as under.
<table>
<tr><td></td><td>Age</td><td>Rock Formation</td></tr>
<tr><td>1.</td><td>Recent to Sub recent</td><td>Alluvium, Gravel</td></tr>
<tr><td>2.</td><td>Archaean</td><td>Charnockite</td></tr>
<tr><td>3.</td><td>Archaean</td><td>Peninsular Gneiss, and Calc Gneiss</td></tr>
</table></td></tr>
<tr><td>4.2</td><td></td><td>Details of Exploration already carried out if any</td><td>:</td><td>No exploration was carried out, as the Rough stone formations are clearly visible from Existing quarry pit.</td></tr>
<tr><td>4.3</td><td>a.</td><td>Estimation of Reserves</td><td>:</td><td>The Geological and Recoverable reserves are estimated by cross sectional method.
Two sections have been drawn, one section drawn length wise as (X-Y), another one section drawn width wise as (A-B) to cover maximum area considered for lease.
The Plans and Sections have been drawn with a scale of 1:1000 and 1:500 respectively. Please refer plate No.III.</td></tr>
</table>

a. Geological Resources

The quarrying is restricted up to a depth of 17m below ground level only. Availability of Resources is given below.

Table No-1

Section	Length in (m)	Width in (m)	Depth in (m)	Volume in m^3	Gravel formation in m^3	Geological Resources of Rough stone in m^3
XY-AB	124	44	2	10912	10912	
	124	44	15	81840		81840
Total					**10912**	**81840**

Gravel Formation : 10,912m^3

The Geological Resources of Rough stone : 81,840m^3

b. Already excavated

The area has been quarried in earlier operation the existing pit dimensions are given below.

Table No-2

Pit No	length (Max) in(m)	Width (Avg) in (m)	Depth (Max) in (m)
I	37	22	1m Below Ground Level
II	84	12	2.5m Below Ground Level
III	67	8	5m Below Ground Level

c. Available Mineable Reserve

The Available mineable reserve calculated by deducting 7.5m safety distance and bench loss.

Table No-3

Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m^3	Mineable Reserves of Rough stone in m^3
XY-AB	II	105	27	4.5	12758	12758
	III	95	17	5	8075	8075
	IV	85	7	5	2975	2975
Total						**23808**

The Available mineable reserve is computed as 23,808m^3 of Rough stone upto a depth of 17m below ground level only.

5.0 Mining:

5.1	Method of Mining	:	1. Opencast method of semi mechanized mining with 5.0m vertical bench width of the bench is not less than bench height. 2. However, as far as the quarrying of Rough stone is concerned, observance of the provisions of Regulation106(2) (b) as above is seldom[possible due to various inherent petrogenetic 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.
5.2	Mode of Working	:	The rough stone is proposed to quarry 5m bench height and width with conventional opencast semi-Mechanized method. The quarry operation involves shallow jack hammer drilling, slurry blasting, excavation, Loading and transportation of Rough stone to the needy buyers. The production of Rough stone in this quarry involves the following method which is typical for Rough Stone quarrying in contrast to other major mineral mining. 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 buyers. Occasionally hydraulic excavators are attached with rock breakers for fragmentation to avoid secondary blasting. The primary boulders thus splitted are removed from the pits by excavators and further made to smaller sizes by rock breakers attached in excavators. It is a conventional opencast semi mechanized method of mining.

5.3	Proposed bench height & Width	:	Quarrying of Rough Stone is proposed bench height of 5m and bench width of 5m.
5.4	Details of Overburden / Mineral Production proposed for the first 5 years.	:	The overburden in the form of gravel formation, it has been removed earlier quarry operation. The excavated rough stone will be directly loaded into tipper to the needy crushers/other buyers for road project and construction works for filling and leveling of low lying areas.

The Yearwise Production and Development Table

Table No –4

Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m^3	Mineable reserve of Rough stone in m^3
I	XY-AB	II	39	27	4.5	4739	4739
	Total						**4739**
II	XY-AB	II	39	27	4.5	4739	4739
	Total						**4739**
III	XY-AB	II	27	27	4.5	3281	3281
		III	17	17	5	1445	1445
	Total						**4726**
IV	XY-AB	III	56	17	5	4760	4760
	Total						**4760**
III	XY-AB	III	22	17	5	1870	1870
		IV	85	7	5	2975	2975
	Total						**4845**
Grand Total							**23808**

The applicant has proposed to carry out 23,808m^3 of Rough stone at the rate of 100% recovery upto a depth of 17m below ground level for the period of five years only.

5.5		Machineries to be used		
	a.	Mining	:	It is proposed to use following machineries for quarrying rough stone 1) Tractor mounted compressor with jack hammer 2) Excavator of 0.90m³ bucket capacity (with Rock breaker attachment).
	b.	Loading	:	Excavator of 0.90m³ bucket capacity (with Rock breaker attachment).
	c.	Transportation	:	Tipper 2Nos 5/10Ts capacity.
5.6		Disposal of Overburden	:	There is no overburden anticipated during quarry operation.
5.7		Brief Note on Conceptual Mining Plan for the entire lease period	:	Conceptual Mining Plan is prepared with an object of Five years of systematic development of bench lay outs, selection of ultimate pit limit, depth of quarrying, ultimate pit slope, selection of sites for construction of infrastructures etc. Ultimate pit size is designed based on certain practical factors such as the economical depth of mining, safety zones, permissible areas etc. Ultimate Pit dimension is given as under,

Ultimate Pit dimension (M)			
Pit No	Length (max) in m	Width (Avg) in m	Depth(max) in (m)
I	109	29	17

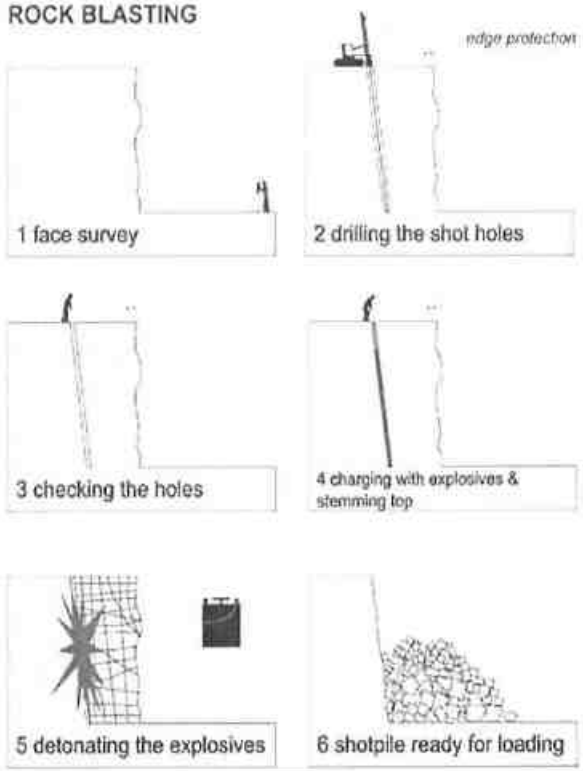
Afforestation has been proposed on all along the boundary barrier by planting trees.

All the baseline information studies like Air Quality monitoring, Noise and Vibration monitoring, Water Analysis studies will be carried out every year as per the MOEF norms.

6.0 Blasting:

6.1	Blasting Pattern	:	The massive formation shall be broken into pieces of portable size by drilling and blasting using jack hammers and shot hole blasting. Powder factor of explosives for breaking such hard rock shall be in the order of 6 to 7 Tonnes per K.g of explosives. Blasting parameters are as follows.

Diameter of the hole	:	32-36 mm
Spacing	:	0.6m
Depth	:	1 to 1.5m
Burden for hole	:	0.6m
Pattern of hole	:	ZigZag
Inclination of hole	:	70° from the horizontal.



6.2	Types of Explosives	:	Small dia, 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough stone. No deep hole drilling or primary blasting is proposed.

6.3	Measures proposed to minimize ground vibration due to blasting	:	Controlled blasting measures will be adopted for minimizing ground vibration and fly rock. Shallow depths jackhammer drilling and blasting is proposed to be carried out with minimum use of explosive mainly to give shattering effect in rough stone for easy excavation and to control fly rock.

Number of holes	:	14
Powder factor	:	6Ts/Kg of explosives
Total explosive required	:	7Kg slurry explosives
Charge / hole	:	0.5Kg
Blasting time	:	12-2 Pm

6.4	Storage of Explosives and safety measures to be taken while blasting.	:	The applicant will engage an authorized explosive agency to carry out the small amount of blasting and it will be supervised by competent and statutory foreman/ mines manager.

7.0 Mine Drainage:

7.1	Depth of Water table	:	The ground water table is reported as 56m below ground level. The quarry operation proposed upto a depth of 17m below ground level only. Hence the quarrying operation may not affect the ground water.
7.2	Arrangement and Places where the mine water is finally proposed to be discharged	:	The ground water may not rise immediately in this type of mining. However, the rain water percolation and collection of water from the seepage shall be less than 300lpm and it shall be pumped about periodically by a stand by diesel powered Centrifugal pump motivated with 7.5H.P.Motor. The quality of water is potable and it is not contaminated with any hazardous things. Hence, water stored in the quarry pit will be pumped into the adjacent agricultural fields. Further the water stored in the old pit will also be used for plantation purposes

8.0 Other Permanent Structures:

8.1	Habitations / Village	:	There are no habitations within a radius of 300m.
8.2	Power lines (HT/LT)	:	There is no LT/HT power lines within a radius of 500m.
8.3	Water bodies (River, Pond, Lake, Odai, Channel etc)	:	There is one Tank on southwestern side which is 300m away from the area. There is Channel passing on southeastern side which is 310m away from the area.
8.4	Archeological / Historical Monuments	:	There are no Archeological / Historical Monuments within a radius of 500m.
8.5	Road (NH, SH, Village Road etc)	:	The National Highway (NH-7) Salem – Kanniyakumari about 1.0km on eastern side of the area. The State Highway (SH-40) Tirunelveli - Tenkasi is about 4.0Km on Northwestern side of the area.
8.6	Places of Worship	:	There are no Places of Worship within a radius of 50m.
8.7	Reserved Forest / Forest / Social Forest / Wild Life Sanctuary etc.,	:	There are no Reserved Forest / Forest / Social Forest/Wild Life Sanctuary etc near the applied area.
8.8	Any Interstate Border, Protected areas under the Wild Life (Protection) Act, 1972, Critically Polluted Areas as Identified by Central Pollution Control Board and Notified Eco sensitive areas	:	There are No inter State border within a radius of 10Km.
8.9	Any Other Structures	:	Nil

9.0 Employment Potential & Welfare Measures:

9.1 Employment Potential (Management & Supervisory personal) :

1.	Skilled	Operator	4No.
		Mechanic	1 No.
		Mines manager /Mate	1 No.
2.	Semi-skilled	Driver	2 No.
3.	Unskilled	Musdoor / Labours	4Nos
		Total =	12Nos

Allowing 10% absentee, the no. of men of roll will be around 10.

The above man power is adequate to meet out the production schedule and the machinery strength envisaged in the mining plan and to comply the statutory provisions of Mines Safety Regulations.

				It is been ensured that, child labour under 18 years of age will not be engaged for quarrying operation. Necessary life insurance policies will be taken by the applicant to all the employees up to the end of the lease period.
9.2		Welfare Measures		
	a.	Drinking Water	:	Packaged drinking water is available from the nearby approved water vendors in Adaimithipankulam village which is about 1.0km on Northern side of the area.
	b.	Sanitary facilities	:	Semipermanent latrines & urinals shall be maintained at convenient places for use of labours as per the provisions of Rule (33) of the Mines Rules, 1960 separately for males and females. Washing facilities shall also be arranged as per rule (36) of the Mines Rules, 1960.
	c.	First Aid Facility	:	First aid kits are kept in Mines office room, in case of such eventualities the victim will be given first aid immediately at the site and injured person will be taken to the hospital. Hospital is available at distance of 9.0Km (NE) in Palayamkottai the competent and Statutory foreman/ permit manager will be in charge of first aid.
	d.	Labour Health	:	As per Mines Rule, Periodic medical examination related to occupational health safety will be conducted to all the workers in applicants own cost.
	e.	Precautionary safety measures to the Labourers	:	Safety provisions like helmet, goggles, safety shoes, Dust mask, Ear muffs etc., have to be provided as per the circulars and amendments made for Mine labours under the guidance of DGMS being a mechanized operation. Necessary training will be conducted once in a year to all the employees with the help of qualified and experienced officers to train about the safe and systematic quarrying operation.

PART – B

10.0 Environmental Management Plan:

10.1	Existing Land Use Pattern	:	1. The area is exhibits almost plain topography covered by Gravel formation. 2. Quarrying is proposed up to a depth of 17m below ground level. 3. Rough stone (Charnockite) is noticed below the Gravel formation. 4. Fluctuation of Water table in this area is in between 56m and 53m during a year. 5. This region receives the average annual rainfall of 800mm to 900mm. The surrounding area is practiced by the seasonal cultivation. The existing land use pattern is given as under.

Table No-5

Sl. No.	Land Use	Present Area (Hect)	Area in use during the quarrying period (Hect)
1.	Quarrying Pit	0.24.0	0.31.0
2.	Infrastructure	Nil	0.01.0
3.	Roads	0.01.0	0.01.0
4.	Green Belt	Nil	0.10.0
5.	Unutilized	0.30.0	0.12.0
	Total =	**0.55.0**	**0.55.0**

10.2	Water Regime	:	Water table in this area is noticed at a depth of 56m and presently, the quarrying of Rough Stone quarry is proposed up to a depth of 17m below ground level and hence, it will not affect the ground water depletion of this area.
10.3	Flora and Fauna	:	Except acacia bushes, no other valuable trees are noticed in the applied area. Further, neither flora of botanical interest nor fauna of zoological interest is noticed in this area.
10.4	Climatic conditions	:	Generally subtropical climatic condition prevails throughout the year and there is no sharp variation in climate. This District receives rain both in south west and north east monsoon. The average rainfall is about 800mm to 900mm and the temperature ranges from 18°C during winter and to a maximum of 42°C during the summer.

<table>
<tr><td>10.5</td><td>Human Settlement</td><td>:</td><td>The nearest habitations with the population is given as under.
Table No-6<table><tr><th>S. No</th><th>Name of the Village</th><th>Approximate distance & Direction from lease applied area</th><th>Approximate population</th></tr><tr><td>1.</td><td>Caussanelpuram</td><td>2.0km - NE</td><td>300</td></tr><tr><td>2.</td><td>Keelaomanallur</td><td>3.5km - NW</td><td>200</td></tr><tr><td>3.</td><td>Ponnakudi</td><td>1.0Km – SE</td><td>600</td></tr><tr><td>4.</td><td>Kandithankulam</td><td>1.5Km-SW</td><td>400</td></tr></table></td></tr>
<tr><td>10.6</td><td>Plan for Air, Dust Suppression</td><td>:</td><td>Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc., will be suppressed by periodical wetting of land by water spraying.
Wet drilling and dust extractor arrangements will be provided to drilling units so as to control raise of dust from the site of drilling.
Operators, those exposed directly to such conditions will be provide such protective equipment like mask, ear plug, helmet, gloze etc., as per the Mines Act.</td></tr>
<tr><td>10.7</td><td>Plan for Noise Control</td><td>:</td><td>Quarrying of Rough Stone will be carried out by drilling and blasting by using low power explosives, and hence, noise will be very minimum. However, periodical noise level monitoring will be carried out to check the noise level in and around the quarry site. Nowhere the noise level should exceed the permissible limit of 80db during the quarry working hours.</td></tr>
<tr><td>10.8</td><td>Environmental Impact Assessment Statement Describing Impact on mining on the next Five years</td><td>:</td><td>The mining plan proposed is for a small production of Rough stone without involving deep hole drilling and heavy blasting. Such limited mining activity is not likely to cause any impact adversely on environment as far as pollution of air, water and noise is concerned, anyhow environmental impact studies will be conducted as per EIA notification issued by MOEF. It is B2 Category mine.</td></tr>
</table>

10.9	Proposal for Waste Management	:	There is no waste anticipated in this proposed quarry operation.
10.10	Proposal of Reclamation of Land affected during mining activities and at the end of mining.	:	In the proposed mining plan only a maximum depth of 17m below ground level has been envisaged as workable depth for safe & economic mining during the lease period. Hence, after quarry reaches ultimate pit limit (for this lease period) of 17m depth, fencing will be constructed around the quarried pits to prevent inherent entry of the public and cattle.
10.11	Program for Afforestation	:	The 7.5m safety distance along the lease boundary has been identified to be utilized for afforestation Appropriate native species of Neem/Pungan trees will be planted in a phased manner as described below.

Table No–7

Year	No. of tress proposed to be planted	Survival %	Area to be covered Sq.m	Name of the species	No of trees expected to be grown
I	20	80%	200	Neem/Pungan	16
II	20	80%	200	Neem/Pungan	16
III	20	80%	200	Neem/Pungan	16
IV	20	80%	200	Neem/Pungan	16
V	20	80%	200	Neem/Pungan	16

Nearly 1000Sqm area is proposed to use under afforestation by planting 20nos. of Neem/Pungan trees during every year with an anticipated survival rate of 80%. The Quarry landuse, layout and afforestation plan is shown in Plate No.III.

10.12	Proposed Financial Estimate / Budget for (EMP) Environment Management		
	A.Fixed Asset Cost:		
	1. Land Cost (400000/1Ha)=	:	Rs. 2,20,000
	2. First aid room and accessories	:	Rs.1,00,000
	3. Labour Shed		Rs.1,00,000
	4. Sanitary Facility		Rs.1,00,000
	Total=		**Rs. 5,20,000/-**

	B.Operational Cost: 1. Machineries 2. Fencing cost **Total**	: : :	 Rs.40,00,000- Rs.1,00,000 **Rs.41,00,000/-**
	C.EMP Cost:	:	Budget Provision for the entire quarrying period.
		: : :	Air Quality Sampling = Rs. 40,000/- Water Quality Sampling = Rs. 40,000/- Noise Monitoring = Rs. 20,000/-
		:	Ground vibration test = Rs. 20,000/-
	Expenditure 1. Drinking water facility 2. Sanitary Arrangments 3. Safety kids 4. Water sprinkling 5. Afforestation 6. Cost towards charity **Total=**	: : : : : :	 Rs.1,00,000/- Rs. 25,000/- Rs. 50,000/- Rs. 70,000/- Rs. 30,000/- Rs. 25,000/- **Rs. 4,30,000/-**
	Total Project Cost (A+B+C)	:	**Rs. 50,50,000/-**

11.0 Mine Closure Plan:

11.1	Steps proposed for phased restoration, reclamation of already mined out area.	:	There is no proposal for back filling, reclamation and rehabilitation. The quarried pits after the end of the life of lease will be fenced to prevent inherent entry of public and cattles.
11.2	Measures to be under taken on mine closure as per Act & Rules	:	Measures will be taken as per the Acts and Rules. The quarried pit will be fenced by using Barbed wire fencing to prevent inherent entry of public and cattle.
11.3	Mitigation measures to be undertaken for safety and restoration/ reclamation of the already mined out area	:	Mitigation measures: Drilling will be carried out by wet drilling mode to control the dust propagation into the air. Blasting will be carried out on limited scale. Mist Water spraying on haul road is proposed to prevent the dust propagation into the air.

MINING PLAN APPROVED By Assistant Director Geology & Mining Tirunelveli

12.0 Any Other Details Intend to Furnish by the Applicant:

(i) Permission will be obtained from the District Mines Office to extract the Rough Stone from the Boundary barriers and for slopes.

(ii) Care and precautionary measures will be taken for the safety of workers as per Rules and Acts.

(iii) The applicant will endeavor every attempt to quarry the Rough Stone economically without any wastage and to improve the environment and ecology.

(iv) The Mining Plan is prepared by incorporating the conditions stipulated in the precise area communication issued and relevant mining laws in force.

(v) Any violation pointed out by the inspecting authorities shall be rectified as per the guidelines of the Department.

Prepared by

C.Natarajan, M.Sc.,M.Phil.,
RQP/MAS/004/87/A

Place : Salem
Date :

C. NATARAJAN, M.Sc.,M.Phil.,
RECOGNISED QUALIFIED PERSON,
RQP / MAS / 004 / 87 / A

This Mining Plan is approved Subject to the Conditions / Stipulation Indicated in the Mining Plan Approval

Lettter Rec.No. 21631 /M1/ 2017

Dated 28.12.2020

Assistant Director i/c
Dept. of Geology & Mining
Tirunelveli.

28/12/20

Rc.No.M1/21631/2017

Office of the Assistant Director
Dept. of Geology and Mining
Tirunelveli.

Dated 18.12.2020.

MINING PLAN APPROVED By Assistant Director of Geology & Mining

NOTICE

Sub: **Mines and Quarries** – Minor Minerals – Roughstone, Jelly and Gravel – Tirunelveli District – Palayamkottai Taluk – Tharuvai Village – S.F.Nos. 845/1B & 845/2B – over an extent of 0.55.0 hectares of patta land – Quarry lease application preferred by Thiru G.Jebarajan – Precise Area communicated to the applicant – applicant Thiru G.Jebarajan expired – Revised Precise Area Communicated in the name of Thiru Joseph John Samuel – Reg.

Ref:

1. Quarry lease application preferred by Thiru G.Jebarajan dated: 26.05.2017
2. The Revenue Divisional Officer, Tirunelveli Letter No. A5/2506/2018, dated. 20.08.2018.
3. Inspection report of the Assistant Geologist of Geology and Mining, Tirunelveli Dated: 22.06.2019.
4. G.O (Ms) No. 169, Industries (MMC-1) Department dated. 04.08.2020.
5. District Collector, Tirunelveli Notice Even No. dated 04.01.2020.
6. This office letter even No. dated 18.02.2020.
7. Letter dated 10.12.2020 of Thiru Joseph John Samuel, S/o Thiru G.Jebarajan, (deceased applicant.)
8. This office letter even No. dated 14.12.2020 addressed to the Government Pleader, Hon'ble Madurai Bench of Madras High Court, Madurai.
9. Letter dated 15.12.2020 received from

Village, Palayamkottai Taluk, Tirunelveli District subject to certain conditions:

In the meantime, Thiru Joseph John Samuel, has informed that the applicant Thiru G.Jebarajan has expired on 27.08.2020 at Madurai Apollo Hospitals on 27.08.2020 and enclosing a copy of the will executed by his father cum deceased applicant and registered vide document No.B.K.III 56/17 dated 22.06.2017, sub Registrar, Melapalayam and requested to issue the precise area communication to him for the area applied for lease.

In this regard, the Government Pleader, Hon'ble Madurai Bench of Madras High Court was requested to offer the opinion and the Additional Government Pleader, Hon'ble Madurai Bench of Madras High Court in the letter under reference cited has opined that there is no legal impediment for transferring the said quarry lease application for issuance of precise area in the name of Thiru Joseph John Samuel son of the late (G.Jebarajan). Accordingly, the authorities may take appropriate action to process further and to issue the quarry license I the name of the present title owner namely Thiru Joseph John Samuel.

Since the applicant Thiru S.Jebarajan has passed away, the precise area already communicated by the District Collector, Tirunelveli to him vide reference 5th cited become void.

Based on the recommendation of the Revenue Divisional Officer, Tirunelveli, the Assistant Geologist, Dept. of Geology and Mining, Tirunelveli and the Additional Government Pleader, Hon'ble Madurai Bench of Madras

MINING PLAN APPROVED By Assistant Director of Geology & Mining Tirunelveli Dist

Roughstone, Jelly and Gravel in respect of the precised area communicated.

Joint Director
Assistant Director, (i/c)
Geology and Mining,
Tirunelveli.

18/12/20

To

Thiru Joseph John Samuel,
S/o G.Jebarajan (Late)
54, Chellathai Nagar,
Mahilchi Nagar,
Perumal Puram,
Tirunelveli-7

ANNEXURE II

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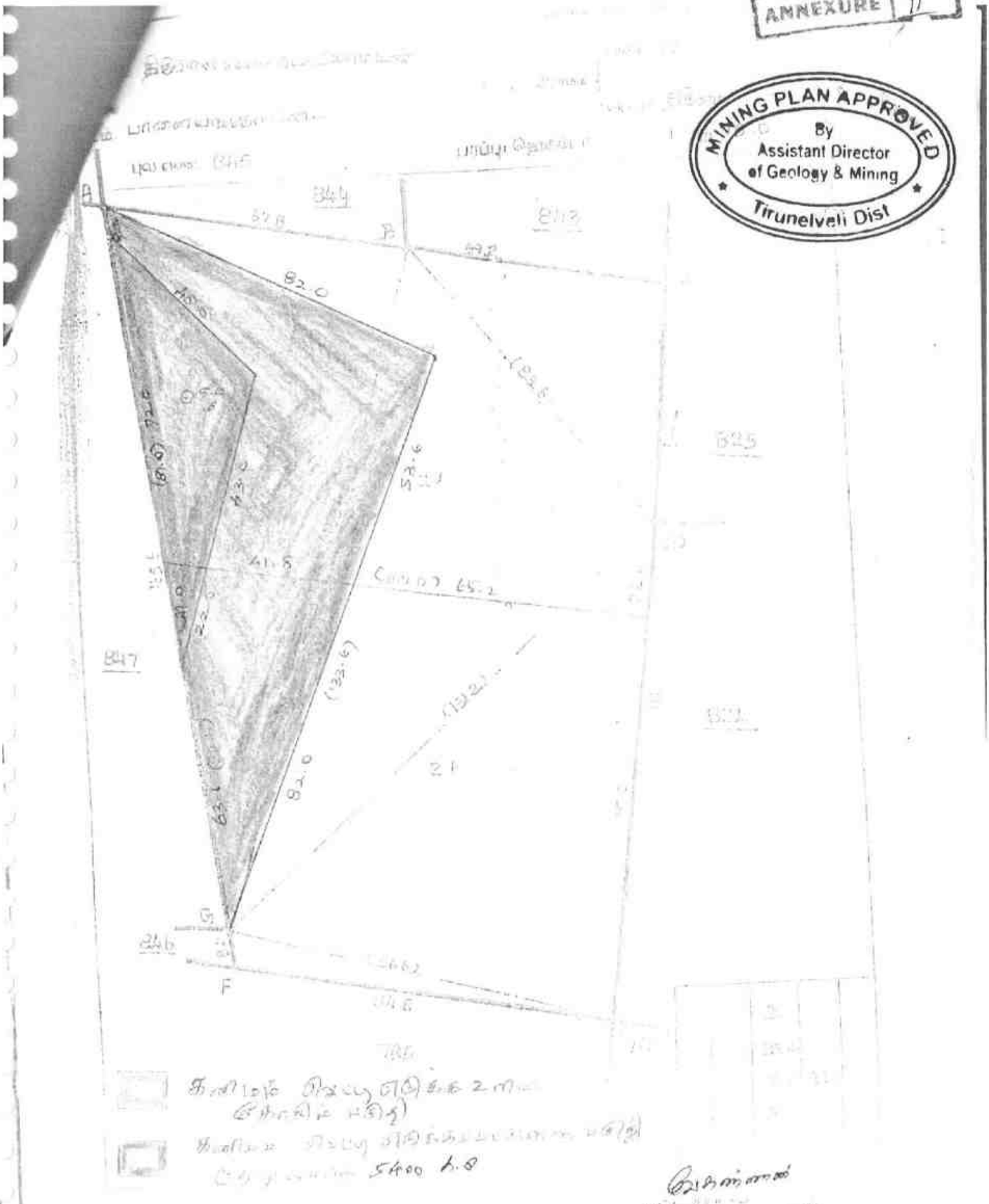
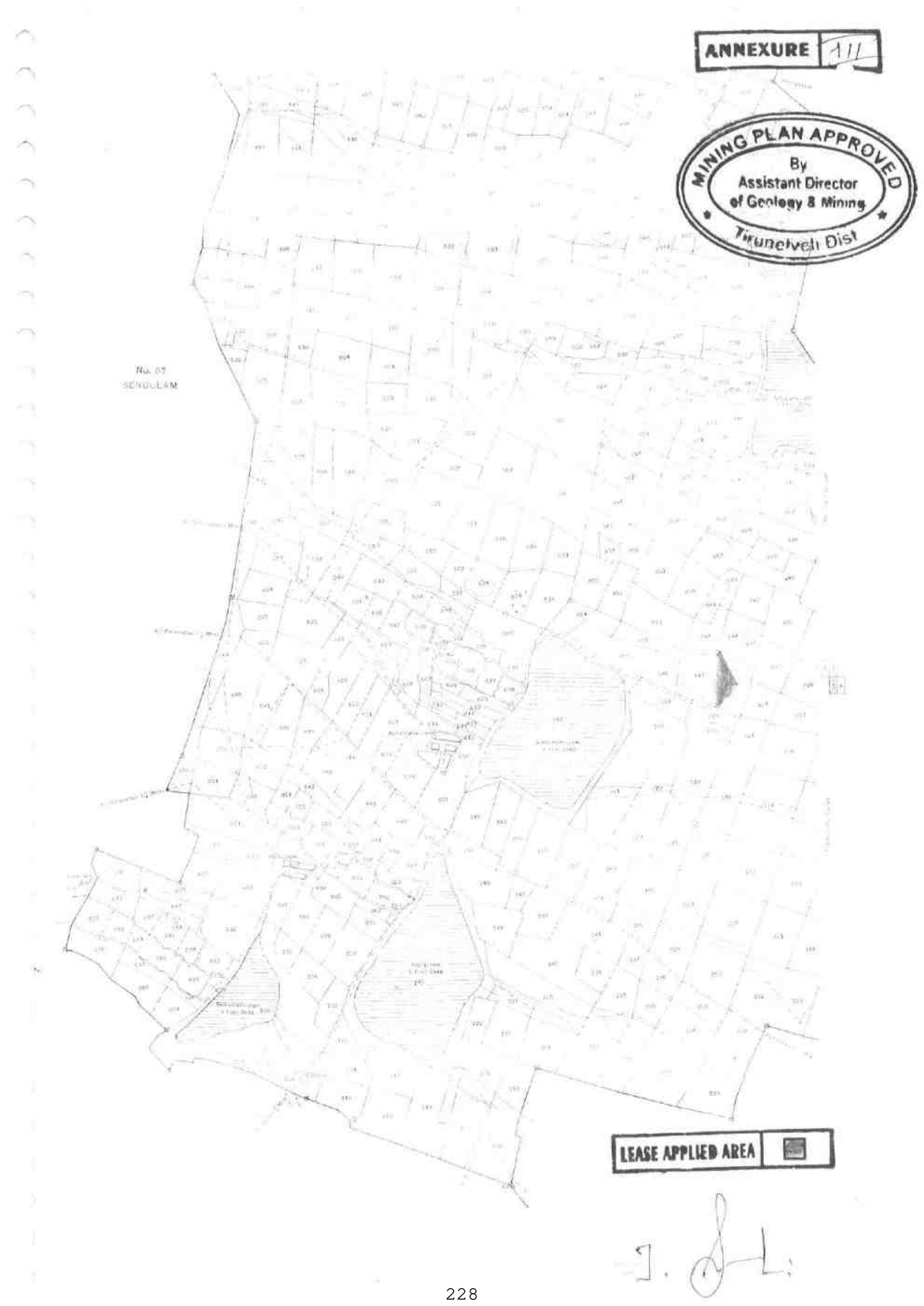
By
Assistant Director
of Geology & Mining
Tirunelveli Dist



LEASE APPLIED AREA


ANNEXURE III
MINING PLAN APPROVED
By
Assistant Director
of Geology & Mining
Tirunelveli Dist
No. 57
SENGULAM
LEASE APPLIED AREA

தமிழக அரசு

வருவாய்த் துறை

நில உரிமை விபரங்கள் : இ. எண் 10(1) பிரிவு

மாவட்டம் : திருநெல்வேலி வட்டம் : பாளையங்கோட்டை

வருவாய் கிராமம் : தருவை பட்டா எண் : 3821

உரிமையாளர்கள் பெயர்

1. ஜெயராஜன் மகன ஜோசப் ஜான் சாமுவேல்

புல எண்	உட்பிரிவு	புன்செய்		தனசெய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	
852	-	0 - 94.00	0.86	--	--	--	--	2020/0103/29/242649-- -- 20-09-2020
845	1B	0 - 37.80	0.20	--	--	--	--	2020/0103/29/242649--257/1424 -- 20-09-2020
858	2B	0 - 16.20	0.15	--	--	--	--	2020/0103/29/242649--257/1424 -- 20-09-2020
784	-	1 - 13.50	1.04	--	--	--	--	2020/0103/29/242649-- -- 20-09-2020
850	2B	0 - 32.00	0.29	--	--	--	--	2020/0103/29/242649-- -- 20-09-2020
858	1B	0 - 16.60	0.15	--	--	--	--	2020/0103/29/242649--257/1424 -- 20-09-2020
858	3B	0 - 16.20	0.10	--	--	--	--	2020/0103/29/242649--257/1424 -- 20-09-2020
856	2	0 - 16.60	0.20	--	--	--	--	2020/0103/29/242649--257/1424 -- 20-09-2020
857	1	0 - 66.00	0.60	--	--	--	--	2020/0103/29/242649-- -- 20-09-2020
845	2B	0 - 17.20	0.20	--	--	--	--	2020/0103/29/242649--257/1424 -- 20-09-2020
		4 - 26.10	3.79					

ANNEXURE V

1431 — ஆம் பசலியில் கீழக்கரைவள் ... 47. தருவை

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
845	1B	0.37.1	0.20	42	3821 கோவிந்தம்மாள்		7	ஆனி			
845	2B	0.13.2	0.20	"	3821 — do —		7	ஆனி			

கிராம நிர்வாக அலுவலர்
47. தருவை கிராமம்,
பாளையங்கோட்டை வட்டம்.

380/82—R.F. III-A-10—40,00,000 Cps.—GDP.-Mou.-7.

எண் 2

(13)	(14)	(15)	(16)	(17)	(18)	(19)

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... Dist

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ANNEXURE VI

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அ-பதிவேடு விவரங்கள்

மாவட்டம் : திருநெல்வேலி

வட்டம் : பாளையங்கோட்டை

கிராமம் : தருவை

1. புல எண்	845	9. மண் வயனமும் ரகமும்	8 - 5
2. உட்பிரிவு எண்	1B	10. மண் தரம்	7
3. பழைய புல உட்பிரிவு எண்	845-1	11. தீர்வை (ரு - நெ)	0.62
4. பகுதி	-	12. பரப்பு (ஹெக்டேர் - ஏர்)	0 - 37.80
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரு - பை)	0.20
6. நிலத்தின் வகை	புஞ்சை	14. பட்டா எண்	3821
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	1.ஜோசப் ஜான் சாமுவேல்

குறிப்பு 1:

1.	மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை நீங்கள் http://eservices.tn.gov.in என்ற இணைய தளத்தில் 90734 என்ற குறிப்பு எண்ணை உள்ளிடு செய்து உறுதி செய்துகொள்ளவும்.

அ-பதிவேடு விவரங்கள்

MINING PLAN APPROVED By Assistant Director of Geology & Mining Tirunelveli Dist

மாவட்டம் : திருநெல்வேலி

வட்டம் : பாளையங்கோட்டை

கிராமம் : தருவை

1. புல எண்	845	9. மண் வயலும் ரகமும்	8 - 5
2. உட்பிரிவு எண்	2B	10. மண் தரம்	7
3. பழைய புல உட்பிரிவு எண்	845-2	11. தீர்வை (ரு - பை)	0.62
4. பகுதி	P	12. பரப்பு (ஹெக்டேர் - ஏர்)	0 - 17.20
5. அசை / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரு - பை)	0.20
6. நிலத்தின் வகை	புஞ்சை	14. பட்டா எண்	3821
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	1.ஜோசப் ஜான் சாமுவேல்

குறிப்பு 1:

1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **http://eservices.tn.gov.in** எனற இணைய தளத்தில் **90734** என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

J. J.

ANNEXURE VII

MINING PLAN APPROVED By Assistant Director of Geology & Mining Tirunelveli Dist

படிவம் எண் 1
Form No. 1

தமிழ்நாடு அரசு
GOVERNMENT OF TAMIL NADU
நகராட்சி நிர்வாகம் மற்றும் குடிநீர் வழங்கல் துறை
DEPARTMENT OF MUNICIPAL ADMINISTRATION AND WATER SUPPLY
மதுரை மாநகராட்சி
MADURAI CORPORATION

இறப்பு சான்றிதழ் - DEATH CERTIFICATE

பிறப்பு மற்றும் இறப்பு பதிவு சட்டம், 1969ன் பிரிவு 12/17 மற்றும் தமிழ்நாடு பிறப்பு இறப்பு பதிவு விதிகள் 2000 விதி எண் 8/13 இன்
கீழ் வழங்கப்படுகிறது.)

(ISSUED UNDER SECTION 12/17 OF THE REGISTRATON OF BIRTHS & DEATHS ACT, 1969 AND RULE 8/13 OF THE TAMIL NADU REGISTRATION OF BIRTH AND DEATH RULES 2000.)

கீழ்கண்ட தகவல் இந்தியா, தமிழ்நாடு மாநிலம், மதுரை மாவட்டம், மதுரை வடக்கு வட்டம், மதுரை மாநகராட்சி வார்டு 44 சேர்ந்த
அசல் இறப்பு பதிவேட்டிலிருந்து எடுக்கப்பட்டவை என சான்று அளிக்கப்படுகிறது.

THIS IS TO CERTIFY THAT THE FOLLOWING INFORMATION HAS BEEN TAKEN FROM THE ORIGINAL RECORD OF DEATH WHICH IS THE REGISTER FOR MADURAI CORPORATION WARD 44 OF MADURAI NORTH TALUK OF MADURAI DISTRICT OF TAMIL NADU STATE, INDIA.

NAME OF DECEASED / இறந்தவரின் பெயர் :
G.JEBARAJAN / G.ஜெபராஜன்

SEX / பாலினம் : MALE / ஆண்

UID NUMBER OF DECEASED / இறந்தவரின் ஆதார் எண் :

DATE OF DEATH / இறந்த தேதி : 27/08/2020
TWENTY SEVEN - AUGUST - TWO THOUSAND TWENTY

PLACE OF DEATH / இறந்த இடம் :
APOLLO SPECIALITY HOSPITAL, LAKE VIEW ROAD,, K.K. NAGAR,, MADURAI - 625020

AGE OF DECEASED / இறந்தவரின் வயது : 58 YEARS

அப்போலோ ஸ்பெஷாலிட்டி மருத்துவமனை, லேக் வியூ ரோடு, கே.கே. நகர், மதுரை. - 625020

NAME OF MOTHER / தாயின் பெயர் :
G.NESAMANI / G.நேசமணி

FATHER NAME / தந்தையின் பெயர் :
S.GABRIEL / S.காபிரியேல்

MOTHER'S UID NUMBER / தாயின் ஆதார் எண் :

FATHER'S UID NO. / தந்தையின் ஆதார் எண் :

HUSBAND / WIFE NAME / கணவர் / மனைவி பெயர் :
D.MERCYMARY / D. மெர்சிமேரி

HUSBAND / WIFE UID NO. / கணவர் / மனைவி ஆதார் எண் :

ADDRESS OF THE DECEASED AT THE TIME OF DEATH / இறப்பின் போது இறந்தவரின் முகவரி :

54, CHELLATHAI NAGAR MAKILLI NAGAR, ., PERUMALPURAM, TIRUNELVELI, TIRUNELVELI, TAMIL NADU - 627007

54, செல்லத்தாய் நகர் மகிழ்ச்சி நகர் , ., பெருமாள்புரம், திருநெல்வேலி, திருநெல்வேலி, தமிழ்நாடு - 627007

PERMANENT ADDRESS OF DECEASED / இறந்தவரின் நிரந்தர முகவரி :

54, CHELLATHAI NAGAR MAKILLI NAGAR, ., PERUMALPURAM, , TIRUNELVELI, TIRUNELVELI, TAMIL NADU -627007

54, செல்லத்தாய் நகர் மகிழ்ச்சி நகர் , ., பெருமாள்புரம், திருநெல்வேலி, திருநெல்வேலி, தமிழ்நாடு - 627007

REGISTRAR OF BIRTHS & DEATHS WARD N44 MADURAI CORPORATION

REGISTRATION NUMBER / பதிவு எண் :
D-2020:33-5294-000459

DATE OF REGISTRATION / பதிவு செய்த தேதி : 31/08/2020

Signature valid
Digitally Signed by OMSAKTHI M
Date: 08-Sep-2020 14:04:31

REMARKS (IF ANY) / குறிப்பு :

DATE OF ISSUE / வழங்கிய நாள் : 08/09/2020

ISSUING AUTHORITY/சான்றிதழ் அளிப்பவர்

REGISTRAR (BIRTH & DEATH)
பதிவாளர் (பிறப்பு & இறப்பு)
MADURAI CORPORATION WARD 44
மதுரை மாநகராட்சி வார்டு 44

THIS IS A COMPUTER GENERATED CERTIFICATE
THE GOVT. OF INDIA VIDE CIRCULAR NO.1/12/2014-VSK(CRS) DATED 27-JULY-2015 HAS APPROVED THIS CERTIFICATE AS A VALID LEGAL DOCUMENT FOR ALL OFFICIAL PURPOSES.
THE REGISTRATION NUMBER IS UNIQUE TO EACH EVENT.

பிறப்பு மற்றும் இறப்பு பதிவு செய்வதை உறுதி செய்வீர்/ ENSURE REGISTRATION OF EVERY BIRTH AND DEATH

D5331846852154678720 20

ANNEXURE VIII

MINING PLAN APPROVED
By
Assistant Director
of Geology & Mining

இந்திய அரசாங்கம்
Government of India

ஜோசப் ஜான் சாமுவேல்
Joseph John Samuel
தந்தை : ஜெபராஜன்
Father : Jebarajan
பிறந்தவருடம் / Year of Birth : 1990
ஆண்பால் / Male

9146 0855 1630

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

இந்திய தனிப்பட்ட அடையாள ஆணைய அமைப்பு
Unique Identification Authority of India

ஆதார்

முகவரி:
S/O: ஜெபராஜன், 54,
செல்லத்தாய் நகர் மகிழ்ச்சி
நகர், பாளையங்கோட்டை,
பாளையங்கோட்டை,
திருநெல்வேலி, பெருமாள்புரம்,
தமிழ் நாடு, 627007

Address:
S/O: Jebarajan, 54, CHELLATHAI
NAGAR MAKILJI NAGAR,
PALAYAMKOTTAI,
Palayamkottai, Tirunelveli,
Perumalpuram, Tamil Nadu,
627007

9146 0855 1630

1947
1800 300 1947

help@uidai.gov.in

www.uidai.gov.in

J. J. L.

ANNEXURE IX

MINING PLAN APPROVED
By
Assistant Director
of Geology & Mining
Regional Controller of Mines
INDIAN BUREAU OF MINES
Ministry of Steel, Mines & Coal
MADRAS

CERTIFICATE OF RECOGNITION AS QUALIFIED PERSON TO PREPARE MINING PLANS

(Under Rule 22 (c) of Mineral Concession Rules 1960)

Shri C. NATARAJAN *resident of* ALAMBADI (VILL), VEDASENDUR (TQ), ANNA (DISTT), TAMILNADU, *son of* SHRI K. CHINNA GOUNDER, *having given satisfactory evidence of his qualifications and experience is hereby granted recognition under Rule 22 (c) of the Mineral Concession Rules, 1960 as a Qualified Person to prepare Mining Plans.*

His registration number is RQP / MAS / 004 / 87 / A

This recognition is valid for a period of two years ending 25.10.1989

P Ramamurthy 26/10/87

Regional Controller of Mines
Indian Bureau of Mines
MADRAS.

Place: MADRAS
Date: 26.10.1987

नक नवीकृत 23 OCT 1995
Renewed up to.....

Regional Controller of Mines
INDIAN BUREAU OF MINES

MINING PLAN APPROVED
By
Assistant Director
of Geology & Mining
Tirunelveli Dist

REGIONAL CONTROLLER OF MINES
INDIAN BUREAU OF MINES
CHENNAI

नक नवीकृत
Renewed up to 23 OCT 1995

क्षेत्रीय खान नियंत्रक
Regional Controller of Mines
भारतीय खान ब्यूरो
INDIAN BUREAU OF MINES

नक नवीकृत 22-10-2021
Renewed up to.....

REGIONAL CONTROLLER OF MINES
INDIAN BUREAU OF MINES
CHENNAI REGION

नक नवीकृत 22 OCT 1997
Renewed up to.....

क्षेत्रीय खान नियंत्रक
Regional Controller of Mines
भारतीय खान ब्यूरो
INDIAN BUREAU OF MINES

नक नवीकृत 22.10.99
Renewed up to.....

M. K. A.
Regional Controller of Mines
INDIAN BUREAU OF MINES

नक नवीकृत 22.10.2001
Renewed up to.....

Regional Controller of Mines
INDIAN BUREAU OF MINES

T. L.

MINING PLAN APPROVED
By
Assistant Director
of Geology & Mining
Tirunelveli Dist

SPEED POST

GOVERNMENT OF INDIA
MINSTRY OF MINES AND MINEALS
INDIAN BUREAU OF MINES
OFFICE OF THE REGIONAL CONTROLLER OF MINES

C 4 A Rajaji Bhavan
Besant Nagar
Chennai 600 090.

No. : 656(48)/2010-Mds

Dated : 21 / 9 /2011

To :
Sri C. Natarajan
S/o K. Chinna Gounder
No. 5/85 Muthugapatti – Post
Namakkal Taluk & District
Pincode – 637405

Sub. : Renewal of recognition as recognized qualified person under Rule 22C of MCR, 1960 reg.

Ref. : a) Your letter dated 5.08.2011.
b) Reg. No. RQP/MAS/004/87/A dated 26.10.87.

Sir,

With reference to your request for renewal of recognition under Rule 22C of MCR, 1960, please find enclosed herewith the original certificate of recognition duly renewed for a further period of ten years.

02. You are advised to prepare standard mining plans/scheme of mining/Progressive Mine Closure Plan/Final Mine Closure Plan complete in all respects as per the outline/guidelines and taking into account all requirements as per CCOM's Circular to RQPs and instructions issued from time to time. Further, you are advised not to furnish any deliberate false information in the mining plan/scheme of mining/Progressive Mine Closure Plan/Final Mine Closure Plan, so as to mislead the authorities. It may please be noted that any such incidence on your part may lead to withdrawal of the recognition granted to you.

03. The recognition is valid up to 22.10.2021.

Yours faithfully,

20/9/11

Encl. as above.

(Ivan Khess)
Regional Controller of Mines

Copy for kind information to :
The Controller of Mines (S), Indian Bureau of Mines, Bangalore without any enclosure.

(Ivan Khess)
Regional Controller of Mines

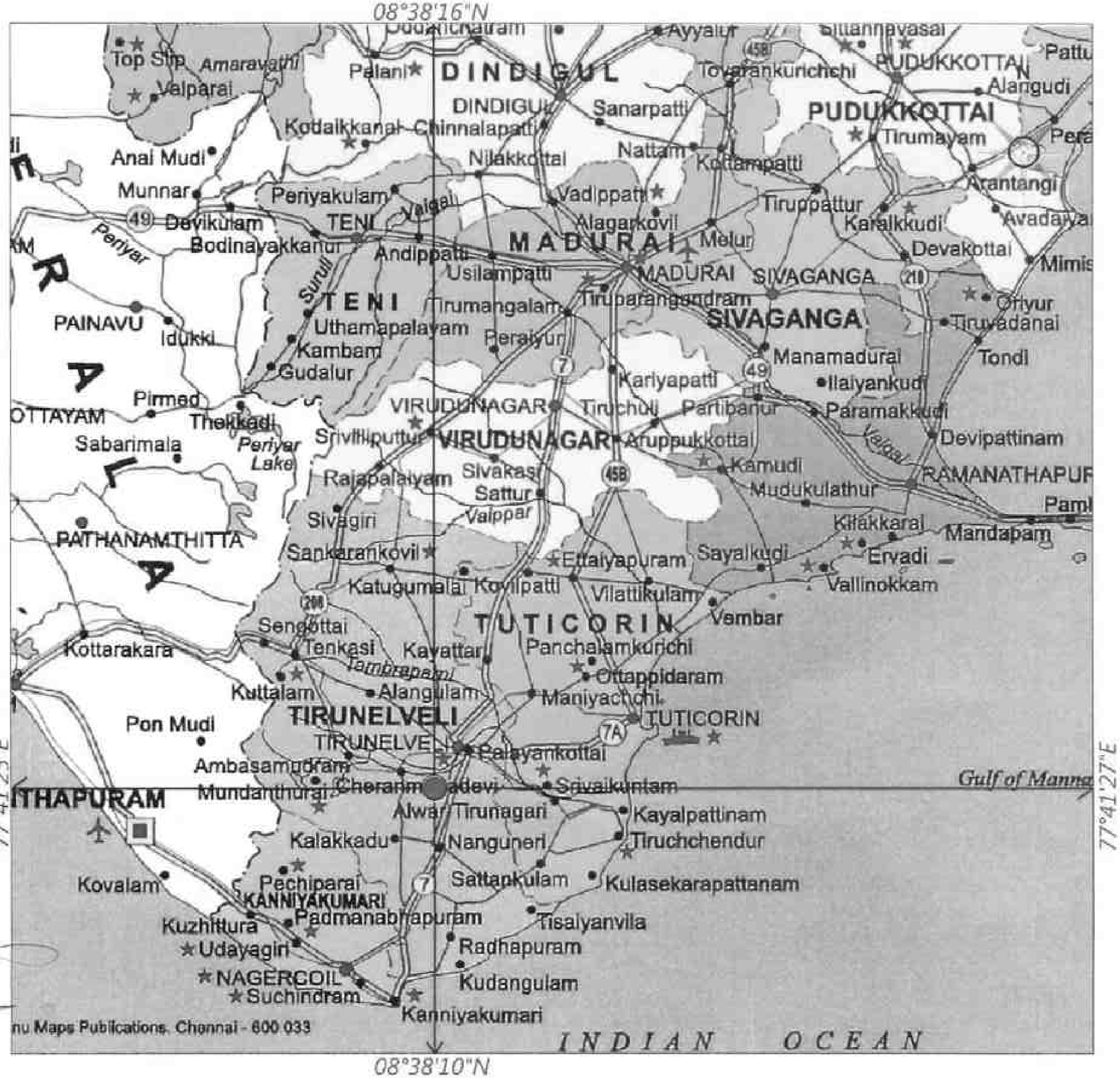


PLATE NO: I

DATE OF SURVEY :

APPLICANT:

THIRU JOSEPH JOHN SAMUEL
S/o.G.JEBARAJAN (LATE),
34, CHELLATHAI NAGAR,
MAHILCHI NAGAR, PERUMAL PURAM,
TIRUNELVELI DISTRICT - 627007.

QUARRY LEASE APPLIED AREA:

S.F.NOS : 845/1B & 845/2B,
EXTENT : 0.55.0 Ha,
VILLAGE : THARUVAI,
TALUK : PALAYAMKOTTAI,
DISTRICT : TIRUNELVELI.

INDEX

Q. L.APPLIED. AREA: ●

TOPO SHEET NO : 58 H / 10

LATITUDE :08°38'10"N to 08°38'16"N

LONGITUDE :77°41'25"E to 77°41'27"E

LOCATION PLAN

NOT TO SCALE

PREPARED BY :

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED ON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

MINING PLAN APPROVED By Assistant Director of Geology & Mining Tirunelveli Dist

C.NATARAJAN,M.Sc.,M.Phil.,
RECOGNIZED QUALIFIED PERSON
RQP/MAS/004/87/A

KEY PLAN

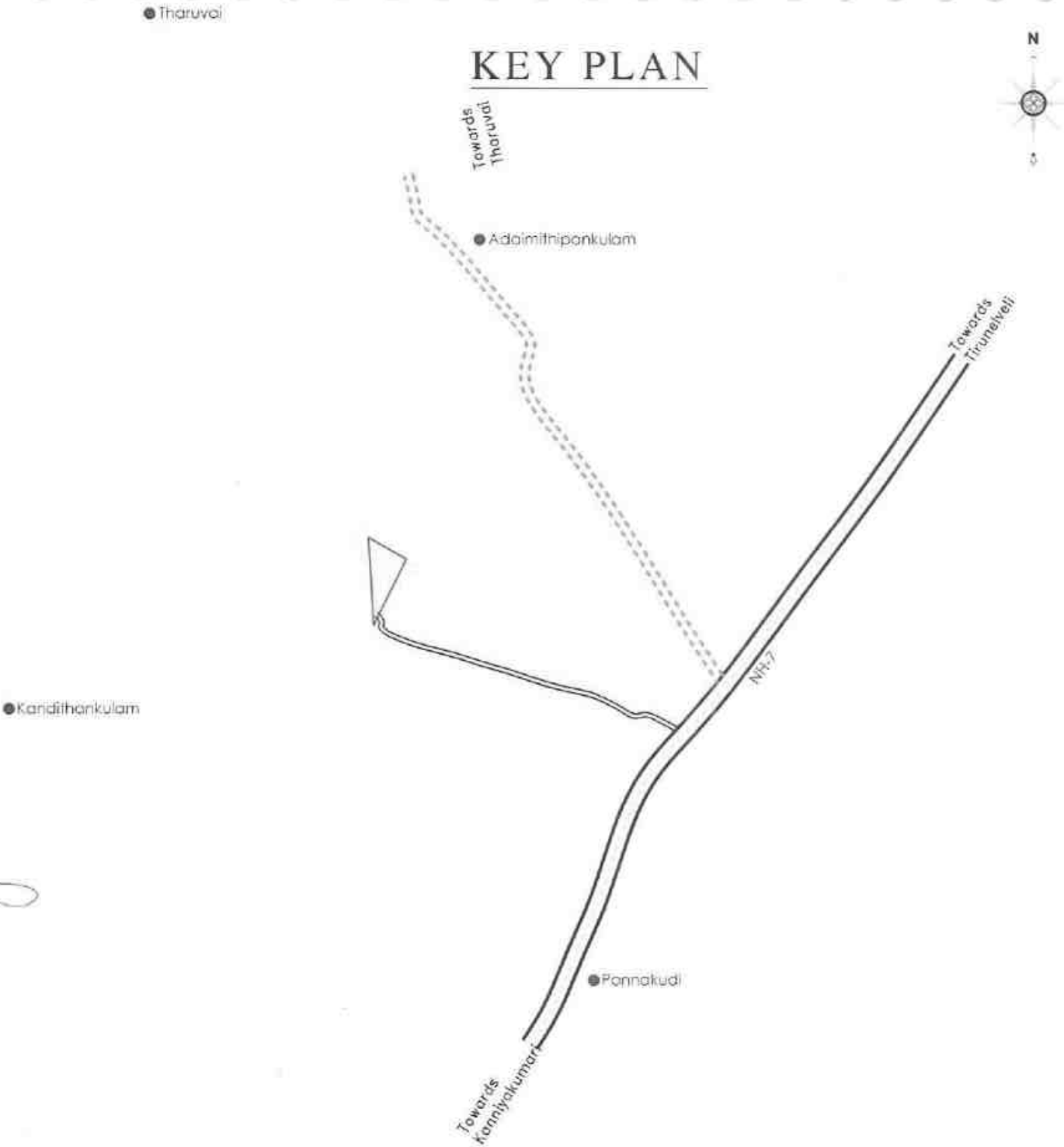


PLATE NO:ID

DATE OF SURVEY :

APPLICANT:

THIRU JOSEPH JOHN SAMUEL,
S/o G.JEBARAJAN (LATE),
54, CHELLATHAI NAGAR,
MAHILCHI NAGAR, PERUMAL PURAM,
TIRUNELVELI DISTRICT - 627007.

QUARRY LEASE APPLIED AREA:

S.F.NOS : 845/1B & 845/2B,
EXTENT : 0.55.0 Ha,
VILLAGE : THARUVAI,
TALUK : PALAYAMKOTTAI,
DISTRICT : TIRUNELVELI.

INDEX

Q.L.A.AREA

APPROACH ROAD

PANCHAYAT ROAD

NATIONAL HIGHWAY

HABITATIONS

KEY PLAN

Not To Scale

MINING PLAN APPROVED By Assistant Director of Geology & Mining Tirunelveli Dist.

PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

C.NATARAJAN,M.Sc.,M.Phil.,
RECOGNIZED QUALIFIED PERSON
RQP/MAS/004/87/A

239

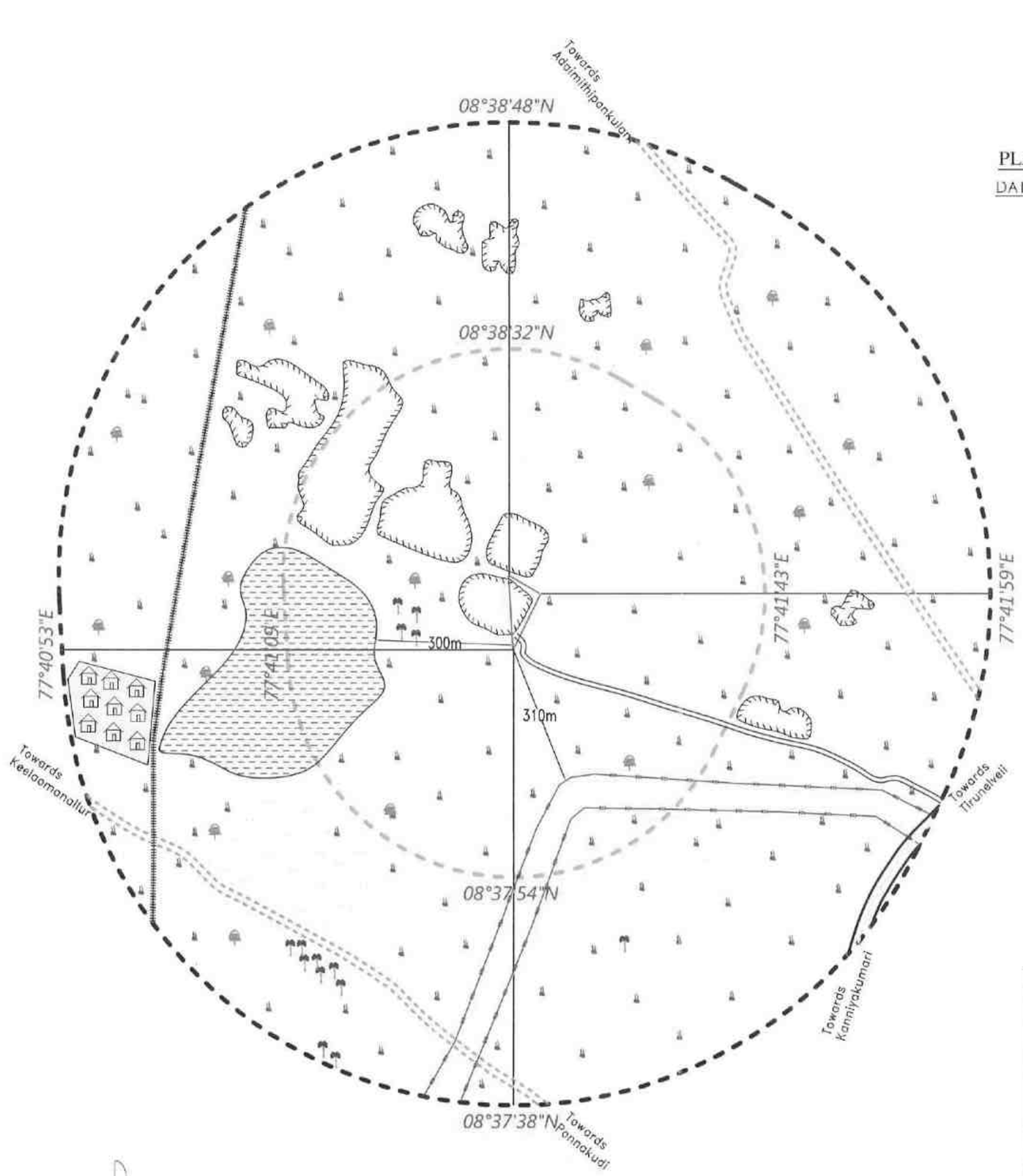


PLATE NO: IA

DATE OF SURVEY :

APPLICANT:

THIRU JOSEPH JOHN S/o.G.JEBARAJAN (LATE)
54, CHELLATHAI NAGAR,
MAHILCHI NAGAR, PERUMAL PURAM,
TIRUNELVELI DISTRICT - 627007

MINING PLAN APPROVED By Assistant Director of Geology & Mining Tirunelveli Dist

QUARRY LEASE APPLIED AREA:

S.F.NOS : 845/1B & 845/2B,
EXTENT : 0.55.0 Ha.
VILLAGE : THARUVAI,
TALUK : PALAYAMKOTTAI,
DISTRICT : TIRUNELVELI.

INDEX

TOPO SHEET NO : 58 H / 10

LATITUDE : 08°38'10"N to 08°38'16"N

LONGITUDE : 77°41'25"E to 77°41'27"E

Q.L.A. AREA	
500M RADIUS	
1KM RADIUS	
APPROACH ROAD	
PANCHAYAT ROAD	
NATIONAL HIGHWAY	
BARREN LAND	
TREES	
AGRICULTURAL LAND	
QUARRY PIT	
HABITATIONS	
CHANNEL	
TANK	
RAILWAY TRACK	

LAND USE PATTERN

DESCRIPTION	AREA IN (%)
ROAD	05
TREES	14
BARREN LAND	57
AGRICULTURAL LAND	16
HABITATIONS	04
WATER BODIES	02
RAILWAY TRACK	02

ENVIRONMENTAL PLAN

SCALE 1:10,000

PREPARED BY :

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

C.NATARAJAN.M.Sc.,M.Phil.,
RECOGNIZED QUALIFIED PERSON
RQP/MAS/004/87/A

MINING PLAN APPROVED By Assistant Director of Geology & Mining Tirunelveli Dist.

PLATE NO: IB

DATE OF SURVEY :

APPLICANT:

THIRU.JOSEPH JOHN SAMUEL,
S/o.GJEBARAJAN (LATE),
54, CHELLATHAI NAGAR,
MAHILCHI NAGAR, PERUMAL PURAM,
TIRUNELVELI DISTRICT - 627007.

QUARRY LEASE APPLIED AREA:

S.F.NOS : 845/1B & 845/2B,
EXTENT : 0.55.0 Ha,
VILLAGE : THARUVAI,
TALUK : PALAYAMKOTTAI,
DISTRICT : TIRUNELVELI.

INDEX

TOPO SHEET NO : 58 H / 10

LATITUDE : 08°38'10"N to 08°38'16"N

LONGITUDE : 77°41'25"E to 77°41'27"E

Q.L.A. AREA

500M RADIUS

1KM RADIUS

APPROACH ROAD

PANCHAYAT ROAD

NATIONAL HIGHWAY

SATELLITE IMAGERY MAP
SCALE 1:10,000

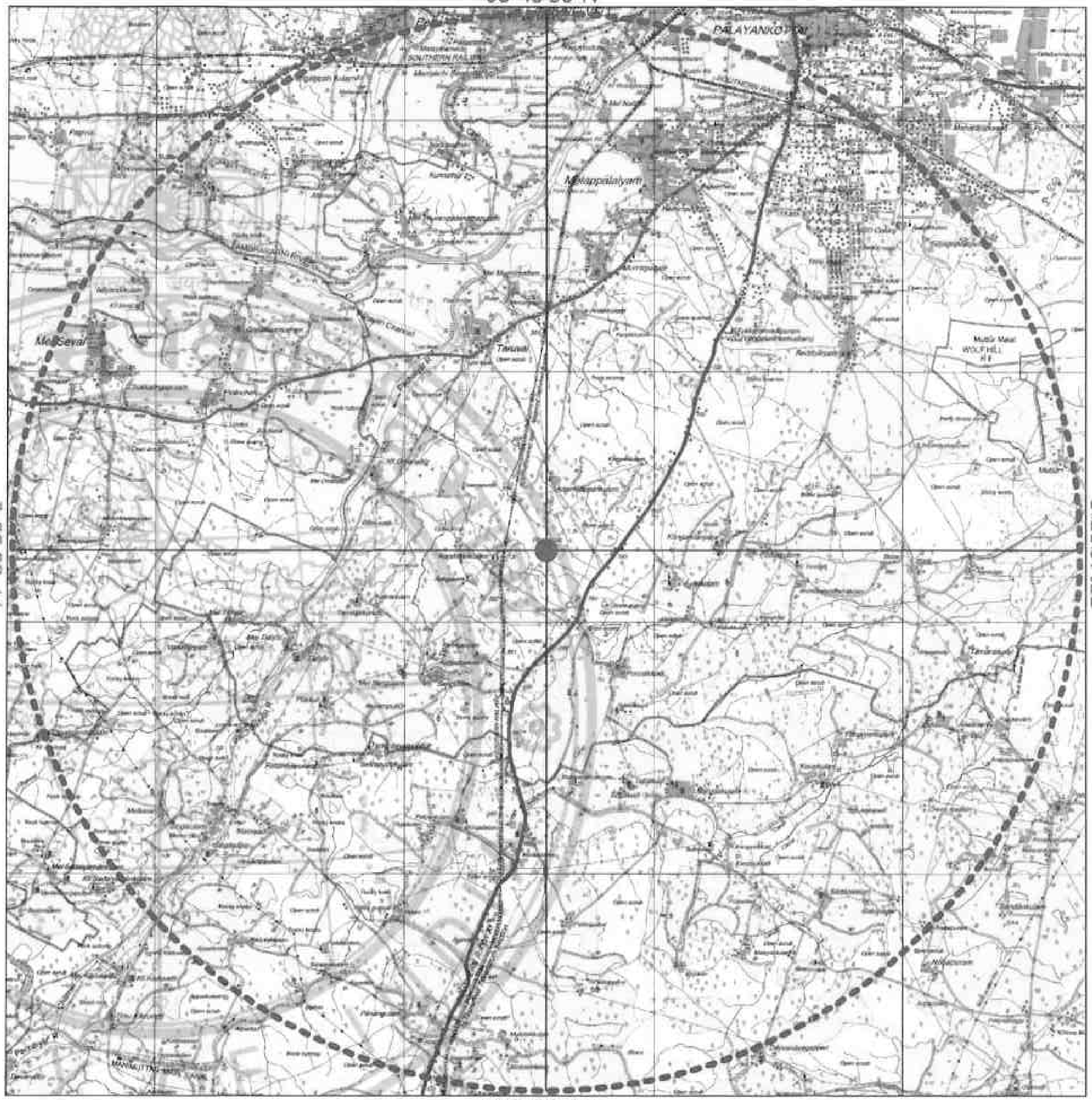
PREPARED BY :

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

C.NATARAJAN,M.Sc.,M.Phil.,
RECOGNIZED QUALIFIED PERSON
RQP/MAS/004/87/A

PLATE NO-I C

DATE OF SURVEY :



APPLICANT:

THIRU.JOSEPH JOHN SAMUEL,
S/o.G.JEBARAJAN (LATE),
54, CHELLATHAI NAGAR,
MAHILCHI NAGAR, PERUMAL PURAM,
TIRUNELVELI DISTRICT - 627007.

MINING PLAN APPROVED
By
Assistant Director
of Geology & Mining
Tirunelv…

QUARRY LEASE APPLIED AREA:

S.F.NOS : 845/1B & 845/2B,
EXTENT : 0.55.0 Ha.
VILLAGE : THARUVAI,
TALUK : PALAYAMKOTTAI,
DISTRICT : TIRUNELVELI.

INDEX

TOPO SHEET NO : 58 H / 10

LATITUDE : 08°38'10"N to 08°38'16"N

LONGITUDE : 77°41'25"E to 77°41'27"E

Q.L.A.AREA

10KM RADIOUS

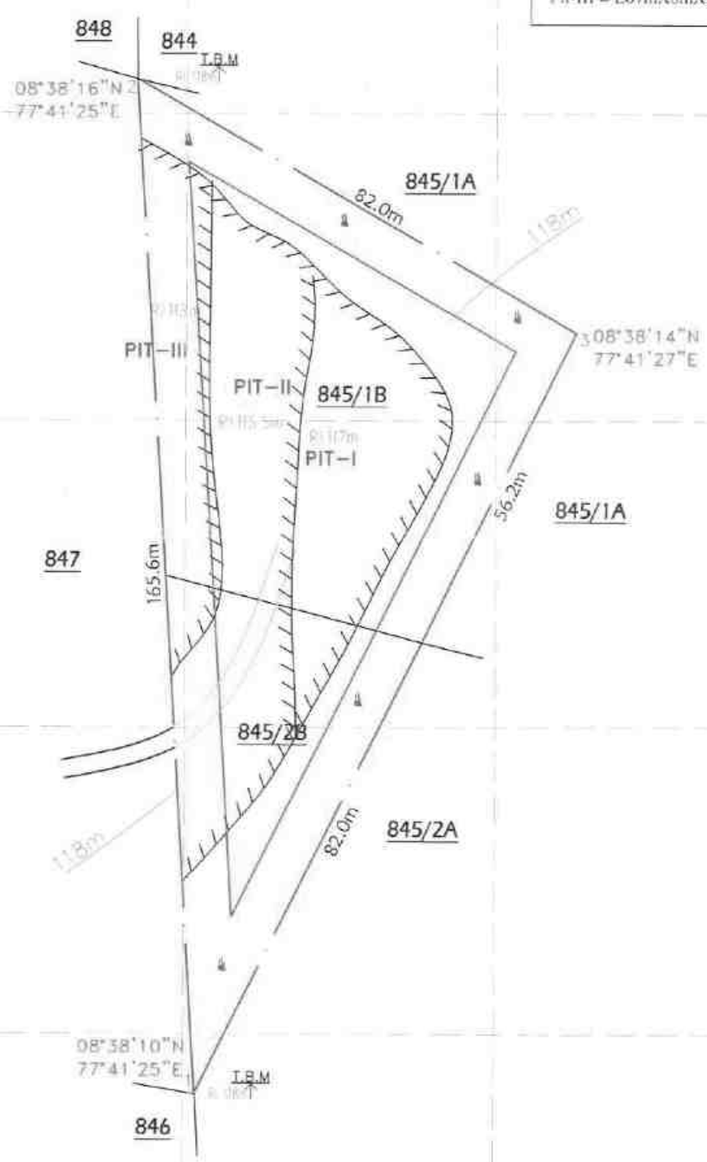
TOPO SKETCH OF QUARRY LEASE APPLIED AREA FOR 10Km RADIUS

SCALE– 1:100000

PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

C.NATARAJAN.M.Sc.,M.Phil.,
RECOGNIZED QUALIFIED PERSON
RQP/MAS/004/87/A



Existing Pit Dimension
Pit-I = L37mX22mXD1.0m
Pit-II = L84mX12mXD2.5m
Pit-III = L67mX8mXD5.0m

N

PLATE NO-II

DATE OF SURVEY :

APPLICANT:

THIRU.JOSEPH JOHN SAMUEL,
S/o.G.JEBARAJAN (LATE),
54, CHELLATHAI NAGAR,
MAHILCHI NAGAR, PERUMAL PURAM,
TIRUNELVELI DISTRICT - 627007.

QUARRY LEASE APPLIED AREA:

S.F.NOS : 845/1B & 845/2B,
EXTENT : 0.55.0 Ha,
VILLAGE : THARUVAI,
TALUK : PALAYAMKOTTAI,
DISTRICT : TIRUNELVELI.

INDEX

QUARRY LEASE BOUNDARY	
7.5m SAFETY DISTANCE	
TEMPORARY BENCH MARK	T.B.M
APPROACH ROAD	
QUARRY ROAD	
CONTOUR	
SCRUB	
QUARRY PIT	

QUARRY LEASE & SURFACE PLAN

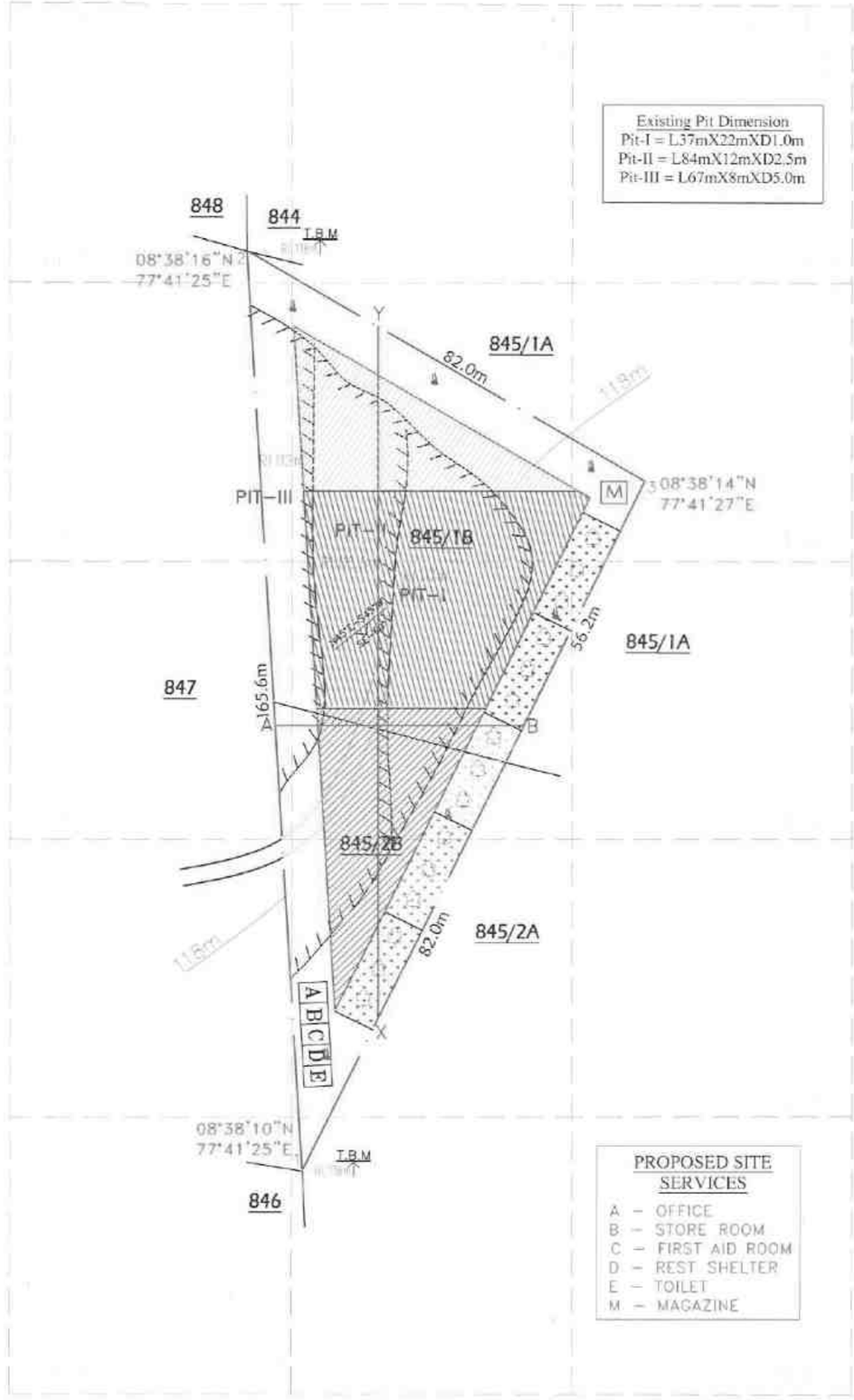
SCALE 1 : 1000

PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

C.NATARAJAN,M.Sc.,M.Phil.,
RECOGNIZED QUALIFIED PERSON
RQP/MAS/004/87/A

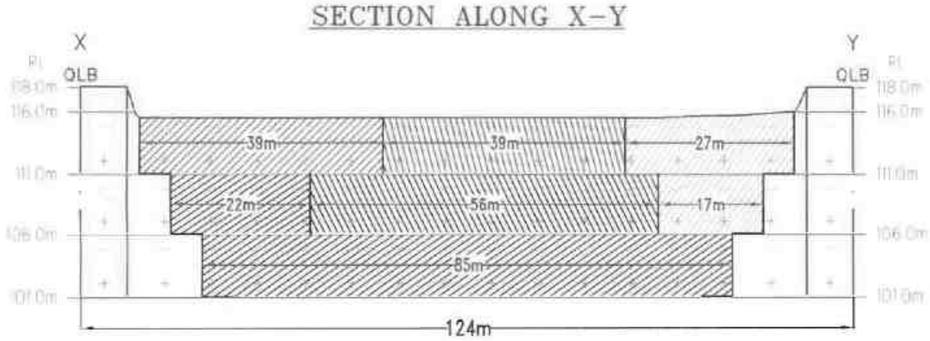
MINING PLAN APPROVED
By
Assistant Director
of Geology & Mining
Tirunelveli Dist



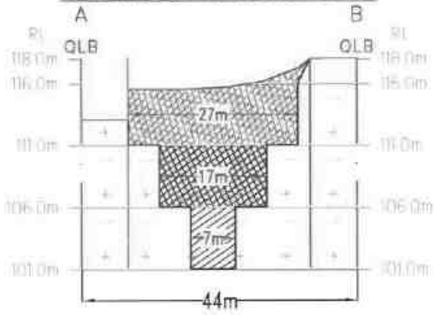
N

1st yr Proposed area to be Quarried	
2nd yr Proposed area to be Quarried	
3rd yr Proposed area to be Quarried	
4th yr Proposed area to be Quarried	
5th yr Proposed area to be Quarried	
1st yr Proposed area to be Planted	
2nd yr Proposed area to be Planted	
3rd yr Proposed area to be Planted	
4th yr Proposed area to be Planted	
5th yr Proposed area to be Planted	

SECTION ALONG X–Y



SECTION ALONG A–B



PRESENT & POST LAND USE PATTERN

DESCRIPTION	PRESENT AREA (Ha)	AREA AT THE END OF THIS QUARRYING PERIOD (Ha)
AREA UNDER QUARRYING	0.24.0	0.31.0
INFRASTRUCTURE	Nil	0.01.0
ROADS	0.01.0	0.01.0
GREEN BELT	Nil	0.10.0
UN–UTILIZED AREA	0.30.0	0.12.0
GRAND TOTAL	0.55.0	0.55.0

PLATE NO-III

DATE OF SURVEY :

APPLICANT:

THIRU.JOSEPH JOHN SAMUEL,
S/o.G.JEBARAJAN (LATE),
54, CHELLATHAI NAGAR,
MAHILCHI NAGAR, PERUMAL PURAM,
TIRUNELVELI DISTRICT – 627007.

QUARRY LEASE APPLIED AREA:

S.F.NOS : 845/1B & 845/2B,
EXTENT : 0.55.0 Ha,
VILLAGE : THARUVAI,
TALUK : PALAYAMKOTTAI,
DISTRICT : TIRUNELVELI.

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7.5m SAFETY DISTANCE	
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QUARRY ROAD	
CONTOUR	
SCRUB	
QUARRY PIT	
GRAVEL	
ROUGH STONE	
STRIKE & DIP	

TOPOGRAPHY, GEOLOGICAL & YEARWISE DEVELOPMENT & PRODUCTION PLAN & SECTIONS

SCALE 1 : 1000
SECTION HOR 1:1000, VER 1:500

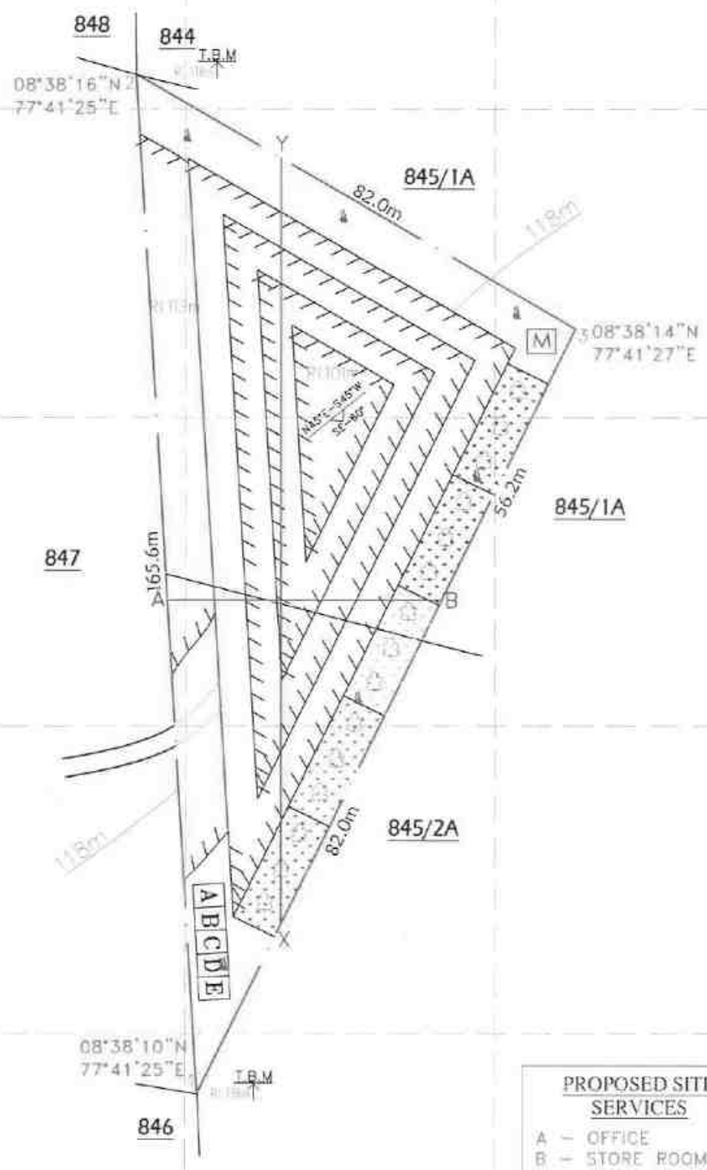
PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED ON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

C.NATARAJAN.M.Sc.,M.Phil.,
RECOGNIZED QUALIFIED PERSON
RQP/MAS/004/87/A

MINING PLAN APPROVED
By
Assistant Director
of Geology & Mining
Tirunelveli Dist

244



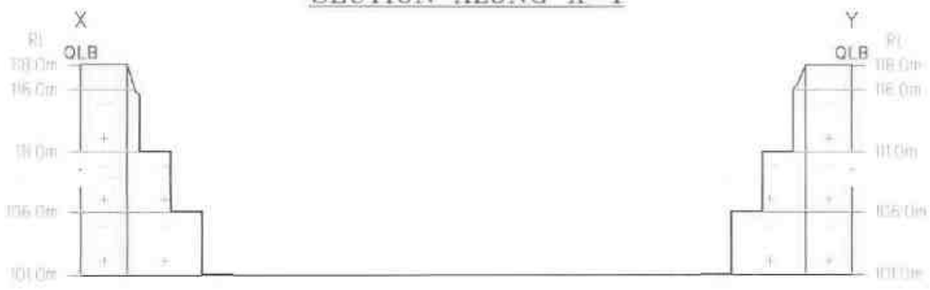
N

1st yr Proposed area to be Planted	
2nd yr Proposed area to be Planted	
3rd yr Proposed area to be Planted	
4th yr Proposed area to be Planted	
5th yr Proposed area to be Planted	

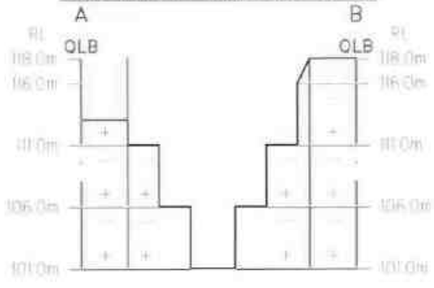
PROPOSED SITE SERVICES

A – OFFICE
B – STORE ROOM
C – FIRST AID ROOM
D – REST SHELTER
E – TOILET
M – MAGAZINE

SECTION ALONG X–Y



SECTION ALONG A–B



ULTIMATE PIT DIMENSION
L109m(Max) X W29m(Avg) X D17m(Max)

PLATE NO-IV
DATE OF SURVEY :

APPLICANT:
THIRU.JOSEPH JOHN SAMUEL,
S/o.G.JEBARAJAN (LATE),
54, CHELLATHAI NAGAR,
MAHILCHI NAGAR, PERUMAL PURAM,
TIRUNELVELI DISTRICT - 627007.

QUARRY LEASE APPLIED AREA:
S.F.NOS : 845/1B & 845/2B,
EXTENT : 0.55.0 Ha,
VILLAGE : THARUVAI,
TALUK : PALAYAMKOTTAI.
DISTRICT : TIRUNELVELI.

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QUARRY PIT	
GRAVEL	
ROUGH STONE	
STRIKE & DIP	

CONCEPTUAL PLAN & SECTIONS
SCALE 1 : 1000
SECTION HOR 1:1000, VER 1:500

PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

C.NATARAJAN.M.Sc.,M.Phil.,
RECOGNIZED QUALIFIED PERSON
RQP/MAS/004/87/A

MINING PLAN APPROVED By Assistant Director of Geology & Mining Tirunelveli Dist

ANNEXURE-VII

VAO CERTIFICATE

சான்று

திருநெல்வேலி மாவட்டம், பாளையங்கோட்டை வட்டம், தருவை கிராமம், புல எண்.845/1B, 845/2B - 0.55.0 ஹெக்டேர் புன்செய் நிலம் பட்டா எண்: 3821-ல் J. ஜோசப் ஜாண் சாமுவேல், த/பெ.G.ஜெபராஜன் என்பவர் பெயரில் கிராம கணக்கில் தாக்கலாக்கியுள்ளது. மேற்படி நிலங்களை சுற்றி 500 மீட்டர் சுற்றளவில் குடியிருப்பு பகுதிகளோ, உயர் அழுத்த மின்சார கம்பிகளோ, வரலாற்று சிறப்புமிக்க புராதன சின்னங்களோ ஏதும் இல்லை என சான்றளிக்கிறேன்.

M. [illegible]
02/12/2021

கிராம நிர்வாக அலுவலர்
47. தருவை கிராமம்,
பாளையங்கோட்டை வட்டம்.

TOPOGRAPHICAL VIEW OF THARUVAI ROUGH STONE AND GRAVEL QUARRY

Name of the applicant	:	J.Joseph John Samuel
S.F.No.	:	845/1B, 845/2B
Extent	:	0.55.0.Ha
Name of the Village	:	Tharuvai,
Taluk	:	Palayamkottai
District	:	Tirunelveli.

M. [illegible] 02/12/2021

Place :

Date :

VAO SIGN & SEAL

கிராம நிர்வாக அலுவலர்
47. தருவை கிராமம்,
பாளையங்கோட்டை வட்டம்

ANNEXURE-VIII BLASTING AGREEMENT

Endorsed after Inspection
C.G. Kalambe 11/07/2017
DY CCE., Chennai.

Licence Endorsed under Rule 107(3) of Explosives Rules,2008
By Shri C.G.Kalambhe, Deputy Chief Controller of Explosives, Chennai on 11/07/2017

अनुज्ञप्ति प्ररूप एलई – 7 | LICENCE FORM LE-7
(विस्फोटक नियम 2008 की अनुसूची 4 के भाग 1 का अनुच्छेद 7 देखें)
(See article no 7 of Part 1 of Schedule IV of Explosives Rules, 2008)

अनुज्ञप्ति : सड़क वैन में विस्फोटकों के परिवहन के लिए
Licence to : transport explosives in a road van

अनुज्ञप्ति संख्या / Licence No. : E/SC/TN/25/1203(E102419)
वार्षिक फीस रूपए / Annual Fee Rs : 2500/-

1. अनुज्ञप्ति एतद्द्वारा जारी की जाती है
Licence is hereby granted to : **M/s ARASAN TRADING COMPANY (Occupier : S.Ramachandran,Partner,M/s ARASAN TRADING COMPANY)**
3, Kovalan Street, Palayamkottai, Tirunelveli,
District-THIRUNELVELI, State-Tamil Nadu, Pincode-627002
2. अनुज्ञप्तिधारी की प्रास्थिति / Status of licensee : **Partnership Firm**
3. सड़क वैन की विशिष्टियाँ / Particulars of the road van:

पंजीकरण संख्या / Registration No.	**TN 72 BF 8566**
यान का मेक एवं मॉडल / Make and model of vehicle	Mahindra and Mahindra BOLERO/2017
लदान रहित वजन / Unladen weight	1725 Kg(s)
लदान सहित अधिकतम वजन / Maximum laden weight	2960 Kg(s)
परिवहन के लिए अनुज्ञेय विस्फोटकों की अधिकतम मात्रा Maximum quantity of explosives permitted for transport	1235 Kg(s)
इंजिन संख्या / Engine No.	TBH1E58462
चैसिस संख्या / Chassis No.	MAIZU2TBKH1E42868
अन्य फिटिंस का विवरण / Desription of Other Fittings	Fire Extinguisher, Battery cut off switch, spark arrester
वाहन के लिए अनुमन्य विस्फोटकों की मात्रा / Quantity of Explosives permitted to carry	1235 Kg(s)

4. अनुज्ञप्त परिसर निम्नलिखित आरेखण (आरेखणों) के अनुरूप होना चाहिए / The licensed premises shall conform to the following drawing(s):
आरेखण संख्या / **Drawing No : E/SC/TN/25/1203(E102419)** दिनांक / **dated : 06/07/2017**
5. समय समय पर यथा संशोधित विस्फोटक अधिनियम, 1884 और उसके अधीन बनाए गए विस्फोटक नियम, 2008 के उपबन्धों और शर्तों एवं निम्नलिखित अनुलग्नकों के अधीन अनुज्ञप्ति प्रदान की जाती है |
The licence is granted subject to the provision of Explosives Act 1884 as amended from time to time and the Explosives Rules, 2008 framed thereunder and the conditions and the following annexures....
(क) उपर्युक्त क्रम संख्या 4 में यथाकथित सड़क वैन का आरेखण / (a) Drawings of the road van as stated in serial no.4 above.
(ख) अनुज्ञापन प्राधिकारी द्वारा हस्ताक्षरित शर्तें / (b) Conditions signed by the licensing authority.
6. यह अनुज्ञप्ति तारीख **31 मार्च 2022** तक विधिमान्य रहेगी / This licence shall remain valid till **31st day of March 2022**

यह अनुज्ञप्ति, अधिनियम या उसके अधीन विरचित नियमों या इस अनुज्ञप्ति की शर्तों के उल्लंघन, अनुसूची 5 के भाग 4 में सन्दर्भित, जहाँ भी लागू हो, या यदि अनुज्ञप्त परिसर आरेखण या उससे संलग्न उपाबन्धों में दर्शाए गए विवरण के अनुरूप नहीं पाए जाने पर निलम्बित या प्रतिसंहृत की जा सकती है।
This licence is liable to be suspended or revoked for any violation of the Act or rules framed there under or the conditions of this licence as set forth under , wherever applicable, referred to in Part 4 of Schedule V or if the licensed premises are not found conforming to the description shown in the plans and annexure attached hereto.

दिनांक / Date: 06/07/2017

संयुक्त मुख्य विस्फोटक नियंत्रक | Joint Chief Controller of Explosives
दक्षिणांचल, चेन्नै | South Circle, Chennai

अनुज्ञप्ति के नवीनीकरण हेतु पृष्ठांकन / Endorsement for renewal of licence:

नवीनीकरण की तिथि Date of Renewal	वैधता समाप्ति की तिथि Date of Expiry	अनुज्ञापन प्राधिकारी के हस्ताक्षर Signature of licensing authority

सांविधिक चेतावनी : विस्फोटकों का लापरवाही से प्रयोग या दुरुपयोग, विधि के अधीन गम्भीर दाण्डिक अपराध होगा।
Statutory Warning : **Mishandling and misuse of explosives shall constitute serious criminal offence under the law.**

शर्तें / Conditions

1. यह अनुज्ञप्ति किसी अन्य सड़क वैन को अंतरणीय नहीं है।
This licence is not transferable to any other explosives van.
2. वाहन, उसकी बॉडी और अन्य फिटिंग में कोई भी परिवर्तन, अनुज्ञापन प्राधिकारी के अनुमोदन के बिना नहीं किया जाना चाहिए।
No alterations should be made to the vehicle, its body and other fittings without approval from the licensing authority.
3. यह अनुज्ञप्ति या उसकी अधिप्रमाणित प्रति वैन में रखी जाएगी एवं निरीक्षण अधिकारी के मांगे जाने पर उसे प्रस्तुत किया जाएगा।
This licence or its authenticated copy shall at all times be kept in the van and produced on demand by an inspecting officer.
4. सड़क यान का, विस्फोटकों के परिवहन के लिए तब तक प्रयोग नहीं किया जाएगा जब तक कि वह ठीक हालत में नहीं है और विस्फोटक नियम 2008 का अनुपालन नहीं करती है।
The road van shall not be used for transport of explosives unless it is in a fit condition and complies with the Explosives Rules, 2008.
5. सड़क यान का प्रयोग, इस अनुज्ञप्ति द्वारा प्राधिकृत सामग्री से भिन्न किसी सामग्री के लिए तब तक नहीं किया जाएगा जब तक कि अनुज्ञापन प्राधिकारी द्वारा इसकी लिखित अनुमति न दे दी हो।
The road van shall not be used for transport of any material other than that authorised by this licence, unless permitted by licensing authority in writing.
6. सड़क यान में धूम्रपान नहीं किया जाएगा व उसमें अग्नि या कृत्रिम प्रकाश या कोई ऐसे वस्तु जिससे आग लग सकती हो, की अनुमति दी जाएगी।
No smoking and no fire or artificial light or any article capable of causing fire shall be allowed on the explosives van.
7. यान का प्रयोग यात्रियों के वहन के लिए नहीं किया जाएगा।
The vehicle shall not be used for carrying passenger.
8. जिस समय सड़क यान पर विस्फोटकों की लदाई या उतराई या परिवहन किया जा रहा हो, उस समय सड़क यान ऐसे किसी सक्षम व्यक्ति के प्रभार में होगी जिसे विस्फोटकों की चढ़-उतराई करने का अनुभव है और उनसे भलीभांति परिचित है। जहाँ यान अनुज्ञप्तिधारी द्वारा न चलाया जा रहा हो वहाँ एक ऐसा दस्तावेज, जिस पर अनुज्ञप्तिधारी के हस्ताक्षर हों और जब व्यक्तियों का नाम दर्ज हो जिन्हें यान को चलाने के लिए प्राधिकृत किया गया हो, वैन के साथ ले जाया जाएगा और किसी निरीक्षण अधिकारी द्वारा मांग की जाने पर उसे पेश किया जाएगा।
Road van, while explosives are being loaded or unloaded or transported shall always be under the charge of competent person who shall be experienced in handling of explosives and fully conversant there under. Where the vehicle is not driven by the licence holder, a document signed by the licensee naming persons authorised to drive and accompany the vehicle shall be carried in the van and produced on demand to an inspecting officer.
9. सड़क यान में किसी भी विस्फोटक का परिवहन तब तक नहीं किया जाएगा जब तक कि वे विस्फोटक नियमों के अनुसार या मुख्य विस्फोटक नियंत्रक द्वारा विनिर्दिष्ट रीति में पैक न कर दिए गए हों।
No explosives unless they are packed in accordance with the Explosives Rules or in a manner specified by the Chief Controller shall be transported in the explosives van.
10. किसी अन्य विस्फोटकों के साथ डिटोनेटरों का परिवहन नहीं किया जाएगा।
Detonators shall not be transported with any other explosives.
11. यदि सड़क यान में कोई टूट फूट हो जाती है या उसमें आग लग जाती है या विस्फोट हो जाता है अथवा सड़क यान दुर्घटना ग्रस्त हो जाती है तो ऐसी टूट फूट, दुर्घटना, अग्नि या विस्फोट की पूरी रिपोर्ट के साथ इस तथ्य की जानकारी अनुज्ञापन प्राधिकारी को तुरन्त दी जाएगी। यदि ऐसी दुर्घटना, अग्नि या विस्फोट में किसी व्यक्ति की मृत्यु हो जाती है या किसी व्यक्ति या सम्पत्ति को गम्भीर क्षति पहुँचती है तो उसकी रिपोर्ट निकटतम पुलिस स्टेशन को तुरन्त की जाएगी।
Any breakdown, accident, fire or explosion occurring in or involving the road van, shall be immediately reported to the licensing authority together with a full report of such breakdown, accident, fire or explosion. If such accident, fire or explosion is attended with loss of human life or serious injury to person or property, a report shall also be made immediately to the nearest Police Station.
12. विस्फोटकों को यान में प्रेषक के अनुज्ञप्त परिसर में ही लादा जाएगा और गंतव्यिती के अनुज्ञप्त परिसर पर ही यान से उतारा जाएगा।
The explosives shall be loaded into the van only at the licensed premises of consignor and unloaded from the van at the licensed premises of the consignee.
13. अनुज्ञप्तिधारी, परिवहन किए जाने वाले विस्फोटकों का लेखा-जोखा प्रपत्र आर.ई.-6 में रखेगा और निरीक्षण अधिकारी द्वारा मांगे जाने पर प्रस्तुत करेगा।
The licensee shall maintain account of explosives transported in Form RE-6 and present the same on demand by an inspecting officer.
14. अनुज्ञप्तिधारी और कर्मचारी परिसर के भीतर आपात के दौरान की जाने वाली प्रक्रिया से अवगत होंगे।
The licensee and the employee shall be conversant with procedure to be taken during the emergency within the premises.
15. किसी निरीक्षण करने या नमूना लेने वाले अधिकारी को सभी युक्तियुक्त समय पर अनुज्ञप्त परिसर में अबाध पहुँच प्रदान की जाएगी और यह अभिनिश्चित करने के लिए कि अधिनियम और इन नियमों के उपबन्धों तथा सुरक्षा सम्बन्धी शर्तों का समाक् रूप से पालन किया जाता है, इस अधिकारी को प्रत्येक सुविधा उपलब्ध कराई जाएगी।
Free access shall be given at all reasonable times to any inspecting or sampling officer and every facility shall be afforded to the officer for ascertaining that the provisions of the Act or these rules and these conditions are duly observed.
16. यदि अनुज्ञापन प्राधिकारी या विस्फोटक नियंत्रक, लिखित में अनुज्ञप्तिधारक को ऐसी संस्तुतियों को क्रियान्वित करने के लिए, जो ऐसे प्राधिकारी की राय में असाम्य जोखिम उत्पन्न कर सकता है और स्थल पर या स्थल से बाहर व्यक्तियों की सुरक्षा के लिए आवश्यक है, सूचित करता है तो अनुज्ञप्तिधारी उन संस्तुतियों को निष्पादित करेगा और ऐसे प्राधिकारी द्वारा विनिर्दिष्ट अवधि के भीतर अनुपालन की रिपोर्ट देगा।
If the licensing authority or a Controller of Explosives informs in writing., the holder of the licence to carry out recommendations, which are in the opinion of such authority may pose unacceptable risk and so necessary for the safety of either on-site or off-site persons , the holder of the license shall execute the recommendations and report compliance within the period specified by such authority.
17. अग्नि या विस्फोटक के कारण होने वाली दुर्घटना और विस्फोटकों की क्षति, कमी या चोरी के बारे में निकटतम पुलिस स्टेशन और अनुज्ञापन प्राधिकारी तथा अनुज्ञापन प्राधिकारी के स्थानीय कार्यालय को तुरन्त रिपोर्ट की जाएगी।
Accidents by fire or explosion and losses, shortage or theft of explosives shall be immediately reported to the nearest police station and the licensing authority and local office of the licensing authority

संयुक्त मुख्य विस्फोटक नियंत्रक / Joint Chief Controller of Explosives
दक्षिण मंडल / चेन्नै | South Circle, Chennai

ANNEXURE-IX AFFIDAVIT AND CER DETAILS

AFFIDAVIT TO SEIAA, TAMIL NADU

I Thiru.Joseph John Samuel, S/o. G.Jebarajan (Late), 54, Chellathai Nagar, Mahilchi Nagar, Perumal Puram, Tirunelveli District-627007. Do hereby solemnly declare and sincerely affirm that, I have applied for getting environment clearance to SEIAA, Tamil Nadu for quarry lease for Rough Stone, Jelly and Gravel quarry over an extent of 0.55.0hectares of Patta land in S.F.Nos.845/1B & 845/2B of Tharuvai Village, Palayamkottai Taluk, Tirunelveli District, Tamil Nadu State,

1. I swear to state and confirm that within 10km area of the quarry site, we have applied for environmental clearance, none of the following is situated
   a. Protected areas notified under the wild life (Protection) Act, 1972 (NBWL).
      Wild Life Sanctuary: Nil within 10km Radius
      Kalakad Mundanthurai Tiger Reserve is 13.08km – (N),
      Koonthankulam Bird Sanctuary is 16.6km - (SE),
      Western Ghats ESA boundary as per MoEF & CC draft notification dated 3rd October 2018 is located 16.9km from the lease area on the Southwestern side.

b. Critically polluted areas as notified by the central pollution control board constituted under water (Prevention and control of Pollution) Act 1974.

c. Interstate boundaries and international boundaries within 10km radius from the boundary of the proposed site.

2. I will complete the following Corporate Environment Responsibility (CER) activities before commencement of the quarrying activities.

CER Activity	**Project cost (Rs)**	**CER cost 2.0% of Project cost (Rs)**
Carrying out various developmental works in the nearby region based on the need of the locals.	Rs.50,50,000/-	Rs.1,01,000/-
Total cost Allocation	Rs.50,50,000/-	Rs.1,01,000/-

3. Details of quarry within 500m radius from the applied area:

S.No	**Name and address of the lessee**	**Quarry location**	**Extent in Hectare**	**Lease Period**
a. Existing Quarries				
1	A.Sankaranarayanan @ Sankaran, 24B, Pillaimar Street, Tisaiyanvilai Taluk, Tirunelveli District.	S.F.No.844, 848 & 849/2 Tharuvai village	2.36.5ha	Proceedings Rc.No.M1/27262/2016 dated 13.07.2018 for a period 5 years from 17.07.2018 to 16.07.2023
2	D.Mercy Mary, W/o.G.Jebarajan, 54, Sivan Mela Ratha Veethi, Palayamkottai Taluk, Tirunelveli District.	S.F.No.851, Tharuvai village	2.51.5ha	Proceedings Rc.No.M1/54558/2014 dated 16.10.2017 for a period 5 years from 25.10.2017 to 24.10.2022

3	D.Mercy Mary, W/o.G.Jebarajan, 54, Sivan Mela Ratha Veethi, Palayamkottai Taluk, Tirunelveli District.	S.F.No.847, Tharuvai village	1.62.5ha	Proceedings Rc.No.M1/3939/2017 dated 13.07.2018 for a period 5 years from 17.07.2018 to 16.07.2023
	a. Abandoned Quarries			
1	A.S.Kumar, 52A/3, TIruvandram Road, Palayamkottai, Tirunelveli.	S.F.No.855/2, 856, 857/1, 858/2, 858/3, 859/2, 860/2 861 & 867, Tharuvai village	3.96.0ha	Proceedings Rc.No.M1/18559/2010 dated 06.01.2012 for a period 5 years from 07.02.2012 to 06.02.2017
	b. Proposed Quarries			
1	Thiru.K.Selvaraj, S/o.Kandasamy, 212A, Udankudi Road, Tisayanvilai Taluk, Tirunelveli District.	S.F.No.824/2, 825/2A, 825/2B, 826/1(P), 826/2(P), 842/2(P), 843, 845/1A and 845/2A(P). Tharuvai village	4.45.20ha	Proposed Quarry
2	Thiru.Joseph John Samuel, S/o. G.Jebarajan (Late), 54, Chellathai Nagar, Mahilchi Nagar, Perumal Puram, Tirunelveli District-627007.	S.F.Nos.845/1B & 845/2B Tharuvai village	0.55.0ha	Under Proposed Quarry

3	G.Jebarajan, No.54, Sivan West Car Street, Tisayanvilai Taluk, Tirunelveli – 2.	S.F.No.857/1, 2, 856/2, 858/1B, 2B & 3B Tharuvai village	2.63.0ha	Proposed Quarry

The total lease within the 500m radius (existing + proposed) (3nos + 3nos) works out to 14.13.70ha including this lease area. **As such cluster situation is applicable and TOR for this project is applied**.

4. There will not be hindrance or disturbance to the people living no enrooted/ nearby our quarry site while transporting the mineral and due to quarrying activities.
5. There is no approved habitation within 300m radius from the periphery of our quarry.
6. I swear that afforestation will be carried out during the course of quarrying operation and maintained.
7. The required insurance will be taken in the name of the laborers working in our quarry site.
8. The existing road from the main road to quarry is in good condition and the same will be maintained and utilized for Transportation of Rough Stone, weathered rock and Gravel.
9. I will not engage any child labor in our quarry site and I aware that engaging child labor is punishable under the law.
10. All types of safety / protective equipment will be provided to all the laborers working in our quarry.
11. No permanent structures, temple etc., are located within 500m radius from the periphery of our quarry.

I ensure to do the social and Environment commitment as mentioned in the Mining plan to the best of our knowledge.

Notary Sign & Seal

Quarry owner sign & Seal

Joseph John Samuel

ANNEXURE-X NABET CERTIFICATE

QUALITY COUNCIL® OF INDIA
Creating an Ecosystem for Quality

National Accreditation Board for Education and Training

Certificate of Accreditation

Eco Tech Labs Pvt Ltd.,

48, 2nd Main Road, Ram Nagar South Extension, Pallikaranai, Chennai- 600100, T.N.

*The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –*

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals - including Open cast only	1	1 (a) (i)	B
2	Thermal power plants	4	1(d)	A
3	Coal washeries	6	2 (a)	B
4	Metallurgical industries - Ferrous only	8	3 (a)	B
5	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	21	5 (f)	A
6	Airports	29	7 (a)	A
7	Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes	31	7 (c)	A
8	Building and construction projects	38	8 (a)	B
9	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in SAAC minutes dated Apr. 20, 2021 and supplementary minutes dated Oct.19, 2021 posted on QCI-NABET website

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/22/2217 dated Jan. 19, 2022. The accreditation needs to be renewed before the expiry date by Eco Tech Labs Pvt. Ltd., Chennai following due process of assessment.

Sr. Director, NABET
Dated: Jan. 19, 2022

Certificate No.
NABET/EIA/2124/SA 0147

Valid up to
Sep. 15, 2023

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.