EXECUTIVE SUMMARY

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT OF GREY COLOUR GRANITE QUARRY

Under Violation case

(MoEF&CC Notification No. S. O. 804 (E), dated 14.03.2017 and S. O. 1030 (E), dated 08.03.2018)

Category: B_1

Extent : 1.09.5 Ha
S. F. Nos. : 448/1(P), 449/1, 449/2 and 449/3A
Village : Vilangamudi
Taluk : Pochampalli
District : Krishnagiri

PROPONENT

Mr.K.S.Thanikachalam
No. 77, Thomsonpet, Kauveripattinam,
Krishnagiri Taluk and District,
Tamil Nadu.
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CONSULTANT

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Executive Summary

Mr.K.S.Thanikachalam of Grey Colour Granite quarry over an extent of 1.09.5 Ha, in S.F.No: 448/1(Part), 449/1, 449/2 and 449/3A is located in Vilangamudi Village, Pochampalli Taluk, Krishnagiri District. The area is marked in the survey of India (SoI) Topo sheet No.57L/07. The area lies between northern latitude of 12°20'55.12" N to 12°20'58.09" N and eastern longitude from 78°18'21.83" E to 78°18'27.00"E. The mining lease was granted in favor Mr.K.S.Thanikachalam G.O (3D) No. 15 Industries (MME-2) Dept. dated 08.02.2011 for a period of 20 years. The mining lease deed was executed on 22.02.2011 and the lease will expire on 27.02.2031.

The ministry has issued another Notification No. S.O 1030 (E) dated 08.03.2018 that the projects/activities covered under category 'B' shall be considered by SEAC/SEIAAs in the respective states. In view of the above the proponent submitted the application to SEIAA/SEAC on 05.04.2018. The proposal has been placed in 109th STATE EXPERT APPRAISAL COMMITTEE MEETING on 26th April 2019 and granted Terms of Reference vide Lr.No. SEIAA-TN/F.No.6547/TOR-398/2018 dated 18.05.2018 for preparation of EIA/EMP report, Ecological Damage Assessment, Remediation Plan, Natural Resource Augmentation and Community Resource Augmentation for obtaining an Environment Clearance from SEIAA/SEAC, Tamil Nadu

1.1 SCOPE OF THE PROJECT

The proposal for Environmental Clearance of Grey Colour Granite quarry of **Mr.K.S.Thanikachalam** requires EIA/EMP report, Ecological Damage Assessment, Remediation Plan, Natural Resource Augmentation and Community Resource Augmentation as per Terms of Reference vide SEIAA Lr.No. SEIAA-TN/F.No.6547/TOR-398/2018 dated 18.05.2018.

1.2 PROJECT DESCRIPTION

Table No 1. 1 Project Details

Project Details	
Proponent	Mr.K.S.Thanikachalam
Total Mine Lease Area	1.09.5 Hectares

Survey No.	448/1(P), 449/1,2 and 449/3A
Site Location	Vilangamudi Village, Pochampalli Taluk, Kirishnagiri District, and Tamil Nadu.
Geographical Co-ordinates	Northern Latitude of 12°20'55.12" N to 12°20'58.09" N Eastern longitude of 78°18'21.83" E to 78°18'27.00"E.
Toposheet No.	57L/07
Elevation	451m above MSL
Accessibility	
Nearest Habitation	Veeramalai– 1 km (NE)
Nearest Town	Pochampalli – 7 km (SE)
Nearest Roadway	SH Road, Karimangalam-Pochampalli – 1 km
Nearest Railway station	Samalpatti – 20 km
Nearest Airport	Bangalore – 106 km
Environmental Sensitiveness	
Interstate Boundary	Tamil Nadu – Andhra Pradesh interstate Boundaries- 29km – North
Coastal Zone	The quarry is located at 190 km away from Bay of Bengal (SE)
Reserve Forest	Thattakkal R.F-4 km (North)
Wildlife sanctuary	There is no wild life sanctuaries around 10kms radius under Wildlife Protection Act1972.
Water bodies	Water Bodies are situated around 10km radius below, Thenpannai River – 4 km (west) Barur Tank- 3.5 km (South) Vilangamudi Lake – 2.5 km (South West) Nedungal Dam – 5km (North West)
Habitations	Veeramalai – 1 km – North – 150 Population N.Thattakal – 3km- NW-300 Population Nagarasampatti – 2km – NW – 400 Population Agaram – 4km –SW-300 Population
Defense Installations	Nil within 10 km radius
Quarries around 500m radius (AD Letter furnished)	Two quarries are found around 500m radius.
Seismic Zone	Zone-II, Moderate damage risk zone as per BMTPC, Vulnerability atlas Seismic zone of India IS: 1893-2002

Mining Details

Particulars	Details
Method of Mining	Open cast method of mining by Semi-mechanized method
Geological resources	102540 m^3
Mineable reserves	72336 m^3
Production (40% recovery)	4384.4m^3 / annum (average) or 21922 m^3 for five years
Topsoil	Nil
Granite Rejects (60%)	32882m^3
Depth of Mining	33m
Water Table	40-42m bgl
Overall Pit Slope	45°
Period of Lease	20 years (22.02.2011– 27.02.2031)
Scheme Period	2016-2021

1.3 Description of the environment

1.3.1 Base line environmental study

Collection of baseline data is an integral part of the preparation of Environmental Impact Assessment reports. The baseline monitoring study has been carried out during the pre-monsoon season (1st December 2019 – February, 2020) to assess the existing environmental scenario in the area. For the purpose of EIA studies, quarry lease area was considered as the core zone and area outside the quarry lease boundary up to 10 km radius from the lease boundary was considered as buffer zone.

Table No 1.2 Baseline Data

Particulars	Details	Standards
Meteorology (December 2019 – February , 2020)		
Rainfall (Avg.)	55.1mm	--
Temperature (Avg.)	24.3^{o}c	--
Wind speed	9 km/h	--
Wind Direction	NE & N directions	
Ambient Air Quality (NAAQS) (From Five Ambient Air Quality Locations)		
PM_{10}	46.47–61.56 µg/m^3	100 µg/m^3
$PM_{2.5}$	22.12-33.33µg/m^3	60 µg/m^3
SO_2	4.64 – 7.27 µg/m^3	80 µg/m^3
NO_x	6.35 – 8.40µg /m^3	80 µg/m^3
Noise Level (CPCB Standards)		
Day time (6:00 am - 10:00 pm)	Core zone – 45.3-48.6 dB (A) Buffer zone –44.3-47.1 dB (A)	Industrial Area Day Time - 75 dB (A) Residential Area Day Time – 55 dB (A)
Night time (10:00pm - 06:00 am)	Core zone – 34.2-38.5dB (A) Buffer zone – 35.4-39.5 B(A)	Industrial Area Night Time – 70 dB(A) Residential Area Night Time – 45dB (A)
Water Quality IS 10500:2012 (Desirable limits)		
pH	6.92 – 7.07	6.5 to 8.5
TDS	650-730 mg/l	500 mg/l
Total Hardness as $CaCO_3$	Core zone – 580 mg/l Buffer zone – 444 mg/l	200 mg/l
Soil Quality		
pH	6.43-7.58	Neutral to moderately alkaline
Electrical Conductivity	18-74 Micromhos /cm	-
Organic Matter	0.011-0.040	-
Alkalinity	Core zone – 0.0099% Buffer zone – 0.0149%	-
Water Holding Capacity	39.40 - 40.20%	Favorable physical condition for plant growth.
Chlorides	1.23 – 2.55 %	Medium level chlorides in soil
Potassium	0.0356-0.0812 %	Favorable physical condition for plant growth.
Hydro Geology		
Depth of Mining	33m.	Quarrying activity 9m above ground water table
Water Table	42m	

1.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

1.4.1 Air Environment

The air borne particulate matter is the main air pollutant by opencast quarrying. The quarrying operations will be carried out by adopting semi–mechanized methods which involves drilling, blasting, wire–saw cutting, excavation, loading, hauling and unloading. Apart from above, there will be other activities associated viz. transportation of Grey ColourGranite and waste, stocking of rejects and dump management within the quarry lease area that may contribute to wash out, slope failure, leachates and other related pollution.

From the results of AERMOD Cloud 5 model, it is concluded the cumulative concentrations of PM10 due to quarrying activities comply with the National Ambient Air Quality Standards (NAAQS 2009). The concentrations of SO2 and NOx generated from quarry area are expected to be low due to absence of any major source. It should be noted that the predicted concentrations are due to the simultaneous operations of quarries. The overall impact on air quality due to the quarry project is expected to be low.

1.4.2 Noise Environment

Noise pollution poses a major health risk to the quarry workers. The sources of noise in the existing open cast quarrying project observed include Drilling, Blasting, Operation of HEMM and Vehicular Movements.

The noise generated by the quarrying activity is dissipated within the core zone. This is because of the distance involved and other topographical features adding to the noise attenuation. From the results, it can be seen that the ambient noise levels (day time and night time) at all the locations will remain within permissible limits prescribed by CPCB and 90dB (A) norms of DGMS. At present no quarrying activity is carried out. However, the expected noise levels are not likely to have any effect. Precaution will be made to keep down the noise exposure level of 85 dB (A) to the operating personnel for 8 hrs duration. As per statutory requirement additional control measures needs to be adopted to avoid the impacts due to ground vibrations and fly rocks due to blasting.

1.4.3 Water Environment

Quarrying operations can affect groundwater quality in several ways. The most obvious impact occurs in quarrying below the water table, either in underground workings or open pits. This provides a direct conduit to aquifers. Groundwater quality is also affected when waters (natural or process waters or waste water) infiltrate through surface materials (including overlying waste or other material) into groundwater. The impact due to quarrying on the water quality is expected to be insignificant because of no use of chemicals or hazardous substances during the quarrying process. The quarrying activity will not intersect groundwater table.

1.4.4 Soil Environment

Soil characteristics indicate favorable condition for plant growth. There is only negligible quantity of top soil generated for the entire life of the mine. It is being used for plantation purpose.

1.4.5 Waste Dump

Top soil shall be removed and stacked separately along lease boundary as earth bund which will be used for afforestation purposes. All the rejects shall be dumped barren area temporarily with DGM permission and back filled over the mined out area in future. Total generation of Grey colour granite rejects and waste for the next five years will be 32883 m^3. The overall mineral to waste ratio for the next five years is 1: 1.49.

1.4.6 Biological Environment

There are no notified endangered species in the area, which may be affected due to the quarry activities; therefore the biological environment will not have significant impact due to quarrying activity. The impact on the biological environment due to amount of dust generation is minimized by well-developed green belt in and around the quarry lease area.

1.4.7 Land Environment

The Grey color granite quarry project will result in disturbance of the land use pattern of the quarry lease area. The land degradation is unavoidable during quarrying activities like excavation, overburden dumping, soil extraction etc. So reclamation of quarried land and proper formation of benches will be given due importance. Stagnant water in the quarry pit will help in

development of agriculture and afforestation in the buffer zone over a period of time utilizing the water in the quarry pit which shows a positive impact due to quarrying activity.

1.4.8 Socio Economic Environment

The quarrying activity will definitely increase the employment opportunity (directly as well as indirectly) in the project area. Some of these impacts would be beneficial. The expectation of the people of area is concerned towards employment, education, road and health facilities. The literacy rate may be increased with the economic benefits which may arise from the quarrying activities.

Table 1.3 Environmental Management Plan

S.No	Parameters	Mining Activity	Mitigation measures
1	Air Environment	Drilling	○ Dust extractor or wet drilling to be followed to control dust at source of emission ○ Use of Sharp drill bits for drilling holes and charging the holes by using optimum charge and using time delay detonator
		Blasting	○ Regular water sprinkling on blasted heaps at regular intervals will help in reducing considerable dust pollution
		Loading	○ Water sprinkling be done before loading by making it moist
		Transportation	○ Water sprinklers along the sides of haul road shall be fixed to control fly of dust while transporting minerals and waste ○ Overloading will be prevented ○ Trucks/Dumpers covered by tarpaulin covers
		DG Sets	○ DG sets will be used only during power failure ○ Adequate stack height for DG sets will be provided as per CPCB norms
		General measures	○ Avenue trees along roads around ML boundary shall be planted as per the norms of MoEF to control fly of dust. ○ Labors engaged in such dust prone areas should be provided with safety devices like ear muff, mask, goggles as per the MMR, 1961 amendments and circulars of DGMS. ○ Regular health check–up of workers and nearby villagers in the impacted area should be carried out and also regular occupational health assessment of employees should be carried out as per the Factories Act ○ Ambient Air Quality Monitoring will be conducted on regular basis to assess the quality of ambient air.

2	Water Environment	Surface water	○ Wastewater discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes.
		Ground water	○ The mining activity will not intersect the ground water table ○ Desilting will be carried out before and immediately after the monsoon season
		Storm water	○ Pit will be used for Storage of rainwater ○ Rain water will be collected in sump in the mining pit 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 judicially utilize the rainwater as part of rain water harvesting
		General measures	○ Regular monitoring and analyzing the quality of water
3	Noise Environment	Drilling	○ Limiting time exposure of workers to excessive noise
		Blasting	○ Carrying out blasting only during day time and not on cloudy days ○ Noise levels will be controlled by using optimum explosive charge, proper delay detonators and proper stemming to prevent blow out of holes. ○ Providing proper noise proof enclosure for the workers separated from the noise source and noise prone equipment
		Transportation	○ Proper and regular maintenance of vehicles, machinery and other equipments. ○ The noise generated by the machinery will be reduced by proper lubrication of the machinery and other equipments. ○ Speed of trucks entering or leaving the mine will be limited to

			moderate speed to prevent undue noise from empty vehicles. o Adequate silencers will be provided in all the diesel engines of vehicles. o Minimum use of horns and speed limit of 10 km/hr in the village area. o It will be ensured that all transportation vehicles carry a valid PUC Certificates
		General measures	o Use of personal protective devices i.e., earmuffs and earplugs by workers, who are working in high noise generating areas o Provision of Quiet areas, where employees can get relief from workplace noise. o The development of green belts around the periphery of the mine to attenuate noise. o Regular medical check–up and proper training to personnel to create awareness about adverse noise level effects.
4	Vibration	Blasting	o Specific charge pattern has to be designed by proper trial vibration studies with varying charge ratios. o Milli second detonators shall be used preferably 25–50ms per delay to control vibrations o Diamond wire saw cutting and chemical blasting shall be used to cut the blocks into saleable dimensions o If the vibration still exceeds the limit a long Trench to a depth of 6m may cut in the direction of wave's movement to break longitudinal waves which travel close to surface, preferably near mine buffer zone o In spite of all measures periodical testing of vibration and noise using approved seismograph by DGMS has to be followed as a part of Environmental monitoring
5	Soil Environment	Topsoil	o Humus top soil shall be preserved for reuse in afforestation and agriculture

			○ Top soil should not be mixed with other waste or reject materials. It should be conserved by judicious utilization in the quarry premises ○ Garland drains will be provided around the mine and dumps to arrest any soil from the quarry area being carried away by the rain water. This will also avoid the soil erosion and siltation in the mining pits and maintaining the stability of the benches
6	Waste Dump	Stabilization of Dumps	○ 1m height parapet shall be constructed for dumps more than 6m height along the toe to prevent and control wash out from dumps entering into natural system through rain water ○ Garland drainage around dump shall prevent under wash of dump by hydrostatic pressure to be developed by surface water and control wash outs and collapse ○ Dump should be terraced for every 5m height and stabilized
7	Plantation	Mine lease boundary and waste dump	○ Provision of green belt all along the periphery of the lease area for control of dust and to attenuate noise ○ Stabilization of Dump with plantation ○ It is strongly recommended that the loss of plant in each year will be counted and again planted in subsequent plantation. ○ The plant should be planted taken from nursery, where the survival rate is high.
8	Land Environment	-	○ The restoration of the degraded land would cover backfilling and terracing with the overburden / wastes and surfacing the same with top soil. ○ Provision of Garland drainage around the dumps ○ Fast growing trees and other native shrubs would be planted to stabilize the reclaimed land ○ Appropriate measures will be taken for Green belt development.

			○ The rain water will be stored in the pit which will recharge the ground water as a part of rain water harvesting scheme for irrigating the nearby agricultural lands.
9	Socio Economic	-	○ Good maintenance practices will be adopted for 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. ○ Drilling, blasting etc at specified location will be followed with proper schedule. ○ Appropriate air pollution control measure will be taken so as to minimize the environmental impact within the core zone. ○ An emergency preparedness plan will be prepared in advance, to deal with fire fighting, evacuation and local communication. ○ For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices has been provided which meet 'BIS' (Bureau of Indian Standards). ○ As a part of CSR activities, community welfare activities will be undertaken by the proponent which leads to socio economic development
10	Occupational Health	-	○ First-aid facilities as per provisions under Rule (44) of Mines Rules 1955 ○ Initial and Periodical medical examination shall be conducted for the employees under Rule 29B & 45 (A). ○ Insurance will be taken in the name of the labourers working in the quarry ○ Workers involved in quarrying work shall be provided protective

			equipments such as Thick Gloves, Goggles, ear plugs, safety boot wears, etc…

1.5 Analysis of Alternatives

The quarrying site is dependent on the geology and mineral deposition of the area. Hence, this project is mineral and site specific and no alternative site considered for this project.

1.6 Environmental Monitoring Program

Success of any environmental management programme depends upon the efficiency of the organizational set up responsible for the implementation of the programme. Regular monitoring of the various environmental parameters is also necessary to evaluate the effectiveness of the management programme. Environmental Monitoring Programme will beconducted for various environmental components as per conditions stipulated in theEnvironmental Clearance Letter issued by SEIAA & Consent to Operate issued by TNPCB.

Table No: 1.4 Post Project Environmental Monitoring Program

S. No.	Environment Attributes	Location	Monitoring		Remarks
			Duration	Frequency	
1	Meteorology and Air Quality	Continuous monitoring weather station in core zone/ nearest IMD station	24 hours	Monthly Once	Wind speed, direction, Temperature, Relative humidity and Rainfall.
2	Air Pollution Monitoring – $PM_{2.5}$, PM_{10}, SO_2 and NO_x	6 locations (One station in the core zone and at least one in nearby residential, area, one in the upwind, two station on the downwind direction and one in cross wind direction).	8 hours	Yearly Once	Fine Dust Sampler and Respirable Dust Sampler
3	Water Pollution Monitoring	Mine effluents, Set of grab samplesduring pre and post monsoonfor ground andsurface water in the vicinity.	–	Once in a year	Physico–chemical, microbiological characteristics
4	Hydrogeology	Water level in open wells in buffer zone around 1km at specific wells	-	Once in 6months	Water level monitoring devices may be used.
5	Noise	Mine Boundary, high noise generatingareas within the lease and at the nearest	24 hours	Monthly Once	Sound level meter

		residential area			
6	Vibration	At the nearest habitation (in case of reporting)	–	During blasting operation	Digital Seismograph
7	Soil	Core Zone and Buffer zone(Grab samples)	–	Once in a year	Physical and Chemical characteristics

1.7 Project Benefits

The proponent **Mr.K.S.Thanikachalam,** is very much conscious of his obligations to society atlarge. Under plantation programme, it is suggested to develop green belt further all along theboundary of the quarry lease area. Apart from the green belts and aesthetic plantation foreliminating fugitive emissions and noise control, all other massive plantation efforts will beexecuted with the assistance of experts and cooperation of the local community. Thequarrying activity will create rural employment. In addition there will be indirectemployment to many more people in the form of contractual jobs like construction ofinfrastructural facilities, transportation of Grey colour Granite to destinations, sanitation, supply of goodsand services to the quarry and other community services etc. The local population will havepreference to get an employment. The proponent will help in socio economicdevelopment of the village by providing educational facilities to children,and welfare amenities like drinking water to school; road and medical facilities to villages andemployment opportunities to nearby villagers. CSR budget is allocated as 2.5% of the profit.

1.8Environmental Management Plan

The Environmental Management Plan (EMP) must be integrated into the process of quarry planning so that the ecological balance of the area is well maintained and adverse effects are minimized. EMP includes all preventive as well as mitigation measures to minimize the impacts on the environment. The Quarry Plan is for the production of Grey color Granitewithout deep hole drilling and heavy blasting. Only controlled blasting is undertaken. Such limited quarrying activity is not likely to cause any impact adversely on the environment as far as pollution of air, water, land and noise is concerned.

1.9 Conclusion

Based on the EIA study it is observed that there will be a marginal increase in the dust pollution, which will be controlled with the effective implementation of the environment management measures as suggested in the EIA/EMP report and as may recommended by SEIAA, State Pollution Control Board, the negative impacts will be minimized to a great extent. There will be negligible impact on ambient environment & ecology due to mining activities, moreover the mining operations will lead to direct and indirect employment generation in the area.

The mining activity in the region will have positive impact on the social economic condition of the area by way of providing employment to the local in-habitants; wages paid to them will increase the per capita income, housing, education, medical and transportation facilities, economic status, health and agriculture by improving the life style of the people. A major part of the labor force will be mainly from local villagers who are expected to engage themselves both in agriculture and mining activities. Indirect employment opportunities to local people in contractual works like construction of infrastructural facilities, transportation of granite to destinations, sanitation, supply of goods and services to the mine and other community services. The State Government will also benefit directly from the granite quarry, through increased revenue from royalties, excise duty and etc.

Also the proponent's Corporate Social Responsibility initiatives will have a positive impact on socio economic environment of the region.