SUMMARY

OF

DRAFT EIA / EMP REPORT

FOR

ROUGHSTONE AND GRAVEL QUARRY

A. Project Proponent Details	
Name	**THIRU. S. BALAKRISHNAN**
Address	**1/105, West Street, Vellur, Virudhunagar Taluk, Virudhunagar District – 626 005**
B. Location Details	
Extent	**1.60.50 HA**
Survey No.	**203/7**
Location	**APPAYANAICKENPATTI VILLAGE, VEMBAKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**
C. Production Details	
Production	**ROUGH STONE - 1,85,232 m3, GRAVEL - 11,834 m3**
Depth	**39 m**
Lease Period	**10 YEARS**
D. EIA/EMP details	
ToR reference	**TO25B0108TN5106991N DATED 07.04.2025**
Baseline Monitoring	**SUMMER SEASON (MAR - MAY 2025)**

CONSULTANT

CREATIVE ENGINEERS & CONSULTANTS

NABET ACCREDITED CONSULTANCY, NABL ACCREDITED TESTING LAB

9B/4, Bharathwajar Street, East Tambaram, Chennai-600059.

Ph: 044-22395170, Cell: 09444133619 Email : cecgiri@yahoo.com,

JULY- 2025

SUMMARY

1.1 INTRODUCTION:

Thiru. S. Balakrishnan propose to operate Rough Stone and Gravel Quarry at Survey No. 203/7, over an area of 1.60.50 hectares In Appayanayyakanpatti Village, Vembakottai Taluk, Virudhunagar District, Tamil Nadu and has initiated action towards obtaining environmental clearance. Production capacity is 1,85,232m3 of Rough Stone & 11,834m3 of Gravel up to depth of 39m for the period of ten years and has initiated action towards obtaining environmental clearance. Entire lease area is private patta land in applicants possession.

Although the individual lease area of this project is less than 5 Ha, the other existing and proposed quarries within the 500m radius cluster along with this subject project works out to >5 Ha. Hence, this proposal is considered under Category – B1 and as per MoEF & CC notification necessitates preparation of EIA/EMP report and public hearing.

Apart from this proposal of Thiru. S. Balakrishnan another proposal of Thiru. R. Gopalakrishnan is also falling in the cluster. As such cumulative impact prediction and individual EMP report preparation is carried out.

This EIA/EMP report for **Thiru. S. Balakrishnan** is prepared based on standard and additional Terms of Reference issued by SEIAA, Tamil Nadu vide TOR Identification No. **TO25B0108TN5106991N dated 07.04.2025** and is in conformance of the generic structure prescribed by MOEF&CC in their notification of September 2006 and the approved mining.

Salient details of the EIA/ EMP report prepared and given below:

Table 1: Salient Details of the Project

Details	
A.Statutory Clearances	
Precise Area Communication	Issued by Department of Geology & Mining vide KV1/717/2024 -Mines, Dated: 24.12.2024.
Mining Plan Approval	Approved Department of Geology & Mining vide Roc. KV1/717/2024, dated 24.01.2025.
Details of Quarries within 500m radius	Approved Department of Geology & Mining vide Roc. KV1/717/2024, dated 24.01.2025.
B. Application for Environmental Clearance	
Terms of Reference	**TO25B0108TN5106991N dated 07.04.2025**
Baseline Data Collection	Carried out by Creative Engineers & Consultants , Chennai for Summer Season (Mar 2025 – May 2025)

C.Site Details	
Location	Appayanaickenpatti village, Vembakottai Taluk, Virudhunagar District, Tamil Nadu
Coordinates	Latitude: 9° 17' 40.72"N to 9° 17' 44.71"N Longitude: 77° 41' 36.40"E to 77° 41' 41.60"E
Nearest Village	Ramalingapuram – 1.0km – (NW) side
Nearest Town	Thiruvengadam -5.0km - NE
Nearest Highway	SH-44 – 3.8Km– SW
Nearest Railway Station	Sivakasi -21km - NE
Nearest Airport	Madurai -75km -NE
Accessibility	Lease area is approachable from the existing road which is connected to Sevalpatti to Thiruvengadam State highway road on the south west.
Topography	The lease area is a plain terrain, Massive formation of Charnokite is clearly visible in the old mined out pit and also the nearby quarry. The slope is gentle towards 'southern side.
D. Environmental Setting of the Study Area	
Nearest Water Bodies	Nikshopa Nadi - 130m (N),Vaippar River-400m- (N), Uppu Odai - 3.2km-(SE), Marugal Odai – 5.2km – (NE), Kayalkudi River - 7.5km – (NE). Nedunkulam Odai - 8.6km – NE.
Nearest Reserve Forests	Nil within 10 km radius
Notified Archaeologically important places, Monuments	Nil within 10km radius
Local Places of Historical and Tourism Interest	Nil within 10 km radius
Environmental sensitive areas, Protected areas as per Wildlife Protection Act, 1972*	Nil within 10km radius
Other industries	Other than crushers, Rough stone quarries, match box, fire works factories no other major industries are located in the study area.
E. Technical Description	
Past production details	-
Geological Reserves	6,11,800 m^3 of rough stone & 16,100 m^3 of gravel
Mineable Reserves	Rough stone - 1,85,232 m3 Gravel - 11,834 m3
Mining Method	Opencast mechanized mining using jackhammer drilling, blasting, excavation through excavator & mineral transport through tippers will be carried out.
Production	Production capacity of 1,85,232 m3 of rough stone and 11,834 m3 of Gravel up to depth of 39m for the period of 10 years
Waste Generation and Management	There is no waste generation anticipated in these quarries since the entire excavated material will be utilized.
Ultimate Depth	39 m
F. Project Requirements	
Manpower	10 persons directly and 50 people indirectly.

Water Requirement and Source	Water Requirement: 8 KLD Source: The required water will be procured initially from outside agencies. Later Rain water harvested in the mine sump can also be used.
Power Requirement	No electricity needed for mining operation. The minimum power requirement for office, etc will be met from state grid.
Site Services	This is a proposed project. Site services like mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.
Project Cost	Rs. **39,88,700 /-**

Figure 1: Location Map

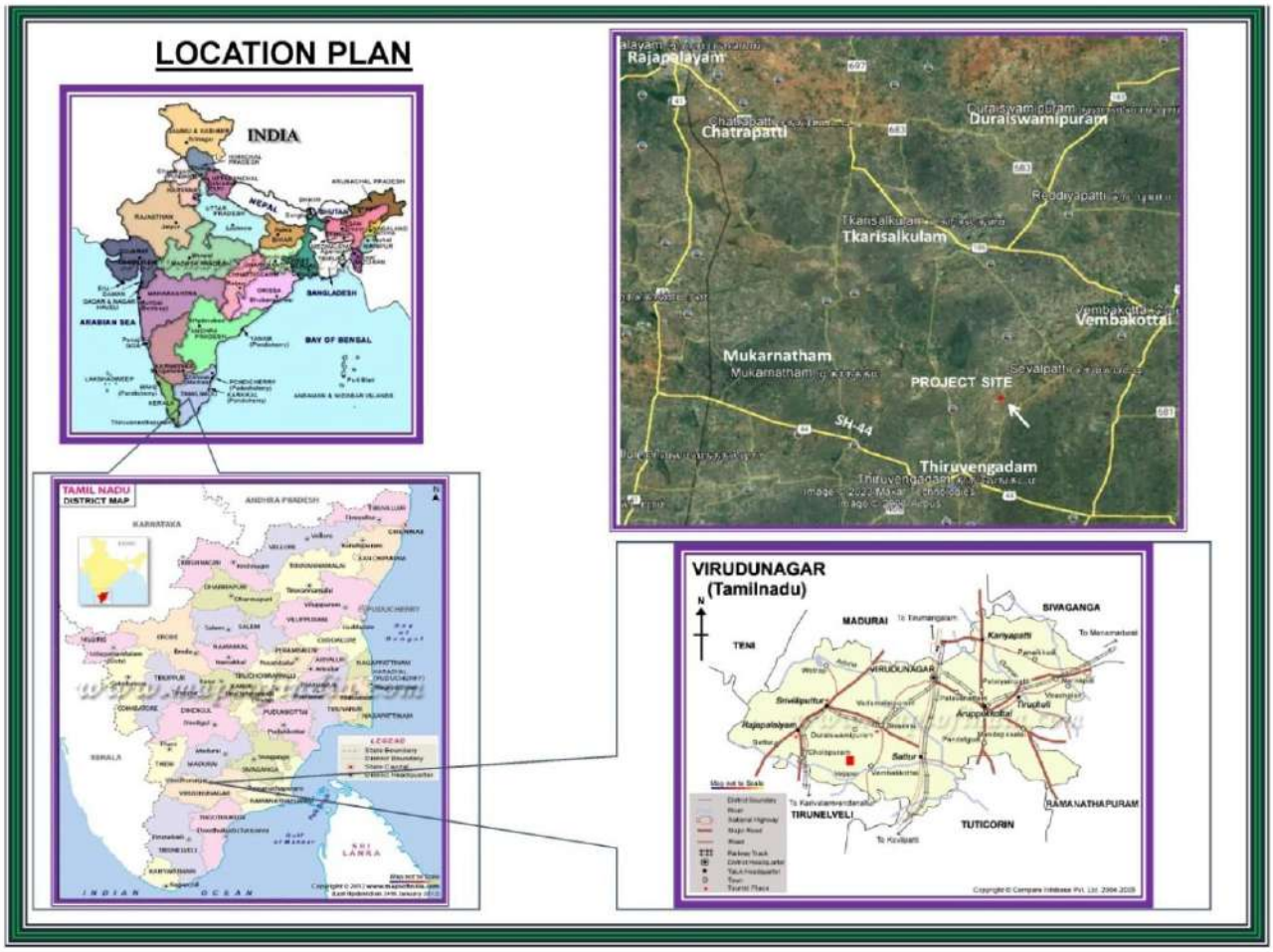


Figure 2: Lease Plan Rough stone and Gravel Quarry

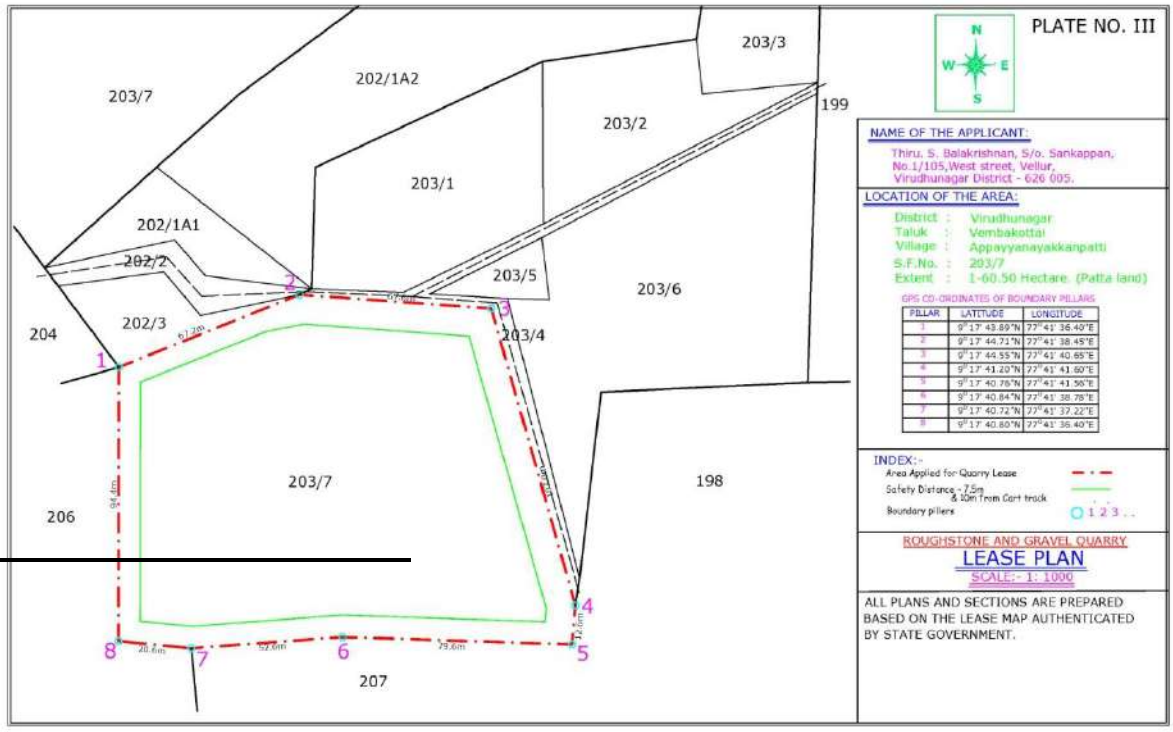
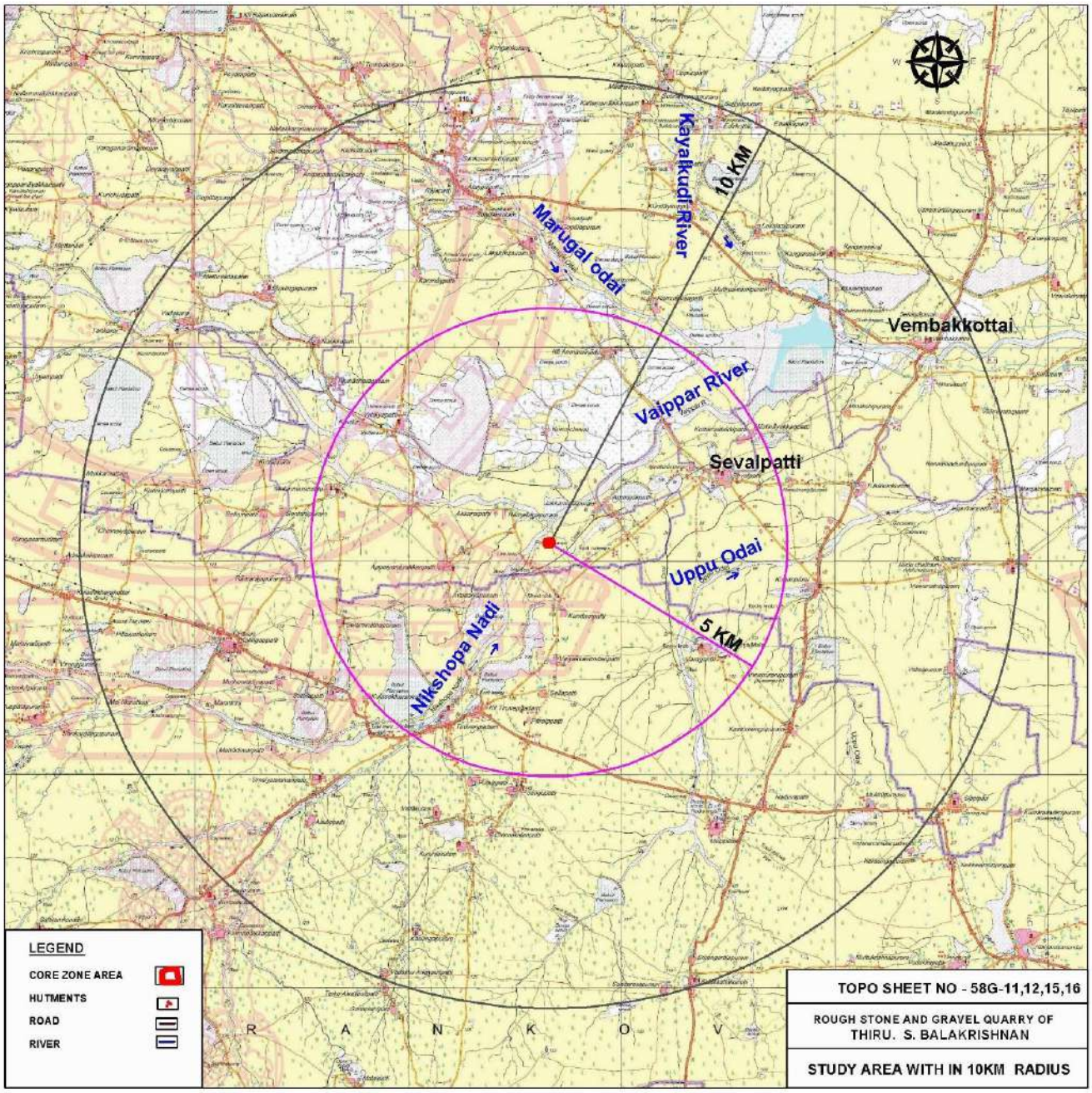


Figure 3: Satellite Imagery Showing Corner Co-ordinates –

Rough astone and Gravel Quarry

Figure 4: Study Area Map



1.3 EXISTING ENVIRONMENTAL SCENARIO:

The studies and data collection have been carried out systematically and meticulously as per relevant IS codes, CPCB and MoEF&CC guidelines and as per approved ToR during **Summer Season (March 2025 to May 2025)** For the purpose of this study, the area has been divided into two zones, namely, core and buffer zones. The combined lease area is considered to be the core zone while the buffer zone encompasses a 10km radius from the periphery of the core zone.

The proposed Rough stone and gravel quarry is located in in Appayanaickenpatti Village, Vembakottai Taluk, Virudhunagar District. Based on 2011 census data, in the 10km radius there are 35 Rural Villages and 2 urban areas from Five Taluks namely Sivakasi, Rajapalayam, Sattur, Sankarankoil, Kovilpatti. of 3 districts namely Virudhunagar, Tirunelveli and of Thoothukkudi District. The demographic profile of the study area is given below:

Table 2: Social, Economic And Demographic Profile of the Study Area

Details	Population	Percentage
A. Gender-wise distribution		
Male Population	49528	49.35
Female Population	50838	50.65
Total	**100366**	**100**
B. Caste-wise population distribution		
Scheduled Caste	23360	23.27
Scheduled Tribes	149	0.15
Other	76857	76.58
Total	**100366**	**100**
C. Literate and Illiterate population		
Literate Males	38114	**54.75**
Literate Females	31498	**45.25**
Total Literate Population	**69612**	**69.36**
Others Males	11414	**37.11**
Others Females	19340	**62.89**
Others Population	**30754**	**30.64**
Total	**100366**	**100**
D. Occupational structure		
Main workers	49466	49.30
Marginal workers	5157	5.10

Details	Population	Percentage
Total Workers	**54623**	**54.40**
Total Non-workers	**45743**	**45.60**
Total	**100366**	**100**

Further developments in this area with respect to these various facilities has occurred over the years.

1.3.1 EXISTING ENVIRONMENTAL QUALITY:

Table 3: Baseline Data

A. Ambient Air Quality Data – 6 Locations			
Parameters	**Core Zone**	**Buffer Zone**	**Limits**
Particulate Matter (Size <10 µm)	57.4 – 73.9	41.1 – 68.0	100
Particulate Matter (Size <2.5 µm)	27.3 – 35.7	19.2 – 31.7	60
Sulphur Dioxide (as SO_2)	5.1 – 8.9	3.9 – 8.6	80
Nitrogen Dioxide (as NO_2)	8.2 – 12.4	6.8 – 12.0	80
Conclusion: The existing Ambient Air Quality levels for PM10, PM2.5, SO2 and NO2, are within the NAAQ standards prescribed CPCB limits. The CO values in all the locations were found to be below detectable limit. Silica values in the study area are found to be below detectable limit. (Detection limit – 0.05 mg/m3)			
B. Water Quality – 6 Locations			
pH at 25 ˚C	7.25 – 7.67	**6.5-8.5**	
Total Dissolved Solids, mg/L	298.56 – 590.7	**2000**	
Chloride as Cl-, mg/L	39.5 – 164	**1000**	
Total Hardness (as CaCO3), mg/L	194 – 396	**600**	
Total Alkalinity (as CaCO3), mg/L	279– 310	**600**	
Sulphates as SO42-, mg/L	16.2 –25.5	**400**	
Iron as Fe, mg/L	0.03 – 0.09	**0.3**	
Nitrate as NO3, mg/L	1.44 – 5.32	**45**	
Fluoride as F, mg/L	0.23 – 0.52	**1.5**	
Conclusion: The water quality of ground water is found to be within the prescribed Permissible limits of IS: 10500 Norms in the absence of an alternative source as per Drinking Water Specifications.			
C. Noise Levels – 6 Locations			
Parameter	**Core Zone**	**Buffer Zone**	**Limit**
Day Equivalent	50.2	45.3 – 48.9	55
Night Equivalent	39.3	37.4 – 43.4	45

Comparing with the MOEF&CC Norm of 55 dB(A) for day time and 45 dB(A) for night time, the monitored ambient noise levels were within the limit values for Residential areas.	
D. Soil Quality – 3 Locations	
Parameter	**Buffer Zone**
pH	6.25 – 7.52
Electrical Conductivity (µmho/cm)	82.55 – 97.54
Organic matter (%)	2.39 – 3.12
Total Nitrogen (mg/kg)	475 - 732
Phosphorus (mg/kg)	2.34 – 3.54
Sodium (mg/kg)	770 – 1040
Potassium (mg/kg)	624-780
Soil is of clayey loam type.	

A. LAND ENVIRONMENT:

Land use pattern study carried out through remote sensing satellite data around the 10km buffer zone shows that 27.07 % of the study area is agriculture/plantation land and 36.66 % are fallow land. Land with scrub constitutes 27.70 %, lands without scrub constitute 2.27% and waterbodies constitute 3.66% and remaining constitute 2.64 %.

BIOLOGICAL ENVIRONMENT:

Flora: Lease area is a non forest, private land exposed with rock and mostly barren interspersed with thorny bushes only. Buffer Zone comprise of agricultural land, rocky waste land, barren land and mined out pits. The Dominated species in the buffer zone are Prosopis juliflora, Sygygium cumuni, Borassus flabellifer, Albizia lebbeck, Acacia auriculiformis, Azadirachta indica, etc are also observed.

Fauna: There is no Wild Life Sanctuary or National Park within the study area of 10 km. Domesticated animals are commonly found. The lease and 10 Km buffer zone does not fall in the Western Ghats ESA boundary. From the study it observed that the area in general consists of species of least concern only.

B. HYDROLOGICAL STUDY:

In the study area, the shallow aquifer is developed through dug wells and deeper aquifer through tube wells. The groundwater has revealed that potential fractures are encountered at deeper levels. Rain water collected in the tanks in the region acts as a good source of water during post monsoon. The water in the wells are available mainly after post monsoon and it reduces during summer. Bore wells are very deep and it reflects that the yield is only better at deeper water levels

The occurrence of groundwater mainly in the porous soil are weathered layers, very negligible amount of groundwater percolated through the poorly fractured layer, after that there is no existence of groundwater. Besides, the mining area consists of hard compact rock, no major water seepage within the mine is expected. From the nearby working mines, no such seepage is also observed.

The stage of groundwater development of Vembakottai where the study area falls is 58%. In view of this, this area can be categorized as 'Safe' from ground water development point of view.

1.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The identified impacts due to the mining operation in the leases individually as well as cumulatively during mining and associated activities have been studied in relation to various environmental components like Air, water, noise, vibration, land, transport etc.,

1.4.1 AIR ENVIRONMENT:

The principal sources of air pollution in general due to mining and allied activities will be Excavation, Drilling, Movement of HEMM such as Excavators, tippers etc., Loading and unloading operation and transportation. In case of this mine, the following measures will be adopted to control impact on the air quality due to mining operations in the lease area:

- Regular wetting of transport road using mobile water tanker.
- Wet drilling / Covering of drill holes with wet clothes
- Use of controlled blasting techniques with Nonel to keep the dust generation low.
- Proper maintenance of roads.
- Avoiding overloading of tippers
- Transportation of material by tarpaulin covered trucks
- Proper maintenance of HEMM to minimize gaseous emission

- Setting up of tyre washing facility in the lease area exit.
- Vehicular emission tests with digital smoke meter.
- Provision of green netting around the lease periphery on all sides.
- Development of green belt/ plantation in various areas within the mine lease area etc.

By adoption of all these measures, no adverse impact on air quality is envisaged due to this proposed opencast mining operation.

The impact on air quality through model simulations are done using AERMOD View Gaussian Plume Air Dispersion Model for the air pollutant arising from the mining operations, namely, PM_{10}, $PM_{2.5}$. **Ground Level Concentration** (GLC) have been computed. It can be seen, the resultant added concentrations with baseline figures on individual basis with respect to PM10 is in the range of 52.9 μg/m3 to 75.8 μg/m3 and with respect to PM2.5 are in the range of 25.1μg/m3 to 36.7 μg/m3, , which are within the stipulated statutory limits for the projects.

Additionally, cumulative impact due to working of both Thiru. R. Gopalakrishnan project and proposed project of Thiru. Balakrishnan on ambient air quality is also assessed. The cumulative post project concentration with respect to PM10 is in the range of 52.9 μg/m3 to 76.3 μg/m3 and with respect to PM2.5 are in the range of 25.1μg/m3 to 36.7 μg/m3 which are within the statutory limits in each case. For preservation of environment in this mine strict enforcement of management schemes will be undertaken for taking corrective actions, as needed. By adopting the effective implementation of all the mitigative measures, no adverse impact on Air quality due to the mining operation in this lease area is expected.

1.4.2 WATER ENVIRONMENT:

The water requirement for this project is expected to be 8 KLD. The water will be sourced initially from outside agencies. Later the rainwater collected in the mine pit sump will be used for this purpose.

The domestic effluent to be generated from the project will be collected in septic tank with soak pits arrangements. This being a mining project there will not be any process effluent. Towards surface runoff management, a garland drain of length 480 m will be constructed and will be connected to settling ponds with silt traps. The supernatant clear water from the settling pond will be flow to the downstream users.

By proper surface runoff management, the rainwater from the lease periphery will be channelized through the peripheral garland drain all around the lease area and then through settling pond to be located in the southern side of the lease area. Besides, plantation will also be carried out in the safety zone. There is no proposal to discharge any effluent into this waterbody. As such no major impact is envisaged on the nearby water bodies due to project operations.

The groundwater resource data of Virudhunagar district was obtained from CGWA brochure, Virudhunagar District.' Based on the report it is seen that that the stage of groundwater development of Vembakottai where the study area falls is 58% and as such this area can be categorized as 'Safe' from ground water development point of view. Thus there is scope for further ground water development. Good rainwater harvesting measures for augmenting the ground water level in the region will be implemented.

1.4.3 NOISE ENVIRONMENT:

During mining operation there will be noise generation due to working of excavators, movement of vehicles, etc. However, it will be felt near the active working area only and at away from its source it will get reduced. There will also be attenuation due to vegetation, tin sheet/ green netting to be erected by the proponent all around the lease and as such there will not be any adverse noise propagation outside the lease boundary Due to natural attenuation effects, by proper green belt development, design / maintenance of machines, etc., the impact on noise levels will be negligible and are expected to be well within the prescribed limits.

1.4.4 VIBRATION:

In the proposed mine workings, blasting & vibration effects will be controlled by adopting following measures.

- Carrying out controlled blasting using Nonel delay detonator.
- Optimum design for burden and spacing.
- The peak particle velocity (PPV) of ground vibration will be kept very low through optimally controlled blasting techniques, after necessary field trials.
- Reducing explosive charge per delay to minimum.
- Using rock breaker wherever possible

- Proper care and supervision during blasting by a competent and experienced person to be carried out.
- Besides, different blasting time for the projects is suggested and the timing is to be mentioned in the display board in the mines entrance.

By adoption of above measures, it will be ensured that ground vibrational levels due to blasting will be maintained within the prescribed DGMS conditions of 10 mm/s for the domestic houses/structures.

1.4.5 IMPACT ON LAND ENVIRONMENT:

In the post mining stage entire 1.18.50 Ha will be used and left as water body. 0.02.0 Ha will be the mine roads & infrastructure, 0.35.0 Ha will be covered with vegetation, and 0.05.00 Ha will be fencing. Effective post closure monitoring will be done to ensure that there will be no adverse impact due to mining operations.

1.4.6 BIOLOGICAL ENVIRONMENT:

Leased and its nearby area is of dry rocky type with very little vegetation. Necessary mitigative measures like dust suppression, proper maintenance of equipment's, greenbelt and plantation etc., will be carried out to prevent dust generation & any further impact on the vegetation. There will be positive impacts will arise due to well-planned green belt development activities.

1.4.7 SOCIO ECONOMIC ENVIRONMENT:

The entire lease area is a private patta land. There are no habitations or hutments in the core zone area and no rehabilitation or resettlement is involved. The mining operations in the proposed mines will each employ about 10 persons directly and about 50 persons. Besides through allied opportunities in logistics, trading, repairing works etc. good employment potential will arise in this area, which will provide raising income levels and standards of living in the area through various service-related activities connected with the project operations.

Towards the socio-economic development of the surrounding area, Rs.2.0 Lakhs is allocated for this project. The activities identified under CER will be implemented in a phased manner by provision of facilities in nearby Government School.

1.4.8 IMPACT ON LOCAL LOGISTICAL SYSTEM DUE TO PROJECT:

The material mined out from this lease area will be directly transported to the crusher units for producing stone aggregates of different sizes or construction of roads, bridges, buildings and other buyers etc. Since the production from this lease is very low there will be hardly 1 to 2 trip/hr of material transportation. During the combined project operations, there will be additional 3 trips per hour. The transport route will be properly maintained to absorb this traffic due to this project. The following mitigative measures are suggested for mitigation of adverse impacts on the logistical aspect of the project:

- Water sprinkling on material in the transport vehicles before transporting, so that no dust nuisance during transport will arise.
- Plantation on either side of the transport road in consultation with the concerned department.
- Proper maintenance of transport roads and vehicles
- Avoiding overloading of material
- Covering of loaded vehicles with tarpaulins sheet if warranted.
- Provision of tyre washing facility at the mine outlet

1.4.9 WASTE MANAGEMENT:

Since the entire mined out material will be used there will not be any solid waste generation from this project. There is no process effluent generation from mines. Hence no liquid waste is generated.

The hazardous waste generated will be stored in a separate storage area with impervious containers for waste oil, oil contaminated clothes, used lead acid batteries, scraps, tyre storage etc. It will be disposed through authorized recyclers or re-processors periodically. The hazardous wastes will be transported in accordance with the provisions of rules. By effective implementation of above said mitigation measures no major impact due to Hazardous waste is expected.

Single use plastics/ use and throwaway plastics will be banned in the site as directed by the Tamil Nadu Government vide GO(Ms)No.84 regarding ban on use of plastic products. The employees will be encouraged to use compostable material or reusable material.

1.5 ENVIRONMENTAL MONITORING PROGRAME:

Regular, systematic and sustained programme schedules for implementation and monitoring of various control measures are devised with clear cut guidelines of various concerned plans for keeping a continuous surveillance on the various environmental quality parameters in the area. The Mines Manager in the mine project site will be directly responsible for various environmental activities in the mine and will undertake effective monitoring and implementation of various environmental control measures promptly and effectively and to oversee various environmental management schemes for air quality control, water quality status, noise level control, plantation programme, social development schemes, etc in the mine. Towards implementation of the environmental control measures, Rs. 15.96 Lakhs is allocated under capital cost and Rs. 13.45s Lakhs/annum under recurring cost per will be spent under recurring cost.

1.6 ADDITIONAL STUDIES:

The baseline monitoring carried out for this project reflects the cumulative impact of the existing quarries. The cumulative impacts of the proposed Rough stone and Gravel Quarries of **Thiru. Balakrishnan & R. Gopalakrishnan,** are provided in detail in the EIA/EMP Report. From the study it is observed that by ensuring systematic mining with proper mitigative measures as suggested in the report no adverse impact on the surrounding environment is envisaged on cumulative basis also. It is also worth mentioning here that, these proposed quarry leases are more of a substitute for the recently expired quarry leases and as such cumulatively no major additional pollution load is expected.

1.7 CONCLUSION:

Since the production from this lease is low, the equipment's to be used and the magnitude of operation is also less. As such no adverse impact on the surrounding environment is expected. By systematic and scientific mining adhering to all the statutory norms and enforcing and strictly implementing the above said mitigation measures mentioned in this report, no adverse impact is envisaged. The proposed mining project will benefit this region in the fields of potential employment opportunities, improved income for local people, improved social welfare facilities in respect of education, medical healthcare systems, etc. in its own way and also revenue to Government through royalty, taxes etc. Besides, it will meet the raw material requirement of the construction industry also.

* * * * * * * * *