EXECUTIVE SUMMARY

For

SULAMALAI GREY GRANITE QUARRY OVER AN EXTENT OF 34.35.5 Ha

At

Survey No: 283 (Part)

Village: Sulamalai

Taluk: Bargur

District: Krishnagiri

State: Tamil Nadu

By

M/s. Tamil Nadu Minerals Limited

(Project termed under Schedule of 1(a) Mining of Minor Minerals 'B1' category as per EIA Notification 2006 and its Amendments & Project falls under Violation category as per S.O. 804 (E) dated 14th March 2017)

Proposal No: SIA/TN/MIN/453082/2023, dated: 14/12/2023

ToR File No: SEIAA-TN/F.No.10547/2023/Violation/ToR-1649/2023 Dated: 10.01.2024

Baseline Period: January 2024 - March 2024

EIA Consultant & Laboratory

HUBERT ENVIRO CARE SYSTEMS (P) LTD, CHENNAI

NABET Certificate No & Validity: NABET/EIA/24-27/RA 0335, valid up to 31.03.2027.

NABL Certificate No: TC-12310 Dated: 25.09.2023 Valid Till 24.09.2025

July 2024

Revision Status

Name of the Client	:	**M/s. Tamil Nadu Minerls Limited**
Name of the Project	:	Sulamalai Grey Granite Quarry over an extent of 34.35.5 Ha
Name of the Report	:	Executive Summary

Project No: H/01/2023/CON/056	**Document No:** RP004

Revision details:

Rev No.	Date	Details	Prepared by		Checked by		Approved by	
			Name	**Sign**	**Name**	**Sign**	**Name**	**Sign**
R0	11.07. 2024	1st Submission	PVRS Surendra		Vamsee Krishna		Dr JR Moses	

1. Introduction

The project proponent TAMIN has obtained mining lease for the existing Grey granite quarry over an extent of 55.22.55 Ha vide G.O. (3D) No.268, Industries Department (MME.1), dated: 21.06.1999 to 20.06.2019 at S.F.No.283 & 247 of Sulamalai Village, Krishnagiri Taluk, Dharmapuri District. Subsequently, TAMIN has surrendered the mining lease area of 6.13.0 Ha vide G.O. (4D) No.2. Industries Department (MME1), dated: 07.06.2002 at S.F.No. 247 of Sulamali Village, Krishnagiri Taluk, Dharmapuri District and the total extent of mining lease area reduced to 49.09.5Ha.

After that the mining plan approved for mining lease area of 34.35.5Ha by Commissioner of Geology and Mining vide Letter No. 13592/MM2/2001, dated: 31.12.2002. The project proponent obtained ToR with public hearing vide letter No. SEIAA-TN/3889/SEACLXVIII/ToR-231/2015, dated: 06.11.2015 in regard to the application submitted vide Rc.No.3445/ML3/2015, dated: 08.09.2015. Public hearing conducted on 15.02.2017 and submitted final EIA report for seeking Environmental Clearance dated: 17.04.2017.

As per MoEF&CC notification vide S.O.804(E) Dt.14.03.2017 & MoEF&CC notification S.O.1030 (E) Dt.08.03.2018, the quarry operate without EC comes under Violation. Hence the proponent has applied for in the violation window i.e., 14.03.2017 to 18.04.2018 to MoEF&CC vide online proposal No.IA/TN/MIN/68063/2017 dated: 07.09.2017.

The quarry operation is done without prior Environmental Clearance from 15.01.2016 to 10.01.2017.

Table- 1 Excavated details during violation period 15.01.2016 to 10.01.2017

S.No	Type of Mineral	Excavated Quantity (m^3)	Depth (m)
1.	Grey Granite	300396	12

Subsequently, MoEF&CC transferred the file to SEIAA vide online proposal No.SIA/TN/MIN/23926/2018 dated: 09.04.2018. SEIAA issued ToR under violation category vide Lr No. SEIAA-TN/F.No.3889/ToR-439/2018 dated: 30.05.2018 and validity of the ToR issued expired as on 29.05.2023. In meanwhile the lease period was expired on 20.06.2019 so the proponent was unable to continue the EC process.

TAMIN applied for quarry lease of 20 years on 06.06.2018 for the proposed Sulamalai Grey granite quarry over an extent of 34.35.5 Ha located at S.F.No.283 (P) of Sulamalai Village, Bargur Taluk and Krishnagiri District. The District Collector and the Commissioner of Geology and Mining have recommended the quarry lease application for a period of 20 years under Rule 8-C of the Tamil Nadu Minor Mineral Concession Rules, 1959. The Government after carefully examined the recommendation of the District Collector and the Commissioner of Geology and Mining, have decided to communicate the precise area for the above said area vide Government letter No.3821994/MME.1/2022-1, dated: 14.02.2023 under sub-rule (3)(b) of Rule 8-C of the Tamil Nadu Minor Mineral Concession Rules, 1959 for grant of quarry lease. The mining plan was approved by the Director of Geology and Mining, Guindy, Chennai vide letter Rc. No.6262/MM4/2019 dated 19.09.2023. Based on MoEF&CC OM , dated 09.09.2019 (Para No. 8 & 9).

Subsequently ToR application submitted to TN-SEIAA vide online proposal No. SIA/TN/MIN/453082/2023, dated: 23.11.2023 under violation category as lateral entry for the proposed production capacity of ROM 30,000 m^3(Recovery @ 25%-7,500m^3 & Rejects @ 75%-22,500m^3)of grey granite for the depth of 29m from top of hill as per the approved mining plan for the period of five years.

The proposal was appraised during 431st SEAC meeting held on 12.12.2023 and 688th SEIAA meeting held on 10.01.2024 and Violation, ToR was issued vide Letter No. SEIAA-TN/F.No.10547/2023/Violation/ToR-1649/2023, dated: 10.01.2024.

The Draft EIA/EMP report is submitted for Public Hearing (PH). After completion of Public Hearing, the minutes raised will be incorporated in the EIA report along with action plan. Final EIA report will be uploaded in the Parivesh portal for further appraisal of the project and obtaining Environmental Clearance.

Table-2 Salient Features of the Project Site

Survey No	S.F.No.283 (Part) of Sulamalai Village
Village	Sulamalai Village
Taluk and District	Bargur Taluk, Krishnagiri District
State	Tamil Nadu
Toposheets No.	57L/2, 3, 6&7
Latitude	12°29'30.83230"N to 12°30'0.25552"N
Longitude	78°17'28.61642"E to 78°18'0.33892"E
Extent Area	34.35.5 Ha
Land Classification	Govt Poramboke Land
Lease Period	20 years
Estimated Geological Reserves (ROM) m^3	Grey Granite-4,38,325 m^3
Estimated Mineable Reserves (ROM) m^3	Grey Granite-2,18,631 m^3

Production Capacity	Grey Granite-30,000 m^3
Annual peak production in m^3	12,000 m^3
Depth of Mining	29m from the surface level and the top surface of the granite body
Method of Mining	Open cast semi mechanized method
Nearest town	Krishnagiri~7km, W
Nearest railway station	Patchur ~20.80km, ENE
Nearest railway line	Patchur-Mulanur Railway line~16.14km, NE
Nearest airport	➢ Hosur Airport ≃58.30km (WNW) ➢ Kempegowda International Airport, Bengaluru 96.87km (NW)
Water Requirement	1.5 KLD
Power Requirement	125kVA
Fuel Requirements	200 liters per day

2. PROJECT DESCRIPTION

2.1. Method of Quarrying

An open cast quarrying by semi-mechanized method will be adopted to operate the quarry. Total production will be Grey Granite-7,500m^3 (@ 25% recovery). 1 No. of Excavator having 300LC capacity Tata Hitachi will be used for excavation and 2 no of 25 tones capacity Ashok Leyland Dumpers will be used during loading.

Reserves of Grey Granite

The Geological reserves of grey granite have been computed based on the Geological Plan & Sections up to the economically workable average depth of 29m from top of hill is 4,38,325 m^3.

Mineable Reserves have been computed as 2,18,631 m^3 after deleting the reserves locked up in safety barrier and benches based on the Conceptual Plan and sections, the effective(Saleable) Mineable Reserves have been worked out as 54,658 m^3 by applying the recovery factor 25%. The total proposed ROM is 30,000m^3. The annual peak production per year would be 12,000m^3 of ROM.

Table-3 Mine Year wise production as per Mining Plan

S. No	Year	ROM (m^3)	Recovery@ 25% (m^3)	Granite Waste @ 75 % (m^3)
1	1st Year	6,000	1,500	4,500
2	2nd Year	12,000	3,000	9,000
3	3rd Year	4,000	1,000	3,000
4	4th Year	4,000	1,000	3,000
5	5th Year	4,000	1,000	3,000
Total		**30,000**	**7,500**	**22,500**

Waste Management

The waste generated during the mining operation like side burden, granite rejects and the non-recoverable/un sized boulders and rubbles etc, will be dumped in the suitable area already selected. The area of disposal waste rock has been identified in northern portion of the lease area. The unsold blocks are kept within the boundary on the country rock area.

2.2 Greenbelt Details

The total area for the proposed green belt is 0.10.0 Ha during 5 years of the proposed quarrying activity and it is proposed to plant 200 no's of trees within the 7.5m safety buffer zone mine lease area.

Table-4 Proposed Greenbelt Development Details

Year	No of trees proposed to be planted	Area to be covered in m^2	Name of the species to be plant	Survival rate expected in %	No of trees expected to be grown
I to V year	200	1000	Neem, Vilvam, Aathi, Panai	80	160

2.3 Land use Pattern of the quarry area

Table-5 Land use pattern of the study area

S.No	Description	Present area (Ha)	Mining plan period (Ha)
1.	Area Under Quarrying	4.34.5	0.18.5
2.	Waste dump	2.62.5	3.83.0
3.	Infrastructure	0.02.0	-
4.	Roads	0.42.0	-
5.	Green Belt	1.64.5	0.10.0
6.	Un-utilized	25.30.0	21.18.5
	Total	**34.35.5**	**25.30.0**

3. IMPACTS AND MITIGATION MEASURES

Impacts due to Mining Activity

Various environmental impacts, which have been identified due to the mining operations, are discussed in the following sections. The environmental parameters most commonly affected by mining activities are:

3.1. Soil Environment

3.1.1. Impacts

Potential impacts are envisaged due to hazardous and non-hazardous wastes generated due to various operations in the project site like municipal waste from domestic use and waste diesel oil from quarry machineries.

3.1.2. Mitigation Measures

Good housekeeping and best practices of waste handling shall be adopted to eliminate/minimize the risks of soil contamination. The wastes generated will be stored in temporary storage facility and disposed through nearby municipal disposal bins. Waste oil generated from quarry machineries and the same is disposed through TNPCB Authorized dealers.

3.2. Land Environment

3.2.1. Land Degradation

The impact on will be due to the following:

- Land degradation due to disposal of large volume of waste materials.
- Creation of infrastructural facilities like office, rest shelter, first-aid centre and other service facilities.

3.2.2. Mitigation Measures

- Dust suppression using water tankers.
- Contour overburden dump to minimize erosion
- Greenbelt around infrastructures within the mine lease area and along the road by using native plants.

3.3. Air Environment

3.3.1 Impacts on Air Environment

The major air pollution sources from the mining operations are DG sets, mining activities like drilling, and transportation. The DG sets are provided with stacks of adequate height to disperse the emanating flue gases containing suspended particulate matter, oxides of Sulphur and nitrogen without affecting the ground level concentrations. The emissions mainly generated from the mining activities are Blasting, Drilling, Excavation, Loading, Unloading, and transportation etc. Machinery like compressors and jack hammers are used for Drilling. The sources of air emission are detailed below in **Table-6**.

Table-6 Sources of air pollution at quarry

S. No	Source of emission	Pollutant
1.	Excavation of Granite	PM

2.	Operation of diesel driven equipment	Gaseous emission
3.	Transportation of product	PM

3.3.2 Mitigation measures

- Use of dust aprons on drilling equipment and adopting wet drilling methods.
- Using controlled blasting, the impact of air pollution was mitigated.
- The production of blast fumes containing noxious gases will be reduced by the following methods:
    - Use of adequate booster/primer.
    - Proper stemming of the blast hole.
    - Development of greenbelt.

Table-7 Dust control measures in quarry

S. No	Activities	Best practices
1	Drilling	➢ Drills should be provided with dust extractors (dry or wet system)
2	Blasting	➢ Water spray before blasting ➢ Water spray on blasted material prior to transportation ➢ Use of control blasting technique
3	Loading	➢ Water spray
4	Hauling (emissions from roads)	➢ Water spray, treatment with surface agents, soil stabilization, paving, traffic control.
5	Transportation of mined material	➢ Covering of the trucks/dumpers to avoid spillage ➢ Compacted haul road ➢ Speed control on vehicles ➢ Development of a green belt of suitable width on both sides of road, which acts as wind break and traps fugitive dust

3.3.3 Air Quality Modelling

Total maximum GLCs from emissions as given below **Table-8.**

Table-8 Total maximum GLCs from emissions

Pollutant	Max. Base Line Conc. (µg/m³)	Estimated Incremental Conc. (µg/m³)	Total Conc. (µg/m³)	NAAQ standard
PM	69.60	0.10	69.70	100
SO_2	21.29	0.09	21.38	80
NO_X	23.01	0.57	23.58	80

The maximum ground level concentration observed due to mining activities and traffic movement through Air Modelling for PM, SO_2 and NO_x are 69.70µg/m³, 21.38 µg/m³ and 23.58 µg/m³ respectively.

3.4 Impacts due to Transportation

The Granite is transported to consumer directly as per buyer's requirement. The granite will be transported through existing road by tippers and approx. no. of trips required is 2 times per week. This minimum trip does not create impact on existing transportation. The vehicular movement for the proposed project is given in **Table-9.**

Table-9 Traffic Volume after Implementation of the Project

For the Road	Volume of Traffic	Volume (V)	Road Capacity (C)	V/C Ratio	LOS Category*	Traffic Classification
Existing	322	343	15000	0.02	"A"	Free Flow Traffic
After implementation	330	435	15000	0.02	"A"	Free Flow Traffic

*LOS (Level of Service) categories are A-Free Flow, B- Reasonably Free Flow, C-Stable Flow, D-Approaching unstable flow, E- Unstable flow, F- Forced or breakdown flow

Due to propose project there will be slight increment in the vehicle movement but the level of service (LOS) anticipated will be Free Flow.

3.4.1 Mitigation Measures

- Regular water sprinkling on haul and access roads.
- Greenbelt development along the haul roads, dumps and along the boundaries of the lease area.
- Utmost care will be taken to prevent spillage of sand and stone from the trucks.

3.5 Wastewater Generation

There is no effluent generation. The domestic sewage of 0.4 KLD will be disposed through septic tank followed by soak pit.

3.5.1 Mitigation Measures

3.5.1.1 Surface Water Pollution Control Measures

- Construction of garland drains of suitable size around mine area and dumps to prevent rain water descent into active mine areas.

- During monsoon season, the rain water will be collected by natural slope of area to water fed tank of the mine and it will be utilized for dust suppression and greenbelt development.
- The dump tops will be provided with inner slopes to control water flow to prevent erosion washouts. The dumps tops and slopes of in active areas will be covered with grasses, shrubs, mulching, etc, to prevent erosion, till final backfilling of dumps into mined out areas.

3.5.1.2 Ground Water Pollution Control Measures

- The domestic sewage from the toilets will be routed to septic tanks.
- Regular monitoring of water levels and quality in the existing open wells and bore well in the vicinity will be carried out.

3.5.1.3 Rain Water Harvesting

The rainwater will be diverted by garland drains to the sump area within the mine lease. The stored water will be used for agriculture activities.

3.5.1.4 Mitigation Measures

- Construct barriers at suitable intervals along the path of the drains.
- Provide necessary overflow arrangement to maintain the natural drainage system.

3.6 Noise Environment

3.6.1 Impact of Noise

The main sources of noise in the mine are as follows:

- Transportation vehicles
- Loading & unloading of minerals.
- Drilling
- Controlled blasting

3.6.1.1 Noise due to Drilling, Excavation and Transportation

The noise levels in the working environment will be maintained within the standards prescribed by Occupational Safety and Health Administration (OSHA). These standards were established with the emphasis on reducing the hearing loss. The permissible limits, as laid down by OSHA, are presented in **Table-10.**

Table-10 Permissible Exposure in Cases of Continuous Noise (OSHA, Govt. of India)

S. No	Sound Level (dB A)	Continuous Duration (Hours)

1	85	8
2	88	4
3	91	2
4	94	1
5	97	0.5
6	100	0.25

3.6.1.2 Noise Due to Blasting

Blasting activities are involved in this Quarry as green belt will be developed around the mine which restricts the propagation of noise. The main source of noise in quarrying is due to usage of machinery like excavators, mining tippers and compressors and diesel generators.

3.6.2 Mitigate Measures

Following mitigation measures should be taken to control noise pollution:

- Wherever the noise levels exceed 85 dB (A), workers should be provided with earmuffs, ear plugs etc.
- All vehicles and machinery will be properly lubricated and maintained regularly.
- Speed of the Vehicles entering and leaving the quarrying lease will be limited to 25 kmph.
- Unnecessary use of horns by the drivers of the vehicles shall be avoided.
- Controlled blasting with proper spacing, burden and stemming will be maintained
- No secondary blasting.
- Minimum quantity of detonating fuse will be consumed by using alternatively Excel non-electrical initiation system.
- The blasting will be carried out during favourable atmospheric condition and less human activity timings.

3.7 Impact of Vibration

Blasting activities are involved in Granite Quarry operations. The vibration during the moment of machinery will be minimal for a short span that will be well within the prescribed limits.

3.7.1 Mitigation Measures

- Proper quantity of explosive, suitable stemming materials and appropriate delay system are to be adopted for safe blasting.
- Using controlled blasting techniques.
- Safe blasting zones are kept around the periphery of the quarry.
- Overcharging will be avoided. The charge per delay will be minimized and preferably more number of delays will be used per blasts.

- Proposed peripheral green belt will be developed in 7.5m safety zone around the quarry

3.8 Impact on Human Settlement

There are no monuments or places of worships in mine area. Ground vibration and noise pollution is maintained minimal and confined to the mine area. The quality of water both surface and ground water is good and all parameters of drinking water are as per IS standards. Water quality analysis will be carried out at periodical intervals during post project monitoring.

The PM, NOx and SO_2 have been observed to be below the prescribed limit. Noise levels have also been found to be below the permissible limits at all the locations.

3.8.1 Mitigation Measures

- The noise generated in the lease area will get attenuated due to plantation all around the lease area.
- As preventive measures, greenbelt development around the mine lease area will be further strengthening for control of air emission to environment.
- All the employees when inducted will be medically examined.

3.9 Biological Environment

3.9.1 Mining activities and their impact on biodiversity

Table-11 Impacts on Biodiversity

S. No	Activity	Examples of aspects	Examples of biodiversity impact
1	Excavation	Land clearing	Loss of habitat, introduction of plant diseases, Siltation of water courses
2	Blasting, Digging and hauling	Dust, noise ,vibration, water pollution	Disruption of water courses ,impacts on aquatic ecosystems due to changes in hydrology and water quality
3	Waste dumping	Clearing, water and soil pollution	Loss of habitat, soil and water contamination, sedimentation.
4	Air emissions	Air pollution	Loss of habitat or species
5	Waste disposal	Oil and water pollution	Encouragement of pests, disease transfer, contamination of groundwater and soil
6	Access roads	Land clearing	Habitat loss or fragmentation, water logging upslope and drainage shadows down slope
7	Water supply (potable or industrial)	Water abstraction or mine dewatering	Loss or changes in habitat or species composition

3.9.2 Mitigation Measures

To reduce the adverse effects on flora/fauna status that are found in project area due to deposition of dust generating from mining operations, water sprinkling and water spraying systems will be ensured in all dust prone areas to arrest dust generation.

3.10 Impacts on Occupational Health due to project operations

Anticipated occupational illness sequel to mining activities involved in the project. Occupational health problems due to dust & noise and Occupational illness by quarry activities are as follows;

- Dust related pneumonia
- Tuberculosis
- Rheumatic arthritis
- Segmental vibration

3.10.1 Mitigation Measures for Occupational Health

- Adoption of dust suppression measures like spraying water, use of drill with dust collection system or wet drills etc.
- Plantation
- Avoid blasting during unfavourable wind & atmospheric conditions.
- Use of personal protective equipment. Compliance with DGMS circulars.
- Emergency response plan that includes installation of emergency response equipment to combat events such as fire.

Table-12 Mitigation for occupational health and safety

S. No	Activity	Mitigation measures
1	Excavation	➢ Planned excavation, avoid haphazard mining
2	Drilling and blasting	➢ In addition, the operators and other workers should be provided with masks, helmets, gloves and earplugs. ➢ Using controlled blasting techniques
3	Safety zone	➢ Provisions for a buffer zone between the local habitation and the mine lease in the form of a green belt of suitable width. ➢ Restricted entry, use of sirens and cordoning of the lasting area are some of the good practices to avoid accidents.
4	Overburden stabilization	➢ Accidents are known to happen due to overburden collapse. ➢ Therefore, slope stabilization and dump stability are critical issues for safety and environment. Proper measures will be taken care.
5	Worker's health surveillance	➢ Health survey programmes for workers and local community. ➢ Regular training and awareness of employees to be conducted to meet health and safety objectives.

3.11 Mitigate Measures for Safety Aspects

- To reduce pollution emanation from quarry operations, carry out splitting of sheet rock by diamond wire saw which largely reduces the dust and noise generation.
- Water sprinkling on haul roads and dumping yards, etc.
- Green belt creation wherever possible to arrest dust and reduce noise propagation.
- All staff and workers will be provided with PPE to guard against excess noise levels
- Provision of safety Helmets, goggles, safety boots, ear muffs, gas masks, etc.
- To provide appropriate instruction, training, retraining, vocational training, etc.
- Organization of safety contests and safety campaigns regularly to update knowledge of safe operational procedures, etc.
- Observation and compliance of all precautions, control measures and stipulations on above lines will ensure that in this project, health and safety problems will be minimal.

4. PROJECT COST & ESTIMATED TIME OF COMPLETION

4.1. Project Cost

The estimated project cost is given below **Table-13.**

Table-13 Project cost

S. No	Description of the Cost	Amount in Rs.
A.	**Fixed Cost**	
1	Land Cost	Nil. Because Govt. land
2	Labour shed	50,000/-
3	Sanitary facilities	50,000/-
4	Fencing Cost	1,25,000/-
	Total	**2,25,000/-**
B.	**Operational Cost**	
1	Jack Hammers	1,98,000/-
2	Compressor	19,82,000/-
3	Diamond wire saw	4,87,000/-
4	Diesel General	4,00,000/-
5	Excavators	6,00,000/-
6	Tippers	58,00,000/-
7	Drinking water facilities for the labours	50,000/-
8	Safety kits	50,000/-
	Total Operational Cost	**95,67,000/-**
C.	**EMP Cost**	
1	Afforestation	30,000/-
2	Water Sprinkling	50,000/-
3	Water Quality test	25,000/-
4	Air Quality test	25,000/-

5	Noise/Vibration test	25,000/-
6	CSR activities	50,000/-
	Total EMP Cost	**2,05,000/-**
	Total Cost of the Project (A+B+C)	**99,97,000/- (Say 1 Crore)**

4.2. Proposed schedule for approval and implementation

The time schedule for the completion of the proposed mining project is given in the below as,

Table-14 Project schedule

Particulars	Time Schedule
Submission of Draft EIA/EMP to TNPCB for Public Hearing	July 2024
Conducting Public Hearing and submitting final EIA/EMP	August 2024
Presentation before SEAC and Obtaining EC	October 2024

The project will be implemented after Obtaining EC from SEIAA and CTO from PCB.

5. MINING CLOSURE PLAN

5.1. Progressive Mine Closure Plan

The quarry is not proposed to back fill the ultimate pit, in as much as good quantity of reserves is available below the workable depth of 29m and there is possibility of technology of up gradation in granite mining for greater depths in course of time for safe mining at economic cost beyond 29m depth. At the end of the quarry, pit boundaries shall be safely fenced with 7.5m buffer safety zone and rain water or seepage water stored in the pit will be used for agriculture purpose.

6. REHABILITATION AND RESETTLEMENT

There will be no Rehabilitation and Resettlement in this proposed project

7. SITE ANALYSIS

Environmental sensitive such as water bodies, reserved forest, wildlife sanctuary, national park, human settlements and other ecological features are given below.

7.1 Environmentally/Ecologically Sensitive areas

The environmental sensitive areas covering an aerial distance of 15 km from the project boundary is given in below Table-15.

Table-15 Lists of Waterbodies

S.No	Water bodies	Distance (~km)	Direction
1.	Odai	Adjacent to Site	N
2.	Gettur Lake	0.49	E
3.	Mattur Ar	2.35	NE
4.	Badatalav Eri	7.31	NW
5.	Bargur Ar	7.90	ENE
6.	Canal near Malaiyandahalli	7.91	SW
7.	Timmapuram Lake	8.26	SW
8.	Badatalav Supply Channel	9.20	NW
9.	Ponnaiyar R	9.51	WSW
10.	Baleguli Eri	9.82	S
11.	Darai Cheruvu Vanka	10.56	NNE
12.	Krishnagiri Dam/Krishnagiri Reservoir Project(KRP) Dam	11.20	W
13.	Thirthamadugu Ar	13.45	NNE

Table-16 List of Reserved Forests

S.No	Reserve Forests	Distance(km)	Direction
1	Togarappalli RF	4.40	SE
2	Varatanapalli RF	6.18	NNE
3	Bargur RF	9.20	ENE
4	Tattakkal RF	10.83	S
5	Neralakotta RF	11.27	NE
6	Nandi Banda RF	12.35	ENE
7	Maharajagadai Ext RF	12.36	N
8	Naralapalli RF	12.99	NNW
9	Maharajagadai RF	13.35	N
10	Kothur RF	14.98	NE

8. BASELINE STUDY

8.1 Study Period

The baseline environmental surveys were carried out during **(January 2024 – March 2024)** within the study area.

8.2 Ambient Air Quality

Table-17 Summary of Ambient Air Quality Monitoring

S.No	Parameters (µg/m^3)	Minimum of Average	Maximum of Average	NAAQ Standards
1.	PM_{10} (µg/m^3)	56.35	58.57	100
2.	$PM_{2.5}$ (µg/m^3)	33.18	35.50	60
3.	SO_2 (µg/m^3)	6.24	9.42	80
4.	NO_2 (µg/m^3)	12.70	19.37	80

The ambient air quality has been monitored at 8 locations for 13 parameters as per NAAQS, 2009 within the study area.

8.3 Noise Environment

Ambient noise levels were monitored using precision noise level meter in and around the project site at 10 km radius at 8 locations during study period.

- In residential area day time noise levels varied from 50.4 dB (A) to 53.9 dB(A) and night time noise levels varied from 40.1 dB(A) to 42.9 dB(A)across the sampling stations. The field observations during the study period the ambient noise levels except one Residential area noise is not within the limit prescribed by MoEF&CC (55 dB(A) Day time & 45 dB(A) Night time).

8.4 Water Quality

The prevailing status of water quality at 08 locations for surface water and 8 locations for ground water have been assessed during the study period. The standard methods prescribed in IS 2296:1992 were followed for sample collection, preservation and analysis in the laboratory for various physiochemical parameters.

8.4.1 Surface water quality

Table-18 Summary of Surface Water Quality Monitoring

S.No	Parameters	Minimum	Maximum	IS 2296:1992 Standards
1.	pH	7.21	7.81	6.5 – 8.5
2.	TDS (mg/l)	283	365	500
3.	COD (mg/l)	16	32	-
4.	BOD (mg/l)	2	4	2
5.	Total Hardness(mg/l)	175	211	-

8.4.2 Ground Water Quality

Table-19 Summary of Ground Water Quality Monitoring

S.NO	Parameters	Minimum	Maximum	IS 10500: 2012 Standards	
				Acceptable Limit	Permissible Limit
1.	pH	7.31	7.79	6.5 – 8.5	NR
2.	Chloride	18.34	52.14	500	2000
3.	Total Hardness (mg/l)	151	257	200	600
4.	Sulphate	12	49	200	400
5.	TDS	278	497	500	2000

- It is observed that all the collected ground water samples meets the drinking water standards (IS 10500:2012) and can be used for drinking.

8.5 Soil Quality

Assessment of soil characteristics is of paramount importance since the vegetation growth, agricultural practices and production is directly related to the soil fertility and quality. Soil sampling was carried out at 08 locations in the study area. It is observed that,

Table-20 Summary of Soil Quality Monitoring

S.No	Parameters	Minimum	Maximum
1.	pH	6.78	8.31
2.	Electrical conductivity (µs/cm)	218	389
3.	Nitrogen (mg/kg)	124.92	408.42
4.	Phosphorus (mg/kg)	18.98	33.05
5.	Potassium (mg/kg)	73.30	144.31

9. WASTE HANDLING

9.1 Solid Waste Management

The municipal solid waste generation and management details are given in **Table-21**.

Table-21 Municipal Solid Waste generation & Management

S. No	Type	Quantity Kg/day	Disposal method
1	Organic	8.1	Municipal bin
2	Inorganic	5.4	TNPCB authorized recyclers
	Total	**13.5**	

As per CPHEEO guidelines: MSW per capita/day =0.45

9.2 Hazardous waste Management

The type of hazardous waste and the quantity generated are detailed in **Table-22**.

Table-22 Hazardous Waste Management

Waste Category No	Description	Quantity (L/Year)	Mode of Disposal
5.1	Waste Oil	3.0	Will be Collected in leak proof containers and disposed to TNPCB Authorized.

10. POST PROJECT MONITORING

10.1 Post Project Environmental Monitoring

The Project proponent set up regular monitoring stations to assess the quality of the environment.

Table-23 Post Project Environmental Monitoring Program

S. No	Area of Monitoring	Number of Sampling Stations	Frequency of Sampling	Parameters to be Analyzed
1.	Meteorology	One	Hourly and Daily basis.	Wind speed and direction, Temperature, Relative Humidity, Atmospheric pressure, Rainfall.
2.	Ambient Air Quality	2 Stations (In downwind)	Twice a week:24 hourly period	PM10, PM2.5, SO2, and NO2
3.	Noise	2 (two within core area and two in buffer area)	Once every season	Ambient Equivalent continuous Sound Pressure Levels (Leq) at day and Night time.
4	Exhaust from DG set	Stack of DG set	Quarterly	PM10, PM2.5, SO2 & CO
5	Vehicular Emissions	Parking area	Periodic monitoring of vehicles	Air emission and noise, PCU
6	Soil	Two Locations within the Project Site	Yearly Once	Physico chemical properties, Nutrients, Heavy metals
7	Terrestrial Ecology	Within 10km, around the project	Once in three years	Symptoms of injuries on plants
8	Surface/ Ground water quality	Two Locations Within Project Site	Yearly Once	As per ISO 10500 Standard parameters

11. DAMAGE ASSESSMENT REPORT

The TAMIN has operated this quarry without prior Environment clearance from the period of 15.01.2016-10.01.2017 with the existing quarry depth of 12m and excavated quantity of 3,00,396 m^3,as per the letter given by Director of Department of Geology and Mining, vide Rc.No. 550/MM4/2019 dated: 27.07.2020. Hence The Damage Assessment for the violation period has been calculated for the period from 15.01.2016-10.01.2017 as per MOEF&CC O.M F.No. 19-125/2019-IA.III Dated 5th March 2020. Based on the above said notification guidelines the Damage Assessment has been calculated on six following aspects.

1. Air Environment
2. Water Environment
3. Green Belt
4. Noise and Vibration Environment

5. Solid Waste Management
6. Land Environment

Also the economic benefits based on the turnover of the quarried quantity and the arrived Damage Cost. The penalty provision has been calculated based on the O.M F.No. 22-21/2020-IA.III Dated 07.07.2021.

A maximum of 3.0% of the net profit as computed will be added to the total damage cost and will be used for community resource augmentation. The proponent did not sell any quarried granite blocks. Hence the turnover is zero. The Damage Assessment cost, Penalty need to be paid to TNPCB for the violation were summarized in below **Table -24.**

Table -24 Summary of Damage Assessment

S. No	Damage Assessment Cost in Lakhs (Rs)	Remediation Plan, Natural Resource & Community Resource Augmentation Plan Cost in Lakhs (Rs)	Penalty for violation cost in Lakhs (Rs)
1.	2,10,716	2,10,716	0.9

12. CONCLUSION

The proposed **"Sulamalai grey granite quarry"** will be beneficial for the development of the nearby villages. Due to this proposed quarry, 30 no's of employment potential will be deployed which increase the social benefits of nearby villages. Environmental aspects like dust emission, noise, siltation due to surface run-off, etc. will have to be controlled within the permissible limit to avoid impacts on the surrounding environment. Necessary pollution control equipment like water sprinkling, plantation, personal protective equipment, etc., will form regular practice in the project. Additional pollution control measures and environmental conservation measures will be adopted to control/minimize impacts on the environment and socio-economic environment of the area. Measures like development of green belt and plantation along with transport road will be created. The CER measures proposed to be adopted by the proponent will improve the social and economic status of the nearby villages.