

EXECUTIVE SUMMARY

ROUGH STONE AND GRAVEL QUARRIES

IN CLUSTER OVER AN EXTENT OF 30.16.0 Ha

At

Thollamur Village, Vanur Taluk and Viluppuram District, Tamil Nadu State

TOTAL EXTENT OF PROPOSED QUARRIES = 9.53.5 ha

Proposal 1	Proposal 2	Proposal 3
Thiru. V. Ramesh	Thiru. I. Justin Prabu	Thiru. K. Gnanasekaran
3.53.0 Ha	3.67.0 Ha	2.33.5 Ha

TOTAL EXTENT OF EXISTING QUARRIES = 20.62.5 ha

Lease 1	Lease 2	Lease 3	Lease 4	Lease 5	Lease 6	Lease 7
Tmt. S.Nanthini	Thiru. C.Ganesan	Thiru. K.Gnanasekaran	Thiru. V.Sankar	Thiru. C.Raja	Thiru. K.Balamurugan	Thiru. V.Sadaiyappan
3.32.5 Ha	2.33.5 Ha	1.24.5 Ha	3.66.5 Ha	2.42.5 Ha	2.12.0 Ha	3.57.0

PREPARED BY

M/s. Geo Exploration and Mining Solution,

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1. INTRODUCTION –

This EIA report is prepared by considering Cumulative load of all proposed & existing quarries of Thollamur Rough Stone and Gravel Cluster Quarries consisting of Three Proposed and Seven Existing Quarries with total extent of Cluster of 30.16.0 ha in Thollamur Village, Vanur Taluk and Viluppuram District and Tamil Nadu State, cluster area calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016.

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

Project Identification:-**1.2.1 Identification of Project****TABLE 1.1: PROPOSED PROJECTS IN THE CLUSTER**

Description/Details	P1	P2	P3
Name of the Quarry	Thiru. V.Ramesh, Rough Stone & Gravel Quarry	Thiru. I Justin Prabu Rough Stone & Gravel Quarry	Thiru. K.Gnanasekaran Rough Stone & Gravel Quarry
S.F.No's	16/11, 16/12, 17/1 & 18/3B	20/2B, 20/2D, 20/2H, 20/2I, 20/2J & 20/2K	21/2F, 21/2G, 21/2H, 21/2I, 21/2J and 21/2K
Extent	3.53.0 ha	3.67.0 ka	2.33.5 ha
Classification of Land	Patta Land	Patta Land	Patta Land
Village	Thollamur		
Taluk	Vanur		
District	Viluppuram		
State	Tamil Nadu		
Latitude Between	12°03'10.49"N to 12°03'20.70"N	12°03'30.43"N to 12°03'40.58"N	12°03'20.03"N to 12°03'27.36"N
Longitude Between	79°40'08.70"E to 79°40'16.98"E	79°39'57.55"E to 79°40'04.80"E	79°40'16.29"E to 79°40'23.75"E

Source: Approved Mining Plan

TABLE: 1.2: IDENTIFICATION OF THE PROJECT PROPONENT

CODE	P1	P2	P3
Project Proponent Details	Thiru. V.Ramesh, S/o. J.Venkatachalapathy, No. 5, Thangaraj Street, HLL Colony, Pammal, Chennai – 75 Email: Cell:	Thiru. I.Justin Prabu, S/o. V. Iyyadurai, 1/56, D9, Church Street, Christopher Nagar, Peruvial, Kanniyakumari District Email: Cell:	Thiru. K.Gnanasekaran, S/o. Kannadi Gounder, Karasanur Village, Vanur Taluk, Viluppuram District. Email: Cell:
Status	Individual	Individual	Individual

2. PROJECT DESCRIPTION –**Project profile and Salient Features**

- The cluster quarry project falls under Thollamur Village, Vanur Taluk and Viluppuram District.
- This project is located – 640m North of Thollamur Village, 1.2 km East of Earaiyur Village and 1.7 Km North of SH -136 (Pondichery Kooteripattu), Thollamur Village is located – 6.5km North West of Vanur Taluk

TABLE 1.3: FEATURES AROUND THE CLUSTER

Nearest Village	Thollamur 640m- SE (Population – 1419)
Nearest Town	Vanur – 7.5km – South East
Nearest Roadway	Thollamur – Valudavur road – 730m – East (NH 66) Pondicherry – Tiruvannamalai – 9.0km East (SH 136) Pondicherry – Kooteripattu 1.3km North
Nearest Railway	Chennai - Viluppuram Railway line – 12.5 km – North West
Nearest Airport	Chennai Airport – 118 km – North East
Seaport	Chennai 130 km North East side
Interstate boundary	Pondicherry Union Territory – 3.0 km – South East Andhra Pradesh State – 118 km – North West
Coastal zone	Bay of Bengal – 21 km –East
Forest	No Reserved Forest within 10km Radius
Wildlife Sanctuary	Cauvery (North) Wildlife sanctuary – 190 km - NW

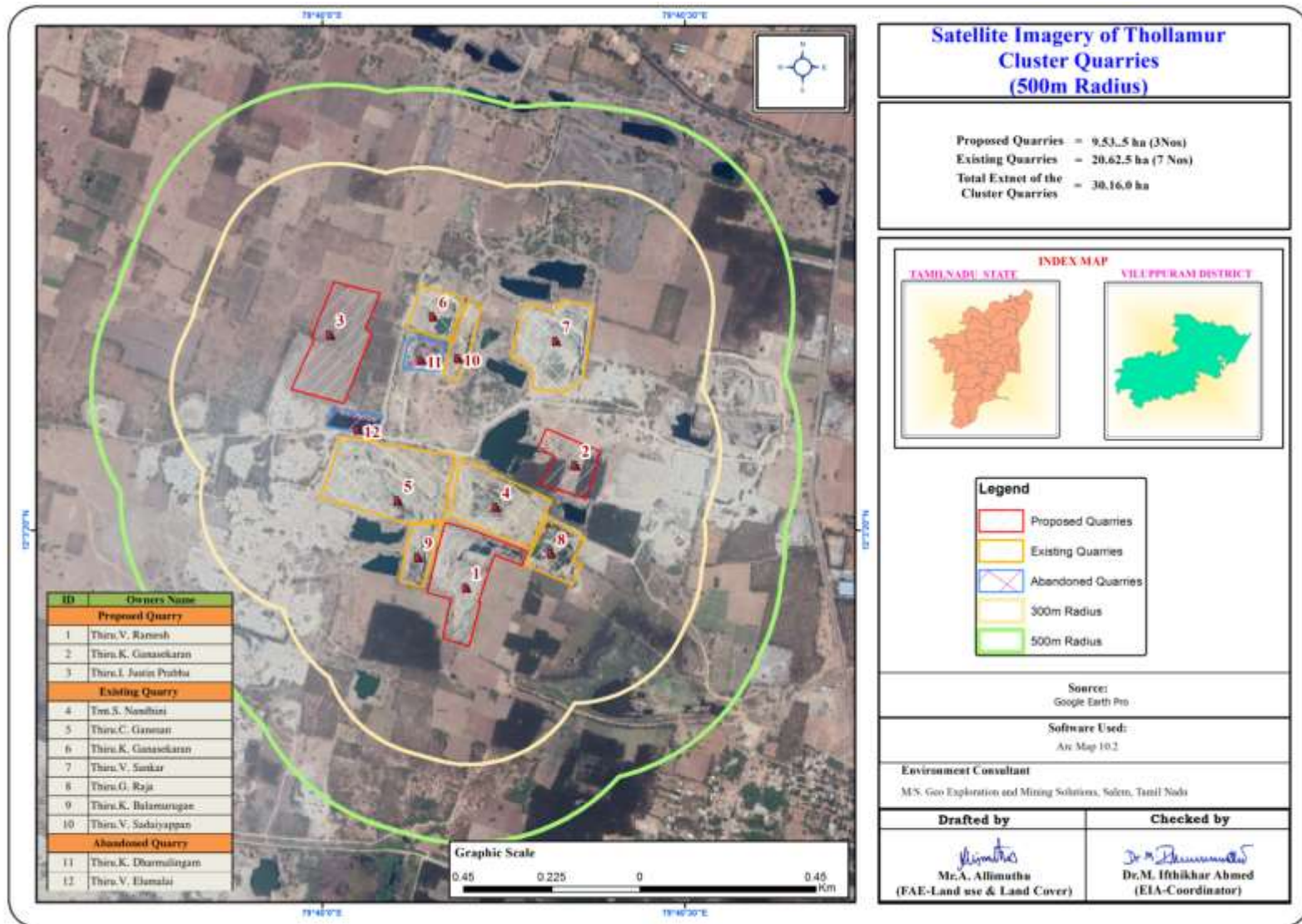
Source: Survey of India Toposheet

TABLE 1.4: RESOURCES AND RESERVES

Geological Resources	Rough Stone	Gravel
P1	12,95,840 m ³	64,792 m ³
P2	16,51,500 m ³	1,10,100m ³
P3	8,17,250	46,700
Total	37,64,590	2,21,592
Mineable Reserves	Rough Stone	Gravel
P1	4,52,723 m ³	24,552 m ³
P2	6,22,065 m ³	88,479 m ³
P3	1,33,570	19,912
Total	12,08,358	1,32,943

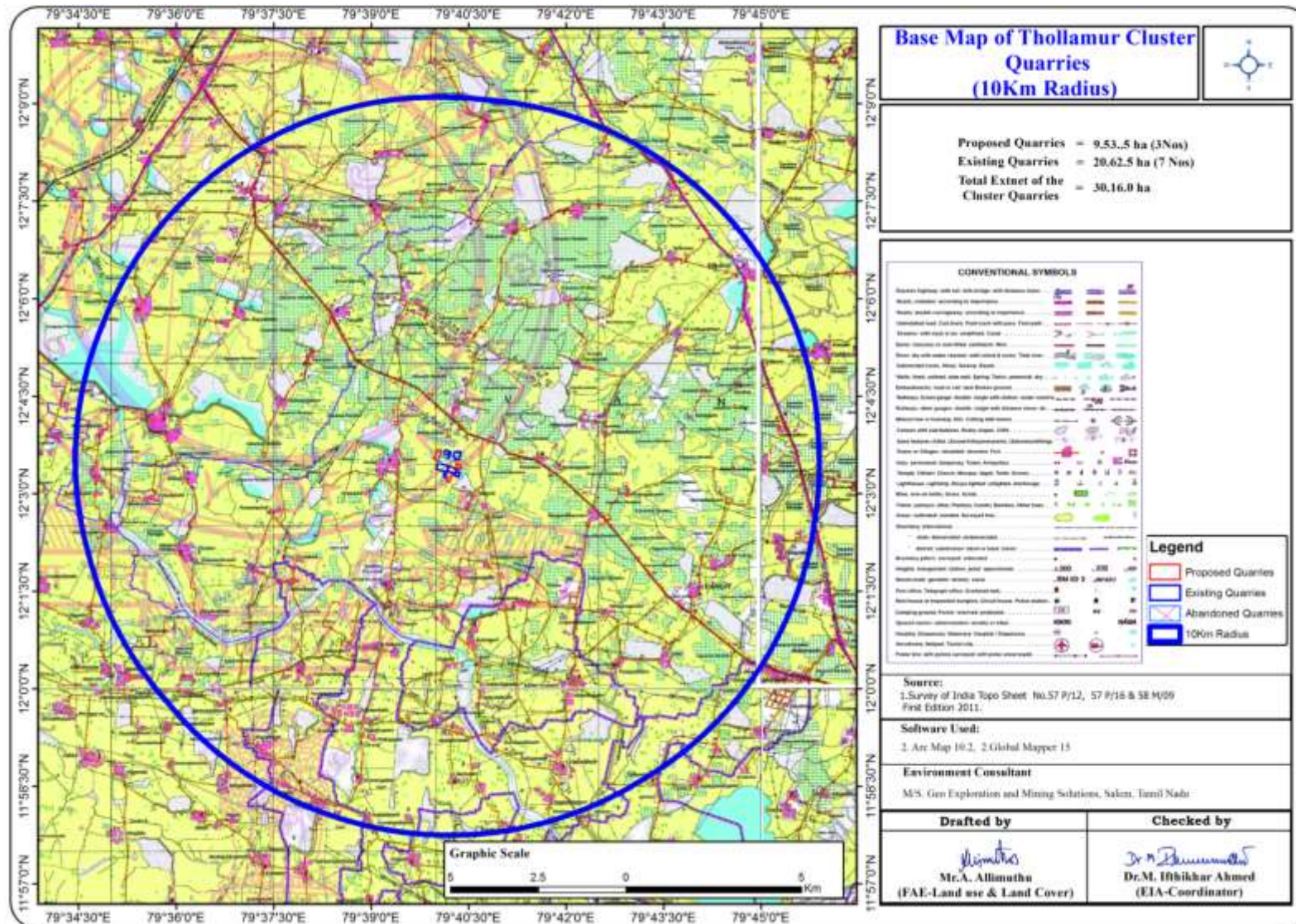
Source: Approved Mining Plan

FIGURE 1.1: SATELLITE IMAGERY CLUSTER QUARRIES



Source: Survey of India Toposheet & Google Imagery

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



Source: Survey of India Toposheet

3. DESCRIPTION OF THE ENVIRONMENT –

Baseline data was generated for various environmental parameters including Air, Water (surface and groundwater), Land and Soil, Ecology and Socio-economic status to determine quality of the prevailing environmental settings. The Base Line Study was conducted during winter season December 2019 – February 2020

3.1 Land Environment

Land use pattern of the area was studied through LISS III imagery of Bhuvan (ISRO). The 10 km radius map of study area was taken for analysis of Land use cover. As the mining is proposed to be carried out by opencast mechanized mining method, studies on land environment of eco-system play an imperative role in identifying susceptible issues and taking appropriate action to uphold ecological equilibrium in the region.

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

Sl.No	Classification	Area In Ha	Area in %
1	Agriculture Fallow	4343.14	13.45
2	Agriculture Plantation	4643.63	14.38
3	Barren Scrub	156.93	0.49
4	Builtup Mining	723.56	2.24
5	Builtup Rural	904.53	2.80
6	Builtup Urban	269.83	0.84
9	Lakes Ponds	2422.88	7.50
11	River stream	392.45	1.22
12	Salt affected Land	57.43	0.18
13	Crop Land	18369.26	56.90
Total		32283.63	100.00

Built-up area = 1174.36 ha ie., 3.64%

Built up Mining area = 723.56 ha ie., 2.24%

Agriculture land = 23012.89 ha ie., 71.28%

Barren land = 56.93 ha ie., 0.49%

This small percentage of Mining Activities shall not have any significant impact on the environment.

3.2 Soil Environment

Physical Characteristics –

The physical properties of the soil samples were examined for Texture, Bulk density, Porosity and water holding capacity. The soil texture found in the study area is Clay Loam Soil and Bulk Density of Soils in the study area varied between 1.06 – 1.29 g/cc. The Water Holding Capacity and Porosity of the soil samples is found to be medium i.e. ranging from 17.5-56 %.

Chemical Characteristics –

- The nature of soil is slightly alkaline to strongly alkaline in nature with pH range 7.65 to 8.66
- The available Nitrogen content range between 125.2 to 190 kg/ha
- The available Phosphorus content range between 1.14 to 1.83 kg/ha
- The available Potassium range between 56 to 64.3 mg/kg
- Whereas, the micronutrient as zinc (Zn), iron (Fe) and copper (Cu) were found in the range of 0.51 to 34.6 mg/kg; 1.85 to 3.15 mg/kg and ND

3.3 Water Environment –

Surface Water

The pH varied from 7.42 to 7.56 while turbidity found within the standards. Total Dissolved Solids varied from 459 to 720mg/l and Chloride varied between 47.0 mg/l and 95 mg/l. Nitrates varied from 18 to 30 mg/l, while sulphates varied from 33 to 60 mg/l.

Ground Water

The pH of the water samples collected ranged from 7.02 to 7.97 and within the acceptable limit of 6.5 to 8.5. pH, Sulphates and Chlorides of water samples from all the sources are within the limits as per the Standard. on Turbidity, the water samples meet the requirement. The Total Dissolved Solids were found in the range of 604-890 mg/l in all samples. The Total hardness varied between 273 to 414.5 mg/l for all samples.

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

3.4 Air Environment –

As per monitoring data, PM10 ranges from 35.8 µg/m³ to 70.2 µg/m³, PM2.5 data ranges from 23.4 µg/m³ to 49.7 µg/m³, SO₂ ranges from 4.2 µg/m³ to 15.2 µg/m³ and NO₂ data ranges from 9.7 µg/m³ to 25.4 µg/m³. The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB.

3.5 Noise Environment –

Ambient noise levels were measured at 10 (Ten) locations in and around the cluster quarries. Noise levels recorded in core zone during day time were from 52.8 – 62.8 dB (A) Leq and during night time were from 37.5 – 39.2 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 39.9 – 49.6 dB (A) Leq and during night time were from 34.2 – 37.5 dB (A) Leq.

The values of noise observed in some of the areas are primarily owing to quarrying activities due to cluster of quarries, movement of vehicles and other anthropogenic activities. Noise monitoring results reveal that the maximum & minimum noise levels at day time were recorded in the range of 70.3 dB(A) in core zone and 27.5 dB(A) in Katterikuppam village and 43.5 dB(A) in Core zone & 26.8 dB(A) in Katterikuppam village at night time.

Thus, the noise level for Industrial and Residential area meets the requirements of CPCB

3.6 Biological Environment –

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

3.7 Socio Economics –

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

The proposed project will aim to provide preferential employment to the local people there by improving the employment opportunity in the area and in turn the social standards will improve.

The nearby villages within 5kms radius has PHC, Anganwadi school, post office, telegram, Government and Private school, bus connectivity besides.

4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES –**4.1 Land Environment:****Anticipated Impact**

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

Mitigation measures

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

4.2 Water Environment

Anticipated Impact

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

Mitigation measures

- Garland drains, settling tank will be constructed along the individual mining leases. The Garland drains of the individual leases will be connected to settling tank and after settling the water will be discharged out to the natural drainage
- Rainwater will be collected in sump in the mining pits and will be allowed to store and pumped out to surface setting tank of 15 m x 10m x 3m to remove suspended solids if any. This collected water will be judiciously used for dust suppression onwards and such sites where dust likely to be generated and for developing green belt. The proponent will collect and judiciously utilize the rainwater as part of rainwater harvesting
- Providing benches with inner slopes and through a system of drains and channels, allowing rain water to descent into surrounding drains, so as to minimize the effects of erosion & water logging arising out of uncontrolled descent of water.
- Reuse the water collected during storm for dust suppression and greenbelt development within the mines
- Installing interceptor traps/oil separators to remove oils and greases. Water from the tipper wash-down facility and machinery maintenance yard will pass through interceptor traps/oil separators prior to its reuse;

- Using flocculating or coagulating agents to assist in the settling of suspended solids during monsoon seasons;
- Periodic analysis of quarry pit water and ground water quality in nearby villages
- Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits
- Waste water discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes
- De-silting will be carried out before and immediately after the monsoon season
- Regular monitoring and analysing the quality of water in open well, bore wells and surface water

4.3 Air Environment–

Anticipated Impact

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

Mitigation measures

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

Advantages of Wet Drilling:-

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

- Due to the dust free atmosphere visibility will be improved resulting in safer working conditions.

Blasting –

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

Haul Road & Transportation –

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

Green Belt –

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

Occupational Health –

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

4.4 Noise Environment**Anticipated Impact**

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

Mitigation measures

- Usage of sharp drill bits while drilling which will help in reducing noise;
- Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders;
- Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained;
- The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system;
- Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise;
- Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise;
- Silencers / mufflers will be installed in all machineries;
- Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise;
- Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured through training and awareness.
- Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects.

4.5 Biological Environment

Anticipated Impact

There is no Forest land, National Parks, Eco sensitive areas, Wild life sanctuaries within the radius of 10km.

There are no migratory corridors, migratory avian-fauna, rare endemic and endangered species. There are no wild animals in the area. No breeding and nesting site were identified in project site. No National park and Wildlife Sanctuary found within 10km radius. The dumps / bunds around the mine itself act as a good barrier for entry of stray animals. In the post mining stage, barbed wire fencing is proposed all around the mined-out void to prevent fall of animals in the mine pits.

Mitigation measures

To reduce the adverse effects on natural flora/fauna status of the area due to deposition of dust generated from mining operations, water sprinkling and water spraying systems will be ensured in all dust prone areas to arrest dust generation. Methodical and well-planned plantation scheme will be carried out.

4.6 Socio Economic Environment.

Anticipated Impact

Employment generation due to the project will provide direct employment for about 94 persons.

Mitigation Measures

- Good maintenance practices will be adopted for plant machinery and equipment, which will help to avert potential noise problems.
- Green belt will be developed in and around the project site as per Central Pollution Control Board (CPCB) guidelines.
- Appropriate air pollution control measure will be taken to minimize the environmental impact within the core zone.
- For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices will be provided as per mines act and rules.
- Benefit to the State and the Central governments through financial revenues by way of royalty, tax, DMF, NMET etc, from this project directly and indirectly.

5 ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

The site has been selected based on geological investigation and exploration as below:

- Occurrence of minerals at the specific site.
- Transportation facility for materials & manpower.
- Overall impact on environment and mitigation feasibility
- Socio – economic background.

The mineral deposits are site specific in nature; hence question of seeking alternate site does not arise for this project.

6 ENVIRONMENT MONITORING PROGRAM –

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

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

7 ADDITIONAL STUDIES - RISK ASSESSMENT & HAZARD –

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

8 PROJECT BENEFITS –

Thollamur Rough Stone and Gravel Cluster quarries projects aims to produce about 12, 08,358 m³ Rough Stone and 1, 32,943 m³ of Gravel. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits

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

9 ENVIRONMENT MANAGEMENT PLAN –

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

Occupational Health and Safety:-

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

10 CONCLUSION –

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

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

