EXECUTIVE SUMMARY

For

SATHANUR BLACK GRANITE QUARRY OVER AN EXTENT OF 8.46.0 HA.

(Schedule 1(a) Mining of Minerals 'B1' category)

Located at

Survey No	**: 315, 316 and 317/1**
Villages	**: Sathanur**
Taluk	**: Thandarampattu**
District	**: Tiruvannamalai**
State	**: Tamil Nadu**

By

M/s. Tamil Nadu Minerals Limited

No. 31, Kamarajar Salai, Chepauk, Chennai – 600 005

EIA Consultant

M/s. EHS360 Labs Private Limited

Ashok Nagar, Chennai

NABET Certificate No. NABET/EIA/2225/IA 0098_Rev.01 validity 24th June 2025

July 2024

1 Introduction

M/s. Tamil Nadu Minerals Ltd, (An undertaking of Government of Tamil Nadu) was established in the year 1978, to carry out systematic mining and development of different minerals all over the state. Ever since its inception TAMIN has developed expertise in the mining of granite dimensional stones of different varieties including Black Granite (Dolerite), Kashmir White (Leptynite), Paradiso (Migmatite Gneiss), Green Onyx (Syenite-porphyry), Red wave (Pink Feldspathic Gneiss) Colombo Juparana (Pegmatitic Granite Gneiss of magmatic origin), Raw silk (Yellow Feldspathic Leptynite) and a number of other coloured granite varieties apart from other industrial minerals viz., Quartz and Feldspar, Graphite, Limestone, Vermiculite etc,.

The Government of Tamil Nadu has issued the precise area communication letter to furnish the approved Mining plan under Rule, 8-C (3b) of the Tamil Nadu Minor Mineral Concession Rules, 1959 for quarrying Black Granite over an extent of 8.46.0 Ha of Government poramboke land in S.F. No. 315, 316 and 317/1 of Sathanur Village, Thandarampattu Taluk, Tiruvannamalai District for a period of 20 years vide Govt. Letter. No.3377/MME.1/2022-1 dated 03.06.2022.

Accordingly, TAMIN submitted the Mining Plan for the subject area and the same was approved by the Commissionerate of Geology and Mining, Chennai vide letter Rc. No. 1033/MM4/2022, dated: 18.08.2022. Mining plan approval letter is enclosed as **Annexure-3**. Mining plan is enclosed as **Annexure-4**.

The production capacity of the quarry proposed during the mining plan period was 44,044 m^3, of ROM of Black Granite per annum and 4,404 m^3 of recoverable production of granite per annum. Open cast semi mechanized mining method will be used for mining.

The EC application was submitted to TN SEIAA vide Online **Proposal No. SIA/TN/MIN/409663/2022 Dt. 08/12/2022**. The proposal was appraised during 347th SEAC meeting held on 13.01.2023 and 592nd SEIAA meeting held on 11.02.2023 and ToR was issued **vide Lr No. SEIAA-TN/F.No.9647/SEAC/ToR-1350/2022, dated: 16.02.2023** for the preparation of EIA/EMP report. The draft EIA/EMP report will be submitted for Public Hearing (PH). After completion of Public Hearing, the minutes issued will be incorporated in the EIA report along with proponent action plan. Final EIA report will be submitted to TNSEAC for further appraisal of the project and obtaining Environmental Clearance.

2 Project Description

Project summary

S. No	Particulars	Details
1.	Project Location	SF. No. 315, 316 and 317/1, Sathanur Village, Thandarampattu Taluk, Tiruvannamalai District, Tamil Nadu State.
2.	Land classification	Government Land
3.	Extent of lease area (Ha.)	8.46.0
4.	Quarry Lease	Govt. Letter. No.3377/MME. 1/2022-1 dated 03.06.2022
5.	Lease Period	20 years
6.	Estimated Geological Reserves (ROM) m^3	1024350
7.	Estimated Mineable Reserves (ROM) m^3	775804
8.	Black Granite production per annum m^3	RoM 44044 with 10% recovery
9.	Depth of Mining	31m above ground level (Top of the hill)
10.	Method of Mining	Open cast semi mechanized method
11.	Water Requirement (KLD)	1.5
12.	Source of Water	Venders and village Panchayat
13.	Power requirement (kVA)	60
14.	Power Backup (DG set) kVA	1* 125
15.	Fuel requirements (Lts/Day)	200
16.	Direct Manpower (Nos)	30
17.	Indirect Manpower (Nos)	20
18.	Municipal Solid Waste Generation (kg/day)	13.5
19.	Waste Oil generation (Lts/Year)	3.0
20.	Project Cost in Lakhs	99.97

2.1 Proposed Method of Mining

The Black granite quarry in the lease area up to an area of 8.46.0 Ha. It is proposed to quarry the Black granite by open cast, semi mechanized method by developing the bench of 6m height and the bench width not less than the height. The slope angle of such benches and sides should not exceed 60° from horizontal.

Based on the Recovery Factory (10%), it is proposed to adopt opencast semi mechanized method of mining.

There is no blockage of minerals due to presence of benches, barriers, internal roads, electrical lines etc. The internal roads are temporary in nature and suitable benches will be formed. No Electrical Lines are passing over the subject area.

Jack Hammers (32m dia), Compressors, Tractors Mounted Air Compressors, Diamond wire saw (capacity- 30 m^3/day) etc shall be used for drilling the granite, Excavation and loading shall be carried out with excavators (3000 LC). These shall be utilized for developmental work, excavation and loading into the trucks. Dumpers of 25 T capacity shall be utilized for all transportation purposes. In addition, certain service equipment like water tankers (for dust suppression), pick-up vehicles etc. will be used.

3 Description of Environment

Study Period: The baseline environmental surveys were carried out during (**Mid December 2023 to Mid-March 2024**) within the study area.

Ambient Air Quality

The monitoring results of ambient air quality were compared with the National Ambient Air Quality Standards (NAAQS) Prescribed by MoEFCC; GoI Notification dated 16.11.2009. The baseline levels of PM10 (33.0 – 61.0 µg/m³), PM2.5 (18.1 – 33.6 µg/m³), SO_2(5.6 – 10.9 µg/m³), NO_2(13.4 - 25.2 µg/m³), While thus it was found that concentration of pollutants was within the limits of NAAQ standards.

All the results of ambient air quality parameters have been found within the limit as per NAAQS. Based on comparison study of results for tested parameters with NAAQS, it is interpreted that ambient air quality of studied locations is average. This interpretation narrates the results found for corresponding locations and study period.

Noise Environment

The observations of day equivalent and night equivalent noise levels at all locations are given below:

- In Industrial areas daytime noise levels were about 49.6 dB(A) and 40.8 dB(A) during nighttime, which is within prescribed limit by CPCB (75 dB(A) Day time & 70 dB(A) Nighttime).
- In residential areas daytime noise levels varied from 48.6 dB(A) to 53.2 dB(A) and nighttime noise levels varied from 39.6 dB(A) to 42.6 dB(A) across the sampling stations. The field observations during the study period indicate that the ambient noise levels are well within the prescribed limit by CPCB (55 dB(A) Day time & 45 dB(A) Nighttime).

Water Environment

The prevailing status of water quality at 8 locations for surface water and 8 locations for ground water were assessed during the study period. The standard methods prescribed in IS

were followed for sample collection, preservation, and analysis in the laboratory for various physiochemical parameters.

Surface water quality

The surface water results were compared with IS 2296:1992 standard and in respect of CPCB water Quality Criteria for designated best use. Based on comparison study of test results with Surface water Quantity Standards (Is 2296 Class A), it is interpreted that water qualities of studied locations are classified under Class E, which can be used for irrigation industrial cooling, and controlled waste disposal.

- ✓ The pH value ranges from 7.21 to 7.71 and within the limits (6.5 – 8.5) of IS 2296:1992.
- ✓ The Electrical Conductivity (EC) of the collected surface water ranges from 385 µS/cm to 1086 µS/cm.
- ✓ The chloride content in the collected surface water ranges from 82 mg/l to 228 mg/l.
- ✓ The sulphate content in the collected surface water sample ranges from 20.4 mg/l to 56.9 mg/l.
- ✓ The Total hardness of the collected surface water sample ranges from 111.2 mg/l to 289.6 mg/l.
- ✓ COD of the collected surface water sample ranges from 20.9 mg/l to 36.2 mg/l.
- ✓ BOD of the collected surface water sample ranges from 1.1 mg/l to 3.9 mg/l.

Ground Water Quality

Physio-chemical characteristics of ground water samples collected from the selected villages during post-monsoon. The Ground water results were compared with drinking water standards (IS 10500:2012).

- ✓ The ground water results of the study area indicate that the pH range varies between 7.16 and 7.65. It is observed that the pH range is within the limit of IS 10500:2012.
- ✓ The Total Dissolved Solids range varies between 444 mg/l – 720 mg/l for the ground water. All the samples are well within the permissible limit of IS 10500: 2012.
- ✓ The acceptable limit of the chloride content is 250 mg/l and permissible limit is 1000 mg/l. The chloride content in the ground water for study area ranges between 124 mg/l – 202 mg/l. It is observed that all are well within the permissible limit of IS 10500:2012.
- ✓ The desirable limit of the sulphate content is 200 mg/l and permissible limit is 400 mg/l. The sulphate content of the ground water of the study area varies between 31.1 mg/l – 50.4 mg/l. It is observed that all the samples are within the Acceptable Limit and permissible limit of IS 10500: 2012.

Based on comparison study of test results with drinking water standard, it is interpreted that water qualities of studied locations meet with the drinking water standards as per IS

10500: 2012 Permissible Limit. These interpretations relate to the sample tested for location only. To prevent ground water contamination and improving the quality and Quantity, rainwater harvesting, and groundwater recharging may be helpful.

Soil Environment

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

- The pH of the soil samples ranged from 7.26 to 8.04 Indicating that the soils are slightly acidic to moderately alkaline in nature.
- Conductivity of the soil samples ranged from 236 µmhos/cm to 328 µmhos/cm.
- Nitrogen content ranged from 229 kg/ha to 402 kg/ha.
- Phosphorous ranged from 142 kg/ha to 257 kg/ha.
- Potassium content ranges from 192 kg/ha to 615 kg/ha.

Biological Environment

- ✓ Baseline Biological survey was carried out to assess the ecology of the study area. The floral diversity is grouped into trees, shrubs, climbers, and herbs. Similarly, the faunal diversity is grouped into mammals, birds, reptiles, and amphibians. There are no extinct flora and fauna species found in the study area.
- ✓ The flora, which includes herbs, shrubs, and trees, were sparsely distributed within the study area as per IUCN status Least concern, vulnerable species are observed within the study area. There are Schedule Species like Blue rock pigeon (Columba livia)- Sch – IV and Nalla Pambu (Naja naja)- Sch II (Part II), Vulnerable Species like King Cobra (Ophiophagus hannah)- Sch II (Part II), and Endemic species like Jerdon's carp (Hypselobarbus pulchellus) identified in the Buffer zone but not in the Project Site. There is no rare or endangered species in the core zone and Buffer zone of the study area.

Socio Economic Environment

- ✓ In the 10 km radius study area, as per 2011 census, the study area consists of 84466 persons inhabited in 30 villages. The statistics regarding the list of villages, number of households and human population.

4 Anticipated Environmental Impacts

4.1 Air Environment

The emissions mainly generated from the mining activities are Blasting, Drilling, Scrapping, Excavation, Loading, Unloading, and transportation etc. Machinery like compressors, jack hammers, Diamond wire saw are used for Drilling.

The maximum ground level concentration observed due to mining activities and traffic movement for PM_{10}, $PM_{2.5}$, and NOx are 3.08 µg/m^3, 1.06 µg/m^3, and 16.1 µg/m^3 respectively. So, it can be concluded that even during operation of quarry the impact envisaged is moderate.

Impacts:

- ✓ Mining operation and associated activities are potentially air polluting, and the major air pollutant is suspended particulate matter.
- ✓ Impact of fugitive dust emission on flora and fauna
- ✓ Reduce photosynthesis in plants due to dust deposition.
- ✓ The intensity of dust generation in the mining is influenced by factors such as hardness of rock, mining technology and material handling etc.
- ✓ Fugitive dust from quarrying operation affects the mine workers who are directly exposed.
- ✓ Diseases like asthma and bronchitis are induced by particulate emission due to mining activities.

Proposed Mitigation Measure:

- ✓ Wet Drilling and Control Blasting will be used.
- ✓ Developing green belts which act as pollution sinks.
- ✓ Regular water sprinkling on haul and access roads.
- ✓ Material coverage during transportation to avoid Dust and Mist.
- ✓ Vehicular Emissions will be minimized by proper training and maintenance of vehicles and other oil - operated equipment.
- ✓ Speed controls on vehicle movements.
- ✓ Periodic health checkups for the workers shall be done.
- ✓ Dust masks will be provided to the workers.
- ✓ Greenbelt development along approach roads and surrounding the Quarry Lease area.

4.2 Noise Environment:

Impacts:

- ✓ Noise Generation by mining activities,

- ✓ Impact of vibrations including damage to materials/structures due to blasting.
- ✓ Hearing impairment problems in workers and nearby area people due to mining activities. Impact on ambient noise level due to rock excavation, transportation, processing equipment and ancillaries.

Proposed Mitigation Measure:

- ➢ Controlled blasting with proper spacing, burden and stemming will be maintained.
- ➢ No secondary blasting.
- ➢ The blasting will be carried out during favorable atmospheric conditions and less human activity timings.
- ➢ The prime movers/diesel engines will be properly maintained.
- ➢ Provision of sound insulated chambers for the workers deployed on machines.
- ➢ Proper designing of plant & machinery by providing inbuilt mechanisms like silencers, mufflers and enclosures for noise generating parts and shock absorbing pads at the foundation of vibrating equipment.
- ➢ Greenbelts around infrastructure site, service building area and township.
- ➢ Trees will be planted on both sides of haul roads.
- ➢ Personal Protective Equipment (PPE) like earmuffs/ear plugs will be provided to the operators.

4.3 Water Environment

Impacts:

- ✓ Runoff from mining areas and contaminated the inland water bodies.
- ✓ Impact on groundwater regime/streams/odai/ springs due to mining activities,
- ✓ Runoff from Spillage during handling of materials.
- ✓ Loss of surface features such as lakes, streams, and ponds through settling.
- ✓ Ground water inflows into the quarry & may contact pollutants.

Proposed Mitigation Measure:

- ✓ There are no major streams and rivers which can be affected by the proposed mining. Hence there will be no major effect on the surface water environment.
- ✓ The black granite will not produce any harmful toxic effluence in the form of solid, liquid or gas.
- ✓ Garland drains will be constructed on all sides of the quarry.
- ✓ All the garland drains will be routed through adequately sized catchpits or settling pits to remove suspended solids from flowing into storm water.
- ✓ The water will be used after settling for irrigation/greenbelt and dust suppression.

- ✓ The overall drainage planning will be done so that the existing pre-mining drainage conditions will be maintained to the extent possible so that run off distribution is not affected.
- ✓ Rainwater harvesting by constructing check dams on natural nallah and developing water bodies should be planned for recharging groundwater.
- ✓ Sewage (0.425 KLD) is being sent to septic tank followed by soak pit. There is no industrial effluent generation during quarry operation.
- ✓ 13.5 kg/ Day Municipal Solid Wastes including food waste are being disposed of into local municipal waste disposal bins.

4.4 Biological Environment

Impacts:

- ✓ Loss of vegetation and wildlife habitat.
- ✓ Impact on surrounding agricultural land & Impact on groundwater quality due to leachate.

Proposed Mitigation Measure:

- ✓ There are Schedule Species like Blue rock pigeon (Columba livia)- Sch – IV and Nalla Pambu (Naja naja)- Sch II (Part II), Vulnerable Species like King Cobra (Ophiophagus hannah)- Sch II (Part II), and Endemic species like Jerdon's carp (Hypselobarbus pulchellus) identified in the study area (Buffer zone). There is no rare or endangered species in the core zone and Buffer zone of the study area.
- ✓ There are no National Parks, Sanctuary, Biosphere Reserve, Tiger Reserve, Elephant Reserve, wildlife migratory routes in core and buffer zones within the 1km radius of the project.
- ✓ No wildlife is found in the quarry Lease area. To minimize the impacts and to improve up on the existing eco system Afforestation plan will be envisaged with native plants.
- ✓ Lighting will be avoided during nighttime in the quarry. However, the operations will be carried out only in daytime.

4.5 Socio Economic

Impacts:

- Impact on the cropping pattern and crop productivity in the buffer zone
- Impact on community resources such as grazing land
- Mining activity may affect health of the workers and people from the nearest village directly.
- Existing road shall be damaged due to heavy vehicle movement.

- Spillages of material transportation
- Dust deposition on plants and trees.
- Accidental Risks during mining due to unsafe measures

Proposed Mitigation Measure:

- ✓ Quarrying in this area is not going to have any negative impact on the social or cultural life of the villagers in the nearby vicinity.
- ✓ The quarry activity will provide job opportunities, which will help them to develop economically.
- ✓ Around 30 people are directly employed, including mining operations. Local villagers residing in the nearby villages will be employed as semi-skilled workers. 20 people are indirectly employed.
- ✓ At the end of quarry operations, the total area excavated will be fenced properly and Greenbelt will be developed.
- ✓ Control of Spillages and Regular Water sprinkling.
- ✓ Avenue Greenbelt development with native plants.
- ✓ Renovation of existing roads will be done.
- ✓ Rainwater harvesting by constructing check dam on natural nallah and developing water bodies should be planned for recharging groundwater.
- ✓ CER is proposed to the nearby villages.

5 Alternative Studies

No Alternative Studies for Site and Technology are considered Since Quarry project is a Site specific. The open cast mining method is sustainable method.

6 Environmental Monitoring Program

A monitoring schedule with respect to Ambient Air Quality, Water & Wastewater Quality, Noise Quality as per Tamil Nadu State Pollution Control Board (TNPCB) will be maintained.

7 Additional Studies

Public Hearing

This EIA report contains information as per TOR and has been prepared as per generic structure given in Appendix III of EIA notification 2006 by MOEF & CC, Govt. of India.

The draft EIA prepared will be submitted for Public Consultation. Upon incorporating the minutes of the public consultation along with proponent action plan the final EIA will be submitted to SEIAA-TN for further appraisal of the project and obtaining Environmental Clearance.

Disaster Management Plan

- ✓ The salient features of Disaster Management Plan shall be included.
- ✓ Emergency shutdown procedure
- ✓ Fire protection system, Emergency safety equipment & Reporting and response to emergency. Emergency Help from nearby industries and tie up with nearby industries.

Corporate Environmental Responsibility

No Relocation and Rehabilitation is involved in the proposed project since it is a government land. Most villages have benefitted mutually where the mining industry has provided indirect jobs for labor and villages provide accommodation for the labor and staff. Supportive industries like food supply and essential shops are economic growth in the villages. The project proponent has earmarked an investment of Rs. 1,99,940 /- towards CER (being 2% of the total capital cost) and this budget will be allocated as per the committee recommendation during the Public Hearing.

8 Benefits of the Proposed Project

- ✓ The quarrying activities in this belt will benefit the local people both directly 30 persons & indirect persons are 20 Nos.
- ✓ Improvement in Per Capita Income.
- ✓ The socio - Economic conditions of the village and distance will enhance due to the project, hence the project should be allowed after considering all the parameters.
- ✓ It can thus be concluded that the project is environmentally compatible, financially viable and would be in the interest of the construction industry thereby indirectly benefiting the masses.

9 Environmental Benefit Analysis

Not recommended.

10 Environment Management Plan

The EMP provides a delivery mechanism to address potential adverse impacts, to instruct contractors and to introduce standards of good practice to be adopted for all project works. For each stage of the programme, the EMP lists all the requirements to ensure effective mitigation of significant biophysical and socio-economic impacts identified in the EIA.

Proposed Project EMP budget is allocated Rs. 2,05,000/-.

11 Conclusion

The proposal is since the current market Black Granite stone material has a good requirement in civil construction & construction & another field. There is no agriculture and forest land are involved in the proposed mining land. There are no areas which are important or sensitive for ecological reasons like Wetlands, coastal zone, biospheres, mountains, other than Ponnaiyar RF ~ 1.16 km (SSE), Uchhimalai RF ~ 3.93 km (NE) etc. Few water bodies are in the 15km radius of the project site are Lake near Site ~ 0.57km (SSE), Lake near Mallikapuram ~ 0.79 km (WNW) etc.

There are no major industries within this area. A comprehensive listing of the mitigation measures (actions) will be prepared and implemented and the parameters that will be monitored to ensure effective implementation of the action. Also, the timing for implementation of the action to ensure that the objectives of mitigation are fully met to minimize the Impacts on environmental attributes. The quarrying activities will provide benefits to the local people both directly 30 Nos & 20 indirect persons. A total cost of Rs. 2,05,000/- under Environmental Management Plan cost.