DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

For

Proposed Ajjanahalli Black Granite Quarry over an extent of 17.50.0 Ha

Proposed Production Capacity: 6,940m^3

At

Survey No: 896
Village: Ajjanahalli
Taluk: Pennagaram
District: Dharmapuri
State: Tamil Nadu

By

M/s. Tamil Nadu Minerals Limited

(Project termed under Schedule 1(a) Mining of Minerals 'B1' category as per EIA Notification 2006 and its Amendments)

ToR Identification No.TO24B0108TN5399141N, Dated: 22.04.2024

Baseline Period: From March 2024 to May 2024

EIA Consultant & Laboratory
M/s. 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

January 2025

Revision Status

Name of the Client	:	**M/s. Tamil Nadu Minerals Limited**
Name of the Project	:	Proposed Ajjanahalli Black Granite Quarry over an extent of 17.50.0 Ha
Name of the report	:	Draftl EIA Report

Project No: H/01/2023/CON/004	**Document No:** RP003

Revision details:

Rev No.	Date	Details	Prepared by: Name	Prepared by: Sign	Checked by: Name	Checked by: Sign	Approved by: Name	Approved by: Sign
R2	28.01.2025	3rd submission-Draft EIA for Public Hearing	P.V.R.S Surendra		Mr.Vamsee Krishna		Dr.J.R.Moses	
R1	25.01.2025	2nd submission-Draft EIA to QC Team	P.V.R.S Surendra		Mr.Vamsee Krishna		Dr.J.R.Moses	
R0	09.01.2024	1st submission to Client	P.V.R.S Surendra		Mr.Vamsee Krishna		Dr.J.R.Moses	

ACKNOWLEDGEMENT

The following personnel are gratefully acknowledged for their fullest support in collection, compilation of needful data regarding the project and kind cooperation in fulfilling the report on Environmental Impact Assessment (EIA) report of **"Proposed Ajjanahalli Black Granite Quarry over an extent of 17.50.0 Ha"** at S.F.896 of Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District, Tamil Nadu State.

M/s Tamil Nadu Minerals Limited,

- Dr. E Ganesan- Deputy Manager (ML)

M/s Hubert Enviro Care System Private Limited

1) Dr. J R Moses (CEO)
2) Dr. Raj Kumar Samuel (Director- Technical)
3) Mr. Vamsee Krishna Navooru (Head-Consultancy& EIA Coordinator)
4) Mr. PVRS. Surendra(EIA Coordinator)

Declaration by the Project Proponent

I, Dr. E Ganesan, Deputy Manager (ML) of M/s Tamil Nadu Minerals Limited, declaration/ undertaking that owing the contents (information and data) of the EIA report preparation has been undertaken in the compliance with Terms of Reference (ToR) for the **"Proposed Ajjanahalli Black Granite Quarry over the extent of 17.50.0Ha"** at S.F.896 of Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District,Tamil Nadu State"and the information and content provided in the report are factually correct.

for Tamil Nadu Minerals Ltd,

Authorised signatory
Deputy Manager (ML)
TAMIN - Chennai

Declaration by the Head of the Accredited Consultant Organization

I, Dr.J.R. Moses, hereby, confirm that the below mentioned experts prepared the EIA/EMP report for **"Proposed Ajjanahalli Black Granite Quarry over the extent of 17.50.0 Ha"** at S.F.896 of Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District, Tamil Nadu State**.** I also confirm that I shall be fully accountable for any misleading information mentioned in this statement.

Signature:

Date: 28.01.2025

Name: Dr. J. R. Moses

Designation: Chief Executive Officer

Name of the EIA Consultant Organization: M/s. Hubert Enviro Care Systems (P) Ltd, Chennai

NABET Certificate No & Validity: NABET/EIA/24-27/RA0335, valid up to 31.03.2027.

Declaration of EIA Co-ordinator

I, hereby, certify that I was involved in the EIA report for the project titled **"Proposed Ajjanahalli Black Granite Quarry over the extent of 17.50.0 Ha"** at S.F.896 of Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District, Tamil Nadu State. I was a part of the EIA team in the following capacity that developed the above EIA with the support of the following functional area experts.

EIA Coordinator
Name: Mr. PVRS. Surendra
Signature: 
Date: 28.01.2025

Contact Information: M/s. Hubert Enviro Care Systems (P) Ltd

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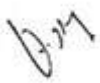
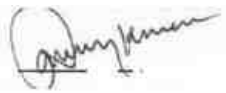
Functional Area Experts (FAEs):

S. No.	Functional Areas	Name of the Expert	Period of Involvement	Signature
1.	WP	Mr. Vamsee Krishna Navooru	**Period : January 2024 to Till date** **Task:** Selection of water monitoring station, interpretation of analysis results, collection of inputs and development of EMP with respect to the wastewater treatment and produced water management.	
2.	SE	Mr. V. Dhivakar	**Period: March 2024 to Till Date** **Task:** Site visit, Collection of secondary data, discussion with stake holders and Preparation of socio -economic status of the study area. Review of demographic characteristics, and supervision of baseline data collection. Collection and analysis of perception study carried out for the proposed project.	
3.	EB	Dr. Rajkumar Samuel	**Period: January 2024 to Till date** **Task:** Primary ecological survey and assessment of flora and fauna with respect to the core and buffer zone in study area and development of EMP. Collection of data from secondary sources and comparing with field data, compilation of Ecology and bio diversity data.	
4.	LU	Mr. Venkateswarlu	**Period: March 2024 to May 2024** **Task :** Development of land use maps of study area using GIS / related tools, site visit for ground reality survey, finalization of land use maps and studying the ecologically sensitive details in the study area as per Topo map and Gazette notifications.	
5.	AP	Mr. Vamsee Krishna Navooru	**Period: January 2024 to Till date** **Task:** Selection of air quality monitoring location, discussion with client on various air pollution control aspects, collection of inputs and development of EMP.	
6.	AQ	Dr. J R Moses	**Period: January 2024 to Till date** **Task:** Collecting Micro metrological data from secondary sources and emission from the proposed DG with the modeling inputs data and development of EMP for the project.	

S. No.	Functional Areas	Name of the Expert	Period of Involvement	Signature
7.	NV	Mr. Vamsee Krishna Navooru	**Period: January 2024 to Till date** **Task:** Selection of noise sampling location for baseline monitoring, interpretation of results and development of EMP	
8.	GEO	B. Mallikarjuna Rao	**Period: March 2024 to May 2024** **Task:** Studying the site topograpghy, existing available mineral resources. Studiying ground profile.	
9.	HG	Mr. Mallikarjuna Rao	**Period: March 2024 to May 202** **Task**: Identification of ground water potential study area, Collection of secondary data and prepa of report with respect to Hydrogeological condit and around the study area.	
10.	SC	Dr. B.C. Nagaraja	**Period: March 2024 to May 2024** **Task:** Identification of soil quality monitoring locations for the project, study of soil nutrients in the study area., proposing the soil management practices during construction and operation phase of project, nutrients for green belt development	
11.	SHW	Mr. Vamsee Krishna Navooru	**Period: January 2024 to Till date** **Task :** Quantification of Municipal solid waste generation and management measures, quantification of hazardous waste generation with management measures.	
12.	RH	Dr. J R Moses	**Period: January 2024 to Till date** **Task:** Identification of hazards materials, Fire accidents and & Disaster management plan along with the preparation of risk for the proposed project and development of EMP.	

EIA Team Members:

S. No	Name	Role
1.	PVRS Surendra	TM for WP
2.	Abraham Abishek Moses	TM for AP & WP
3.	Pravina Rachel Moses	TM for WP & EB
4.	Dr Ramrajan S	TM for EB
5.	Praveenkumaar R	TM for EC (Sector – 1)
6.	M.Monadevi	TM for EC (Sector – 1)
7.	Uma Maheshwari P	TM for HG & LU

LU- Land Use

AP- Air Pollution monitoring, prevention and control

AQ- Meteorology, air quality modeling and prediction

WP- Water pollution monitoring, prevention and control

EB- Ecology and biodiversity

NV- Noise& Vibration

SE-Socio-economics

HG- Hydrology, ground water and water conservation

GEO- Geology

RH - Risk assessment and hazards management

SHW- Solid and hazardous waste management

SC-Soil Conservation

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3	Modified Mining Plan
4	Sectional Plates
5	Terms of Reference
6	300m VAO Letter
7	500m AD letter
8	FMB sketch
9	Copy of Village Map
10	Copy of Adangal
11	Copy of A- Register
12	RQP Certificate
13	Blasting affidavit
14	Approved Mining Plan(old)

List of Abbreviations

AAQ	Ambient Air Quality
AAQM	Ambient Air Quality Monitoring
AMSL	Above Mean Sea Level
BGL	Below Ground Level
CPCB	Central Pollution Control Board
CER	Corporate Environmental Responsibility
EMC	Environmental Management Cell
EMP	Environmental Management Plan
GLC	Ground Level Concentration
GO	Government Order
ISO	International Organization for Standardization
IUCN	International Union for Conservation of Nature
PIA	Project Influnced Area
O.B	Over Burden
S.B	Side Burden
MoEF&CC	Ministry of Environment Forest & Climate Change
NAAQS	National Ambient Air Quality Standards
NABET	National Accreditation Board for Education and Training
QCI	Quality Council of India
SEIAA	State Environmental Impact Assessment Authority
SEAC	State Level Expert Appraisal Committee
TNPCB	Tamil Nadu Pollution Control Board
TWAD	Tamil Nadu Water Supply And Drainage Board

Executive Summary

1. Introduction

The Proposed Ajjanahalli Black Granite Quarry over an extent of 17.50.0 Ha at S.F.No.896 of Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District, Tamil Nadu State. It is a Government Poramboke Land. TAMIN has applied lease application on 13.02.2022. Subsequently the Precise area communication letter has been issued by Additional Chief Secretary, Natural Resources (MME.1) Department, Secretariat, Chennai vide Letter No. Letter No.3740397/MME.1/2023-1, dated: 13.09.2023 to grant lease for 20 years. Precise area communication letter is enclosed as **Annexure-1.**

Accordingly, mining plan has been approved by the Commissioner of Geology and Mining, Chennai vide Rc.No.6167/MM4/2022, dated: 23.11.2023 for the proposed production capacity of 6,940m^3 at 10% recovery of ROM 69,403m^3 during the five years of Mining plan period. Mining plan approval letter is enclosed as **Annexure-2** and approved mining plan is enclosed as **Annexure-14**.

ToR application was submitted to TN-SEIAA vide online proposal No. SIA/TN/MIN/460253/2024, dated: 07.02.2024 since the proposed project area is more than 5.00.0Ha. The proposal was appraised during 451st SEAC meeting held on 13.03.2024. During the meeting, the committee advised TAMIN to submit the revise the mining plan by leaving a minimum distance of 60m from the Masakkal Reserve forest abutting the proposed project site. Hence, the modified mining plan with 10% recovery has been prepared and same as been attached as **Annexure-3.** Further, the proposal was appraised in 709th SEIAA meeting held on 15.04.2024 and ToR was issued along with public hearing vide ToR Identification No. TO24B0108TN5399141N, dated 22.04.2024 under B1 Category, Schedule 1(a) Mining of Minerals as per EIA Notification 2006 and its subsequent amendments for the minor minerals, as the area of the proposed project is more than 5Ha was enclosed as **Annexure-5**.

Based on the obtained ToR, the draft EIA will be prepared and the draft EIA report will be submitted for public hearing. After completion of public hearing, the final EIA report will be prepared by incorporating the public hearing minutes along with compliance. The final EIA report will be submitted for the appraisal in Tamil Nadu SEAC/SEIAA for seeking Environmental Clearance.

Table-1 Salient Features of the Project Site

Survey No	S.F.No. 896
Village	Ajjanahalli
Taluk and District	Pennagaram Taluk, Dharmapuri District
State	Tamil Nadu
Toposheets No.	D43X16
Latitude	12°3’48.1953"Nto12°4’13.7287"N
Longitude	77°49’7.5609"E to 77°49’37.3636"E
Extent Area	17.50.0 Ha
Land Classification	Government Poramboke Land
Lease Period	20 years

Geological Reserves (ROM)	8,87,700m^3
Mineable Reserves (ROM)	5,62,152m^3
Production Capacity	ROM-69,404m^3 & 6,940m^3 (@10% Recovery)
Annual Peak Production	ROM-17,000m^3 & 1,700m^3 (@10% Recovery)
Depth of Mining	30m from the top of hill
Method of Mining	Open cast semi mechanized method
Nearest Town	Pennagaram, ~10km, NE
Nearest Railway Station	Railway Station: Mettur Dam, ~28.51km, S
Nearest Airport	Nearest Airport: Salem Airport, ~40.07km, SE
Interstate boundary	Tamil Nadu- Karnataka State Boundary at 6.60km, NW
Water Requirement	3.5 KLD
Power Requirement	60 kVA
Ground Water Level	11.6m BGL (TWAD- May 2024) Category of Taluk: Critical (As per CGWB)

2. PROJECT DESCRIPTION

2.1 Method of Quarrying

The quarrying operation is being carried out by open cast semi-mechanized method with deployment of HEMM for development and production activities under Regulation106. The quarrying work being carried out under the direct supervision of our statutory mining personal of TAMIN as approved by the Directorate General of Mines Safety (DGMS) under MMR,1961.

Reserves of Black Granite

The Geological reserves of black granite have been computed based on the Geological Plan & Sections as 8,87,700m^3. Mineable Reserves have been computed as 5,62,152 m^3. The total proposed production capacity is 6,940m^3 at 10% recovery of ROM 69,404m^3. The annual peak production will be 1,700m^3 at 10% recovery of ROM 17,000m^3.

Table-2 Ultimate Pit Dimensional Details

S. No	Description	Ultimate Pit Dimensions (m)		
		Length	Average Width	Depth
1	Top	734.00	65.00	30m
2	Bottom	529.00	23.17	

Table-3 Available Reserves

S. No	Geological Reserves (m^3)	Mineable Reserves (m^3)	Proposed Production at 10% recovery (m^3)
1.	8,87,700	5,62,152	6,940

Table-4 Proposed Year Wise Production

S. No	Year	ROM (m^3)	Recovery@10% (m^3)	Granite Waste @ 90% (m^3)
1	1st Year	10,002	1000	9,002
2	2nd Year	11,999	1200	10,799
3	3rd Year	14,403	1440	12,963
4	4th Year	16,000	1600	14,400
5	5th Year	17,000	1700	15,300
Total		**69,404**	**6,940**	**62,464**

Waste Management

The granite waste generated during the mining operation is 62,464m^3 will be dumped in the suitable area already selected. The area of disposal of waste has been identified in southern portion of the lease area. The unsold blocks are kept within the boundary on the country rock area.

2.2 Greenbelt Details

TAMIN is proposing to plant 2,200 trees are proposed to plant within the 7.5m safety buffer zone mine lease area and also in the proposed green belt area of 0.26.0Ha.

Table-5 Proposed Greenbelt Development Details

Year	No of trees proposed to plant	Name of the species to be plant	Survival rate expected	No of trees expected to grow
2025-2026	2,200	Neem, Vilvam, Aathi, Panai	80%	1,750

2.3 Man Power Requirement

Manpower details are given in below table.

Table-6 Manpower Details

S.No	Description	No of persons
A	**Technical/Mining Personnel**	
1	Geologist/Agent (M.sc Qualified)	1
2	Mine Manager (Holder of Manager Certificate of Competency under MMR, 1961)	1
3	Mining Mate cum Blaster	1
4	Machinery operator	6
5	Diesel Mechanic	1
B	**Workers**	
1	Skilled	1

2	Semi- Skilled	9
3	Un-skilled	10
	Total	**30**

2.4 List of Equipments

The lists of Equipment are given in below table.

Table-7 List of Machineries

S. No	Machinery	Capacity	Numbers
1	Excavator	300 LC	1
2	Compressor	400 cfm	2
3	Dumpers	25 Tonnes	2
4	Diamond wire saw	30 m^3/day	1
5	Jack Hammers (32mm dia.)	1.2 to 6m	6
6	Diesel Generator	125 kVA	1
7	Tractor Mounted Air Compressor	-	1

2.5 Land use Pattern of the Lease Area

Table-8 Land Use Pattern of the Lease Area

S. No	Description	Present Area (Ha)	Upto Lease Period (Ha)	Area at the end of the life of Mine (Ha)
1	Mining Area	Nil	3.72.5	5.08.0
2	Waste Dump	Nil	4.63.5	4.59.0
3	Office Infrastructure	0.01.0	Nil	0.01.0
4	Tar Road	0.20.5	Nil	0.20.0
5	Afforestation	Nil	0.26.0	1.52.5
6	Un Utilized area	17.28.5	8.66.5	6.09.0
	Total	**17.50.0**	**17.28.5**	**17.50.0**

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 Land Environment

Impacts

Potential impacts envisaged due to mining operations on land environment are

- The topsoil and bushes observed in the hill slides over the dyke will be removed completely. Hence the top hill ridge will be excavated which will interrupt the aesthetic view of the locality.
- The proposed quarrying operation will alters the hill lock slope and natural drainage pattern.
- Due to the proposed mining activity a pit will be created over the hill lock and left open with the approximate dimension as follows.

Table- 9 Ultimate Pit

S. No	Description	Ultimate Pit Dimensions (m)		
		Length	Average Width	Depth
1	Top	734	65	30m
2	Bottom	529	23.17	

- The granite waste generated during the five years of mining plan period will be around 62,464m^3. These wastes are proposed to be dumped on the southern side of lease area.
- Usage of chemicals like Rock Breaking Powder ($Ca(OH)_2$ for secondary blasting, fuel and lubricants used for machineries will affect the soil quality and fertility.
- Generation of hazardous and non-hazardous wastages.
- Creation of infrastructure facilities like office building, rest shelter, first-aid centre, toilets and other service facilities.

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 will be disposed through TNPCB authorized dealers.
- Dust suppression using water tankers.
- Greenbelt around infrastructure within the mine lease area and along the periphery of the mine lease area by using native plants.
- Proper fencing will be provided around the mine lease area.

3.2 Air Environment

Source

The major sources of air pollution due to mining operations are DG sets, Machineries and Vehicular transportation. The activities causing air pollution due to the mining operations will be excavation, drilling, blasting and transportation. The sources of air emission are given below in **Table-10**.

Table-10 Sources of air pollution due mining operations

S. No	Source of emission	Pollutant
1.	Excavation of Granite	PM
2.	Operation of diesel driven equipment	Gaseous emission

3.	Transportation of product	PM, NO_x, CO

Impacts

- Due to mining activity, Air pollution will cause respiratory problems.
- Air pollution will affect nearby ecosystems, vegetation, livestock habitats and water sources.

Mitigation measures

The mitigation measures due to the proposed mining activity for air environment are given below.

Table-11 Dust Control Measures

S. No	Activities	Control Measures
1	Drilling	➢ Adopting wet drilling method ➢ Drilling machine should be provided with dust extractors
2	Blasting	➢ Use of control blasting technique ➢ Water spray before blasting ➢ Usage of Rock breaking powder($Ca(OH)_2$) ➢ Usage of Wire saw cutting method
3	Loading	➢ Water spray on granite material before loading
4	Transportation of material	➢ Covering of the trucks/dumpers to avoid spillage ➢ Water spray on the haul roads before and after transportation ➢ Maintenance of haul road ➢ Speed of vehicles will be limited upto 25km/hr ➢ Development of a green belt of suitable width on both sides of haul road

3.2.1 Air Quality Modelling

Total maximum GLCs from emissions as given below **Table-12.**

Table-12 Total maximum GLC

Pollutant	Max. Base Line Conc. ($\mu g/m^3$)	Estimated Incremental Conc. ($\mu g/m^3$)	Total Conc. ($\mu g/m^3$)	NAAQ standard
PM	57.35	5.48	62.83	100
SO_2	12.63	0.41	13.04	80
NOX	25.13	1.87	27.0	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 62.83µg/m^3, 13.04µg/m^3 and 27.0µg/m^3 respectively.

3.3 Transportation of material

Impacts

The granite will be transported through existing road by tippers and approximately 2 times per week materials will be transported. The traffic load was observed on Major District Road MDR 654 -

Pennagaram – Nagamarai Road, The vehicular movement for the proposed project is given in **Table-13.**

Table-13 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	679	981	6000	0.26	"A"	Free Flow Traffic
After implementation	689	999	6000	0.17	"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.

Mitigation Measures

- Covering of the trucks/dumpers to avoid spillage
- Water spray on the haul roads before and after transportation
- Maintenance of haul road
- Speed control on vehicles
- Development of a green belt of suitable width on both sides of haul roads.

3.4 Water Environment

Impacts

Impacts envisaged due to wastewater generation during mining operations are

- Wastewater generated from the mines can pollute surface water and groundwater, which can harm wildlife and human health.
- Runoff from mining wastewater can devastate surrounding vegetation.
- Explosive blasting in a mine can cause groundwater to seep to lower depths or connect aquifers, exposing them to contamination by toxic heavy metals.

Mitigation Measures

Surface Water Pollution Control Measures

- Construction of garland drains of suitable size around mine area and dumps to prevent rainwater descent into active mine areas.
- Construction of baffle wall or trenches nearby water bodies to prevent runoff water from mines.
- The dumping will be provided with slopes and covered with grasses, shrubs, etc to prevent erosion.

Ground Water Pollution Control Measures

- The domestic sewage of 1.2 KLD will be disposed through septic tank followed by soak pit.

- Regular monitoring of water levels and quality in the existing open wells and bore well in the vicinity will be carried out.

3.5 Rain Water Harvesting

Impacts

Impacts envisaged due to rainwater on mining operations are

- Heavy rainfall can cause high water levels at a mining site, which can damage equipment and threaten worker safety.
- Rainwater can carry pollutants from a mining site into nearby water bodies; these pollutants can include heavy metals, acids, and other substances that can contaminate the water.
- When it rains, the loosened topsoil can be washed away, carrying sediments that pollute water bodies.

Mitigation Measures

- Construct barriers at suitable intervals along the path of the drains to restrict the flow of water.
- Construction of baffle wall or trenches nearby water bodies to prevent runoff water from mines.
- Provide necessary overflow arrangement to maintain the natural drainage system.
- 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 and for dust suppression purpose.

3.6 Noise Environment

Impact

The main sources of noise generation during mining operations are

- Drilling
- Blasting
- Loading & unloading of materials
- Transportation

Mitigate Measures

Following mitigation measures should be taken to control noise pollution

- Workers will 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.
- Usage of NONEL Blasting (Non-Electric Detonator).
- The blasting will be carried out during favorable atmospheric condition.

3.7 Vibration due to mining operations

Impacts

Due to mining activities, the following impacts of vibration are envisaged as follows:

- Structural damage to infrastructure facilities within the mine lease area.
- Ground Subsidence
- Vibrations cause human health impacts such as fatigue, muscle strain, joint pain, sleep disturbances, cardiovascular problems etc.

Mitigation Measures

- No primary blasting will be used for granite quarry operations. Only secondary controlled blasting techniques will be used.
- Usage of NONEL Blasting.
- Proposed peripheral green belt will be developed in 7.5m safety zone around the quarry.
- All vehicles and machinery will be properly lubricated and maintained regularly.
- Periodical health checkup will be done for the workers.

3.8 Biological Environment

Impacts

Impacts on biodiversity are given below.

Table-14 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

Mitigation Measures

- To reduce the adverse effects on flora/fauna due to deposition of dust generation from mining operations, water sprinkling and water spraying systems will be ensured in all dust prone areas to arrest dust generation.
- Development of greenbelt around the mine lease area.

3.9 Occupational Health due to mining operations

Impacts

The following occupational health issues are observed due to mining operations.

- Exposure to chemicals
- Dust
- Noise and vibration
- High temperatures and humidity

Mitigation Measures

The mitigation measures of occupational health and safety is given below.

Table-15 Mitigation for occupational health and safety

S. No	Activity	Mitigation measures
1	Excavation	➢ Planned excavation, avoid haphazard mining.
2	Drilling and blasting	➢ Adopting wet drilling method. ➢ Using controlled blasting techniques. ➢ Usage of diamond wire saw cutting.
3	Safety zone	➢ Provisions of green belt in the 7.5m safety zone area around the mine lease. ➢ 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	➢ Providing personal protective equipments such as masks, helmets, gloves, earplugs etc., for workers. ➢ Health survey program for workers and local community. ➢ Regular training and awareness of employees to be conducted to meet health and safety objectives.

4. PROJECT COST & ESTIMATED TIME OF COMPLETION

4.1 Project Cost

The estimated project cost is given below **Table-16.**

Table-16 Project cost details

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-17 Project schedule

Particulars	Time Schedule
Submission of Draft EIA/EMP to TNPCB for Public Hearing	January-2025
Conduction of Public Hearing	March-2025
Submitting final EIA/EMP	May-2025
Presentation to SEAC and Obtaining EC	July-2025

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

4.3 CER Activity

Based on O.M F.No. 22-65/2017-IA.III dated: 01.05.2018, 2.0% of the Project cost need to be spent for CER activities i.e., Rs. 2.0 Lakhs. However, TAMIN is proposing for Rs. 4.0Lakhs which is 4.0% of Project cost under CER activities for the Ajjanahalli Government Higher Secondary School.

5. MINING CLOSURE PLAN

5.1 Progressive Mine Closure Plan

As a petro genetic character the depth persistence of the black granite body in the mine lease area is beyond the workable limits. Based on the statutory provisions of mine safety rules and regulations the workable depth is proposed for 30m from top of the hill. However, in course of time there is a possibility of up gradation of technology for safe mining beyond 40m. Hence, it is proposed not to backfill the ultimate pit. The pit boundaries shall be safely fenced with 7.5m buffer safety zone and rainwater or seepage water stored in the pit will be used for agriculture purpose. Green belt development will be maintained in the 7.5m buffer safety zone. Garland drain will be constructed around the quarry area to prevent the flow of silt and sediment runoff. At the end of the life of mine, the mine closure plan will be prepared and submitted to the competent authority to obtain approval and the same will be implemented.

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 15km from the project boundary is given in below tables.

Table-18 Lists of Wild Life Sanctuary

S.No	Monuments	Distance (~km)	Direction
1	Cauvery Wildlife Sanctuary Core/ESZ	6.41	NW
2	Cauvery South Wildlife Sanctuary	6.81	NNW

Table-19 Lists of Monuments

S.No	Monuments	Distance (~km)	Direction
Nil			

Table-20 Lists of Water bodies

S.No	Water bodies	Distance (~km)	Direction

1.	Odai	Within the site	
2.	Adda Vanka	0.06	E
3.	Adda Vanka	0.68	SSW
4.	Moongilmaduvu Check Dam	1.36	SSE
5.	Sintalapadi Pallam	1.44	SE
6.	Ichappadi Pallam	1.58	SSE
7.	Varattu Pallam	2.33	NW
8.	Periya Pallam	2.68	E
9.	Guttala Pallam	4.26	SE
10.	Metturankottai Check Dam	4.34	SSE
11.	Godubhavi Pallam	4.69	WSW
12.	Varattu Kanar	5.07	N
13.	Mathala Pallam	5.53	SE
14.	Kaveri(Cauvery) R	6.33	NW
15.	Voddamma Eri	6.43	ENE
16.	Chinnar R	6.61	NNW
17.	Tottimaduvu Pallam/Bhavi Pallam	6.85	NNW
18.	Morattu Pallam	6.89	SSW
19.	Bilimaduvu Halla	6.9	WNW
20.	Maddala Pallam	7.28	S
21.	Attukombai Halla	7.84	W
22.	Maththalapallam Check Dam	7.89	S
23.	Dasari Pallam	8.19	ESE
24.	Goddu Pallam	8.21	ESE
25.	Chinna Kinar Pallam	8.26	SSW
26.	Periya Pallam	8.4	SE
27.	Kalmaduvu Pallam	9.87	NNE
28.	Pullimadagu Halla	10.15	W
29.	Gaudikere Halla	10.51	W
30.	Doddavarti Halla	11.2	W
31.	Nagamarattu Pallam	11.32	NE
32.	Gulyada Halla	11.6	NW
33.	Chikkavarti Halla	11.61	W
34.	Periya Pallam	11.75	ENE
35.	Stanley Reservoir/Mettur Dam	12.62	SSW
36.	Yelakettu Halla	12.64	WSW
37.	Sembarattu Pallam	12.88	SW
38.	Ottu Pallam	13.0	SW
39.	Kora Pallam	13.16	SW
40.	Bennatti Halla	13.23	NNW
41.	Anaibidda Halla	14.01	NNE
42.	Panankattu Pallam	14.13	SW
43.	Kallumaduvu Pallam	14.72	NNW
44.	Kannikkal Pallam	14.86	WSW

Table-21 Lists of nearby Habitations

S.No	Name of the Village	Distance(~km)	Direction	Approximate population
1.	Karikallur	0.25	WNW	150
2.	Periya Vettilapuram	0.32	S	400
3.	Chinna Vettilapuram	0.39	S	650
4.	Santepete	0.54	ENE	200

5.	Neruppuran	0.86	WSW	100

Table-22 List of Reserved Forests

S.No	Reserved Forest	Distance (~km)	Direction
1	Bevanurmalai RF	Adjacent to Site	N
2	Masakkallu RF	0.50	ESE
3	Badanavadi RF	4.11	SW
4	Pennagaram RF	5.35	NNE
5	Erumbalai RF	6.48	SSE
6	Voddappatti RF	6.64	NNW
7	Madesvaramalai RF	6.99	NW
8	Perumbalai Malai RF	7.06	S
9	Kalappambadi RF	7.47	ESE
10	Guttirayan RF	12.53	NNE
11	Biligundlu RF	13.26	NNW

8. BASELINE STUDY

8.1 Study Period

The baseline environmental monitoring were carried out during **(March 2024 to May 2024)** within the study area.

8.2 Ambient Air Quality

The ambient air quality has been monitored at 8 locations for 15 parameters as per NAAQS, 2009 within the study area.

Table-23 Summary of Ambient Air Quality Monitoring

S.No	Parameters	Minimum of Average (µg/m³)	Maximum of Average (µg/m³)	NAAQ Standards (µg/m³)
1	PM_{10}	35.34	48.26	100
2	$PM_{2.5}$	21.09	27.56	60
3	SO_2	7.18	10.63	80
4	NO_2	14.12	21.15	80

8.3 Noise Environment

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

- In Industrial area (Project site), day time noise level was about 68 dB (A) and 65.45 dB(A) during night time, which is within prescribed limit by CPCB for Industrial area (75 dB(A) Day time & 70 dB(A)Night time).

- In Residential area day time noise levels varied from 40.2 dB (A) to 47.1 dB (A) and night time noise levels varied from37.1 dB(A) to 41.4 dB(A) across the sampling stations. The field observations during the study period indicate that the ambient noise levels in Residential area are within the limit prescribed by CPCB for Residential area (55 dB (A) Day time & 45 dB(A) Night time).

8.4 Water Quality

The prevailing status of water quality at 8 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-24 Summary of Surface Water Quality Monitoring

S.No	Parameters	Minimum	Maximum	IS 2296:1992 Standards
1.	pH	7.3	8.26	6.5 – 8.5
2.	TDS (mg/l)	483	894	500
3.	COD (mg/l)	16	32	-
4.	BOD (mg/l)	1.4	4.3	2
5.	Total Hardness(mg/l)	204.1	564.6	300

8.4.2 Ground Water Quality

Table-25 Summary of Ground Water Quality Monitoring

S. No	Parameters	Minimum	Maximum	IS 10500: 2012 Standards	
				Acceptable Limit	Permissible Limit
1.	pH	6.84	7.83	6.5 – 8.5	NR
2.	Chloride	212.79	332.21	250	1000
3.	Total Hardness (mg/l)	210	584	200	600
4.	Sulphate	53.59	317.14	200	400
5.	TDS	680	1583	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 8 locations in the study area.

Table-26 Summary of Soil Quality

S.No	Parameters	Minimum	Maximum
1.	pH	6.95	8.47
3.	Nitrogen (%)	0.00939	0.01327
4.	Phosphorus (mg/kg)	BLQ	8.49
5.	Potassium (mg/kg)	2.03	8.78

9. WASTE HANDLING

9.1 Solid Waste Management

The municipal solid waste generation and management details are given in **Table-27**.

Table-27 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 its mode of disposal are detailed in **Table-28**.

Table-28 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 recyclers

10. POST PROJECT MONITORING

Post Project Environmental Monitoring

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

Table-29 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	Wind speed and direction,

			Daily basis	Temperature, Relative Humidity, Atmospheric pressure, Rainfall.
2.	Ambient Air Quality	2 Stations (one in up wind and one in downwind)	Twice a week:24 hourly period	PM_{10}, $PM_{2.5}$, SO_2, and NO_2
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	PM_{10}, $PM_{2.5}$, SO_2, and NO_2
5	Soil	Two Locations within the Project Site	Yearly Once	Physico chemical properties, Nutrients, Heavy metals
6	Terrestrial Ecology	Within 10km around the project	Once in three years	Symptoms of injuries on plants
7	Surface/ Ground water quality	Two Locations within the study area	Yearly Once	As per ISO 10500 Standard parameters and IS 2296:1992 Standards

11. CONCLUSION

The **"Proposed Ajjanahalli Black granite quarry over an extent of 17.50.0Ha"** 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, vibration, 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 measures like water sprinkling, plantation, personal protective equipment and diamond wire saw cutting, etc., would form regular practice in the project. Additional pollution control measures and environmental conservation measures will be adopted to control/minimize impacts on the environment. The CER measures proposed to be adopted by the proponent will improve the social and economic status of the nearby villages.

1. INTRODUCTION

1.1 Purpose of the report

The Proposed Ajjanahalli Black Granite Quarry over an extent of 17.50.0 Ha of Government Poramboke land located at S.F.No 896 of Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District, Tamil Nadu.

As per EIA Notification 2006 and its subsequent amendment S.O.1886 (E) dated; 20th April 2022 for the mining of minerals as the area of the proposed project is 17.50.0Ha fall under B1 category. As per Hon'ble National Green Tribunal, vide order dated 13th September, 2018 in O.M. No. 186 of 2016 and MoEF&CC Office Memorandum F.No.L- 11011/175/2018-IA-II (M) Dated: 12.12.2018, clarified the requirement of EIA/EMP and Public Hearing for B1 category projects.

Based on this, the ToR was obtained vide ToR Identification No. TO24B0108TN5399141N Dated: 22.04.2024. The draft EIA report will be submitted for public hearing after completion of public hearing the final EIA report will be prepared by incorporating the public hearing minutes along with compliance. The final EIA report will be submitted for the appraisal in Tamil Nadu SEAC/SEIAA for seeking Environmental Clearance.

1.2 Project background

TAMIN has applied lease application on 13.02.2022. Subsequently the Precise area communication letter has been issued by Additional Chief Secretary, Natural Resources (MME.1) Department, Secretariat, Chennai vide Letter No. Letter No.3740397/MME.1/2023-1, dated: 13.09.2023 to grant lease for 20 years. Precise area communication letter is enclosed as **Annexure-1.**

Accordingly, mining plan has been approved by the Commissioner of Geology and Mining, Chennai vide Rc.No.6167/MM4/2022, dated: 23.11.2023 for the proposed production capacity of 6,940m^3 at 10% recovery of ROM 69,403m^3 during the five years of Mining plan period. Mining plan approval letter is enclosed as **Annexure-2** and approved mining plan is enclosed as **Annexure-14**.

ToR application was submitted to TN-SEIAA vide online proposal No. SIA/TN/MIN/460253/2024, dated: 07.02.2024 as the area of the proposed project is more than 5.00.0Ha. The proposal was appraised during 451st SEAC meeting held on 13.03.2024. During the meeting, the committee advised TAMIN to submit the revise the mining plan by leaving a minimum distance of 60m from the Masakkal Reserve forest abutting the proposed project site. Hence, the modified mining plan with 10% recovery has been prepared and same as been attached as **Annexure-3.** Further, the proposal was appraised in 709th SEIAA meeting held on 15.04.2024 and ToR was issued along with public hearing vide ToR Identification No. TO24B0108TN5399141N Dated: 22.04.2024, under B1 Category, Schedule 1(a)

Mining of Minerals as per EIA Notification 2006 and its subsequent amendments for the minor minerals, as the area of the proposed project is more than 5Ha and the same was enclosed as **Annexure-5**.

Based on the obtained ToR, the draft EIA will be prepared and the draft EIA report will be submitted for public hearing. After completion of public hearing, the final EIA report will be prepared by incorporating the public hearing minutes along with compliance. The final EIA report will be submitted for the appraisal in Tamil Nadu SEAC/SEIAA for seeking Environmental Clearance.

1.3 Identification of Project & Project Proponent

1.3.1 Identification of Project

The proposed Black Granite Mine is over an extent of 17.50.0Ha located at S.F.896 of Ajanahalli Village, Pennagaram Taluk, Dharmapuri District, Tamil Nadu State. TAMIN is obtaining Environmental Clearance from SEIAA-Tamil Nadu. Since, the project falls under B1 Category, Schedule 1(a) Mining of Minerals as per MoEF&CC Notification and its amendment vide S. O. 1886(E) dated; 20.04.2022.

1.3.2 Identification of Project Proponent

Tamil Nadu Minerals Limited (TAMIN) (An Undertaking of Government of Tamil Nadu) has been established in the year1978. It entered the international granite market in the year 1979 and has secured a steady market for dimensional blocks of black and other color materials in countries like Japan, Germany, Italy, Australia, UK, Switzerland, Holland, USA etc. TAMIN had started the Captive Graphite Mine in the year 1986.

TAMIN is only organization recognized by Bureau of Indian Standard for manufacture and supply of I.S. Sand all over the country. TAMIN has also been marketing granite cubes with sides measuring 6cm to 12cm. 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 migmatitic origin), Raw silk (Yellow Feldspathic Leptynite) and a number of other color granite varieties apart from other industrial minerals viz. quartz and feldspar, graphite, lime stone, silica sand, vermiculite, etc.

TAMIN has also set up industrial units for polishing processing the granite stones one each at Manali (Chennai), Madhepalli at Krishnagiri District and Melur at Madurai District. A Beneficiation plant for the beneficiation of graphite ore has been established close to Sivaganga Graphite mine. An exfoliation plant for the processing of vermiculite mineral at Sevathur village Tirupathur district has also been established.

1.4 Brief Description of the Project

1.4.1 Nature and Size of the Project

The quarrying operation is being carried out by open cast semi-mechanized method with 6m bench height and 6m bench width along with deployment of HEMM for development and production activities under Regulation106.

Geological reserves of black granite have been computed based on the Geological Plan & Sections up to the economically workable average depth of 30m from the top of the hillock granite body works out to 8,87,700 m^3.

Mineable Reserves have been computed as 5,62,152 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 56,215 m^3 by applying the recovery factor 10%. The total proposed production capacity is 6,940m^3 at 10% recovery of ROM 69,404m^3. The annual peak production will be 1,700m^3 at 10% recovery of ROM 17,000m^3.

Open cast Semi mechanized method will be followed for proposed mining as per mining plan. The granite waste generated during the mining operation is 62,464m^3 will be dumped in the suitable area already selected. The area of disposal of waste has been identified in southern portion of the lease area. Sectional plates are enclosed as **Annexure-4.**

Table 1-1 Ultimate Pit Dimensional Details

S. No	Description	Average Ultimate Pit Dimensions (m)		
		Length	Average Width	Depth
1	Top	734.00	65.00	30
2	Bottom	529.00	23.17	

Table 1-2 Reserves of Proposed Quarry

S. No	Geological Reserves (m^3)	Mineable Reserves (m^3)	Proposed Production at 10% recovery (m^3)
1.	8,87,700	5,62,152	6,940

1.4.2 Location of the project

The proposed project is over an extent of 17.50.0 Ha; the lease area is located at S.F.No.896 Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District, and Tamil Nadu State. Quarry lease area falls in the survey of India Topo sheet no D43X16 and the area lies in the Eastern Longitude from 77°49'7.5609"E to 77°49'37.3636"E and Northern latitude from 12°03'48.1953"N to 12°04'13.7287"N. The quarry lease

area is hillock with height of about 75m surrounded by plain lands. The altitude of the area is 455m AMSL (Above Mean Sea Level). The site co-ordinates are given in below table.

Table 1-3 Boundary Co-ordinates of the Project Site

S.No	Latitude(N)	Longitude(E)	S.No	Latitude(N)	Longitude(E)
BP1	12° 3' 53.1855"	77° 49' 37.3636"	BP21	12° 4' 11.0286"	77° 49' 11.0789"
BP2	12° 3' 48.1953"	77° 49' 36.7796"	BP22	12° 4' 11.4880"	77° 49' 11.8487"
BP3	12° 3' 49.0111"	77° 49' 35.0346"	BP23	12° 4' 10.6999"	77° 49' 12.9007"
BP4	12° 3' 52.0901"	77° 49' 33.2404"	BP24	12° 4' 12.6949"	77° 49' 14.6155"
BP5	12° 3' 54.7943"	77° 49' 31.4992"	BP25	12° 4' 12.3567"	77° 49' 14.8566"
BP6	12° 3' 55.4314"	77° 49' 29.5347"	BP26	12° 4' 13.7287"	77° 49' 15.9985"
BP7	12° 3' 53.4441"	77° 49' 27.5591"	BP27	12° 4' 12.0111"	77° 49' 17.2485"
BP8	12° 3' 56.8310"	77° 49' 22.5606"	BP28	12° 4' 10.1498"	77° 49' 16.3536"
BP9	12° 3' 59.4989"	77° 49' 23.7516"	BP29	12° 4' 10.1765"	77° 49' 15.6730"
BP10	12° 4' 1.4598"	77° 49' 20.9860"	BP30	12° 4' 8.2360"	77° 49' 14.1943"
BP11	12° 4' 3.1781"	77° 49' 16.1304"	BP31	12° 4' 7.0524"	77° 49' 15.8340"
BP12	12° 4' 4.7924"	77° 49' 15.7330"	BP32	12° 4' 7.2185"	77° 49' 16.1714"
BP13	12° 4' 6.0739"	77° 49' 15.8712"	BP33	12° 4' 6.7421"	77° 49' 17.2448"
BP14	12° 4' 6.5927"	77° 49' 13.4014"	BP34	12° 4' 7.1380"	77° 49' 17.8323"
BP15	12° 4' 5.1674"	77° 49' 12.9564"	BP35	12° 4' 7.4636"	77° 49' 19.9404"
BP16	12° 4' 5.7229"	77° 49' 10.9426"	BP36	12° 4' 5.2900"	77° 49' 25.3701"
BP17	12° 4' 4.6495"	77° 49' 10.3610"	BP37	12° 3' 59.0213"	77° 49' 32.1578"
BP18	12° 4' 5.0710"	77° 49' 9.5614"	BP38	12° 3' 59.0214"	77° 49' 34.4664"
BP19	12° 4' 6.6885"	77° 49' 7.5609"	BP39	12° 3' 54.9344"	77° 49' 35.8858"
BP20	12° 4' 11.3069"	77° 49' 10.6069"			

1.4.3 Site Elevation and Ground Water depth:

The Altitude of the proposed project site is 455m above MSL. Height of the hillock is 75m. The available ground water depth is 11.6m (As per TWAD). The Pennagaram Taluk falls under critical category as per CGWB.

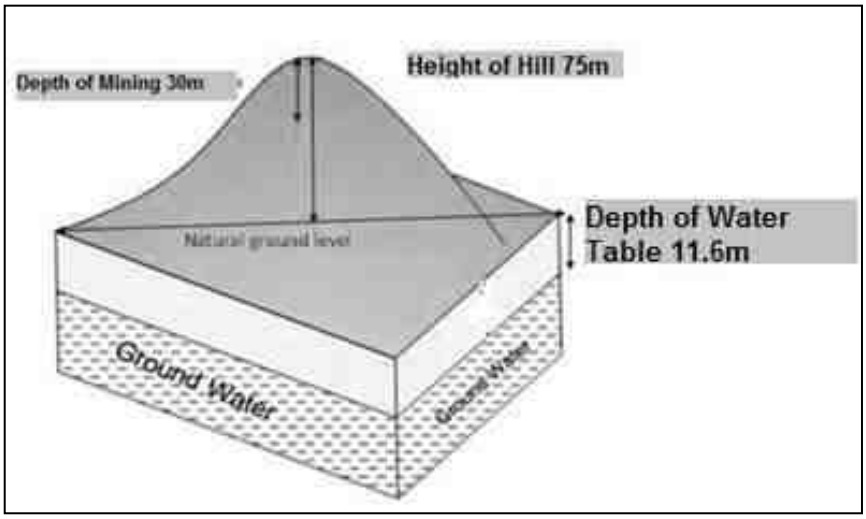

Figure 1-1 Schematic Diagram of Site Elevation and Ground Water Regime

1.5 EIA Study

As a part of compliance to the regulatory requirement i.e., to obtain Environmental Clearance from SEIAA-TN, TAMIN has appointed Environmental Consultant accredited by National Accreditation Board for Education and Training (NABET)-Quality Council of India (QCI), New Delhi. The work of undertaking field studies and preparation of EIA/EMP report under B1category as obtained Terms of Reference from SEIAA-TN was assigned to M/s Hubert Enviro Care Systems (P) Ltd. (HECS) Chennai by the project proponent. HECS is accredited by NABET, vide possession of Certificate No. NABET/EIA/24-27/RA0335, valid up to 31.03.2027.

1.6 EIA Cost

EIA study was undertaken by HECS for an amount of Rs.1, 54, 225/- Lakhs.The base line monitoring was done by M/s. HECS lab, Chennai, an NABL and MoEF& CC Accredited Laboratory. NABL Certificate No: TC-12310 Dated: 25.09.2023 Valid Till 24.09.2025.

1.7 Importance of the Project to the country and Region

Granite quarries play a significant role in India's economy and infrastructure development. Here are some key aspects highlighting the importance of granite quarries to India:

Economic Importance:

1. Employment: Granite quarries provide direct and indirect employment to thousands of people, contributing to the livelihoods of many families.

2. Revenue generation: Granite exports earn significant foreign exchange for India, boosting the country's economy.

3. GDP contribution: The mining and quarrying sector, including granite, contributes substantially to India's Gross Domestic Product (GDP).

Global Significance:

1. Export hub: India is a significant exporter of granite, catering to global demand, particularly from countries like China, the United States, and the Middle East.

2. Quality and diversity: Indian granite is renowned for its quality, color, and pattern variety, making it a preferred choice globally.

Overall, granite quarries contribute substantially to India's economic growth, infrastructure development, and social welfare, while also catering to global demand for this valuable natural resource.

1.8 Scope of the Study

The scope of the work mentioned includes an assessment study of proposed black granite quarry project and their impact on the region. This study puts forward the most effective ways to protect the environment from increasing pollution caused by the mining activities and recommendations for environmental-friendly development initiatives in the region.

An Environmental Impact Assessment (EIA) is an assessment of the possible impact, whether positive or negative that, the mining activities may have on the environment, together consisting of the natural, social and economic aspects, i.e., aiming at “Sustainable Development” due to the project activities.

This EIA report presents the existing baseline scenario and the assessment and evaluation of the environmental impacts that may arise during mining. This report also highlights the Environmental Monitoring Program during the operation phase of the project and the post mined management program. The generic structure of the EIA document will be as per the EIA Notification of the MoEF&CC dated 14th September 2006 and subsequent amendments. The basic structure of the report will be as under.

Chapter 1: Introduction

Introductory information is presented in this Chapter. The introduction chapter provides background to the project, project proponent and describes the objective of this document. The purpose and organization of the report is also presented in this chapter.

Chapter 2: Project Description

This chapter includes project description and infrastructure facilities delineating all the quarry operations and environmental aspect of the quarry activities.

Chapter 3: Description of the Environment

This chapter provides baseline environmental status of Environmental Components (Primary data) delineating meteorological details of the project site and surrounding area.

Chapter 4: Anticipated Environmental Impacts & Mitigation Measures

This chapter presents the analysis of impacts on the environmental and social aspects of the project as a result of establishment of plan and thereby suggesting the mitigation measures.

Chapter 5: Analysis of Alternatives (Technology and Sites)

This chapter includes the justification for the selection of the project site from Environmental point of view as well as from economic point of view.

Chapter 6: Environmental Monitoring Programme

This chapter will include the technical aspects of monitoring, the effectiveness of mitigation measures which will include the measurement methodologies, frequency, location, data analysis, reporting schedules etc,

Chapter 7: Additional Studies

This chapter will detail about the public consultation sought regarding the project. It will also identify the risks of the project in relation to the public and the surrounding environment during quarry operation phase and thereby presents Disaster Management Plan, Social impact assessment and R&R action plans.

Chapter 8: Project Benefits

This chapter deals with improvement in physical and social infrastructures, employment potential and other tangible benefits.

Chapter 9: Environmental Cost Benefit analysis

Not recommended during scoping

Chapter 10: Environmental Management Plan

This is the key chapter of the report and presents the mitigation plan, covers the institutional and monitoring requirements to implement environmental mitigation measures and to assess their adequacy during project implementation.

Chapter 11: Summary and Conclusion

This chapter summarizes the information given in Chapters in this EIA/EMP report and the conclusion based on the environmental study, impact identification, mitigation measures and the environmental management plan.

Chapter 12: Disclosure of the Consultant

Names of consultants engaged in the preparation of the EIA/EMP report along with their brief resume and nature of consultancy rendered are included in this chapter.

1.8.1 Objectives of the Study

- To ensure environmental considerations are explicitly addressed and incorporated into the development decision-making process.
- To anticipate and avoid, minimize or offset the adverse significant biophysical, social and other relevant effects of the above project proposal.
- To protect the productivity and capacity of natural systems and the ecological processes which maintain their respective functions
- To promote development that is sustainable and optimizes resource use as well as management opportunities.
- To fully recognize the scope and requirements of the ToR and comply with the same.
- The major objective of this study is to prepare a detailed Environmental Impact Assessment study within the study area i.e 10 km radius from the project.

1.8.2 EIA Process

An Environmental Impact Assessment (EIA) is an assessment of the possible impact, whether positive or negative, that a proposed project may have on the environment, together consisting of the natural, social and economic aspects, i.e., aiming at "Sustainable Development" due to the project activities. The EIA process followed for this EIA report is composed of the following stages:

1. Study of project information.
2. Screening & Scoping.
3. Environmental pre-feasibility study & application for approval of ToR.
4. Collection of detailed project management plan/report.
5. Baseline data collection.
6. Impact identification, Prediction & Evaluation.
7. Mitigation measures & delineation of EMP.
8. Risk assessment and safety & disaster management plan.
9. Review & finalization of EIA Report based on the ToR requirements.

10. Submission of EIA report for implementation of mitigation measures & EMP as well as necessary clearances from relevant Authority.

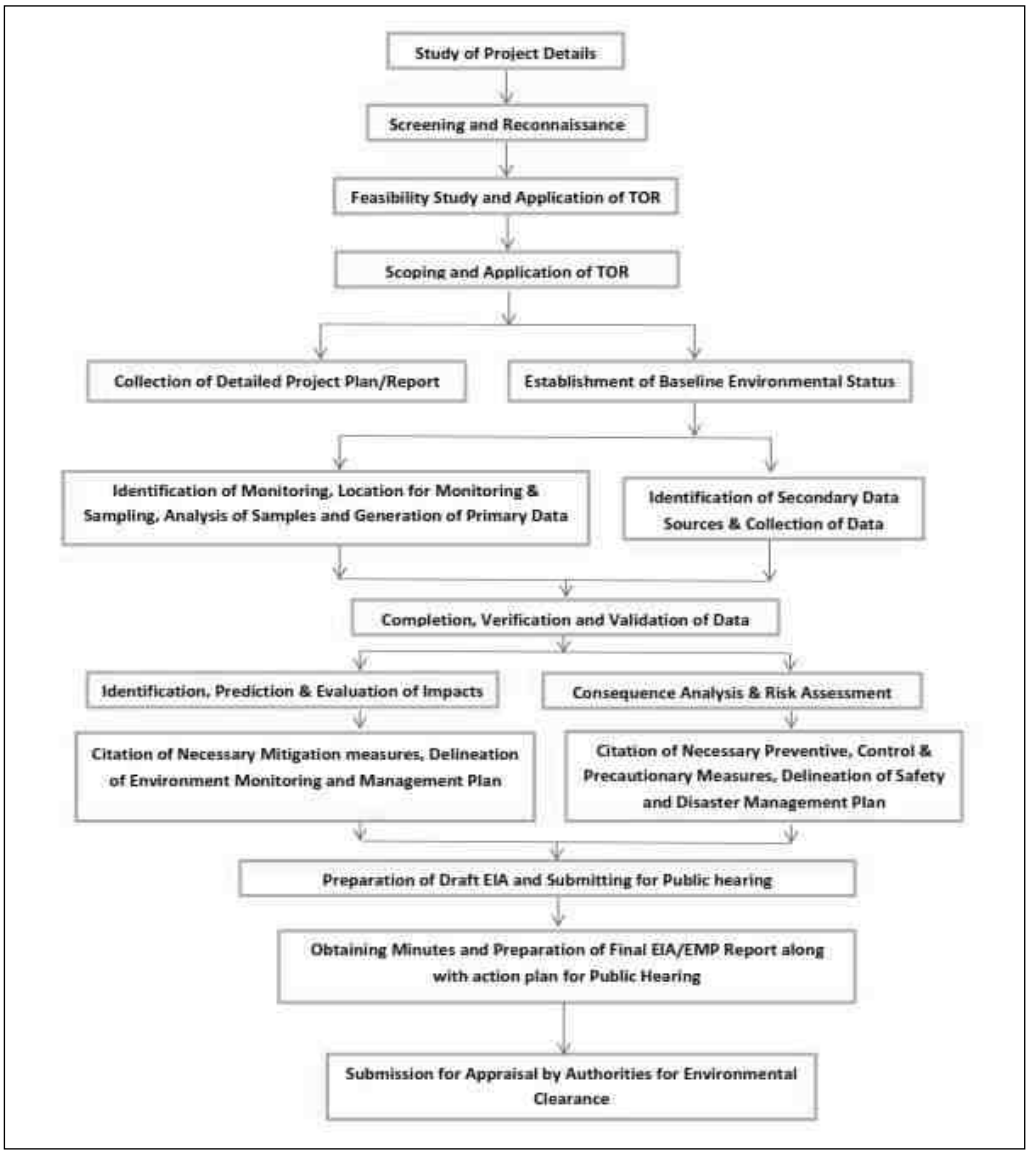

Figure 1-2 Feasibility & Environmental Assessment Process

1.8.3 Legal Complicability

The establishment and functioning of mining industry will be governed by Tamin Client to provide the following environmental acts/regulations besides the local zoning and land use laws of the States.

S.No	Acts/Rules
1	The Environment Protection Act of 1986 amended in 2018
2	Environmental Impact Assessment Notification 14thSep2006 and subsequent amendments time to time
3	The Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988
4	The Water (Prevention and Control of Pollution) Cess Act, 1977, as amended in 2003
5	The Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987, 2014 and 2018.
6	The Noise Pollution and Regulation Act: 2000 amended in 2010

7	The Wildlife (Protection) Act, 1972 as amended in 1991, 1993, 2002, 2006 and 2013
8	The Forest (Conservation) Act, 1980 as amended in 1988 and 1998
9	The Public Liability Insurance Act, 1991, 1992 and 2015
10	The Mines and Minerals (Regulation and Development) Act, 1957 as amended in 2016
11	Circulars issued by the Director-General Mines Safety (DGMS)
12	Contract Labor Regulation and Abolition Act 1970 amended in 2017
13	The Motor Vehicles Act – 1989 as amended in 2022
14	PESO – Explosives and handling of Hazardous Material: 1934 amended in 2021.

1.8.4 Terms of Refernce Compliance

The Terms of Reference (ToR) issued by SEIAA-Tamil Nadu compliance is given as

1.8.4.1 SEIAA Specific Conditions

S. No	Terms of Reference	Compliance
1.1	The authority (SEIAA) noted that the subject was appraised in the 451st SEAC meeting held on 13.03.2024. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant Terms of Reference (ToR) along with Public Hearing under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions.	Environmental Impact Assessment Study has been conducted with base line period from March 2024 to May 2024 for the proposed project. A separate Environment Management Plan has been prepared and as per EIA Notification 2006 – Appendix I on structure of EIA, the EMP has been incorporated in Chapter 10 as per the TN -SEIAA/ SEAC template. Based on the obtained ToR, the draft EIA report will be submitted for public hearing. After completion of public hearing, the final EIA report will be prepared by incorporating the public hearing minutes along with compliance. The final EIA report will be submitted for the appraisal in Tamil Nadu SEAC/SEIAA for seeking Environmental Clearance.
SEAC Standard Conditions		
1.	In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following: (i) Original pit dimension (ii) Quantity achieved Vs EC Approved Quantity (iii) Balance Quantity as per Mineable Reserve calculated. (iv) Mined out Depth as on date Vs EC Permitted depth (v) Details of illegal/illicit mining (vi) Violation in the quarry during the past	As the proposed project is a fresh quarry, the details of existing mines operation from AD mines are not applicable.

<table>
<tr><td></td><td>working.
(vii) Quantity of material mined out outside the mine lease area
(viii) Condition of Safety zone/benches(ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.</td><td></td></tr>
<tr><td>2.</td><td>Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site.</td><td>The VAO certificate stating 300m radius details from the project site is attached as Annexure 6.</td></tr>
<tr><td>3.</td><td>The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry.</td><td>The mining activity proposed for depth of 30m from the top of the hill. The total height of the hill is 75m AGL.Ground water table is available at 11.6m BGL as per TWAD. Mining activities will not intersect with ground water table, as the proposed depth of mining will be above ground level (from the top of the hill).</td></tr>
<tr><td>4.</td><td>The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.</td><td>The detailed bio diversity study has been carried out and the details of list of flora and faunal species in the study area has been discussed in Chapter – 3, Section 3.9.</td></tr>
<tr><td>5.</td><td>The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.</td><td>The Additional Chief Secretary to Government, Natural Resources(MME.1) Department, Government of issued Precise area communication letter for quarrying of black granite over an textent of 17.50.0Ha of government poramboke land to grant of lease for 20 years vide Letter .No.370397/MME.1/2023-1, dated: 13.09.2023.
Precise area communication letter is enclosed as Annexure-I.
The nearby Wildlife Sancturay are given below.
<table>
<tr><th>S.No</th><th>Description</th><th>Distance(~km)</th><th>Direction</th></tr>
<tr><td>1</td><td>Cauvery Wildlife Sanctuary Core/ESZ</td><td>6.41</td><td>NW</td></tr>
<tr><td>2</td><td>Cauvery South Wildlife Sanctuary</td><td>6.81</td><td>NNW</td></tr>
</table>
</td></tr>
</table>

<table>
<tr>
<td></td>
<td></td>
<td>The nearest reserve forest details are given below.
<table>
<tr><th>S.No</th><th>Reserved Forest</th><th>Distance (~km)</th><th>Direction</th></tr>
<tr><td>1</td><td>Bevanurmalai RF</td><td>Adjacent to Site</td><td>N</td></tr>
<tr><td>2</td><td>Masakkallu RF</td><td>0.50</td><td>ESE</td></tr>
<tr><td>3</td><td>Badanavadi RF</td><td>4.11</td><td>SW</td></tr>
<tr><td>4</td><td>Pennagaram RF</td><td>5.35</td><td>NNE</td></tr>
<tr><td>5</td><td>Erumbalai RF</td><td>6.48</td><td>SSE</td></tr>
<tr><td>6</td><td>Voddappatti RF</td><td>6.64</td><td>NNW</td></tr>
<tr><td>7</td><td>Madesvaramalai R</td><td>6.99</td><td>NW</td></tr>
<tr><td>8</td><td>Perumbalai Malai RF</td><td>7.06</td><td>S</td></tr>
<tr><td>9</td><td>Kalappambadi RF</td><td>7.47</td><td>ESE</td></tr>
<tr><td>10</td><td>Guttirayan RF</td><td>12.53</td><td>NNE</td></tr>
<tr><td>11</td><td>Biligundlu RF</td><td>13.26</td><td>NNW</td></tr>
</table>
As per modified mining plan, a safety distance of 60m is left from the Maskkal RF which is abutting the proposed project site.</td>
</tr>
<tr>
<td>6.</td>
<td>In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures</td>
<td>Not applicable, as the proposed quarry is a fresh quarry.</td>
</tr>
</table>

	during the time of appraisal for obtaining the EC.	
7.	However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.	Since the proposed quarry depth is 30m from top of the hill, the slope stability plan is not required.
8.	The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent.	The blasting affidavit is attached as **Annexure 13.**
9.	The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.	Conceptual design of blasting is attached as **Annexure 13.**
10.	The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.	The photographic evidences of quarries operated by the project proponent will be provide during the final EC presentation.
11. 12.	If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines. What was the period of the operation and stoppage	Not applicable, as the proposed project is a fresh quarry.

13.	of the earlier mines with last work permit issued by the AD/DD mines Quantity of minerals mined out. • Highest production achieved in any one year • Detail of approved depth of mining. • Actual depth of the mining achieved earlier. • Name of the person already mined in that leases area • If EC and CTO already obtained, the copy of the same shall be submitted. • Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.	
14	All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	• The boundary coordinates of the site is given in **Table1-3** & Google mage of the site with boundary coordinates is given in **Figure 2-2.** • Topo map shown in **Figure 3-1.** • Geomorphology of the study area is discussed in **Chapter 3, Section 3.3.6 and Figure 3-9.** • Geology of PIA is given in **Chapter 3, Section 3.3.9.** • Land use and Land cover is discussed in **Chapter 3, Section 3.3.3.7 and Table 3-2.** • Ecological Features of the study area is given in **Table 3-1 and Figure 3-2, Figure 3-3and Figure 3-4.**
15.	The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.,	Proponent will provide the drone survey video at the time of final EC presentation.
16.	The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	The green belt and fencing process will be started after completion of public hearing. The photographic evidences of the same will be provided.

<table>
<tr>
<td>17.</td>
<td>The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same.</td>
<td>
<u>Available Reserves</u>
<table>
<tr><th>S. No</th><th>Geological Reserves (m^3)</th><th>Mineable Reserves (m^3)</th><th>Proposed Production at 10% recovery (m^3)</th></tr>
<tr><td>1.</td><td>8,87,700</td><td>5,62,152</td><td>6,940</td></tr>
</table>
<u>Year-wise Production details</u>
<table>
<tr><th>S. No</th><th>Year</th><th>ROM (m^3)</th><th>Recovery@10% (m^3)</th><th>Granite Waste @ 90% (m^3)</th></tr>
<tr><td>1</td><td>1st Year</td><td>10,002</td><td>1000</td><td>9,002</td></tr>
<tr><td>2</td><td>2nd Year</td><td>11,999</td><td>1200</td><td>10,799</td></tr>
<tr><td>3</td><td>3rd Year</td><td>14,403</td><td>1440</td><td>12,963</td></tr>
<tr><td>4</td><td>4th Year</td><td>16,000</td><td>1600</td><td>14,400</td></tr>
<tr><td>5</td><td>5th Year</td><td>17,000</td><td>1700</td><td>15,300</td></tr>
<tr><td colspan="2">Total</td><td>69,404</td><td>6,940</td><td>62,464</td></tr>
</table>
Mining Technology were discussed in Chapter 2, Section 2.8.2. Impacts due to proposed mining activity and its mitigation measures are discussed in Chapter 4.
</td>
</tr>
<tr>
<td>18.</td>
<td>The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.</td>
<td>Organization chart of the TAMIN is discussed in Chapter 10, Figure 10.1</td>
</tr>
<tr>
<td>19.</td>
<td>The Project Proponent shall conduct the hydro-geological study considering the contour map of</td>
<td>The mining activity proposed for depth of 30m from the top of the hill. The total height of the hill is 75m AGL.Ground water table is available at 11.6m BGL as per TWAD. Mining activities will not intersect</td>
</tr>
</table>

	the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.	with ground water table, as the proposed depth of mining will be above ground level (from the top of the hill).
20.	The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.	Base line monitoring has been done for the period of **March 2024 to May 2024** and the details of baseline study have been discussed in **Chapter 3, Section 3.5 to Section 3.9.** Traffic study is provided in **Chapter 4, Section 4.3, and Table 4-14 & Table 4-15.**
21.	The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	The Cumulative Impact study due to mining operations carried out in terms of soil health, biodiversity, air pollution, water pollution, climate change and food control & health impacts are discussed in **Chapter 4**. The EMP is given in **Chapter 10** & EMP cost is provided in **Section 10.11.**
22.	Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	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 and also for dust suppression purpose. The following measures will be adopted as a part of rainwater harvesting. • Construct barriers at suitable intervals along the path of the drains to restrict the flow of water. • Construction of baffle wall or trenches nearby water bodies to prevent runoff water from mines. • Provide necessary overflow arrangement to maintain the natural drainage system. Rainwater harvesting details are provided in **Chapter 4, Section 4.22.**

23.	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	Land use/land cover of study area is given in **Chapter 3** and **Section 3.3.3.7, Table 3-2, Figure 3-6** Land use detail of the quarry area is provided in **Chapter 2, Section 2.5 and Table 2-2.**
24.	Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.	The granite waste generated during the mining operation is 62,464m^3 will be dumped in the suitable area already selected. The area of disposal of waste has been identified in southern portion of the lease area of about 4.63.5Ha. The dump will be maintained not exceeding 5m height and the angle of slope of dumps will be at 45^o from horizontal. The unsold blocks are kept within the boundary on the country rock area.
25.	Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.	Not applicable, Since there is no critically polluted area within the study area.
26.	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided	**Water conservation measures:** • Construction of garland drains of suitable size around mine area and dumps to prevent rain water descent into active mine areas. • Construction of baffle wall or trenches nearby water bodies to prevent runoff water from mines. • The dumping will be provided with slopes and covered with grasses, shrubs, etc to prevent erosion. • The domestic sewage of 1.2 KLD will be disposed through septic tank followed by soak pit. • Regular monitoring of water levels and quality in the existing open wells and bore well in the vicinity will be carried out. **Rainwater Harvesting:**

		• Construct barriers at suitable intervals along the path of the drains to restrict the flow of water. • Construction of baffle wall or trenches nearby water bodies to prevent runoff water from mines. • Provide necessary overflow arrangement to maintain the natural drainage system. • 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 and for dust suppression purpose. Rainwater Harvesting is discussed in **Chapter 4, Section 4.4.1.** Water Conservation measures discussed in **Section 4.21.**
27.	Impact on local transport infrastructure due to the Project should be indicated.	**Impact and Mitigation on local transport:** The increment in the dust emissions will be mainly due to transportation activity. Therefore, emissions due to mineral handling during mining operation are not much and restricted to the lease area only. Proper mitigation measures are practiced during mining activities to control air pollution are as follows: • Covering of the trucks/dumpers to avoid spillage • Water spray on the haul roads before and after transportation • Maintenance of haul road • Speed control on vehicles • Development of a green belt of suitable width on both sides of haul roads. Impact on local transport infrastructure due to the Project is discussed in **Chapter 4 Section 4.3 and** mitigation measures were discussed S**ection 4.21.**
28.	A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	The detailed bio diversity study has been carried out and the details of list of flora and faunal species in the study area has been discussed in **Chapter – 3, Section 3.9.**
29.	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	Mine closure plan is discussed in **Chapter 2, Section 2.13.**
30.	As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study,	The EIA coordinator educated the local students on the importance of local flora and fauna during the site visit.

<table>
<tr><td></td><td>wherever possible.</td><td></td></tr>
<tr><td>31.</td><td>The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.</td><td>TAMIN is proposing to plant 2,200 trees within the 7.5m safety buffer zone mine lease area and also in the proposed green belt area of 0.26.0Ha.

<table><tr><th>Year</th><th>No of trees proposed to plant</th><th>Name of the species to be plant</th><th>Survival rate expected</th><th>No of trees expected to grow</th></tr><tr><td>2025-2026</td><td>2,200</td><td>Neem, Vilvam, Aathi, Panai</td><td>80%</td><td>1,750</td></tr></table>
The above mentioned native plant species will be planted in a mixed manner along consultation with DFO.</td></tr>
<tr><td>32.</td><td>Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner</td><td>TAMIN proposed to plant 2,200 trees in consultation with DFO. These saplings will be raised in appropriate size of ecofriendly bags and will be planted based on site specific choices.</td></tr>
<tr><td>33.</td><td>A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.</td><td>Detailed Disaster management plan are provided in Chapter 7 and Section 7.2.3.</td></tr>
<tr><td>34.</td><td>A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.</td><td>Risk Assessment and management plan is discussed in Chapter 7 and Section 7.2.</td></tr>
<tr><td>35.</td><td>Occupational Health impacts of the Project should</td><td>Impacts</td></tr>
</table>

	be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	The following occupational health issues are observed due to mining operations. • Exposure to chemicals • Airborne hazards • Dust • Noise and vibration • High temperatures and humidity • Manual handling Occupational Health impacts & preventive measures detail given in **Chapter 4, Section 4.11 and Section 4.26** The detailed EMP was discussed in **Chapter 10** and buget is given in **Section 10.11.**
36.	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	Occupational Health impacts & preventive measures detail given in **Chapter 4, Section 4.12 and 4.26** The detailed EMP is given in **Chapter 10.**
37.	The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	The socio-economic study was carried out within the study area from the mining activity. The detailed measures of socio-economic significance are discussed in **Chapter 3, Section 3.10.**
38.	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	Not Applicable for the proposed project.
39.	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	• This proposed quarry will benefit to the local people by providing direct employment for 30 persons & indirect employment for 20 persons. • The direct beneficiaries will be those who get employed in the mines as skilled and unskilled workers. • Improvement in Per Capita Income.

<table>
<tr><td></td><td></td><td>• The socio - eeconomic conditions of the village will enhance due to this proposed project.
• Thus the project is environmentally compatible, financially viable and would be in the interest of construction industry thereby indirectly benefiting the masses.</td></tr>
<tr><td>40.</td><td>If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.</td><td>Not applicable, as the proposed project is a fresh lease.</td></tr>
<tr><td>41.</td><td>The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.</td><td>The EMP details was discussed in Chapter 10 and EMP Cost details are provided in Section 10.11.</td></tr>
<tr><td>42.</td><td>Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.</td><td>All the information provided by the project proponent is factual and no false information has been submitted.</td></tr>
<tr><td>43.</td><td>The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) l0O m, (iii) 200 m and (iv)300 m (v) 50Om shall be enumerated with The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) l0O m, (iii) 200 m and (iv)300 m (v) 50Om shall be enumerated with</td><td>The structures located within the radius of (i) 50 m, (ii) l00 m, (iii) 200 m and (iv)300 m (v) 500m were enumerated below.
<table>
<tr><th>S.No</th><th>Description</th><th>Count</th></tr>
<tr><td colspan="3">0-50m</td></tr>
<tr><td>1</td><td>Temple</td><td>1</td></tr>
<tr><td>2</td><td>House</td><td>4</td></tr>
<tr><td colspan="3">50-100m</td></tr>
<tr><td>2</td><td>House</td><td>2</td></tr>
<tr><td colspan="3">100-200m</td></tr>
<tr><td>1</td><td>Temple</td><td>1</td></tr>
<tr><td>2</td><td>House</td><td>11</td></tr>
</table></td></tr>
</table>

		3	Electric Tower	1	
		200-300m			
		1	House	23	
		2	Poultary Farm	1	
		300-400m			
		1	House	54	
		400-500m			
		1	Temple	2	
		2	House	52	
		3	Primary School	1	
		4	Electric Tower	1	

SEIAA standard Conditions		
Cluster Management Committee		
1.	Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.	There is only one existing quarry of same proponent located within 500m radius of the proposed site. Hence, Cluster Managaement Committee is not required. The 500m radius cluster letter is attcehd as **Annexure-7.**
2.	The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.	Cluster management committee is not required. However TAMIN is a government organization, the EMP will be effectively implemented.
3.	The List of members of the committee formed shall be submitted to AD Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines	Since there is no cluster mines other than same proponent quarry, the cluster management committee is not applicable. The 500m radius cluster letter is attcehd as **Annexure-7.**
4.	Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the quarry in the form of route map and network.	Not applicable as there is no cluster mines with in 500m radius.
5.	The committee shall deliberate on risk management plan pertaining to the cluster in a	The cluster management committee formation is not applicable. However Risk management of the proposed mining project is discussed in **Chapter 7, Section 7.2**.

	holistic inner especially during natural calamities like intense rain and the mitigation measures Considering the inundation of the cluster and evacuation plan.	
6.	The Cluster Management Committee shall forms Environmental Policy to practice sustainable mining in a scientific and the ccordance with the law. The role played by in implementing the ronmental policy devised shall be given in detail.	The cluster management committee formation is not applicable. However, the Environment Policy of TAMIN is discussed in **Chapter 10 in Section 10.1.**
7.	The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.	The cluster management committee formation is not applicable since there is no cluster mines within 500m radius. The 500m radius cluster letter is attcehd as **Annexure-7**
8.	The committee shall furnish the Emergency Management plan within the cluster.	Since there is no cluster mines other than same proponent quarry, the cluster management committee is not applicable. The 500m radius cluster letter is attcehd as **Annexure-7.**
9.	The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public	There is only one existing quarry of same proponent located within 500m radius of the proposed site. Hence, Cluster Managaement Committee is not required. The detailed Impacts and Mitigation measures of occupational health is discussed in **Chapter 4, Section 4.11 and 4.26.**
10	The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.	Since there is no cluster mines other than same proponent quarry, the cluster management committee is not applicable. The 500m radius cluster letter is attcehd as **Annexure-7.**
11.	The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.	There is only one existing quarry of same proponent located within 500m radius of the proposed site. Hence, Cluster Managaement Committee is not required. The 500m radius cluster letter is attcehd as **Annexure-7.** Fire safety and evacuation plan is discussed in **Chapter 7, Section 7.2.1**
Impact study on mining		
12.	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following a) Soil health &soil biological, physical and chemical features b) Climate change leading to Droughts. Floods	The detailed impact study has been carried out in terms of soil health, Climate Change, Pollution leading to release of Green house gases, water, agriculture, Hydrothermal Geothermal effect due to destruction, Bio-geothermal processes and Sediment geochemistry and their mitigation measures were discussed in **Chapter 4.**

	etc. c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature. & Livelihood of the local people. d) Possibilities of water contamination and impact on aquatic ecosystem health e) Agriculture, Forestry & Traditional practices f) Hydrothermal Geothermal effect due to destruction in the Environment. g) Bio-geochemical processes and its foot prints including environmental stress. h) Sediment geochemistry in the surface streams.	
Agriculture & Agro Biodiversity		
13.	Impact on surrounding agricultural fields around the proposed mining Area	There will be minimal impact envisaged on the nearby agricultural land; however TAMIN is following all environmental pollution control measures. The detailed impact and mitigation measure are discussed in **Chapter-4, Section 4.27.**
14.	Impact on soil flora & vegetation around the project site	Impact and mitigation measures of soil given in **Section 4.2 & 4.15.** Impact and mitigation measures of flora&fauna given in **Section 4.6 & 4.24.**
15.	Details of type of vegetations including no. of trees & shrubs within the proposed mining area and If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.	As per the plate no.5 of the sectional plates, the proposed pit area does not contain any trees to transplant. However, the Project proponent is committed to plant 2,200 trees in the periphery of the proposed lease area.
16.	The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural ecosystem.	The details of Flora and fauna are discussed in **Chapter 3**, **Section 3.9**. The impact & control measure on biodiversity is discussed in **Section 4**. **Section 4.6 and Section 4.24.**

<table>
<tr><td>17.</td><td>Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.</td><td>All the essential environmental protective measures will be followed by the proponent to manage the surrounding environment and restore the ecosystem.</td></tr>
<tr><td>18.</td><td>The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.</td><td>The detailed impact on nearby agricultural fields and the mitigation measures were discussed in Chapter 4, Section 4.7 and 4.27.</td></tr>
<tr><td colspan="3">Forests</td></tr>
<tr><td>19</td><td>The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.</td><td>The nearby wildlife sancturies are given below.
<table>
<tr><th>S.No</th><th>Description</th><th>Distance(~km)</th><th>Direction</th></tr>
<tr><td>1</td><td>Cauvery Wildlife Sanctuary Core/ESZ</td><td>6.41</td><td>NW</td></tr>
<tr><td>2</td><td>Cauvery South Wildlife Sanctuary</td><td>6.81</td><td>NNW</td></tr>
</table>
The nearest reserved forest details are given below.
<table>
<tr><th>S.No</th><th>Reserved Forest</th><th>Distance (~km)</th><th>Direction</th></tr>
<tr><td>1</td><td>Bevanurmalai RF</td><td>Adjacent to Site</td><td>N</td></tr>
<tr><td>2</td><td>Masakkallu RF</td><td>0.50</td><td>ESE</td></tr>
<tr><td>3</td><td>Badanavadi RF</td><td>4.11</td><td>SW</td></tr>
<tr><td>4</td><td>Pennagaram RF</td><td>5.35</td><td>NNE</td></tr>
<tr><td>5</td><td>Erumbalai RF</td><td>6.48</td><td>SSE</td></tr>
<tr><td>6</td><td>Voddappatti RF</td><td>6.64</td><td>NNW</td></tr>
<tr><td>7</td><td>Madesvaramalai R</td><td>6.99</td><td>NW</td></tr>
<tr><td>8</td><td>Perumbalai Malai RF</td><td>7.06</td><td>S</td></tr>
<tr><td>9</td><td>Kalappambadi RF</td><td>7.47</td><td>ESE</td></tr>
<tr><td>10</td><td>Guttirayan RF</td><td>12.53</td><td>NNE</td></tr>
<tr><td>11</td><td>Biligundlu RF</td><td>13.26</td><td>NNW</td></tr>
</table>
As per modified mining plan, a safety distance of 60m is left from the Maskkal RF, which is abutting the proposed project site. Reserve forest details are given in Chapter 3, Table 3-1.</td></tr>
<tr><td>20</td><td>The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.</td><td>Detailed biodiversity study is discussed in Chapter 3, Section 3.9.
The impacts and mitigation measures of biological environment is discussed in Chapter 4, Section 4.6. and 4.24.</td></tr>
<tr><td>21.</td><td>The Environmental Impact Assessment should</td><td>The impacts and mitigation measures of Biological environment is discussed in Chapter 4, Section 4.6</td></tr>
</table>

<table>
<tr><td></td><td>study impact on standing trees and the existing trees should be numbered and action suggested for protection.</td><td>and 4.24.</td></tr>
<tr><td>22.</td><td>The Environmental Impact Assessment should study impact on protected areas, Reserve Forest National Park Corridors and Wildlife pathways, near project site.</td><td>The nearby wildlife sancturies are given below.
<table>
<tr><th>S.No</th><th>Description</th><th>Distance(~km)</th><th>Direction</th></tr>
<tr><td>1</td><td>Cauvery Wildlife Sanctuary Core/ESZ</td><td>6.41</td><td>NW</td></tr>
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<tr><td>10</td><td>Guttirayan RF</td><td>12.53</td><td>NNE</td></tr>
<tr><td>11</td><td>Biligundlu RF</td><td>13.26</td><td>NNW</td></tr>
</table>
As per modified mining plan, a safety distance of 60m is left from the Maskkal RF, which is abutting the proposed project site. The reserved forest details are given in Chapter 3, Table 3-1.</td></tr>
<tr><td colspan="3">Water Environment</td></tr>
<tr><td>23.</td><td>Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect</td><td>The mining activity proposed for depth of 30m from the top of the hill. The total height of the hill is 75m AGL.Ground water table is available at 11.6m BGL as per TWAD. Mining activities will not intersect with ground water table, as the proposed depth of mining will be above ground level (from the top of the hill).</td></tr>
</table>

	groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.	
24	Erosion Control measures.	Erosion control measures were discussed in **Chapter 4** and **Section 4.16.**
25.	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.	The detailed study has been carried out in and around the mining lease area in the aspect of nearby villages, waterbodies, Rivers and ecological tragile area and the same has been discussed in **Chapter 4.**
26.	The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.	The project surrounding the water body is seasonal, with common aquatic fish and flora found. Thus, no effects on aquatic species or habitats relative to project activities.
27.	The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.	The potential fragmentation impact of natural environment, by the activities is discussed in **Chapter 4**.
28.	The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archacological sites possible land form changes visual and aesthetic impacts.	The project surrounding the water body is seasonal, with common aquatic fish and flora found. Therefore, the project will not impact the ecological character of the aquatic plants and animals in water bodies. There are no any nearby caves, heritage site from the proposed site. Therefore, there will be no impacts due to the proposed activities.
29.	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.	Impact and mitigation measures of soil given in **Section 4.2 and 4.16.**
30.	The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites	Impacts and mitigation measures on water environment are discussed in **Chapter 4, Section 4.4 and Section 4.21.**
Energy		
31.	The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.	Mitigation Measures to control noise, air, water, and dust are provided in **Chapter 4.**
Climate Change		
32	The Environmental Impact Assessment shall study in detail the carbon emission and also	Operating a granite quarry can have several impacts on increasing carbon emissions and contributing to temperature rise, primarily through direct and indirect mechanisms.

	suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.	The proposed granite quarry covering an area of 17.50.0 hectares of Govt land has the potential to generate various GHG emissions, including carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), fluorinated gases, water vapour, and ozone. These emissions can arise from different phases of quarrying operations, such as excavation, transportation, energy consumption, and land-use changes. A detailed study has been conducted to analyze and mitigating these emissions for minimizing environmental impact and promoting sustainable quarrying practices the same has been discussed in Chapter Section Other environmental impacts and mitigation measures are discussed in **Chapter 4.**
33	The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.	The operation of the proposed granite quarry can have various impacts on climate change, temperature rise, pollution, and carbon stocks, both above and below the soil. The detailed impacts and mitigation measures are discussed in **Chapter 4. Section 4.4 and in Section 4.19.**
Mine Closure Plan		
34	Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.	Mine Closure Plan is provided in **Chapter 2, Section 2.13.**
EMP		
35	Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.	Environment Management Plan is provided in **Chapter 10.**
36	The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.	Environment Management Plan is provided in **Chapter 10.** Budget for Environmental Protection is given in **Table 10-7.**
Risk Assessment		
37.	To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.	Risk Identification & Management are provided in **Chapter 7, Section 7.2.**
Disaster Management Plan		
38.	To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities	Detailed Disaster management plan are provided in **Chapter 7** and **Section 7.2.3.**

	covering the entire mine lease period as per precise area	
Others		
39.	The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.	The VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads and water bodies is obtained and attached as **Annexure -6**.
40	As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.	The project proponent committed to address the concerns raised in Public Hearing in environmental aspects and the activities proposed will be as a part of proposed EMP.
41.	The project proponent shall study and furnish the possible pollution due to plastic and microplastics on aquatic environment and fresh water system due to activities, contemplated during mining may be inverstigated and reported.	No plastics are envisaged in the proposed project site.

1.8.4.2 Standard Terms of Reference

S. No	Terms of Reference	Compliance
1.1	An EIA-EMP Report shall be prepared for peak capacity (…..MTPA)operation in an ML/project area of.....ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.	The EIA report of the proposed project is prepared with peak capacity of 1,700m^3 of 10% recovery of 17,000m^3 RoM with total proposed production of 6,940m^3 of 10% recovery of 69,404m^3 RoM along with all 12 Chapters given in the Appendix III of EIA Notification 2006.
1.2	An EIA-EMP Report would be prepared for peak capacity operation to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community,	The EIA report of the proposed project is prepared with peak capacity of 1,700m^3 of 10% recovery of 17,000m^3 RoM with total proposed production of 6,940m^3 of 10% recovery of 69,404m^3 RoM along with all 12 Chapters given in the Appendix III of EIA Notification 2006. The Cumulative Impact study due to mining operations carried out in terms of soil health, biodiversity, air

	etc. throughcollection of data and information, generation of data on impacts including prediction modeling for..... MTPA of mineral production based on approved project/Mining Plan for.....MTPA. Baseline data collection can be for any season (three months) except monsoon.	pollution, water pollution, climate change and food control & health impacts are discussed in **Chapter 4**. The EMP is given in **Chapter 10**, **Section 10.4.** The Baseline monitoring was conducted from **March 2024 to May 2024** and the detailed baseline monitoring methodology for the environmental aspects including air, water soil, noise and the results were discussed in **Chapter 3, Scetion 3.5 to 3.8**
1.3	Propoer KML file with pin drop and coordinate of mine at 500-1000 m interval be provided	KML file is provided already uploaded in the PARIVESH portal.
1.4	A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries, mines and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given. The above details to be furnished in tabular form also.	• The topo map of the study area in1:50,000 scale is given in **Chapter 3, Section 3.1 and Figure 3-1.** • Environmental sensitive areas covering within 15 km from project boundary is given in **Chapter 3 Section 3.2 , Figure 3-2, Figure 3-3 and Figure 3-4.** The details of environmental sensitive areas were given in **in Table 3.1** • Land use/land cover of study area is given in **Chapter 3**, **Section 3.3.3.7, Table 3-2** and **Figure 3-6.**
1.5	Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical features such as water bodies, etc should be furnished.	Land use/land cover of study area is given in **Chapter 3**, **Section 3.3.3.7, Table 3-2** and **Figure 3-6.** The Field Measurement Book sketch detailing the proposed mine lease area boundary lines and topographical feaures is attached as **Annexure 8**
1.6	A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.	Drainage map of the study area is in **Chapter 3, Section 3.3.8**, and **Figure 3-11.** Contour map of the study area is given in **Chapter 3, Section 3.3.4**, and **Figure 3-8.**
1.7	Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with	Drainage map of the study area is in **Chapter 3, Section 3.3.8**, and **Figure 3-11.**

<table>
<tr><td></td><td>names, details of rivers/ riverlet system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river need eloboration in form of lengthe, quantity and quality of water to be diverted</td><td></td></tr>
<tr><td>1.8</td><td>Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects.</td><td>
<u>Available Reserves</u>
<table>
<tr><th>S. No</th><th>Geological Reserves (m^3)</th><th>Mineable Reserves (m^3)</th><th>Proposed Production at 10% recovery (m^3)</th></tr>
<tr><td>1.</td><td>8,87,700</td><td>5,62,152</td><td>6,940</td></tr>
</table>
<u>Year-wise Production details</u>
<table>
<tr><th>S. No</th><th>Year</th><th>ROM (m^3)</th><th>Recovery@10% (m^3)</th><th>Granite Waste @ 90% (m^3)</th></tr>
<tr><td>1</td><td>1st Year</td><td>10,002</td><td>1000</td><td>9,002</td></tr>
<tr><td>2</td><td>2nd Year</td><td>11,999</td><td>1200</td><td>10,799</td></tr>
<tr><td>3</td><td>3rd Year</td><td>14,403</td><td>1440</td><td>12,963</td></tr>
<tr><td>4</td><td>4th Year</td><td>16,000</td><td>1600</td><td>14,400</td></tr>
<tr><td>5</td><td>5th Year</td><td>17,000</td><td>1700</td><td>15,300</td></tr>
<tr><td colspan="2">Total</td><td>69,404</td><td>6,940</td><td>62,464</td></tr>
</table>
The details of mineral reserves were discussed in Chapter 2, Section 2.5.
The mine closure plan is discussed in Chapter 2.13
The Mining Plan is approved by Commisoner of Department of Geology and Mining Rc.No.6167/MM4/2022, dated: 23.11.2023 and the same is attached as Annexure-2. The modified mining plan with 10% recovery has been prepared and submitted for approval from Deputy Director(Mines),
</td></tr>
</table>

		Department of Geology and Mining vide Rc. No. 2460/ML4/2002 and the same has been attached as **Annexure-3.**
1.9	Details of mining methods, technology, equipment to be used, etc., tionale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.	**Mining Technology** The quarrying operation is being carried out by open cast semi-mechanized method with deployment of HEMM for development and production activities under Regulation106. The quarrying work being carried out under the direct supervision of our statutory mining personal of TAMIN as approved by the Directorate General of Mines Safety (DGMS) under MMR,1961. The details of mining technology is discussed in **Chapter -2 section 2.8.** Process description is dicussed in **Chapter 2, Section 2.9** List of equipents used is provided in **Chapter 2, Section 2.10.4, Table 2-8.**
1.10	Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing though the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.	The mining activity proposed in depth of 30m from the top of the hill. (AGL as per mining plan) Ground water table is available at 11.6m BGL as per TWAD. Mining activities will not intersect with ground water table as the proposed depth of mining will be above ground level (from the top of the hill). Workable depth will be 30m from the top of the hill of height. Impact and mitigation easures on water environment is discussed in **Chapter 4, Section 4.3 and Section 4.21.**
1.11	A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, Stockyard, ownship/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed iversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.	**Land use details of the quarry area:** A Land use detail of the quarry area is provided in **Chapter 2, Section 2.5, and Table 2.2**
1.12	Original land use (agricultural land/forestland/grazing land/wasteland/water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations	The entire mine lease area of 17.50.0Ha is Government Poramboke land which is leased by TAMIN. TAMIN obtained precise area communication letter vide Lr.No. 3740397/MME.1/2023-1, dated: 13.09.2023. Precise area communication letter is enclosed as **Annexure-I.** The Land use detail of the quarry area is provided in **Chapter 2, Section 2.5, and Table 2.2**

	should be analyzed. Extent of area under surface rights and under mining rights should be specified. Area under Surface Rights	
1.13	Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of theState Govt. should also be obtained and furnished.	The details of Flora and fauna are discussed in **Chapter 3**, **Section 3.10**. Also the impact & control measure on biodiversity is discussed in Section 4.6 and 4.24. The conservation plan for Indian Peafowl (Peacock) with budgetary provision is discussed in **Chapter 3, Section 3.9.10.**
1.14	One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/ MoEF&CC certification of the respective laborartory and NABET accreditation of the consultant to be provided.	Base line monitoring has been done for the period of **March 2024 to May 2024** and the details of baseline study have been discussed in **Chapter 3 Section 3.5 to Section 3.8.** NABET Certificate No & Validity of the Consultant : 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
1.15	Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts	Base line monitoring has been done for the period of **March 2024 to May 2024** and the details of baseline study have been discussed in **Chapter 3 Section 3.5 to Section 3.8.** The monitoring was conducted asper CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards was followed.

	in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in theupwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be asper CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be providedalong with the specified standards.	
1.16	For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed and accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. ispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided	Base line monitoring has been done for the period of **March 2024 to May 2024** and the details of baseline study have been discussed in **Chapter 3 Section 3.5 to Section 3.8.** Wind rose diagram is given in **Chapter 4, Section 4.2.1, Figure 4-1.**
1.17	A detailed traffic study along with presence of habitation in 100 mts distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectlycontribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.	Traffic study is provided in **Chapter 4, Section 4.3, and Table 4-14 &Table 4-15.** Impacts and mitigation measures on transportation is given in **Chapter 4. Section 4.3. and 4.21**
1.18	The socio-economic study to conducted with actual survey report and a comparative assessment to be provided from the census data should be provided in EIA/ EMP report also occupational status & economic status of the study area and what economically project will contribute should be clearly mention. The study should also include the status of infrastructural facilities and amenities present in the study area and a comparative assessment with census data to be provided	The socio-economic study was carried out within the study area from the mining activity. The detailed measures of socio-economic significance are discussed in **Chapter 3, Section 3.10**

	and to link it with the initialization and quantification of need based survey for CSR activities to be followed.	
1.19	The Ecology and biodiversity study should also indicate the likely impact of change in forest area for surface infrastructural development or mining activity in relation to the climate change of that area and what will be the compensatory measure to be adopted by PP to minimize the impact of forest diversion.	The details of flora and fauna are discussed in **Chapter 3**, **Section 3.9**. Also the impact & control measure on biodiversity is discussed in **Chapter 4**, **Section 4.6** and the mitigation measures were discussed in **Section 4.24.**
1.20	Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be submitted.	Occupational Health impacts & preventive measures detail given in **Chapter 4, Section 4.11 & Section 4.26.**
1.21	Impact of proposed project/activity on hydrological regime of the area shall be assessed and report 1.22 be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted	The proposed project area is a hillock with a height of 75m above ground level. The proposed depth of the project is 30m from top of the hill. Hence, the ground water will not get affected.
1.22	Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls withindark/grey zone.	Impact and Mitigation measures of water environment is discussed in **Chapter 4, Section 4.4** and in **Section 4.21**. The details of rainwater harvesting are provided in **Chapter 4, Section 4.22.**
1.23	Study on land subsidence including modeling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.	The impact and mitigation measures of land environment is discussed in **Chapter 4, Section 4.2 and Section 4.15.**
1.24	Detailed water balance should be provided. The break up of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the competing users should be provided.	The water requirement for the project is addressed in **Chapter 2**, **Section 2.10.1** and **Table 2.6.** The total water requirement is sourced from private tank suppliers.

1.25	PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs	Mobile/static water jet, Fog cannon sprinkling system and mobile water sprinkler will be used as air pollution control equipments.
1.26	PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of mineral. The measures adopted to conserve energy or use of renewable sources shall be explored	PP will propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of mineral.
1.27	PP to evaluate the green house emission gases from the mine operation plant and corresponding carbon absorption plan.	Operating a granite quarry can have several impacts on increasing carbon emissions and contributing to temperature rise, primarily through direct and indirect mechanisms. The proposed Granite Quarry covering an area of 17.50.0 hectares of Govt land has the potential to generate various GHG emissions, including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N2O), fluorinated gases, water vapour, and ozone. These emissions can arise from different phases of quarrying operations, such as excavation, transportation, energy consumption, and land-use changes. A detailed study has been conducted to analyze and mitigating these emissions for minimizing environmental impact and promoting sustainable quarrying practices the same has been discussed in Chapter Section Other environmental impacts and mitigation measures are discussed in **Chapter 4.**The mitigation measure of Air Environment is discussed in **Chapter 4, Section 4.17**
1.28	Site specific Impact assessment with its mitigation measures, Risk Assessment and Disaster Preparedness and Management Plan should be provided .	The Cumulative site specific Impact study due to mining operations carried out in terms of soil health, biodiversity, air pollution, water pollution, climate change and food control & health impacts are discussed in **Chapter 4**. Risk Assessment and Disaster Management plan is discussed in **Chapter 7.**
1.29	Impact of choice of mining method, technology, selected use of machinery and impact on air quality, mineral transportation, handling & storage/stockyard, etc, Impact of blasting, noise andvibrations should be provided.	Impact and mitigation measures due to the proposed minig activity is discussed in **Chapter -4.**
1.30	Impacts of mineral transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of effluents from workshop etc, management plan for maintenance of HEMM and other	**Total maximum GLCs from emissions:** The maximum ground level concentration observed due to mining activities and traffic movement through Air Modelling for PM, SO_2 and NO_x are 64.93µg/m^3, 12.95µg/m^3, 26.1µg/m^3 respectively. The details are provided in **Chapter 4 and Table 4.11.** Wind rose diagram considered for dispersion modeling is shown in **Chapter 4, Section 4.2.1, and Figure**

<table>
<tr><td></td><td>machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided.</td><td>4.1.
Transportation:
The details are provided in Chapter 4, Section 4.3, and Table 4.14 & Table 4.15.</td></tr>
<tr><td>1.31</td><td>Details of various facilities to be provided to the workers in terms of parking, rest areas and canteen, and effluents/pollution load resulting from these activities should also be given.</td><td>An area of 0.01.0Ha of out of 17.50.0Ha will be utilized for infrastructure facilities purposes. The details of land use break up of the proposed project site is given in Chpater 2, Section 2.5, Table 2-2
The details of infrastructure facilities is discussed in Chapter 2, Section 2.11. The detailed EMP is given in Chapter 10 and Section 10.11.</td></tr>
<tr><td>1.32</td><td>The number and efficiency of mobile/static water jet, Fog cannon sprinkling system along the main mineral transportation road inside the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality should be provided.</td><td>Mobile/static water jet, Fog cannon sprinkling system and mobile water sprinkler will be used as air pollution control equipments.</td></tr>
<tr><td>1.33</td><td>Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre-mining status should be provided. A Plan for the ecological restoration of the mined out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and issues of re-handling (wherever applicable) and backfilling and progressive mine closure and reclamation should be furnished.</td><td>Mine closure plan is discussed in Chapter 2, Section 2.13.</td></tr>
<tr><td>1.34</td><td>Adequate greenbelt nearby areas, mineral stock yard and transportation area of mineral shall be provided with details of species selected and survival rate Greenbelt development should be undertaken particularly around the transport route.</td><td>TAMIN is proposing to plant 2,200 trees are proposed to plant within the 7.5m safety buffer zone mine lease area and in the proposed green belt area of 0.26.0 Ha.
<table>
<tr><th>Year</th><th>No of trees proposed to plant</th><th>Name of the species to be plant</th><th>Survival rate expected</th><th>No of trees expected to grow</th></tr>
<tr><td>2025-2026</td><td>2,200</td><td>Neem, Vilvam, Aathi, Panai</td><td>80%</td><td>1,750</td></tr>
</table></td></tr>
<tr><td>1.35</td><td>Cost of EMP (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.</td><td>The Capital and Recurring EMP cost is given Chapter 10, Section 10.11

The details of Mine Closure Plan is given in Chapter 2, Section 2.13.</td></tr>
</table>

1.36	Details of R&R. Detailed project specific R&R Plan with data on the existing socio- economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and costs along with the schedule of the implementation of the R&R Plan should be given.	The lease area is classified as Government Poramboke land. There is no Project Affected People (PAP) by the proposed mining activities. Hence, there is no need of R&R Plan. There is no human settlement in allotted mine lease area.Socio economic study has been done and incorporated in **Chapter 3**, **Section 3.10**
1.37	CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project should be given.	The draft EIA report is being prepared and will be submitted for Public Hearing. Based on the querry raised by the public, the CSR activity for the proposed project village will be crried out by the project proponent.
1.38	Corporate Environment Responsibility	
1.39	a) The Company must have a well laid down Environment Policy approved by the Board of Directors.	TAMIN has a well laid down Environment Policy approved by its Board of Directors. Environmental Policy of TAMIN is given in **Chapter 10, Section 10.1.1.**
1.40	b) The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.	TAMIN has a well laid down Environment Policy approved by its Board of Directors. Environmental Policy of TAMIN is given in **Chapter 10, Section 10.1.1.**
1.41	c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.	TAMIN has a well laid down Environment Policy approved by its Board of Directors. Environmental Policy of TAMIN is given in **Chapter 10, Section 10.1.1.** The Hierarchial system of TAMIN is given in **Chapter 10** and **Figure 10.1.**
1.42	d) To have proper checks and balances, the company should have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large	TAMIN has a well laid down Environment Policy approved by its Board of Directors. Environmental Policy of TAMIN is given in **Chapter 10, Section 10.1.1.**
1.43	e) Environment Managament Cell and its responsibilities to be clearly spleel out in EIA/ EMP report	The proposed Environment Managament Cell and its responsibilities were discussed in **Chapter 10.**
1.44	f) In built mechanism of self-monitoring of compliance of environmental regulations should be indicated	The proposed Environment Managament Cell and its responsibilities were discussed in **Chapter 10.**

<table>
<tr><td>1.45</td><td>Status of any litigations/ court cases filed/pending on the project should be provided.</td><td>Not applicable.</td></tr>
<tr><td>1.46</td><td>PP shall submit clarification from DFO that mine does not falls under corridors of any National Park and Wildlife Sanctuary with certified map showing distance of nearest sanctuary</td><td>The Additional Chief Secretary to Government, Natural Resources(MME.1) Department, Government of issued Precise area communication letter for quarrying of black granite over an textent of 17.50.0Ha of government poramboke land to grant of lease for 20 years vide Letter .No.370397/MME.1/2023-1, dated: 13.09.2023.
Precise area communication letter is enclosed as Annexure-I.
The nearby Wildlife Sancturay are given below.
<table>
<tr><th>S.No</th><th>Description</th><th>Distance(~km)</th><th>Direction</th></tr>
<tr><td>1</td><td>Cauvery Wildlife Sanctuary Core/ESZ</td><td>6.41</td><td>NW</td></tr>
<tr><td>2</td><td>Cauvery South Wildlife Sanctuary</td><td>6.81</td><td>NNW</td></tr>
</table>
.
As per modified mining plan, a safety distance of 60m is left from the Maskkal RF which is abutting the proposed project site.</td></tr>
<tr><td>1.47</td><td>Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan approval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable</td><td>The Mining Plan approved by Commisoner of Department of Geology and Mining Rc.No.6167/MM4/2022, dated: 23.11.2023 and the same is attached as Annexure-2.</td></tr>
<tr><td>1.48</td><td>Details on the Forest Clearance should be given as per the format given:</td><td>Not applicable, as the proposed mine lease area does not involve any Forest land.</td></tr>
<tr><td>1.49</td><td>In case of expansion of the proposal, the status of the work done as per mining plan and approved mine closure plan shall be detailed in EIA/ EMP report</td><td>Not applicable, as the proposed project is a fresh lease.</td></tr>
<tr><td>1.50</td><td>Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general public and commitments made by the proponent and the time bound action proposed with budgets in suitable time frame. These details should be presented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.</td><td>The draft EIA for the proposed project is being prepared and will be submitted for Public Hearing in Tamil Nadu Pollution Control Board. Hence, after completion of Public Hearing, the minutes will be incorporated in the final EIA along with compliance and the final EIA report will be submitted for EC appraisal in SEIAA.</td></tr>
</table>

<table>
<tr><td>1.51</td><td>PP shall carry out survey through drone highlighting the ground reality for atleast 10 minutes</td><td>Proponent will provide the report for green belt developed with necessary videos done by drone survey at the time of Final EC Presentation.</td></tr>
<tr><td>1.52</td><td>Detailed Chronology of the project starting from the first lease deed alloted/Block allotment/ Land acquired to its No. of renewals, CTO /CTE with details of no. renewals, previous EC(s) granted details and its compliance details, NOC details from various Govt bodies like Forest NOC(s), CGWA permissions, Power permissions, etc as per the requisites respectively to be furnished in tabular form.</td><td>The detailed chronology of the proposed project is discussed in Chapter-1, Section 1.2.</td></tr>
<tr><td>1.53</td><td>The first page of the EIA/ EMP report must mention the peak capacity production, area, detail of PP, Consultant (NABET acrreditation) and Laboratory (NABL / MoEF & CC certification)</td><td>The peak capacity, production area, detail of Project proponenet, NABET accreditation details of consultant were provided in the first page of EMP report.</td></tr>
<tr><td>1.54</td><td>The compliances of ToR must be properly cited with respective chapter section and page no in tabular form and also mention sequence of the respective ToR complied within the EIA-EMP reportin all the chapter, section.</td><td>ToR points are properly complied with repective reference in the section of this EIA report.</td></tr>
<tr><td></td><td colspan="2">SEAC Site Specific Conditions</td></tr>
<tr><td>1.</td><td>The project proponent shall obtain NBWL clearance from the competent authority since Cauvery South Wildlife Sanctuary is located within 10km radius from the proposed project site and the Eco Sensitive Zone for the sanctuary is not yet declared</td><td>The project proponent will obtain NBWL clearance from the competent authority since Cauvery South Wildlife Sanctuary is located within 10km radius from the proposed project site and the Eco Sensitive Zone.</td></tr>
<tr><td>2.</td><td>The proponent shall furnish the revised mining plan by leaving a minimum safety distance of 60m from the Masakkal Reserve Forest situated abutting the project site.</td><td>The modified mining plan with 10% recovery has been prepared and submitted for approval from Deputy Director(Mines), Department of Geology and Mining vide Rc. No. 2460/ML4/2002 and the same has been attached as Annexure-3.</td></tr>
<tr><td>3.</td><td>The proponent shall carry out tree plantations in the Masakkal Reserve Forest in consultation with the DFO and furnish photographic/ videographic evidences for the same. The proponent shall also provide percolation pits in consultation withthe DFO.</td><td>TAMIN is proposing to plant 2,200 trees are proposed to plant within the 7.5m safety buffer zone mine lease area and in the proposed green belt area of 0.26.0 Ha.
<table>
<tr><th>Year</th><th>No of trees proposed to plant</th><th>Name of the species to be plant</th><th>Survival rate expected</th><th>No of trees expected to</th></tr>
</table>
</td></tr>
</table>

		<table><tr><td></td><td></td><td></td><td></td><td>**grow**</td></tr><tr><td>2025-2026</td><td>2,200</td><td>Neem, Vilvam, Aathi, Panai</td><td>80%</td><td>1,750</td></tr></table>
4.	Since Cauvery North & South Wildlife Sanctuaries are located within 10km radius from the project site, the proponent shall provide details on the impact of the project activity on the sanctuaries and the conservation measures to mitigate the same in consultation with the DFO.	The details of Flora and fauna are discussed in **Chapter 3**, **Section 3.10**. Also the impact & control measure on biodiversity is discussed in **Section 4.6 and 4.24.** The conservation plan for Indian Peafowl (Peacock) with budgetary provision is discussed in **Chapter 3, Section 3.9.10.**
5.	The Project Proponent shall furnish the revised EMP based on the study carried out on impact of the dust & other environmental impacts due to proposed quarrying operations on the nearby agricultural lands for the life of the mine in the format prescribed by the SEAC considering the cluster situation.	The detailed EMP is given in **Chapter 10 and Section 10.11.**
6.	The PP shall submit the slope stability action plan by carrying out the scientific studies to assess the slope tability of the working benches to be constructed (above ground level) along with a conceptual working plan for maintaining the safety aspects within the lease.	The project proponent will submit the slope stability action plan before final EC appraisal meeting.
7.	The PP shall undertake Hydrogeology study considering nearby existing wells, Aquifers, Ground water & surface water levels etc., within the radius of 1km.	The mining activity proposed for depth of 30m from the top of the hill. The total height of the hill is 75m AGL.Ground water table is available at 11.6m BGL as per TWAD. Mining activities will not intersect with ground water table, as the proposed depth of mining will be above ground level (from the top of the hill).
8.	The study on impact of the proposed quarrying operations on the surrounding environment which includes water bodies, Odai etc., shall be furnished.	The detailed site specific impacts on surrounding environment were discussed in **Chapter 4.**

2 PROJECT DESCRIPTION

2.1 Description of the project

The quarry operation is proposed to carry out by opencast semi mechanized method by formation of benches. Benches are proposed with a height of 6m &6 m width with vertical slopes. The area applied for quarry lease exhibits hilly terrain; the altitude of the area is above ~455 AMSL. The total proposed production capacity is 6,940m^3 at 10% recovery of ROM 69,404m^3. The annual peak production will be 1,700m^3 at 10% recovery of ROM 17,000m^3.

2.2 Type of Project

The project falls under B1 Category, Schedule 1(a) Mining of Minerals as per MoEF&CC notification2006 and its subsequent amendments.The quarrying operation is being carried out by open cast semi-mechanized method with 6m bench height and 6m bench width along with deployment of HEMM for development and production activities under Regulation106.

2.3 Need of the Project

The granite dimensional stone material by virtue of its pleasing color and texture and its best ability to take polishing and appealing look in polished product has attracted the consumers in the building construction and interior decoration industries. The domestic market capabilities have also been explored in recent periods. Bulk quantity of the blocks is produced and exported as raw blocks and some quantity is being processed at TAMIN's granite processing units and exported as value added finished products.

The earning source in the targeted area is limited, most of the people in and around the area depend upon the seasonal agriculture and much of the people migrate to nearby towns where good industries and factories are growing up. This project will provide direct employment for about 30 persons. This material is well known in the international supermarket of Granite which will fetch a good fetch a good foreign exchange to the nation.

2.4 Location of the quarry

The quarry is located at SF.No.896 of Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District and Tamil Nadu State. Quarry lease area falls in the survey of India Topo sheet D43X16 and the area lies in the eastern Longitude from 77°49'7.5609"E to 77°49'37.3636"E and Northern latitude from 12°3'48.1953"N to12°4'13.7287"N. The topography of the area is hilly. The elevation of the lease area is ≃455m AMSL.Height of the hillock is 75m. The project location map is given in **Figure 2-1.** Google Image with Site Coordinates is given in **Figure 2-2**. 300m Radius Google image of the lease area is shown in **Figure 2-3.** 500m Radius Google image of the lease area is shown in **Figure 2-4.** 1km Radius Google image of the lease area is shown in **Figure 2-5**. 5km Radius Google image of the lease area is shown in **Figure 2-6.** 10km Radius Google image of the lease area is shown in **Figure 2-7**.

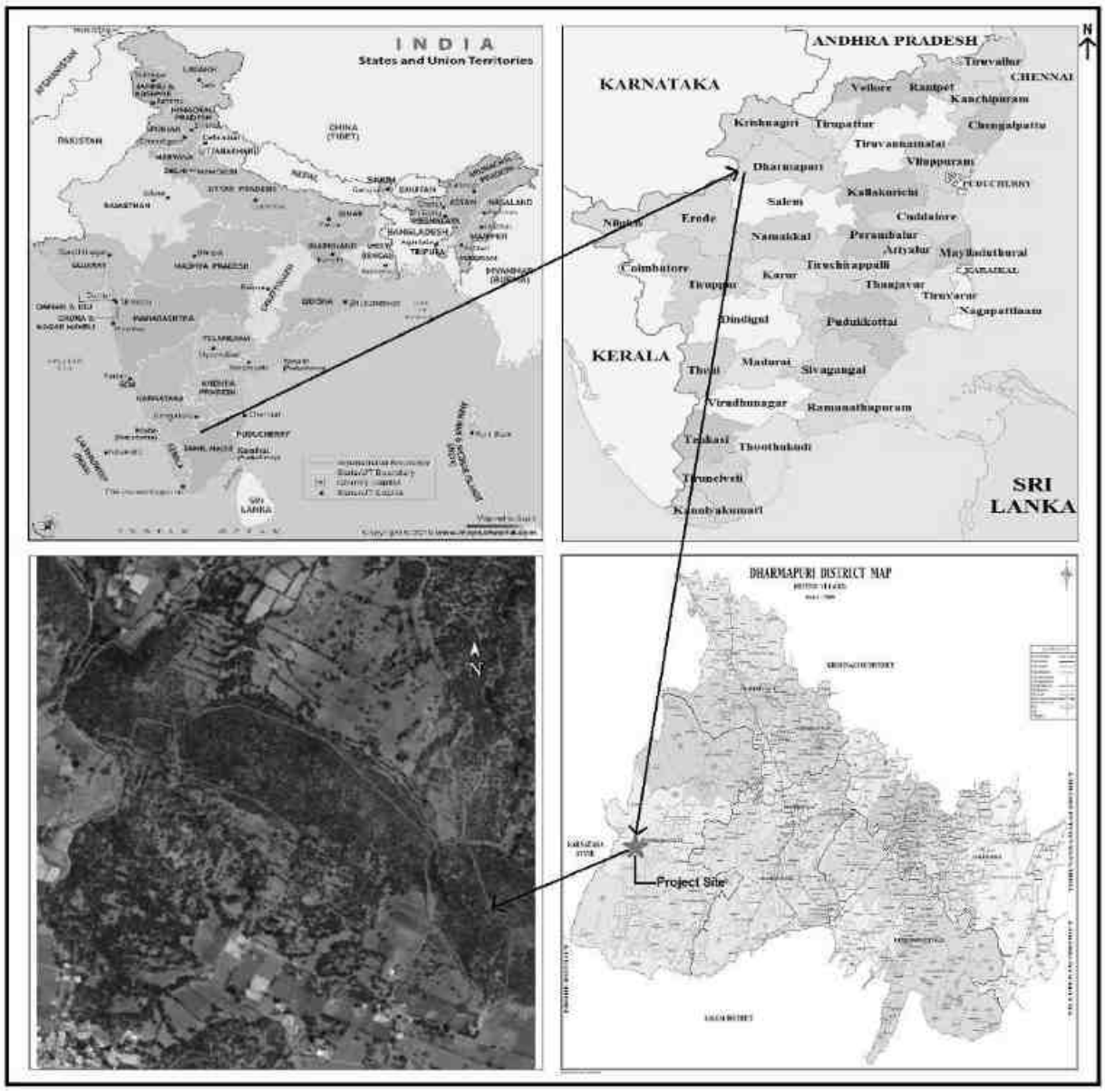


Figure 2-1 Project Location Map

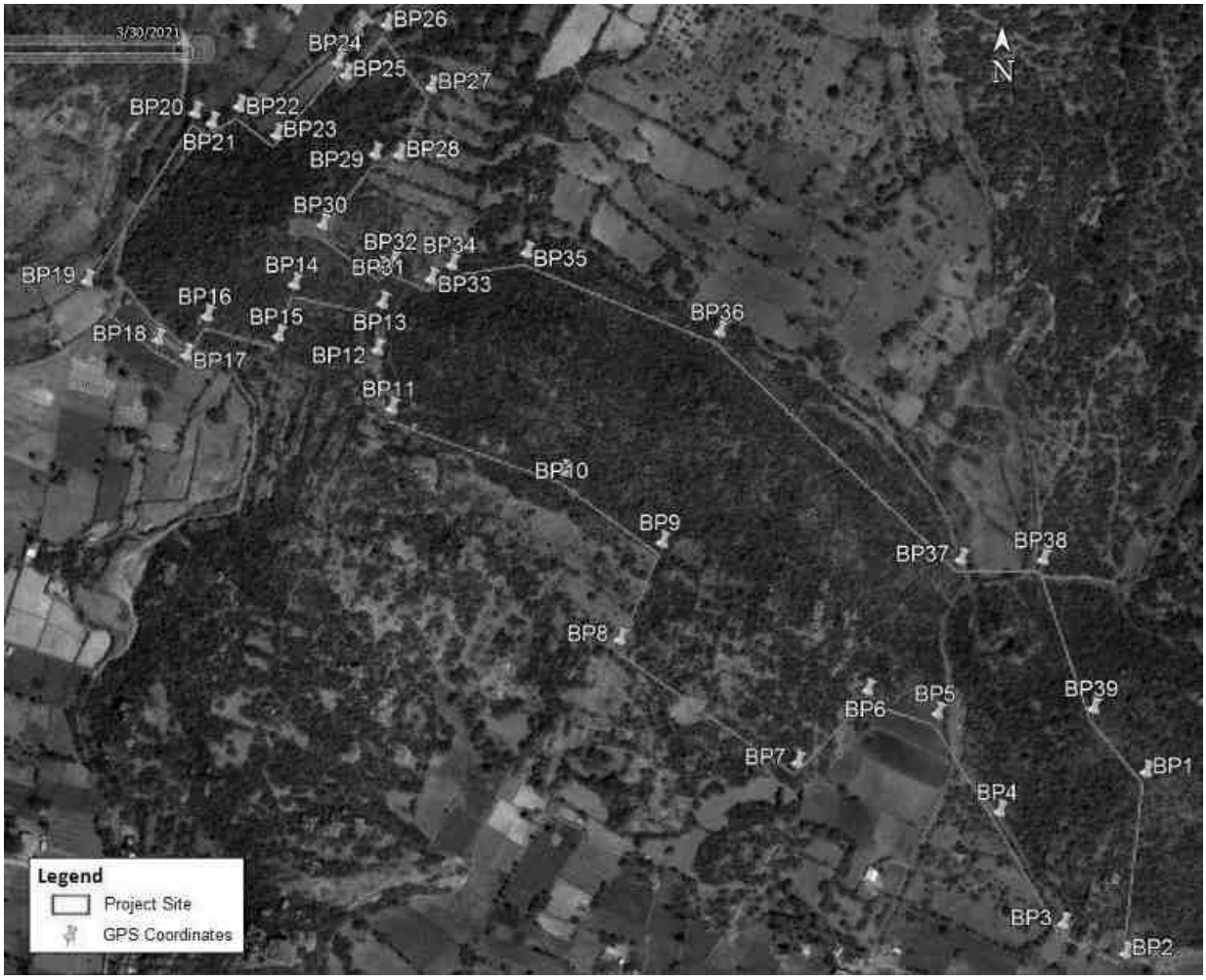


Figure 2-2 Google Image with Site Coordinates

Figure 2-3 300m Google Image of the Lease Area

Figure 2-4 500m Radius Google Imagery of the Lease Area

Figure 2-5 1km Radius Google Imagery of of the Lease Area

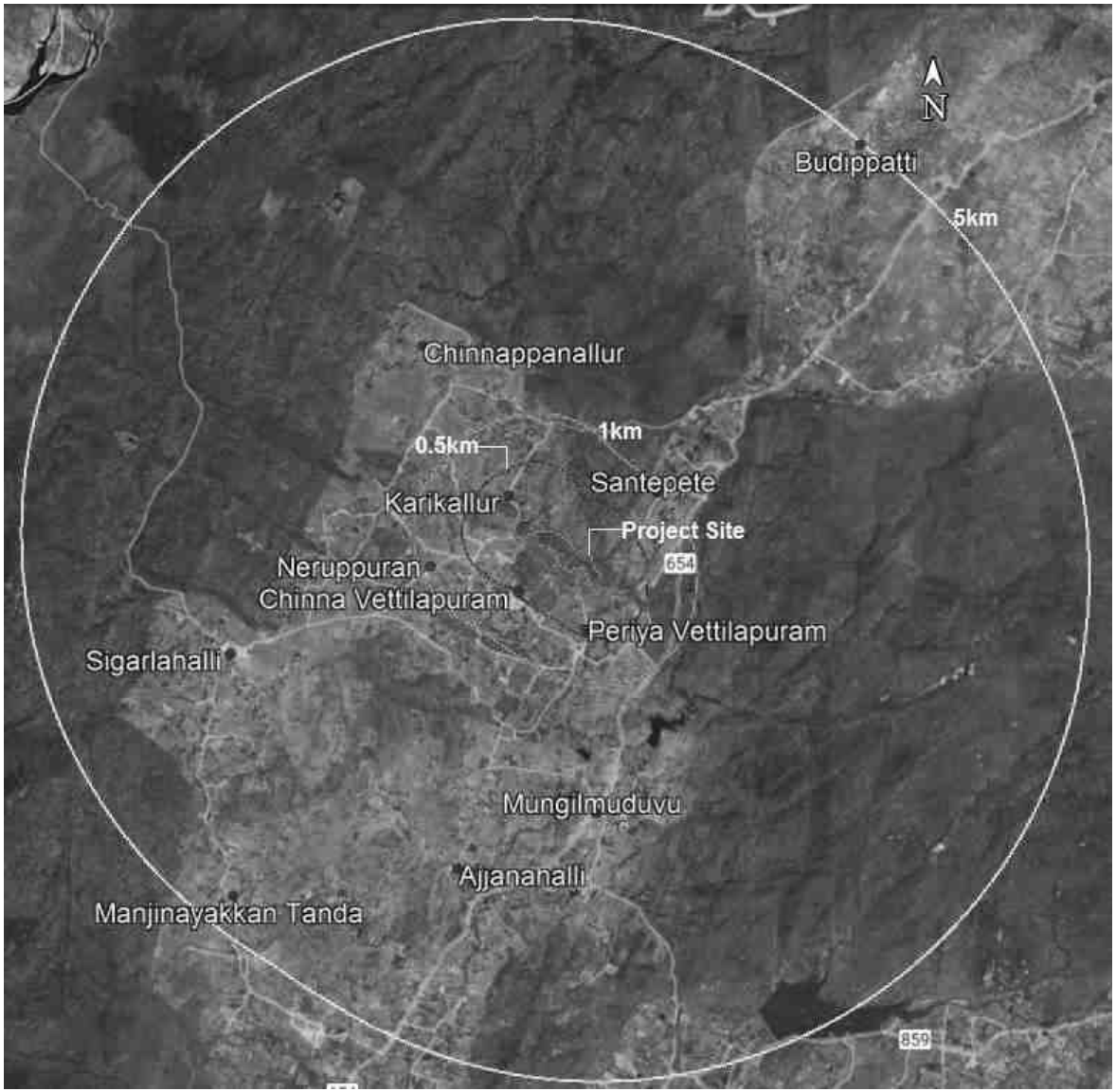


Figure 2-6 5km Radius Google Imagery of the Project Site

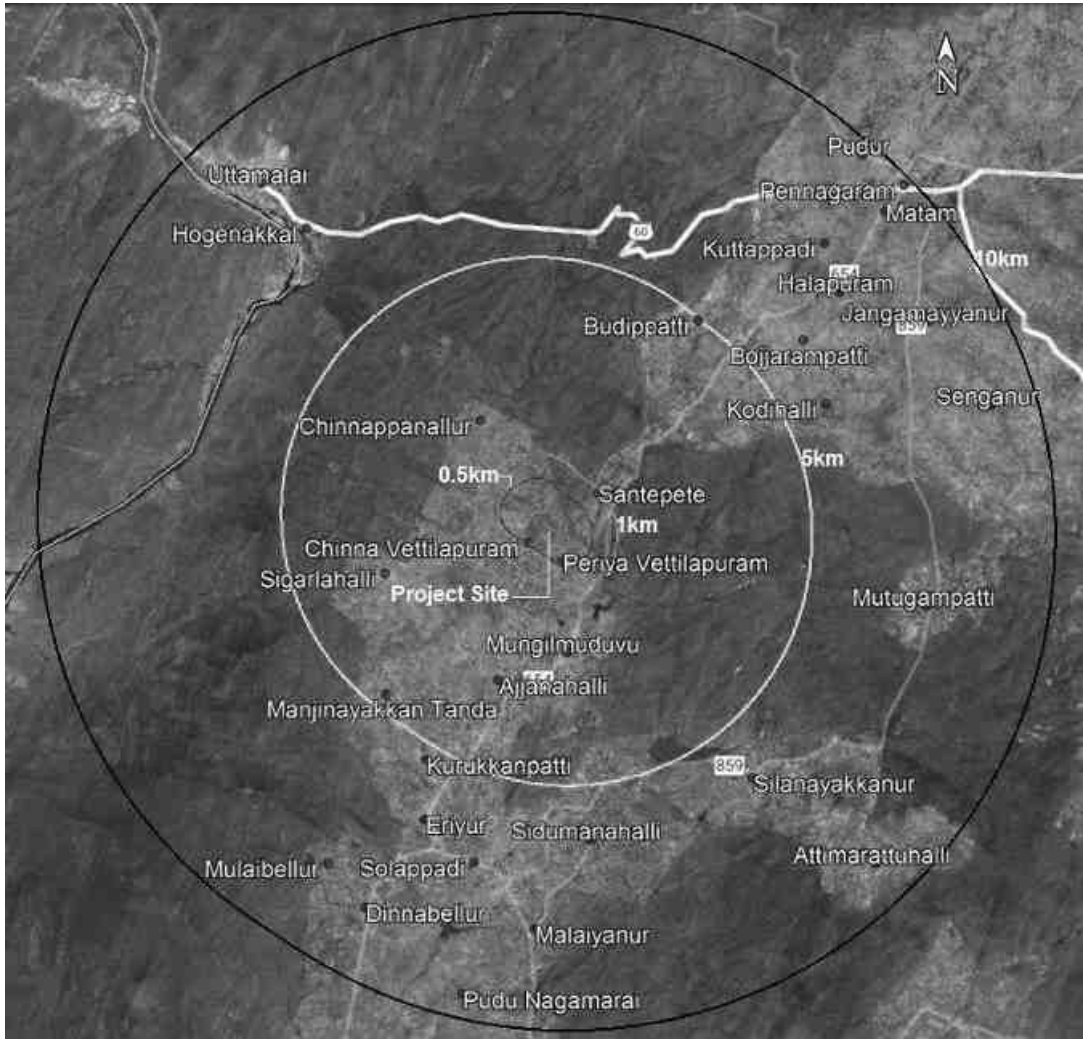


Figure 2-7 10km Radius Google Imagery of the Project Site

Table 2-1 Project summary

S. No	Particulars	Details
1.	Project Location	S.F.No.896, Ajjanahalli Village, Penngaram Taluk, Dharmapuri District, TamilNadu State.
2.	Land classification	Government Land
3.	Extent of lease area (Ha.)	17.50.0
4.	Precise area communication	Precise area communication letter was granted by Additional Chief Secretary, Natural Resources (MME.1) Department vide Letter. No.3740397/MME.1/2023-1, dated: 13.09.2023.
5.	Lease Period	20 years
6.	Estimated Geological Reserves (ROM) m^3	8,87,700
7.	Estimated Mineable Reserves (ROM) m^3	5,62,152
8.	Total production capacity m^3	6,940
9.	Depth of Mining	30m from the top of the hillock
10.	Method of Mining	Open cast semi mechanized method
11.	Water Requirement (KLD)	3.5
12.	Source of Water	Private tankers
13.	Direct Manpower (Nos)	30
14.	Municipal Solid Waste Generation (kg/day)	13.5
15.	Project Cost in Lakhs	Rs.99.97

2.5 Size or Magnitude of operation

The quarrying operation is being carried out by open cast semi-mechanized method with 6m bench height and 6m bench width along with deployment of HEMM for development and production activities under Regulation106.

Geological reserves of black granite have been computed based on the Geological Plan &Sections up to the economically workable average depth of 30m from the surface level and the top surface of the granite body works out to 8,87,700 m^3.

Mineable Reserves have been computed as 5,62,152 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 56,215 m^3 by applying the recovery factor 10%.

The total proposed production capacity is 6,940m^3 at 10% recovery of ROM 69,404m^3. The annual peak production will be 1,700m^3 at 10% recovery of ROM 17,000m^3.

The granite waste generated during the mining operation is 62,464m^3 will be dumped in the suitable area already selected. The area of disposal of waste has been identified in southern portion of the lease area. The Land Use break up summarized as **Table 2-2.** Granite Quarry Reserves is given in **Table 2-3.** The

yearwise production details are given in the**Table 2-4**. Year wise production plan and Section given in **Figure 2-8.** Land use and Afforestation Plan is shown in **Figure 2-9.** Mine Closure Plan opf the Quarry is shown in **Figure 2-10.**

Table 2-2 Land use details of the lease area

S. No	Description	Present Area (Ha)	Upto Lease Period (Ha)	Area at the end of the life of Mine(Ha)
1	Mining Area	Nil	3.72.5	5.08.0
2	Waste Dump	Nil	4.63.5	4.59.0
3	Office Infrastructure	0.01.0	Nil	0.01.0
4	Tar Road	0.20.5	Nil	0.20.5
5	Afforestation	Nil	0.26.0	1.52.5
6	Un Utilized area	17.28.5	8.66.5	6.09.0
Total		**17.50.0**	**17.28.5**	**17.50.0**

Table 2-3 Granite Quarry Reserves

S. No	Geological Reserves (m^3)	Mineable Reserves (m^3)	Mineable Saleable Granite Reserves at 10% recovery (m^3)
1.	8,87,700	5,62,152	56,215

Table 2-4 Yearwise Production details

S. No	Year	ROM (m^3)	Recovery@10% (m^3)	Granite Waste @ 90% (m^3)
1	1stYear	10,002	1000	9,002
2	2ndYear	11,999	1200	10,799
3	3rdYear	14,403	1440	12,963
4	4thYear	16,000	1600	14,400
5	5thYear	17,000	1700	15,300
Total		**69,404**	**6,940**	**62,464**

Estimated Life of the Quarry:

- Proposed ROM: 69,404 m^3
- Recoverable Reserved @ 10%: 6,940 m^3
- Estimated Life of the Quarry: 33 years

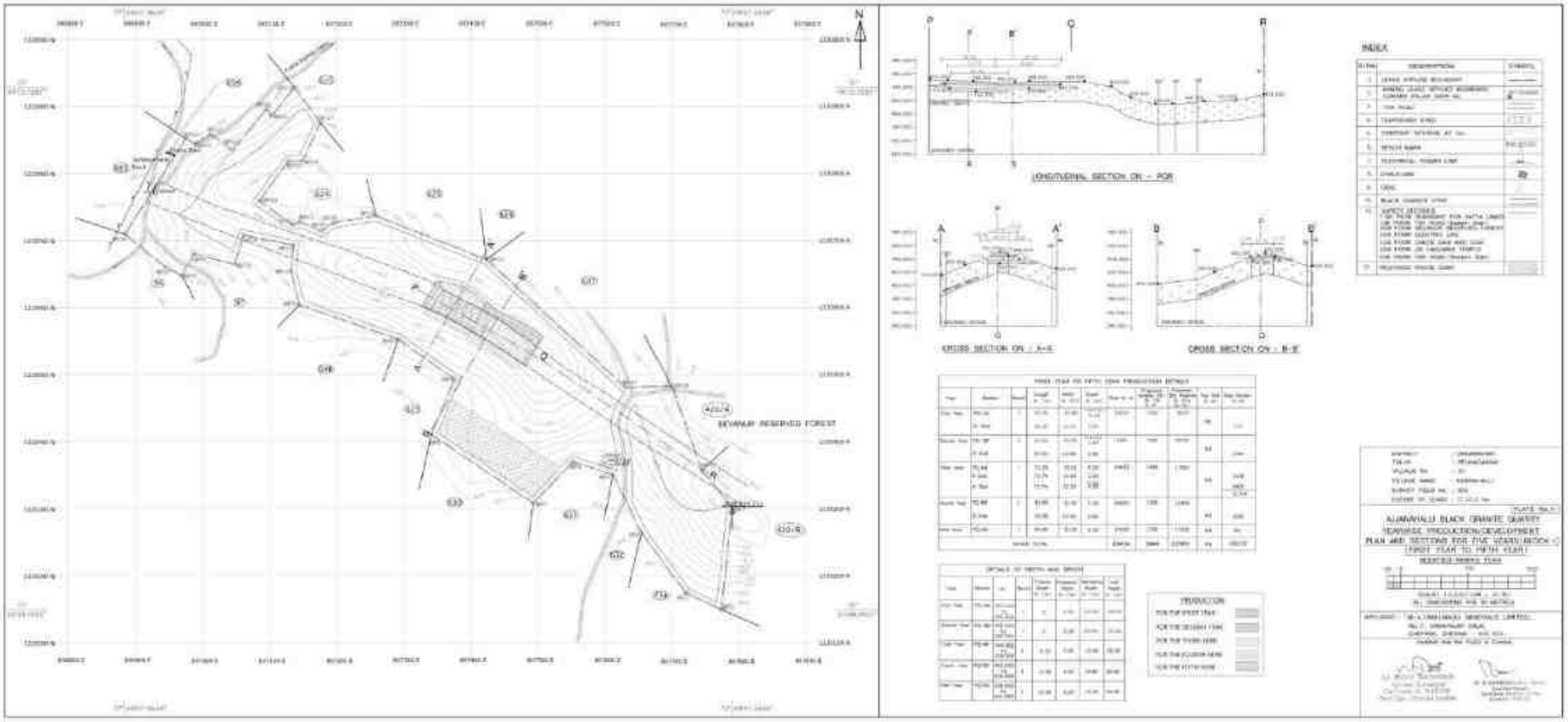


Figure 2-8 Yearwise Production/Development Plan for first five years

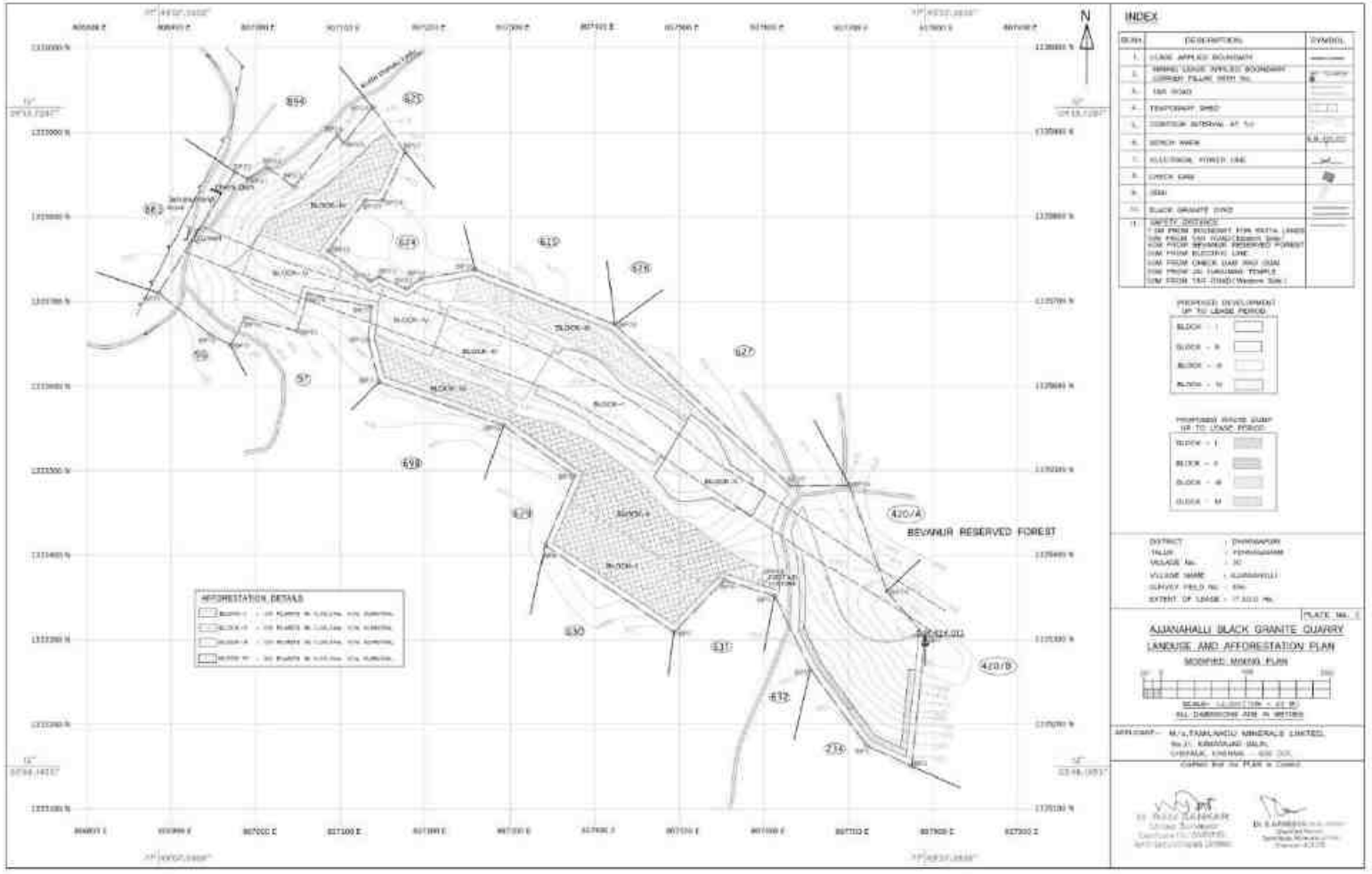


Figure 2-9 Land Use and Afforestation Plan

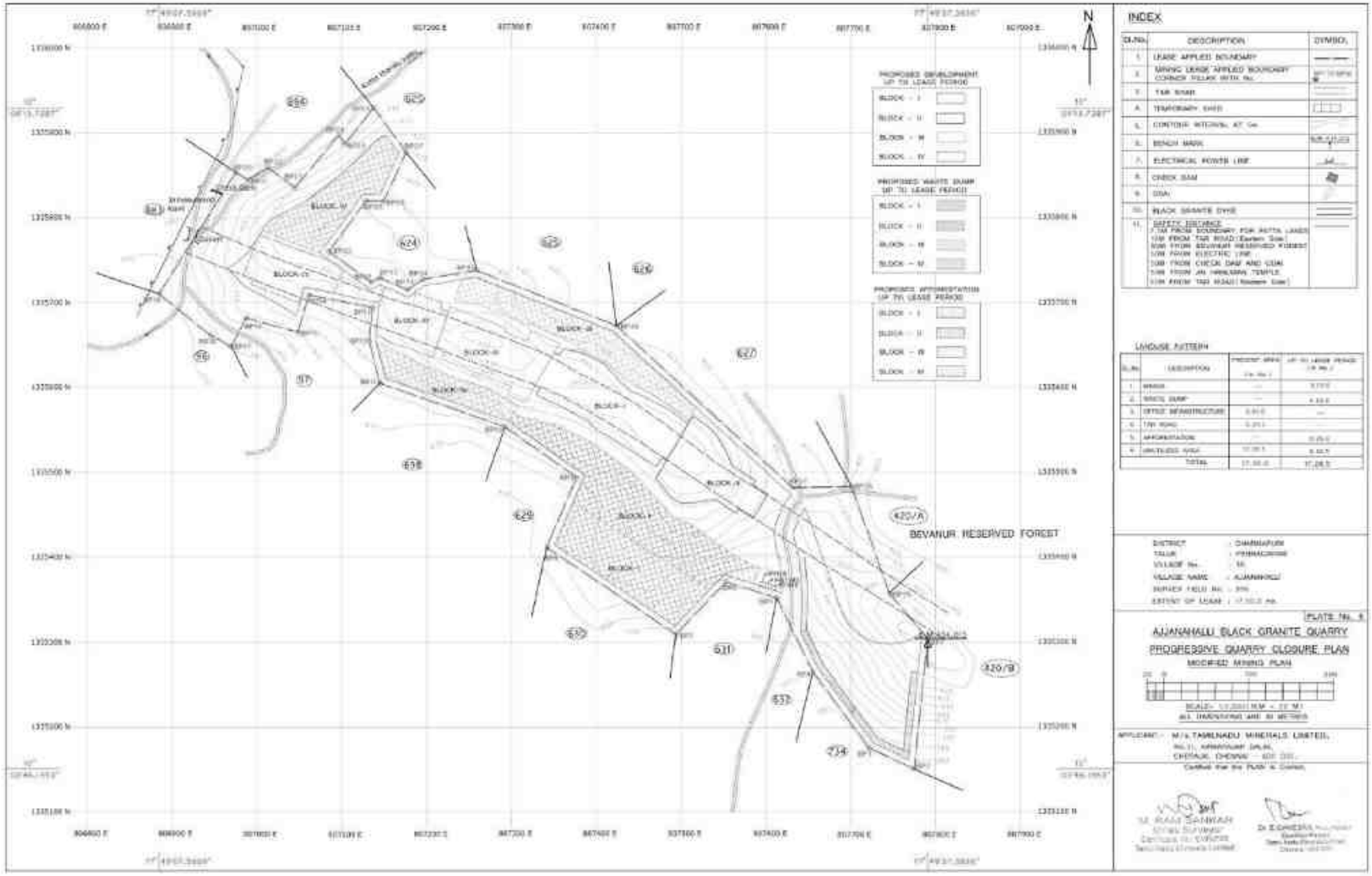


Figure 2-10 Mine Closure Plan of the Quarry

2.6 Proposed schedule for approval and implementation

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

Particulars	Time Schedule
Submission of Draft EIA/EMP to TNPCB for Public Hearing	January-2025
Conduction of Public Hearing	March-2025
Submitting final EIA/EMP	April-2025
Presentation to SEAC and Obtaining EC	May-2025

The project will be implemented after Obtaining Environmental Clearance from SEIAA and Consent To Operate from Tamil Nadu Pollution Control Board.

2.7 Project Cost

The project cost is summarized in**Table 2-5**.

Table 2-5 Project cost

S. No	Description of the Cost	Amount in Rs.
D. 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/-**
E. 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/-**
F. 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)**

2.8 Technology & Process Description

2.8.1 Technology

Primary step of mining of minerals is the removal of the deposits from the ground. Once the minerals / ore are removed, additional preparation process is required to isolate the valuable minerals from their waste gangue minerals. There are two basic method of mining of minerals opencast and underground mining. The choice of method depends on the geologic, hydrological, geo-technical, geographic, economic, technological, environmental, safety, Socio - political and financial considerations. Schematic Diagram of Mining Process is given in **Figure 2-11.**

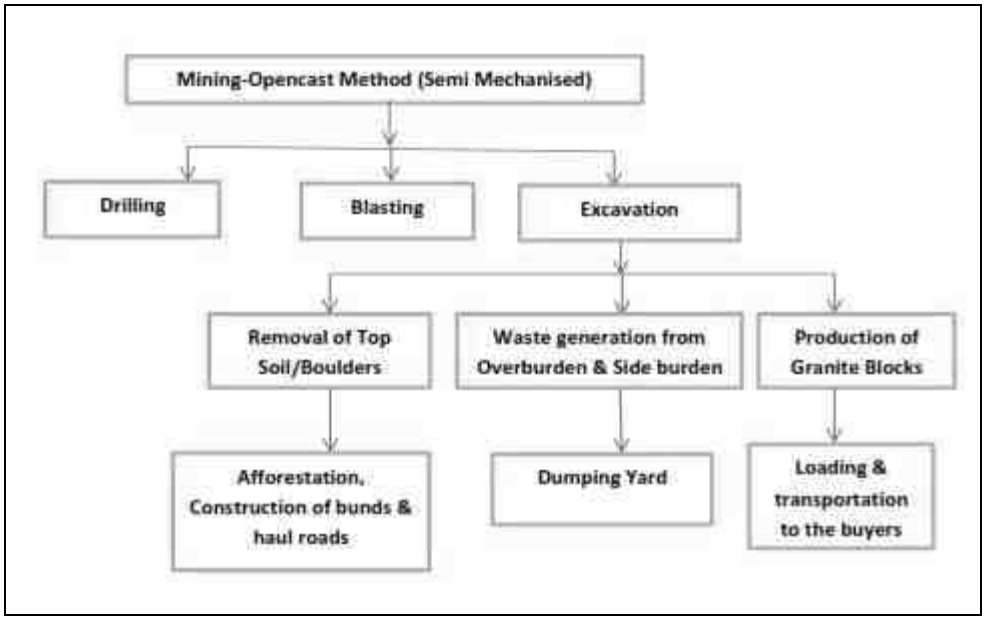


Figure 2-11 Schematic Diagram of Mining Process

2.8.2 Method of mining-Open Cast Working

In accordance with the Regulation 106 (2)(a) of the Metalliferous Mines Regulations 1961, in all open cast workings where the ore body forms hard rock, the working faces and sides should be adequately benched and sloped. A bench height not exceeding 6m and a bench width not less than the height has to be maintained. The slope angle of such benches and sides should not exceed 60° from the horizontal. However, observance of these statutory provisions into in granite dimensional stone mining is seldom possible due to the field difficulties and technical reasons as below:

- Recovery of the granite mineral is to be as undamaged rectangular dimensional blocks. In the attempt to the benches and sides with the above statutory parameters haphazard blasting may be involved.
- In which case the commercial granite body may get spoiled due to generation of blasting cracks. In the exercise of forming the benches with 60° slope within the granite deposit, the portion confined within the 60° as we as its complimentary part in the extricated block will become as mineral waste while shaping into rectangular blocks.
- The granite industry needs blocks as huge as few cubic meters volume with measurements up to

3m x 2m x 2m. Production of such huge blocks with a moving bench of 6m height is not possible. Production of such huge blocks in turn increases the recovery and reduces the mineral waste during dressing. Blocks of smaller size of certain varieties of granite are not marketable now-a-days.

- Formation of too many benches with more height and the width equal to the height may lease to mineral lock up.

Hence, in order to avoid granite waste and to facilitate economical and convenient mining operations, it is proposed to obtain relaxation to the provisions of Regulation 106 (2) (a) up to a bench parameter of 6m height and 3m width with vertical faces. Such a provision for relaxation of the Regulation has been provided within the regulation 106 (2) (a). Further, it is to be noteworthy that opencast granite mining operations with the above proposed bench parameters may not be detrimental to Mines Safety, since the entire terrain is made up of hard rock, compact sheet and possess high stability on slope even at higher vertical angles.

It is proposed not to backfill the pit in as much as good quantities of reserves are underlying the pits. The stock yard for the granite blocks produced and the dressing yard where the manual dressing and shaping of the blocks are carried out are located near the working pit in order to minimize the lead from the pit to the dressing yard and stock yard. A mine office, store room, first-aid room and workers rest shelter are provided within the lease hold area.

2.9 Process Description

1)Splitting of rock mass of considerable volume from the parent sheet rock carefully avoiding any kind of damage in the form of cracks adopting the following methods.

a) Diamond wire cutting along the horizontal as well as two vertical sides parallel to strike and dip direction and the third vertical face will be a free face is liberated by conventional serial blasting.
b) Separation of the horizontal (bottom) and the vertical (length side) planes by serial blasting simultaneously along the above two planes by using 32mm dia. blast holes charged with mild explosive like gun powder or detonating. The process continued aiming at the liberation of huge volume of the granite body from the parent sheet rock is called 'Primary Cutting'.

2) The 'Secondary Splitting' into required size involves long hole drilling upto the bottom of the separated block along the required planes for which mostly rock breaking powder or expansion mortar is used for splitting. It is chemically called as 'Calcium Hydroxide' $Ca(OH)_2$.

3) Removing the defective portions and dressing into the useful dimensional blocks are done manually using feather and wedges and chiselling respective by the labourers who are skilled in this work.

The defect free rectangular shaped dimensional stones as consumers are produced by the method described as above, which is constantly supervised by experienced Mining Geologist and Mining Engineer.

The waste materials generated during mining activity includes the rock fragments of different angularity formed during the removal of naturally defective and uneconomical portions of the deposits and the working waste formed during dressing of the extricated blocks. During the five years of Mining Plan period such waste materials are proposed to be dumped on the southern portion of the lease hold area.

2.9.1 Drilling & Blasting

The blasting parameters in the mining of granite dimensional stones are entirely different from that of industrial minerals, since the basic purpose for the use of explosives in both the cases are entirely different. In the industrial minerals, maximum fragmentation and crushing of the ore is essential, whereas in the granite mining, the granite stones are to be extricated intact, without any damage on both the extricated part and the parent rock body.

The portion to be extricated from the parent rock body is free in all planes by adopting different methods. Only mild explosives such as detonating cord, ordinary detonators etc will be used for the production of granite blocks. The blast holes of 32mm diameter are drilled up to the bottom of the horizontal plane all along the required planes without deviations.

Conventional 32 mm dia blast holes are drilled perfectly parallel to each other at 20 to 25cm intervals without any hole deviations, all along the required plane of splitting. The holes are drilled up to a depth of few cms above the required horizontal plane. Sub grade drilling is not necessary, since the splitting will be affected up to a further distance of few cms from the drill hole on blasting. Sub grade drilling may affect the underlying granite deposit.

Explosives such as gelatin, delay detonators etc. may also be used occasionally at places further away from the granite deposit for certain development works such as forming approach roads to the working faces below ground level for forming flat surfaces to be used as dumping yard etc. The explosives required for this mine is obtained from the authorized, licensed dealer for which necessary permission will be obtained from the authority concerned. The blasting will be under the direct supervision of the statutory persons of TAMIN.

The secondary splitting into required size involves along hole drilling up to the bottom of the separated block along the required planes for which mostly rock breaking powder is used for splitting. It is chemically called as Calcium Hydroxide $Ca(OH)_2$.

Now-a-days the splitting the rock from the parent rock is done by using diamond wire sawing, which largely reduces the use of explosives in granite mining. Many adverse effects of blasting are avoided and hence the recovery will be substantially increased by diamond wire cutting. Hence it is proposed to deploy one diamond wire saw machine in this mine.

2.9.2 Loading & Transportation

The mode of transport of the granite blocks produced and marketed is by road of various consumer destinations and granite processing units located at different parts of the country. The blocks approved for export market are shipped through Chennai / Tuticorin Harbours to various countries.

2.9.3 Exploration

A number of valuable data for economical mining of the granite stone in this area have been known.

1. Occurrence of the Black granite is economically viable quality and quantity has been established by geological mapping and visual examination by mining geologist experiences in granite mining which have been proved by actual mining practice.
2. The depth persistence of the granite is proved beyond the workable limits of depth of 40m from the top surface of the granite body works.
3. The recovery of the saleable granite stones has been established as 10% from the visual exploration and from the data available by actual mining practices during the past mining in this area.

2.9.4 Storage of Explosives

The applicant will engage an authorized explosive agency to carry out the small amount of blasting as such no storage of explosives is envisaged for this proposal. The blasting will be supervised by DGMS authorized Mines Foreman /Mines Manager..

2.9.5 Mine Drainage

The lease applied area is hillock of 75m height with slope. Through the area receives scanty rainfall, the ground water level is at 11.6m depth. The Production faces are operated at shallow depths i.e 30m. During the rainy seasons, the surface runoff water and the ground water are collected in sump and dewatered to nearby agricultural field with the help of 10HP motors.

2.9.6 Disposal of Waste

The Mine waste will includes the over burden, side burden, rock fragments and rubbles generated as mineral rejects during production works and the country rock fragments generated during development works such as approach road formation, formation of dumping yard sites etc., During the first five years of mining plan period, such waste material are proposed to be dumped in the Southern portion of the lease area.

2.9.7 Top Soil Management

Topsoil will be properly stacked at earmarked dump site with adequate measures. It will be used for growing plants along the fringes of the site roads and reclamation of external dump and backfilled area. The topsoil stockpiles will be low height and will be grassed to retain fertility. Besides these topsoil stacks there will be temporary stacks near the excavation area and area to be reclaimed which will be made use of concurrent lying without bringing the topsoil to the soil stack near the OB dump.

2.9.8 Stabilization of Dump

As the waste generation in the mine includes hard rock fragments of considerable size and irregular shape with varying angularity, the waste dump will be stable on its own even at higher slopes of the sides. However, suitable variety of soil will be identified and brought from outside and used for increasing the stability of the sides of the waste dumps and also for planting trees over the dumps in a phased manner.

2.10 Other Requirements

2.10.1 Water Requirements

The total water requirement is 3.5 KLD. The total water requirement will be met through private tankers. The granite quarry will not produce toxic effluent in the form of solid, liquid or gas. No wastewater will be generated by quarry operation except domestic sewage. Domestic sewage will be disposed to septic tank followed by soak pit. Septic tank will be cleaned periodically.

Table 2-6 Water Requirements

S. No	Description	Water Requirement (KLD)
1	Drinking & Domestic purpose	1.5
2	Wire Saw Cutting	0.5
3	Dust suppression	1.0
4	Green Belt	0.5
Total		**3.5**

2.10.2 Sewage Generation

The domestic sewage of 1.2 KLD will be disposed through septic tank followed by soak pit

2.10.3 Power & Fuel Requirement

The Power and Fuel requirement details are given in **Table 2-7.**

Table 2-7 Fuel Requirement

S. No	Description	Power Required

1	Power requirement (kVA)	60
2	Power Backup (DG set)	1*125kVA
3	Fuel requirements (Lts/Day)	200

2.10.4 List of Equipments

The list of Equipments is given in **Table 2-8.**

Table 2-8 List of Equipments

S. No	Machinery Type	Numbers	Capacity	Motive Power
1	Jack Hammer (32mm dia.)	6	1.2 to 6m	Compressed air
2	Compressor	2	400 psi	Diesel Drive
3	Tractor Mounted air Compressor	1	-	Diesel Drive
4	Diamond Wire Saw	1	$30m^3$ /day	Diesel Generator
5	Diesel Generator	1	125 kVA	Diesel
6	Excavator	1	300Lc	Diesel
7	Dumper	2	25Tonnes	Diesel

2.10.5 Man power Requirement

Manpower details are given in **Table 2-9.**

Table 2-9 Manpower Details

S. No	Details	Numbers
A	**Technical/Mining Personnel**	
1	Geologist/Agent (M.sc Qualified)	1
2	Mine Manager (Holder of Manager Certificate of Competency under MMR, 1961	1
3	Mining Mate cum Blaster	1
4	Machinery operator	6
5	Diesel Mechanic	1
B	**Workers**	
1	Skilled	1
2	Semi- Skilled	9
3	Un-skilled	10
	Total	**30**

2.11 Infrastructure facilities

Infrastructure facilities like Mine office, Temporary rest shelters for workers, Sanitation facilities will be provided.

2.12 Description of mitigation measures incorporated into the project to meet the environmental standards

From an environmental perspective, this phase is of paramount significance due to its potential to invoke long-term impacts. The adverse effects that are likely to occur during operational phase of the project are: Air Pollution (gaseous emissions), Effluent/Sewage generation, Noise generation, Solid waste generation etc.

2.12.1 Solid Waste Management

The municipal solid waste generation and management details are given in **Table 2-10**.

Table 2-10 Municipal Solid Waste generation & Management

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

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

2.12.2 Hazardous Waste Management

The type of hazardous waste and the quantity generated are detailed in**Table 2-11.**

Table 2-11 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 agencies.

2.13 Progressive Mine Closure Plan

As a petrogenetic character, the depth persistence of the black granite body in the area is beyond the workable limits. However, it is very difficult to operate granite dimensional stone mine economically below an average depth of 30m by observing the statutory provisions of mine safety rules and regulations. Hence, in the proposed mining plan, only 30m average depth has been envisaged as 'Workable depth' for safe and economic mining.

However, it is proposed not to back fill the ultimate pit, in as much as good quantity of reserves is available below the workable depth of 30m 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 30m depth. The pit boundaries shall be safely fenced to prevent inherent entry of public and cattle and used for agricultural purpose when the pit is filled with underground seepage water or rainwater.

2.13.1 Assessment of New and untested technology for the risk of technological failure

The project is a fresh granite quarry. The technology used for this proposed mining is made by TAMIN. The mining technology is tried & tested method, and therefore there is no risk of technological failure. In addition to this, TAMIN is being processed to take care of any technological failures.

3 DESCRIPTION OF ENVIRONMENT

This chapter depicts the establishment of baseline for valued environmental components, as identified in and around the proposed project of **Proposed Ajjanahalli Black granite quarry over an extent of 17.50.0 Ha** at S.F. No. 896 Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District, Tamil Nadu by M/s. Tamil Nadu Minerals Limited. The primary baseline data monitoring covered one season (three (3) months) i.e., from **March 2024 to May 2024,** and the secondary data was collected from government and semi-government organization's published data. The primary baseline data has been generated by M/s. Hubert Enviro Care Systems (P) Ltd, Chennai, a MoEF&CC approved and National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited environmental testing laboratory for the following terrestrial environmental components. NABL Certificate No: TC-12310 Dated: 25.09.2023 Valid Till 24.09.2025.

- **Meteorology:**

  Temperature, Relative Humidity, Rainfall, Wind Speed & Direction- **Refer Section - 3.4**

- **Ambient Air Quality:**

  Particulate matter <10 micron size (PM_{10}), Particulate matter <2.5 micron size ($PM_{2.5}$), Sulphur Dioxide (SO_2), Nitrogen Dioxide (NO_2), Carbon Monoxide (CO), Lead (Pb), Ozone (O_3), Benzene (C_6H_6), Benzo (a) pyrene ($C_{20}H_{12}$), Arsenic (As), Nickel (Ni), Ammonia (NH_3)-**Refer Section - 3.5.**

- **Ambient Noise Levels:**

  Day equivalent noise levels, Night equivalent noise levels – **ReferSection - 3.6.**

- **Inland Water Quality:**

  Groundwater Quality, Surface Water Quality –**Refer Section - 3.7.**

- **Soil Quality – Refer Section - 3.8.**
- **Ecology – Refer Section - 3.10.**
- **Social Economic Status – Refer Section - 3.11.**

3.1 Study Area

A 10 Km radial distance with the proposed project site as the epicentre has been identified as the General study area for assessing the baseline environmental status. The core study area is the project area and its immediate surroundings to the tune of 1.0 Km radius from the boundary. Further the Project Impact/Influence Area (PIA) is 10Km from the boundary of the project site which covers parts of Ajjanahalli Village of Pennagaram Taluk, Dharmapuri district of Tamil Nadu State. The primary

baseline data monitored covered three (3) months i.e., from **March 2024 to May 2024.** Description of the Study Area, components & Methodologies

As described in Chapter 1, M/s. TAMIN proposing the "**Proposed Ajjanahalli Black granite quarry over an extent of 17.50.0 Ha"** at Ajjanahalli Village of Pennagaram Taluk, Dharmapuri District, Tamil Nadu over an extent of 17.50 ha. As part of its endeavor to promote new industries and considering the demand for industrial land in the vicinity of Bangalore-Hosur Industrial Stretch.An overall idea of the study area with reference to the physical conditions are presented for better understanding in the following sections before proceeding into the section on the prevailing environmental conditions of the study area. Topo Map of the study area is given in **Figure 3-1.**

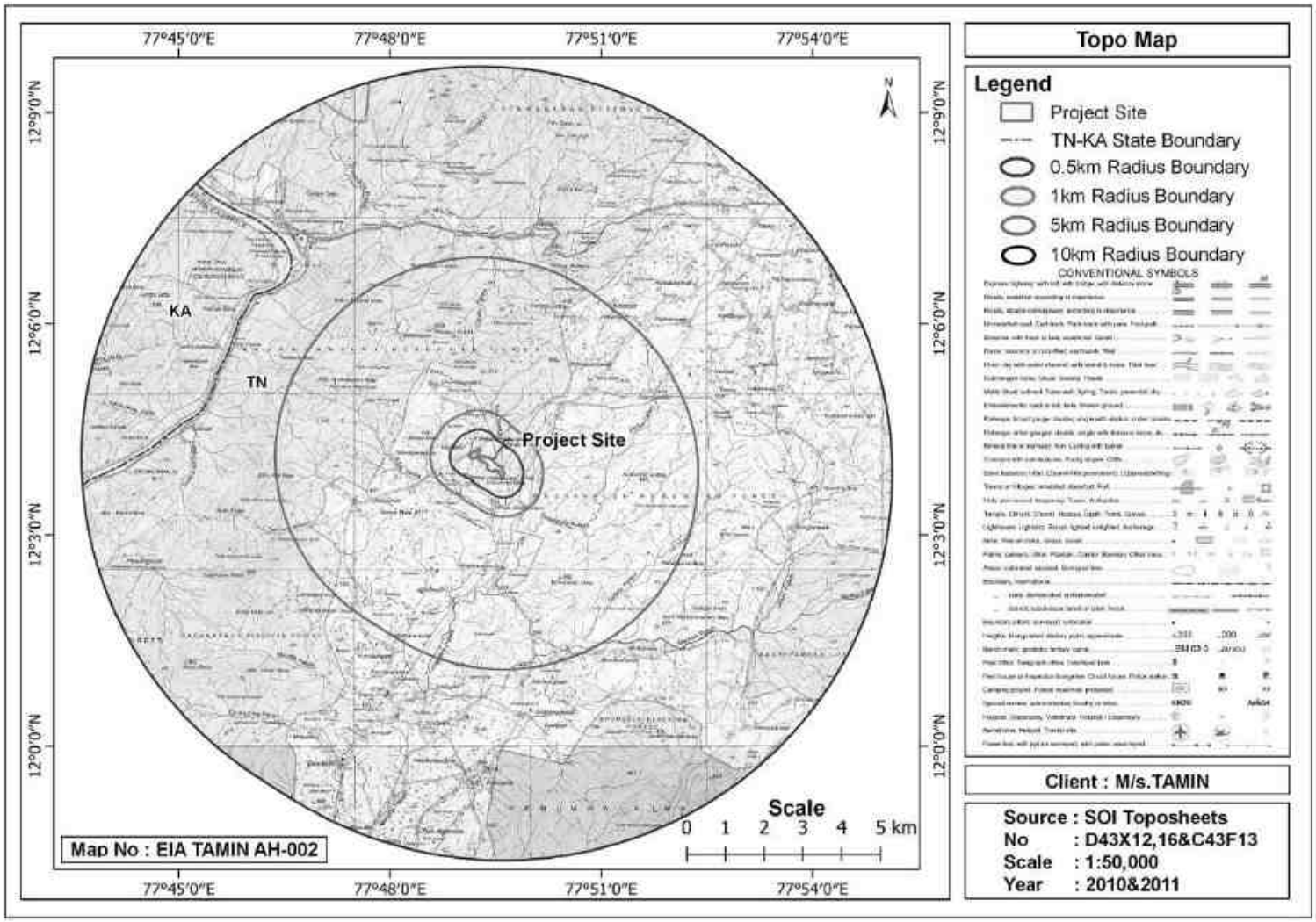


Figure 3-1 Topo Map of Study Area

3.2 Environmentally/Ecologically Sensitive areas

This section details with the environmentally sensitive areas present within the project site and surrounding environment. It included national parks, state forest, essential habitats etc. The environmental sensitive areas covering an aerial distance of 15 km from the project boundary is given in **Table 3-1** and **Figure 3-2, Figure 3-3, Figure 3-4.**

Table 3-1 Environmentally Sensitive Areas within 15km from Project Boundary

<table>
<tr><th>S.No</th><th>Areas</th><th>Distance & Direction from project boundary</th></tr>
<tr><td>1.</td><td>Wild Life Santuary</td><td>
<table>
<tr><th>S.No</th><th>Monuments</th><th>Distance (~km)</th><th>Direction</th></tr>
<tr><td>1</td><td>Cauvery Wildlife Sanctuary Core/ESZ</td><td>6.41</td><td>NW</td></tr>
<tr><td>2</td><td>Cauvery South Wildlife Sanctuary</td><td>6.81</td><td>NNW</td></tr>
</table>
</td></tr>
<tr><td>1</td><td>Monuments</td><td>
<table>
<tr><th>S.No</th><th>Monuments</th><th>Distance (~km)</th><th>Direction</th></tr>
<tr><td colspan="4">Nil</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Waterbodies &Reserve Forest</td><td>
<table>
<tr><th>S.No</th><th>Water bodies</th><th>Distance (~km)</th><th>Direction</th></tr>
<tr><td>1</td><td>Odai</td><td colspan="2">Within the site</td></tr>
<tr><td>2</td><td>Adda Vanka</td><td>0.06</td><td>E</td></tr>
<tr><td>3</td><td>Adda Vanka</td><td>0.68</td><td>SSW</td></tr>
<tr><td>4</td><td>Moongilmaduvu Check Dam</td><td>1.36</td><td>SSE</td></tr>
<tr><td>5</td><td>Sintalapadi Pallam</td><td>1.44</td><td>SE</td></tr>
<tr><td>6</td><td>Ichappadi Pallam</td><td>1.58</td><td>SSE</td></tr>
<tr><td>7</td><td>Varattu Pallam</td><td>2.33</td><td>NW</td></tr>
<tr><td>8</td><td>Periya Pallam</td><td>2.68</td><td>E</td></tr>
<tr><td>9</td><td>Guttala Pallam</td><td>4.26</td><td>SE</td></tr>
<tr><td>10</td><td>Metturankottai Check Dam</td><td>4.34</td><td>SSE</td></tr>
<tr><td>11</td><td>Godubhavi Pallam</td><td>4.69</td><td>WSW</td></tr>
<tr><td>12</td><td>Varattu Kanar</td><td>5.07</td><td>N</td></tr>
<tr><td>13</td><td>Mathala Pallam</td><td>5.53</td><td>SE</td></tr>
<tr><td>14</td><td>Kaveri(Cauvery) R</td><td>6.33</td><td>NW</td></tr>
<tr><td>15</td><td>Voddamma Eri</td><td>6.43</td><td>ENE</td></tr>
<tr><td>16</td><td>Chinnar R</td><td>6.61</td><td>NNW</td></tr>
<tr><td>17</td><td>Tottimaduvu Pallam/Bhavi Pallam</td><td>6.85</td><td>NNW</td></tr>
<tr><td>18</td><td>Morattu Pallam</td><td>6.89</td><td>SSW</td></tr>
<tr><td>19</td><td>Bilimaduvu Halla</td><td>6.9</td><td>WNW</td></tr>
<tr><td>20</td><td>Maddala Pallam</td><td>7.28</td><td>S</td></tr>
<tr><td>21</td><td>Attukombai Halla</td><td>7.84</td><td>W</td></tr>
<tr><td>22</td><td>Maththalapallam Check Dam</td><td>7.89</td><td>S</td></tr>
<tr><td>23</td><td>Dasari Pallam</td><td>8.19</td><td>ESE</td></tr>
<tr><td>24</td><td>Goddu Pallam</td><td>8.21</td><td>ESE</td></tr>
<tr><td>25</td><td>Chinna Kinar Pallam</td><td>8.26</td><td>SSW</td></tr>
<tr><td>26</td><td>Periya Pallam</td><td>8.4</td><td>SE</td></tr>
<tr><td>27</td><td>Kalmaduvu Pallam</td><td>9.87</td><td>NNE</td></tr>
<tr><td>28</td><td>Pullimadagu Halla</td><td>10.15</td><td>W</td></tr>
<tr><td>29</td><td>Gaudikere Halla</td><td>10.51</td><td>W</td></tr>
<tr><td>30</td><td>Doddavarti Halla</td><td>11.2</td><td>W</td></tr>
<tr><td>31</td><td>Nagamarattu Pallam</td><td>11.32</td><td>NE</td></tr>
<tr><td>32</td><td>Gulyada Halla</td><td>11.6</td><td>NW</td></tr>
<tr><td>33</td><td>Chikkavarti Halla</td><td>11.61</td><td>W</td></tr>
<tr><td>34</td><td>Periya Pallam</td><td>11.75</td><td>ENE</td></tr>
<tr><td>35</td><td>Stanley Reservoir/Mettur Dam</td><td>12.62</td><td>SSW</td></tr>
<tr><td>36</td><td>Yelakettu Halla</td><td>12.64</td><td>WSW</td></tr>
</table>
</td></tr>
</table>

		37	Sembarattu Pallam	12.88	SW
		38	Ottu Pallam	13.0	SW
		39	Kora Pallam	13.16	SW
		40	Bennatti Halla	13.23	NNW
		41	Anaibidda Halla	14.01	NNE
		42	Panankattu Pallam	14.13	SW
		43	Kallumaduvu Pallam	14.72	NNW
		44	Kannikkal Pallam	14.86	WSW
		Reserved Forest			
		1	Bevanurmalai RF	Adjacent to Site	N
		2	Masakkallu RF	0.50	ESE
		3	Badanavadi RF	4.11	SW
		4	Pennagaram RF	5.35	NNE
		5	Erumbalai RF	6.48	SSE
		6	Voddappatti RF	6.64	NNW
		7	Madesvaramalai R	6.99	NW
		8	Perumbalai Malai RF	7.06	S
		9	Kalappambadi RF	7.47	ESE
		10	Guttirayan RF	12.53	NNE
		11	Biligundlu RF	13.26	NNW
3	Manmade	**S. No**	**Places**	**Distance (~km)**	**Direction**
		Schools			
		1	Chinna Vathalapuram Goverment High School	0.51	SW
		2	Chinappanallur Goverment School	1.84	NNW
		3	Manalparuthikadu Goverment Primary School	1.90	W
		4	Teakadai Panchayat Union Middle School	3.42	NE
		5	Eriyur Goverment High School	5.23	SSW
		College			
		1	Eriyur Government Arts and Science College	5.07	SSW
		2	Sri Meenakshi Arts & Science College	7.78	SSW
		3	Al Islamiya Polytechnic College	9.28	ENE
		Hospitals			
		1	Eriyur Goverment PHC	6.70	SSW
		2	Malaiyanoor Goverment PHC	7.98	S
		3	Pennagaram Goverment PHC	10.54	NE
		4	Pennagaram Goverment Hospital	10.93	NE
		5	Kadamadai Goverment PHC	12.01	E
		Government Buildings			
		1	Jakkampatti VAO office	5	NE
		2	Eriyur Revenue Office	6.44	SSW
		3	Pennagaram Office of The Deputy Superintendent of Police	10.26	NE
		4	Pennagaram Taluk Office	10.48	NE
		5	Pennagram Court	12.11	NE
		Religious Place			
		1	Jai Hanuman Temple	0.01	W
		2	Muniyappan Kovil	0.41	S
		3	Sri Ayyappa Temple	0.44	S
		4	Sri Sivan Kovil	0.54	SW
		5	CMS Christ Church	4.82	SSW

		6 Kaveri Amma Deshanatheshwara Temple — 7.25 — NW 7 Sri Lakshmi Narasimha Swamy Temple — 7.37 — NE 8 Jamia Masjid — 10.76 — NE 9 Periyandichi Amman Temple — 11.08 — NE 10 Sri Mutthaiyan Kovil — 13.11 — SSW **Industries** 1 Pennagaram Tncsc Godown — 9.61 — NE 2 P.K.P Poultry Farm — 10.72 — NE
4	State, National boundaries	TN-AP state boundary~6.60km,NW
5	Nearest Highway/Railway/Town and city	S. No 1: Karikallur- Chinna Vettilapuram Road — Crossing within Site S. No 2: MDR-654 (Pennagaram- Nagamarai) — 0.81 — E S. No 3: SH-60(Hogenakkal-Pennagaram-Tirupathur) — 5.34 — NNE S. No 4: NH-544H(Erode-Thoppur) — 24.76 — SE S. No 5: Railway Station: Mettur Dam — 28.51 — S S. No 6: Nearest Town - Pennagaram — 10.0 — NE
6	Nearest port/ Airport	➢ Salem Airport at a distance of ~ 40.07km towards SE ➢ Kempegowda International Airport at a distance of ~ 123.52km towards N
7	Near by villages and Population	S. No 1: Karikallur — 0.25 — WNW — 150 S. No 2: Chinna Vettilapuram — 0.32 — S — 400 S. No 3: Periya Vettilapuram — 0.39 — S — 650 S. No 4: Santepete — 0.54 — ENE — 200 S. No 5: Neruppuran — 0.86 — WSW — 100
8	Defence installations	Nil

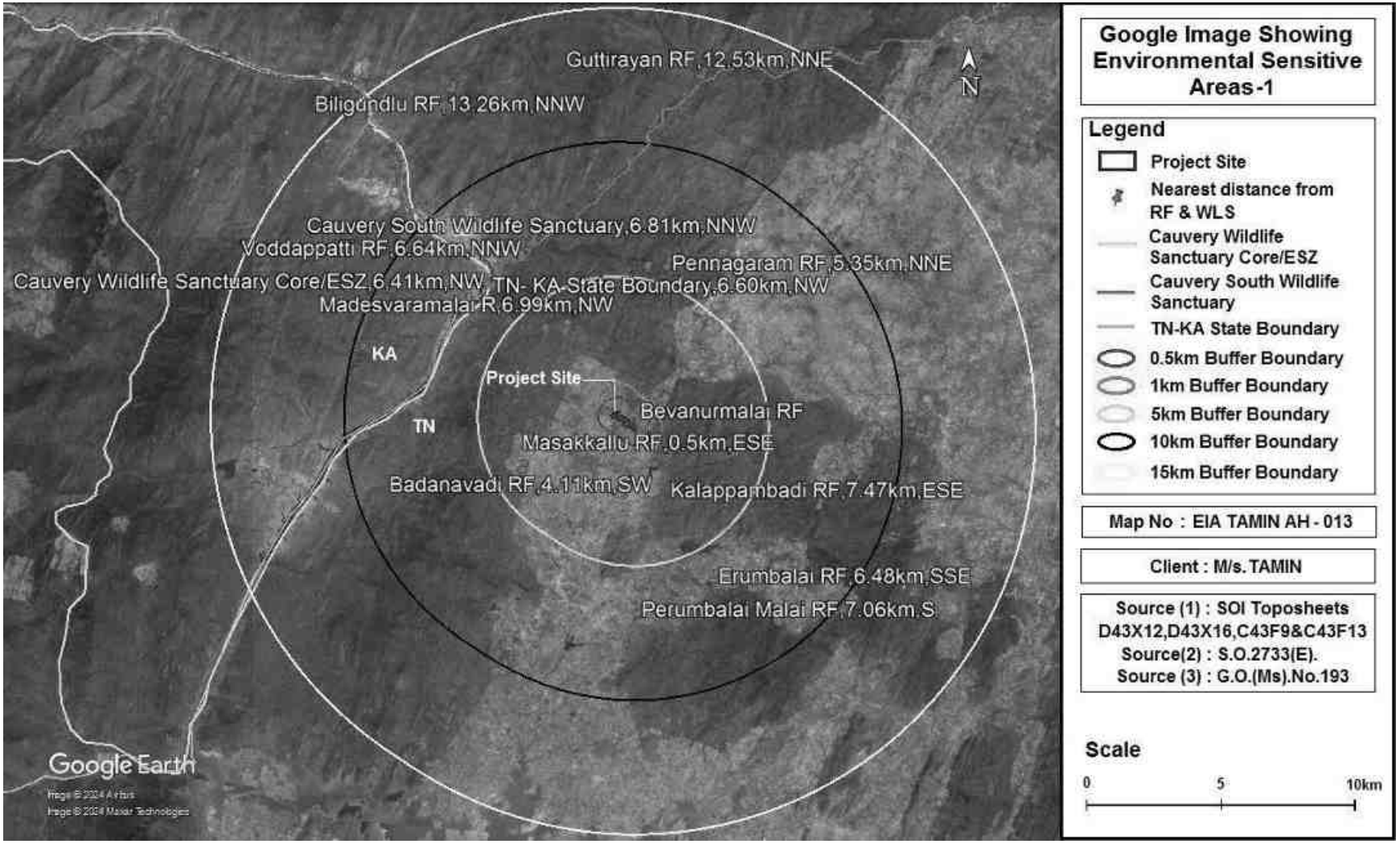


Figure 3-2 Environmental Sensitive Areas Covering within 15 km from Project Boundary

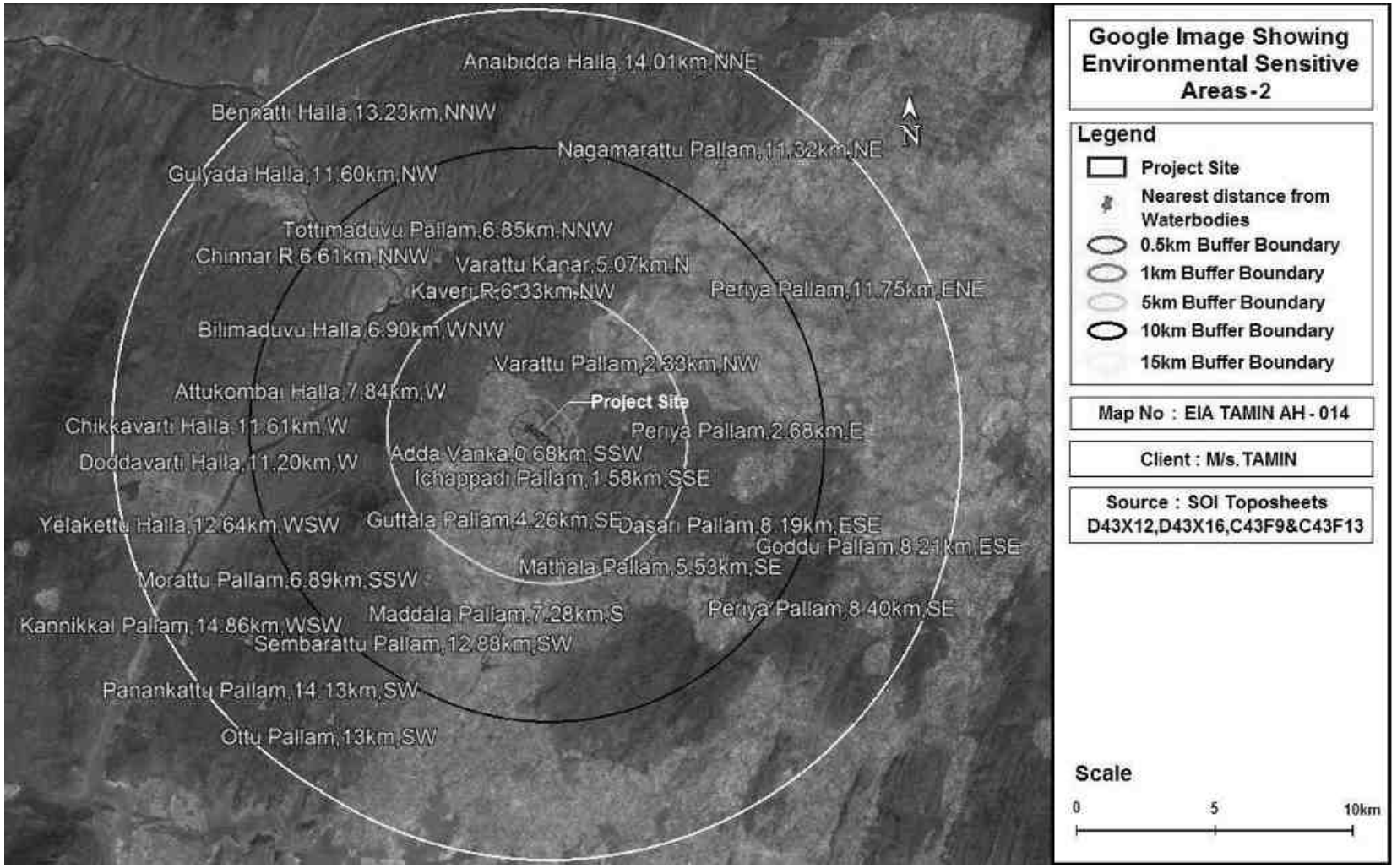


Figure 3-3 Environmental Sensitive Areas Covering within 15 km from Project Boundary

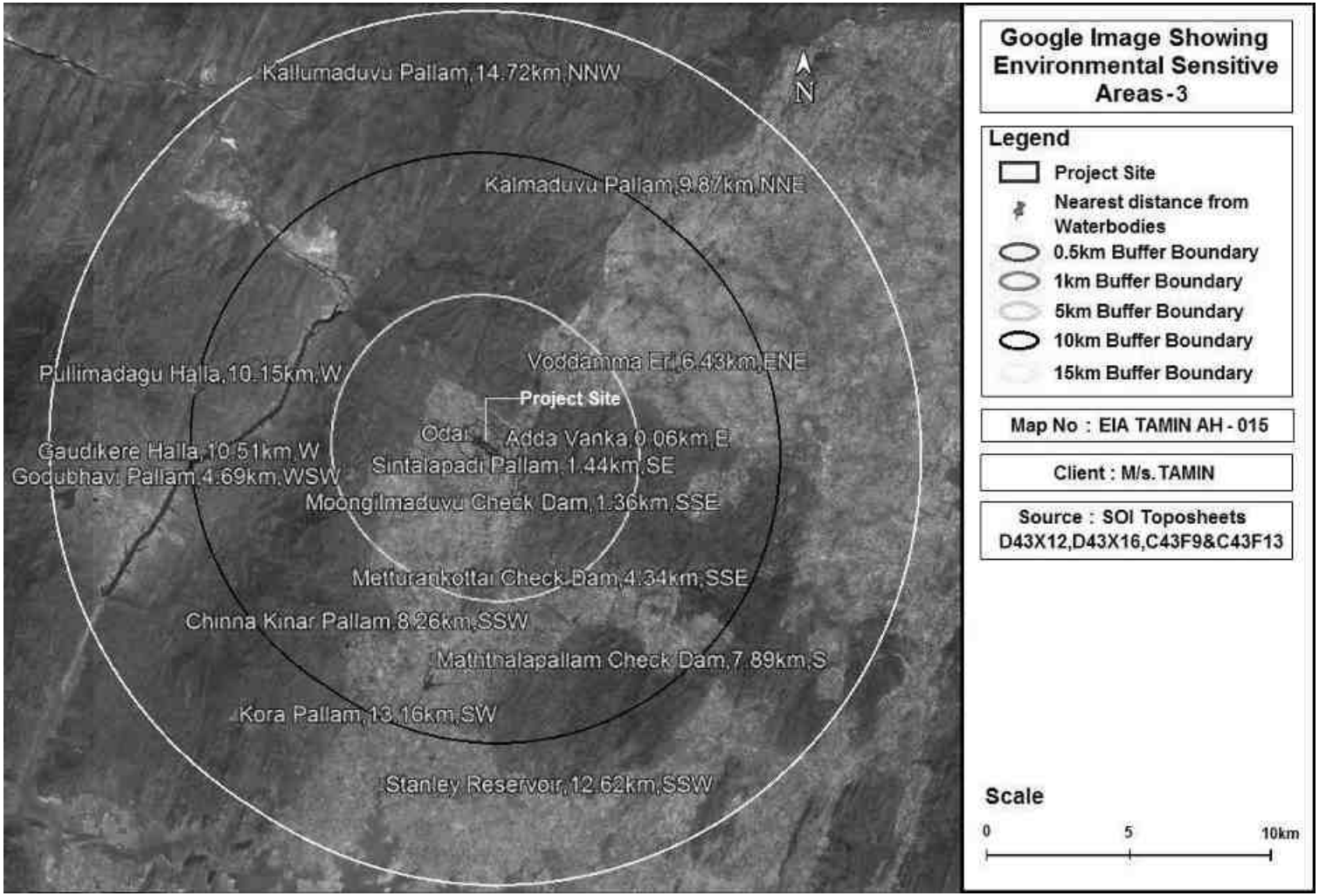


Figure 3-4 Environmental Sensitive Areas Covering within 15 km from Project Boundary

3.3 Physical Conditions of PIA district

In this section, the physical conditions of PIA district are discussed in general and wherever possible references to the conditions prevailing in the study area in particular are also provided. The physical conditions are discussed as under:

- District profile
- Drainage, land use, geology, Physiographic
- Natural resources

Climatic conditions, seismic zone characteristics and natural hazard

3.3.1 PIA District Profile

Dharmapuri district lies between 11° 47' and 12° 33' of Northern latitude and 77° 02' and 78° 40'30'' of Eastern longitude. This district is bounded on the north by Krishnagiri district , on the east by Tiruvannamalai and Villupuram districts, on the south by Salem district, and on the west by Karnataka's Chamarajanagar district. The total geographical area of the district is 4497 sq kms, i.e. 3.46% of Tamil Nadu. This district is placed at 14th rank in comparision to other districts in terms of area in Tamil Nadu. It is located 297 kms away from chennai and 126 kms away from Bangalore. Neighbouring cities like Bangalore, Mysore, Tumkur, Chittoor, Tirupathi, Thrissur, Palakkad, Puducherry also lie within a 300 kms radius.

Source: https://censusindia.gov.in/nada/index.php/catalog/1146

Ref: Census of India 2011 - Series 34 - District Census Handbook Tamil Nadu, Part A –Dharmapuri

3.3.2 Climatic Conditions

Dharmapuri district is situated in the Western Agro climatic zone. The climate of the Dharmapuri district is generally normal and warm. The district has 37°C and the mean daily minimum temperature of about 25°C in the plains. The district temperature is a gradual decrease of both day and night from June to December, when the mean daily maximum is about 30°C and the mean daily minimum about 19°C in the plains.

April and May are the hottest months in the year with a highest temperature being 38°C in April. The climate becomes cool in December and continue up to February, touching a minimum of 17°C in January. The climate of the district on the whole is slightly humid.

In summer, the wind is hot and uncomfortable. From December to February, the wind is very cold. The district gets rainfall from both south-west and north-west monsoons. During the monsoon season, the climate is pleasant.

Source: https://censusindia.gov.in/nada/index.php/catalog/1146

Ref: Census of India 2011 - Series 34 - District Census Handbook Tamil Nadu, Part A - Dharmapuri

3.3.3 Natural Resources of PIA District

3.3.3.1 Flora & Fauna

Dharmapuri district has various flora and fauna spices which includes short shrubs and throne plants. The whole district is predominantly covered with forests. Spider valley located near Hogenakkal is home for many wild animals. The district falls in the migratory path of elephants. Man and elephant conflicts are most common in these parts. Many tribal communities depend on these forests. Vathalmalai, a mountain hamlet on top of Servarayan hill chain has suitable conditions to cultivate coffee and jack fruit. Wild boars and spotted deers are commonly seen in Morappur and Harur forest region. Gaurs sometimes stroll near villages around Bommidi region.

Source: https://censusindia.gov.in/nada/index.php/catalog/1146

Ref: Census of India 2011 - Series 34 - District Census Handbook Tamil Nadu, Part A –Dharmapuri

3.3.3.2 Forest Resources

Dharmapuri district has tropical forests. Thoppur ghat section has one of the scenic highways surrounded by mountains and forests. For a massive tree planting program to increase tree cover in the district, the Environmental and Forest Department has planted 60,000 seedlings in public places, Government institutions, Industries, Schools, Colleges and roads in Harur taluks. Dharmapuri and Harur are the two forest divisions in this district.

Source: https://censusindia.gov.in/nada/index.php/catalog/1146

Ref: Census of India 2011 - Series 34 - District Census Handbook Tamil Nadu, Part A –Dharmapuri

3.3.3.3 Irrigation

The chief rivers that flow through the district are Cauvery, Chinnar, Markandanathi and Vaniyar. Though river Cauvery flows in the border of the State as well as in the district, due to topographical condition, possibility of construction of dam is far away in the planning of the State. Krishnagiri dam, which is constructed across Thenpennar, irrigates part of the area. Chinnar, Palar, Thoppiar, Kallar, Varathiar and Pambar are minor rivers, which are almost dry during most part of the year.

Major sources of water supply for irrigation in this district during 2010-11 are given in the following table.

Sl.no	Irrigation source	Number	Length (in Kms)
1	Canals	85	187
2	Tube Wells & Other Wells	1405	-
3	Open Wells	83970	-
4	Reservoir	7	-
5	Tanks	1015	-

Source: Statistical HandBook of TamilNadu, 2011

Chinnar Reservoir, Nagavathi Reservoir,Thoppaiyar Reservoir, Kesargulihalla Reservoir, Thumbalahalli Reservoir and Vaniyar Reservoir are the source of irrigation of this district. By all these water reservoirs, large area of land is irrigated. Lakes like Alapuram and Annasagaram also contributes to the irrigation in the district.

The different sources of irrigation are canals, wells, tanks, lakes and reservoirs. Tube wells or wells covered 56198.1 hectares which accounted to 93% of the irrigation in the district. Lakes and reservoirs contributed 5% of the irrigation in Dharmapuri district.

Source: https://censusindia.gov.in/nada/index.php/catalog/1146

Ref: Census of India 2011 - Series 34 - District Census Handbook Tamil Nadu, Part A –Dharmapuri

3.3.3.4 Agricultural Resources

The district economy is mainly agrarian in nature. Nearly 70% of the work force is dependent on agriculture and allied activities. The district is one among the most backward and drought prone area in the State. To achieve the food production target, various schemes are being implemented for the benefit of the farmers and those are System of Rice Intensification, Pulses production and development, Initiative for nutritional security through intensive millets promotion and Rainfed area development programme in Dharmapuri district. The Agricultural Engineering Department is implementing a number of development programmes throughout the district. These can be classified as follows:

1. Land Development Scheme
2. Minor Irrigation Scheme
3. Soil Conservation works in Tribal Area (Integrated Tribal Development Programme)
4. Agricultural Mechanization (Farm Mechanization)
5. National Agricultural Development Programme(NADP)
6. Run off Management Programme
7. Artificial recharge ground water scheme
8. IAMWARM (Irrigated Agriculture Modernization and Water bodies Restoration Management)

The important food grains in the district are paddy, cholam, cumbu, ragi and samai. The major pulses cultivated are redgram, greengram, blackgram, horsegram, bengalgram and cowpea. The other commercial crops like cotton, chilly, sugarcane, turmeric, tamarind and corriander are also cultivated in Dharmapuri district.

Source: https://censusindia.gov.in/nada/index.php/catalog/1146

Ref: Census of India 2011 - Series 34 - District Census Handbook Tamil Nadu, Part A –Dharmapuri

3.3.3.5 Mineral Resources

Dharmapuri district is endowed with sizeable reserves of granite. The following table shows the various mining and quarrying units in each taluks of the district during 2010-11.

Sl.No	Name of the taluk		No. of Mining Quarrying Units			
		Quartz	Sand	Rough stone	Black Granite	Grey Granite
1	Dharmapuri	-	-	20	1	0
2	Pennagaram	3	-	3	5	0
3	Harur	-	3	23	4	-
4	Pappireddipatti	-	1	11	3	0

5	Palakkodu	-	1	17	6	1
Total		**3**	**5**	**74**	**19**	**1**

Source: District Statistical Handbook, 2010-11

High quality black granite is present in this district. Quartz is available at Kendiganapalli Village of Pennagaram Taluk, A.Velampatti of Harur taluk andPethathampatti of Pappireddipatti Taluk. Another high value mineral available in this district is Molybdenum, it was discovered near Harur by the Ministry of Mines in 2001. It is the only source of the minerals in India. The ability of molybdenum to withstand extreme temperatures without significantly expanding or softening makes it useful in applications involving intense heat, including the manufacture of aircraft parts,electrical contacts, industrial motors and filaments. The following table shows the minerals available in the district and its quantity during 2010-11.

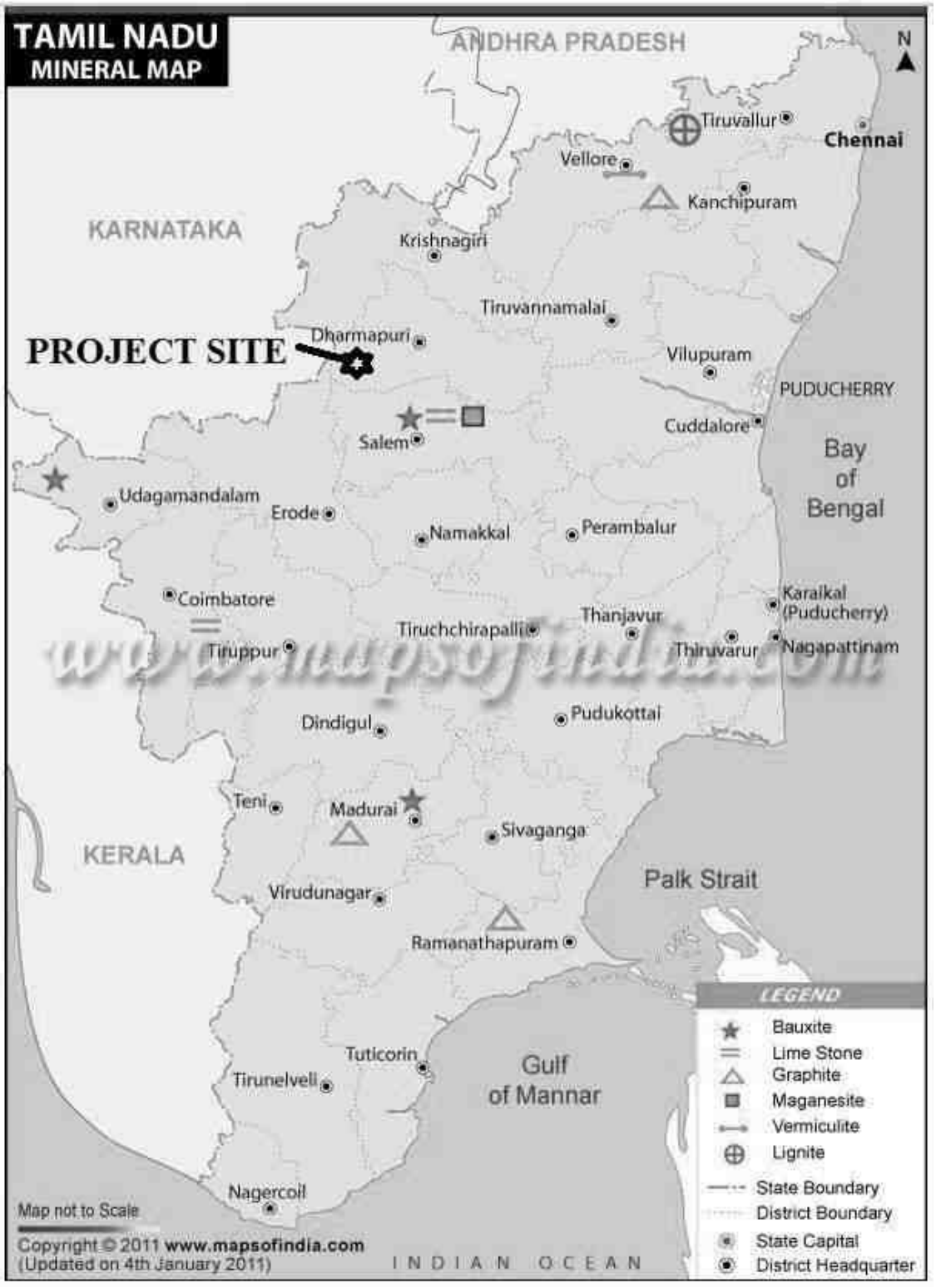
Name of the Minerals	**Quantity**	**Value (Rs in '000')**
Rough Stone Jelly	10069 units	3514725
Black Granite	16518.502 cubic meter	4672580
Quartz	4652 tones	93040

Source: District Statistical Handbook, 2010-11

Source: https://censusindia.gov.in/nada/index.php/catalog/1146

Ref: Census of India 2011 - Series 34 - District Census Handbook Tamil Nadu, Part A –Dharmapuri

The mineral map of Tamilnadu is shown in the **Figure 3-5**



Source: *Maps of India*

Figure 3-5 Mineral Map of Tamil Nadu

3.3.3.6 Land Use & Land Cover

Definition

A delineable area of the earth's terrestrial surface, embracing all attributes of the biosphere immediately above or below this surface, includes:

- Near surface climate,
- Soil and terrain forms,

Surface hydrology including shallow lakes, rivers, marshes and swamps, near-surface sedimentary layers and associated ground water and geo hydrological reserves, plant and animal populations, Human settlement pattern and physical results of past and present human activity (terracing, water storage or drainage structures, roads, buildings, etc.

Land Use (LU)

Territory characterized according to its current and future planned functional dimension or socio–economic purpose (e.g. residential, industrial, commercial, agricultural, forestry, recreational).

Land Cover (LC)

Physical and biological cover of the earth's surface including artificial surfaces, agricultural areas, forests, (semi) natural areas, wetlands, waterbodies.

Classification Scheme

There are three levels of classification, viz., Level-I, Level-II, Level-III. Based on NRSC-2012, Level-I consists of 8 classes, Level-II consists of 31 classes, and Level-III consists of 54 classes. In this EIA, Level-III classification in 1:50000 scale is adopted.

LULC classification through Satellite Image

For preparation of LULC, Resourcesat-2 LISS III satellite image is used. This satellite operates in a sun-synchronous orbit at an altitude of 817 km. It takes 101.35 minutes to complete one revolution around the earth and complete about 14 orbits per day. The entire earth is covered by 341 orbits during a 24-day cycle. The LISS-3 sensor covers a 140-km orbital swath at a spatial resolution of 24 meters with a 24-day repeat cycle. False Color Composite (FCC) images of the study area was prepared using bands 4 (NIR) 3 (Red), and 2 (Green) and discrimination of features were made by visual interpretation (on screen) using these images and Survey of India toposheet. The interpretation key was based on the relationships between ground features and image elements like, texture, tone, shape, location and pattern.

3.3.3.7 Land use land cover for the study area

The land use pattern of the study area is 336.14 Sq.Km given in **Table 3-2** land use map of the study area is given in **Figure 3-6**.

Table 3-2 Land use pattern of the Study Area

S.No.	Description	Area (Sq.Km)	Area (Acres)	Area (Hectares)	Percentage (%)
1	Deciduous	206.57	51044.48	20657	60.68
2	Crop land	87.13	21530.26	8713	25.60
3	Fallow	19.87	4909.98	1987	5.84
4	Scrub land	11.65	2878.77	1165	3.42
5	River / Stream / Canals	4.57	1129.27	457	1.34
6	Rural	3.48	859.93	348	1.02
7	Evergreen / Semi Evergreen	3.03	748.73	303	0.89
8	Tanks / Lakes /Ponds	2.57	635.06	257	0.75
9	Barren rocky	1.09	269.34	109	0.32
10	Mining	0.32	79.07	32	0.09
11	Salt Affected land	0.06	14.83	6	0.02
12	Urban	0.06	14.83	6	0.02
	Total	**340.40**	**84114.54**	**34040**	**100.00**

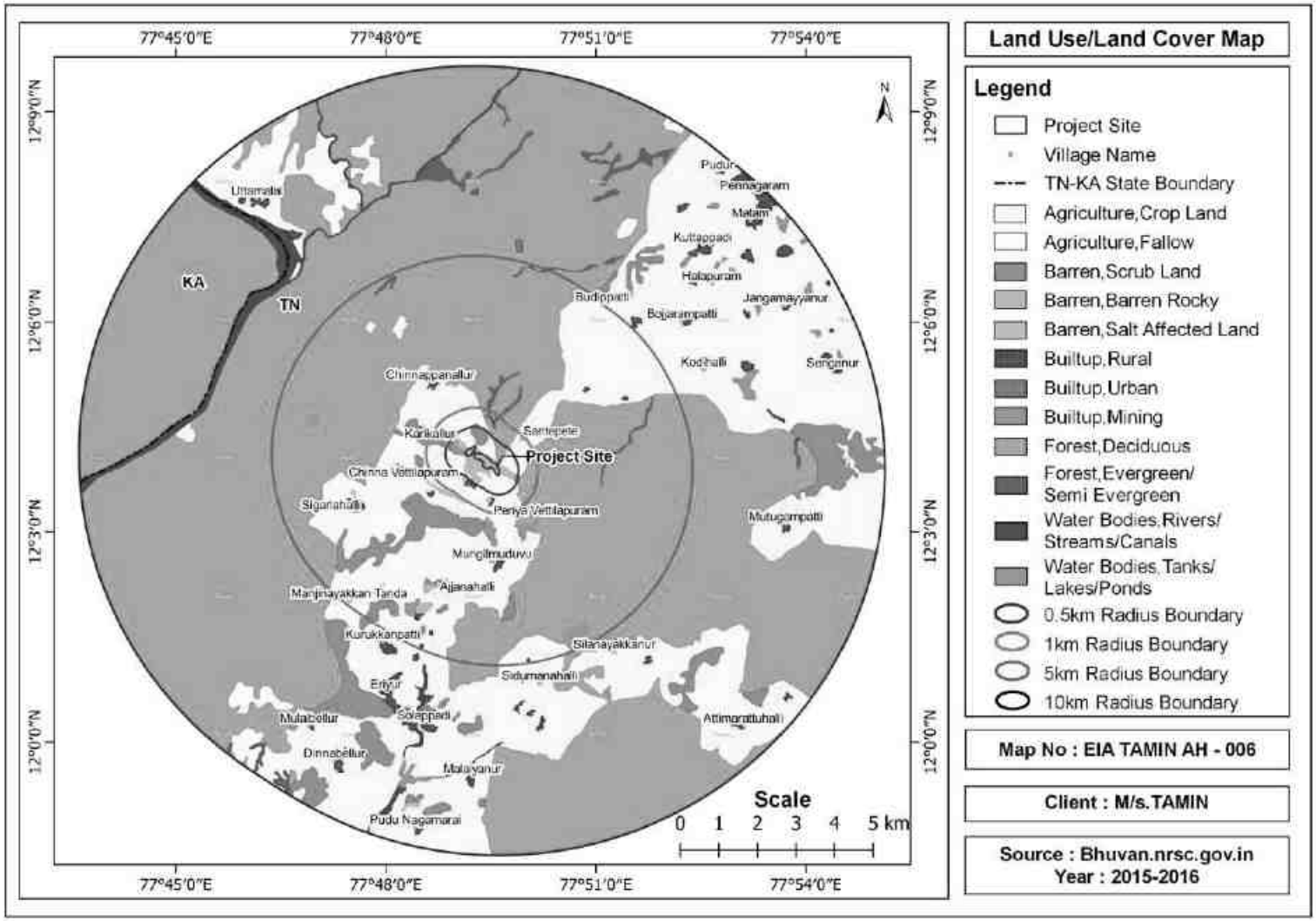


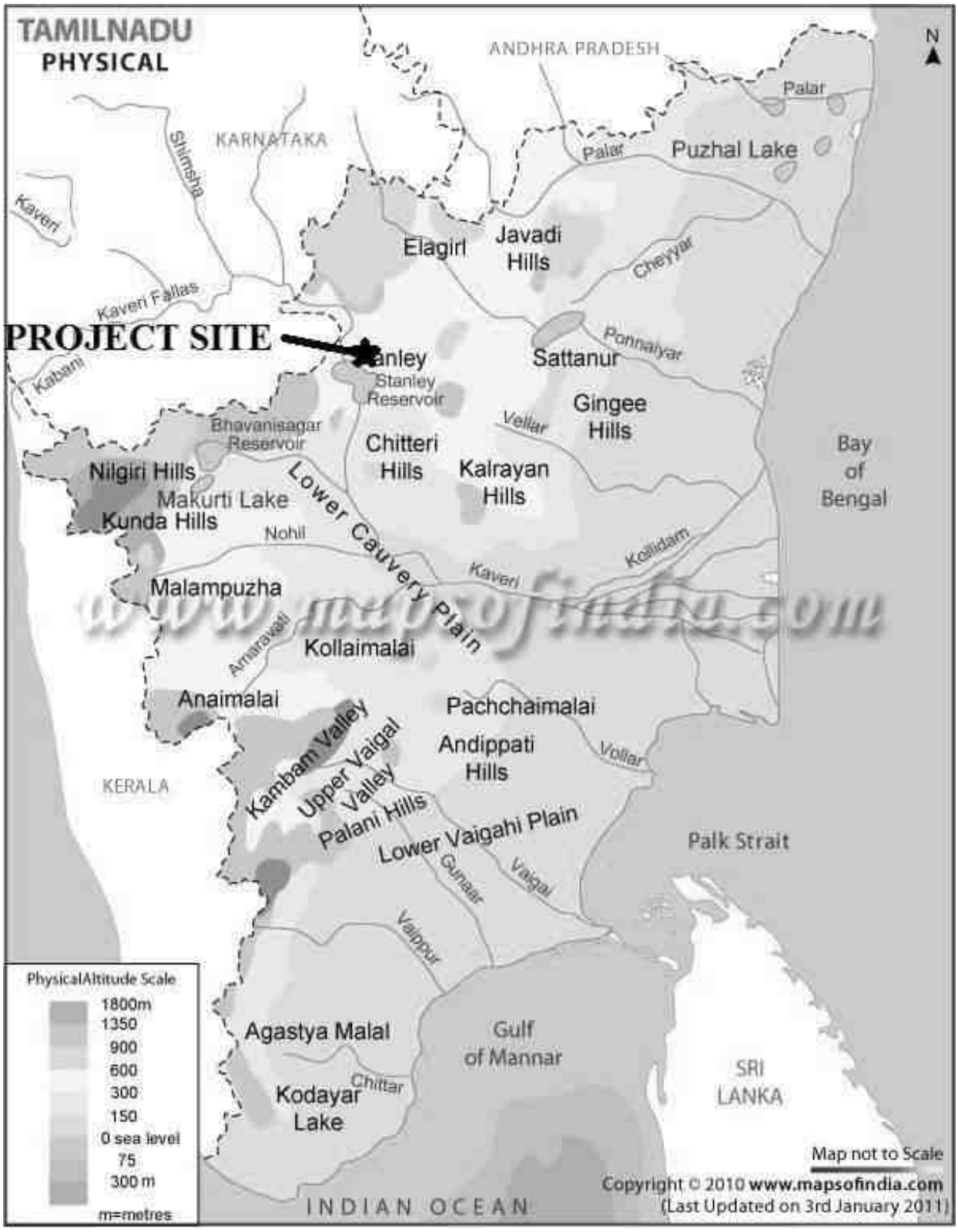
Figure 3-6 Land use/Land cover map of the Study Area

3.3.4 Topography

- Dharmapuri district forms part of the upland plateau region of Tamil Nadu with many hill ranges and undulating plains.
- The western part of the district between Pennagaram and Denkanikottai has hill ranges of Mysore Plateau with a chain of undulating hills.
- The southern boundary of the district is occupied by the Shevaroy hill ranges.
- The plains occupying the central, eastern and southern parts of the district have an average elevation of 488 m. above Mean Sea Level.
- The Plateau region along the western boundary and the north western part of the district has an average elevation of 914 m. above Mean Sea Level.

Source: https://spc.tn.gov.in/Exe_Summary_DHDR/Dharmapuri.pdf

(Ref: State planning Comission –Tamil Nadu, "District Human Development Report-2017, Dharmapuri District")



(Source: Maps of India)

Figure 3-7 Physical Map of Tamilnadu

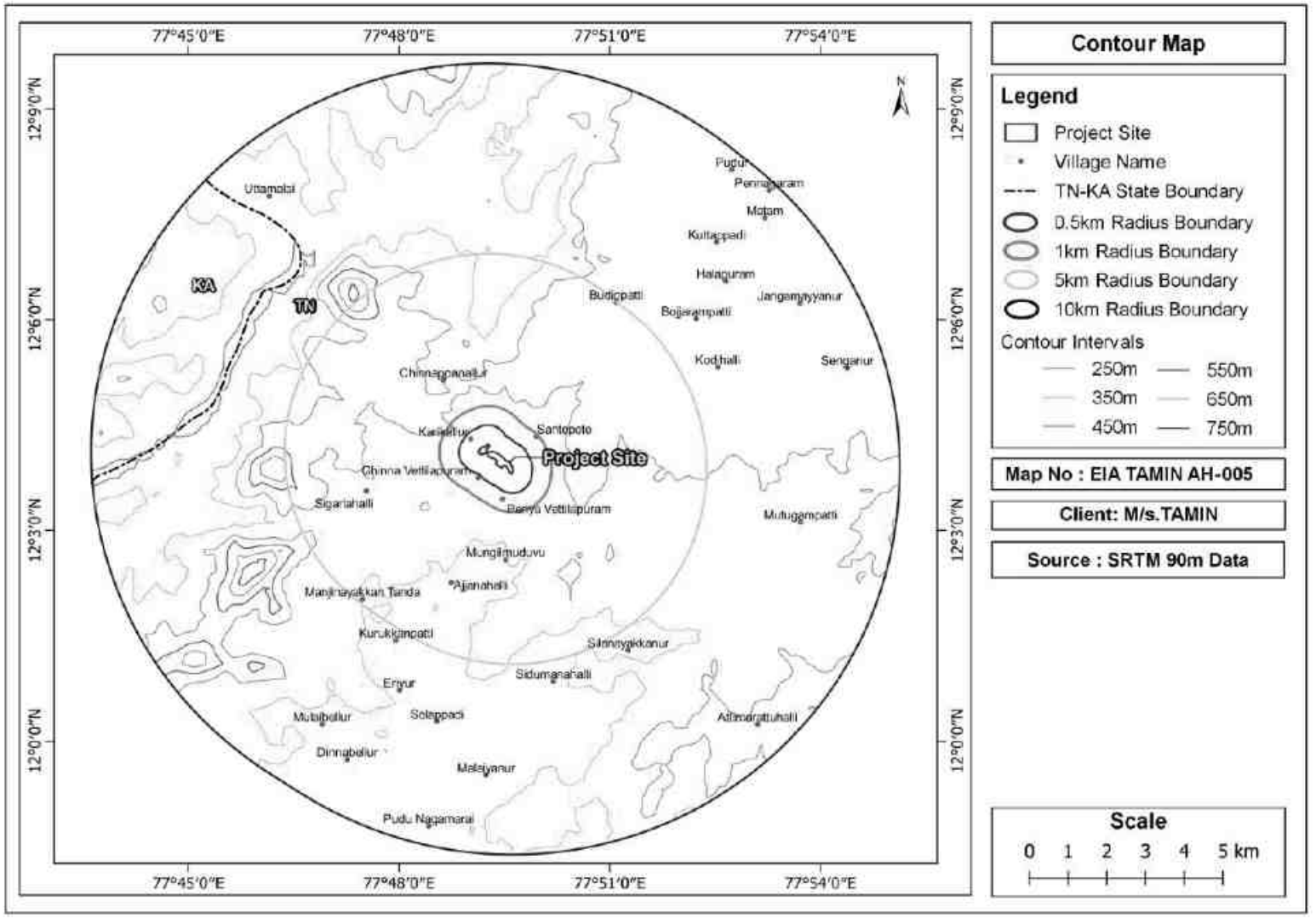


Figure 3-8 Contour map of the Study Area

3.3.5 Geomorphology of PIA District

Dharmapuri district forms part of the upland plateau region of Tamil Nadu with many hill ranges and undulating plains. The western part of the district between Pennagaram and Denkanikottai has hill ranges of Mysore Plateau with a chain of undulating hills. The southern boundary of the district is occupied by the Shevaroy hill ranges. The plains occupying the central, eastern and southern parts of the district have an average elevation of 488 m. above Mean Sea Level. The Plateau region along the western boundary and the northwestern part of the district has an average elevation of 914 m. above Mean Sea Level.

The prominent geomorphic units identified in the district through interpretation of Satellite imagery are 1) Structural Hills 2) Inselberg 3) pediments, 4) Buried pediments 5) Shallow Buried Pediments 6) Plateau,7) Flood plain, and 8) Bazada Zone.

Source:http://cgwb.gov.in/sites/default/files/2022-10/dharmapuri.pdf

(**Ref**: Government of India Ministry of Water Resources Central Ground Water Board South Eastern Coastal Region Chennai, "District Ground Water Brochure Dharmapuri District"

3.3.6 Geomorphology of the study area

Total geographical area of the study area is 340.40 Sq.Km. The Geomorphology pattern of the study area is given in **Table 3-3,** The Geomorphology map of the study area is shown in the **Figure 3-9.**

Table 3-3 Geomorphology pattern of the study area

S.No.	Description	Area (Sq.Km)	Area (Acres)	Area (Hectares)	Percentage (%)
1	Structural Origin-Moderately Dissected Hills and Valleys	198.56	49065.17	19856	58.33
2	Denudational Origin-Pediment Pediplain Complex	121.19	29946.65	12119	35.60
3	Waterbodies	14.22	3513.83	1422	4.18
4	Structural Origin-Low Dissected Hills and Valleys	5.42	1339.31	542	1.59
5	Denudational Origin-Low Dissected Hills and Valleys	0.62	153.21	62	0.18
6	Fluvial Origin-Active Flood Plain	0.26	64.25	26	0.08
7	Anthropogenic Origin-Anthropogenic Terrain	0.13	32.12	13	0.04
Total		**340.40**	**84114.54**	**34040**	**100**

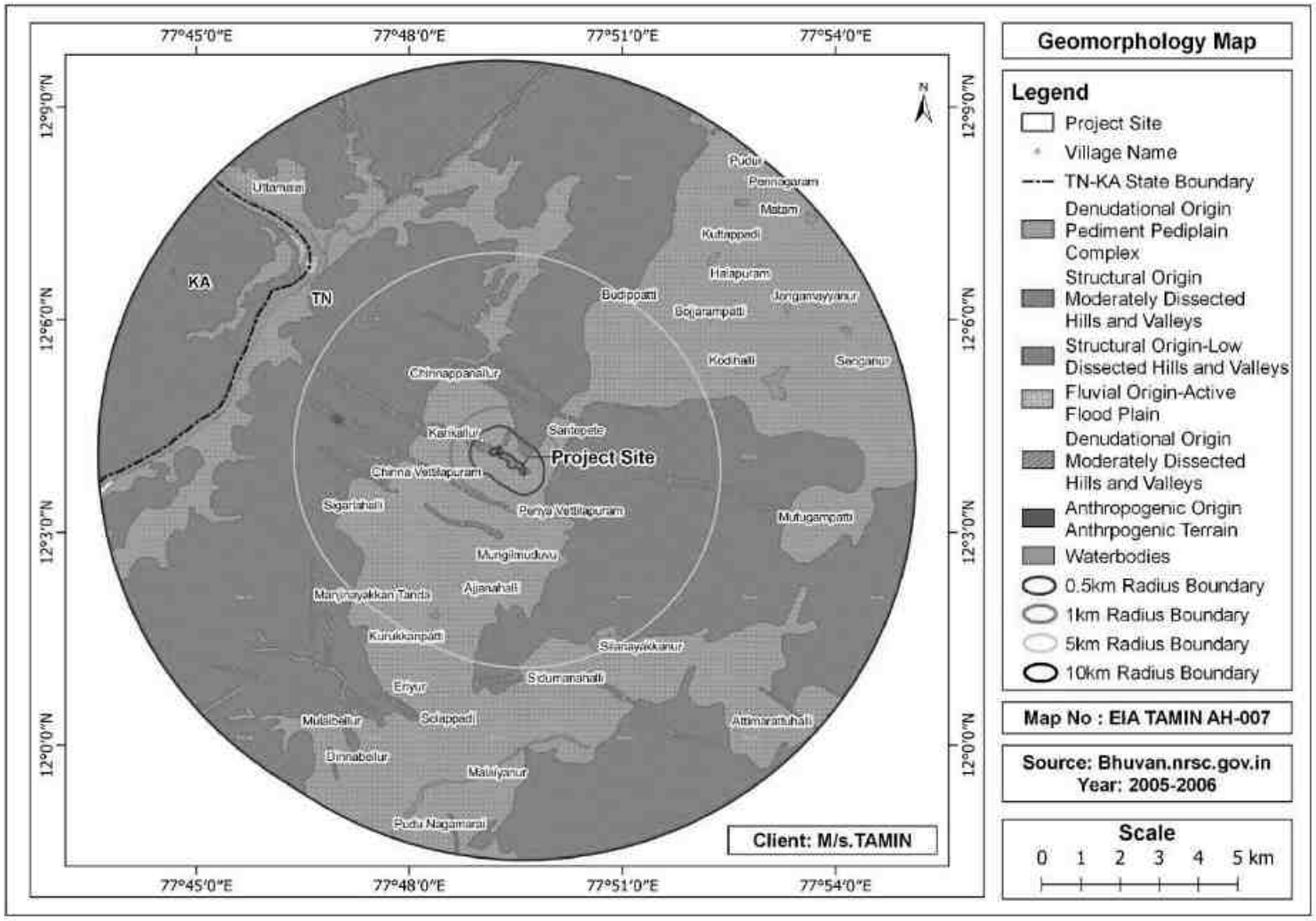


Figure 3-9 Geomorphology map of the study area

3.3.7 Hydrogeology of PIA District Profile

The district is underlain by Archaean Crystalline formations with recent alluvial deposits of limited areal and vertical extents along major rivers. (Plate-II). The important aquifer systems in the district are constituted by i) unconsolidated & semi-consolidated formations and (ii) weathered and fractured crystalline rocks.

In the areas underlain by crystalline rocks, occurrence of ground water is essentially limited to zone of weathering and fracturing. Generally the hard rock aquifers areheterogeneous in nature, which is indicated by the variations in lithology, structure and texture. Ground water occurs under phreatic condition in the weathered mantle and semi confined to confined condition in the fracture and fissured zones of these rocks. Thickness of weathered material varied widely from less than 1m bgl to more than 20m bgl.

The Alluvium with intervening crystalline outcrops are noticed as patches west of Dharmapuri, and Papireddipatti areas. The ground water occurs under water table to semi-confined conditions. The discharge ranges from 10 to 20 m/day.

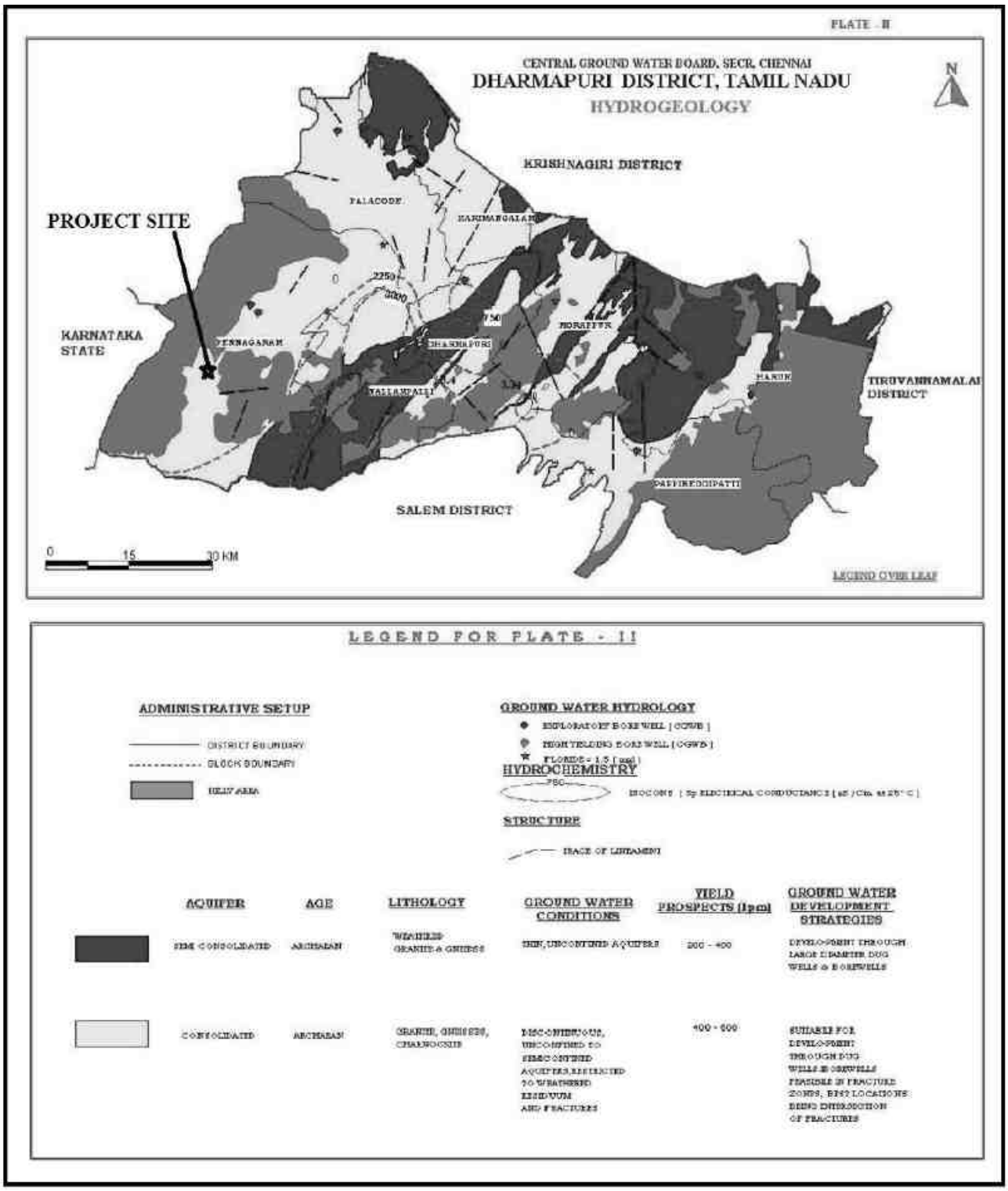
The yield of large diameter wells in the district, tapping the weathered mantle of crystalline rocks ranges from 150-200 m^3/day and are able to sustain pumping for 2 to4 hours per day. The yield of large diameter wells tested in crystalline rocks ranges from 150 to 200 m3/day for drawdown of 1 to 3 m. The yield characteristics of wells vary considerably depending on the topographic set-up, litho logy and nature of weathering. The transmissivity of weathered formations computed from pumping test data using empirical methods range from 12 to 22 m^2/day. The specific capacity in the fissured formation ranges from 2.89 to 153.74 lpm/m/dd. In the porous formation the specific capacity values vary from 6.31 to 28.7 lpm/m/dd.

The yield of bore wells drilled down to a depth of 36 to 200 m bgl, by various state agencies mainly for domestic purposes. The discharge ranged from 2 to 33 lps. The yield of successful bore wells drilled down to a depth of 200 m bgl during the groundwater exploration programme of Central Ground Water Board ranged from 1 to 12lps. The aquifer and well parameters of the wells show wide variation, both in crystalline and sedimentary formations.

The depth to water level in the district varied between 5.27 and 16.70 mbgl during pre-monsoon (Plate-III) and varied between 2.47 and 11.32 mbgl during postmonsoon (Plate-IV). The seasonal fluctuation shows a rise in water level, which ranges from 3.71 to 7.06 m bgl. The piezometric head varied between 2.66 to 20.06mbgl (May 2006) during pre monsoon and 1.19 to 14.57 mbgl during post monsoon.

Source:http://cgwb.gov.in/sites/default/files/2022-10/dharmapuri.pdf

(**Ref**: Government of India Ministry of Water Resources Central Ground Water Board South Eastern Coastal Region Chennai, "District Ground Water Brochure Dharmapuri District")



Source: *http://cgwb.gov.in/District_Profile/TamilNadu/TIRUVALLUR.pdf*

Figure 3-10 Hydrogeology Map of Dharmapuri District

3.3.8 Drainage Pattern in PIA District

Dharmapuri district is drained by Cauvery and Ponnaiyar rivers and their tributaries. Cauvery river flows along the south western boundary of the district. It flows in an easterly direction up to Bellgundla and then

takes a more or less southerly course till it reaches the Stanley Reservoir. The Doddahalla and the Chinnar R. are important tributaries of Cauvery river in the district.

Ponnaiyar is the major river draining the district and is ephemeral in nature. It originates from Nandhi hills in Karnataka, enters Tamil Nadu west of Bagalur and flows almost in a south easterly direction till it reaches Daddampatti from where it takes an easterly course. Pambar, Vaniyar and Kallar are the important tributaries of Ponnaiyar draining the eastern part of the district whereas the Chinnar and Markandeya Nadhi drain the northern part of the district.

Source:http://cgwb.gov.in/sites/default/files/2022-10/dharmapuri.pdf

(**Ref**: Government of India Ministry of Water Resources Central Ground Water Board South Eastern Coastal Region Chennai, "District Ground Water Brochure Dharmapuri District")

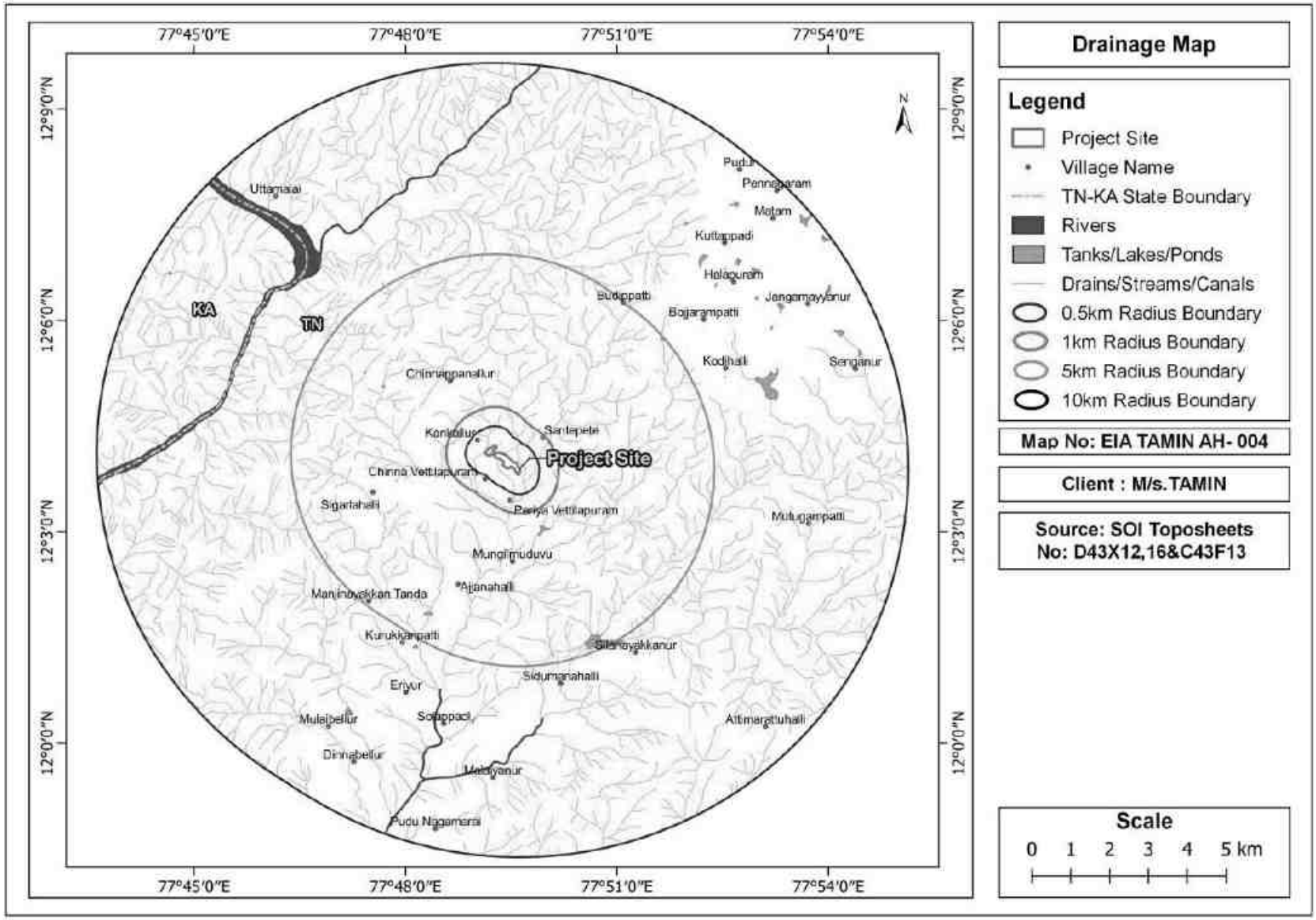


Figure 3-11 Drainage map of the study area

3.3.9 Geology

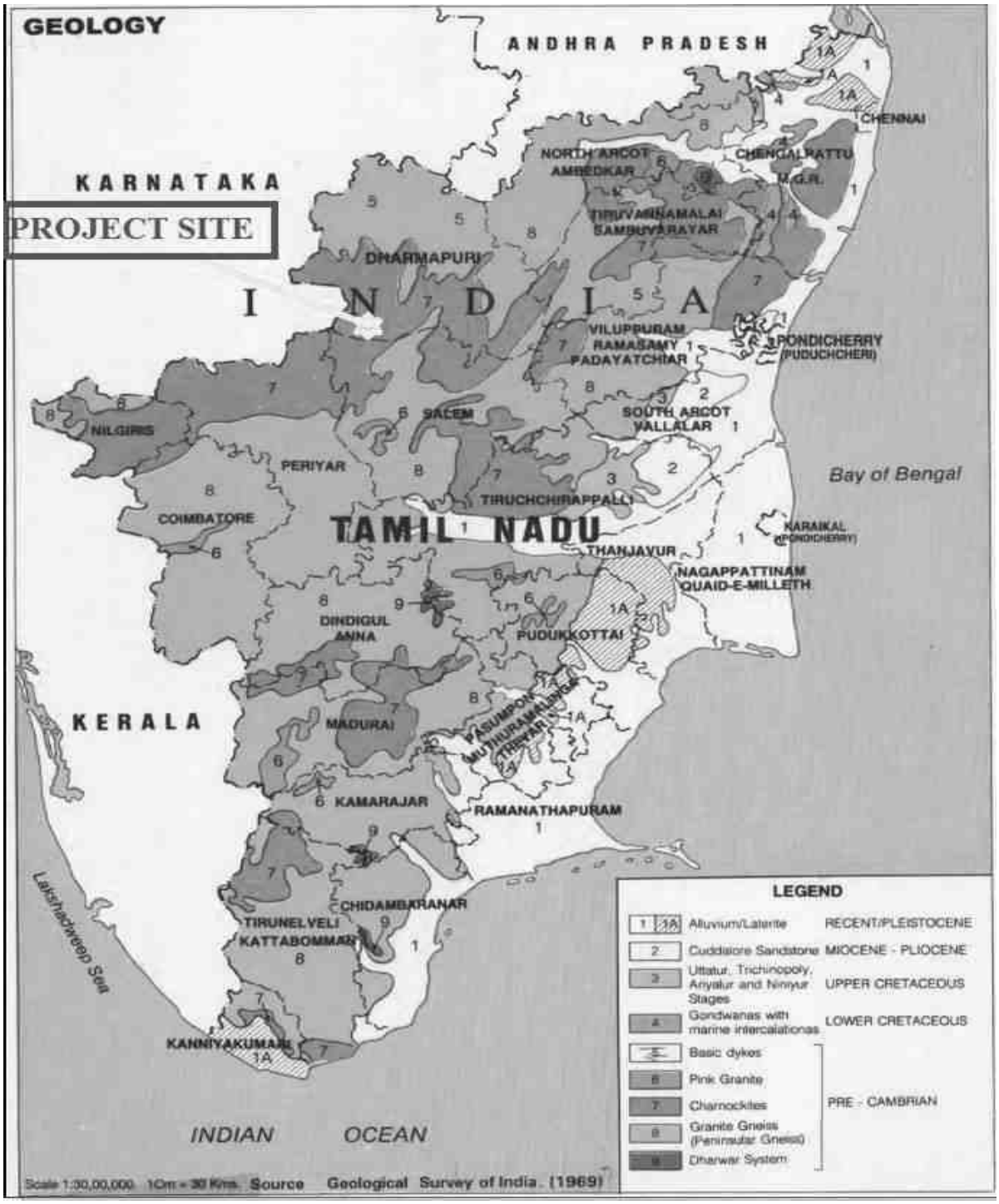
Geologically Dharmapuri District is covered by crystalline rocks of Archaean age. The entire district is underlain by hard crystalline rocks of Archaean age comprising of various rock types such as Gneiss, Charnockite, etc., The Gneissic type of crystalline formation is found in the north and north eastern part of the district. Shoolagiri, Hosur, Denganikottai and Kelamangalam areas are covered by Granitic & Gneiss. Veppanapalli, Krishnagiri and parts of Kaveripaattinam areas are covered by peninsular Gneiss. Bargur, part of Kariamangalam, Palacode, Pochampalli and Uthangarai are covered by Biotite Gneiss. Part of Harur, Uthangarai and Morappurareas are covered by foliated gneiss.

Charnockite occurs in the southern part of the district, covering part of Palacode, part of Morappur, Pappireddipatti, part of Dharmapuri, Pennagaram and Nallampalli. Quartzites are found in patches in Denganikottai block. Dolerite dykes varying from few feet to few miles in length cut across the country rock in this district.

Alluvial deposits such as sand, silt, clay and gravels which are transported sediments by the river Ponnaiyar and Chinnar are found on either side of the river courses. These formations are overlying the hard rock's as a thin layer.

In Dharmapuri district, weathered thickness ranges from 8 m to 15 mbgl. And jointed formation ranges from 15 m to 60 m in general. The strike direction is generally North East – South west, dipping towards south east. Geological map of Tamilnadu is given as **Figure 3-12.**

Source:https://nwm.gov.in/sites/default/files/Notes%20on%20Dharmapuri%20District.pdf

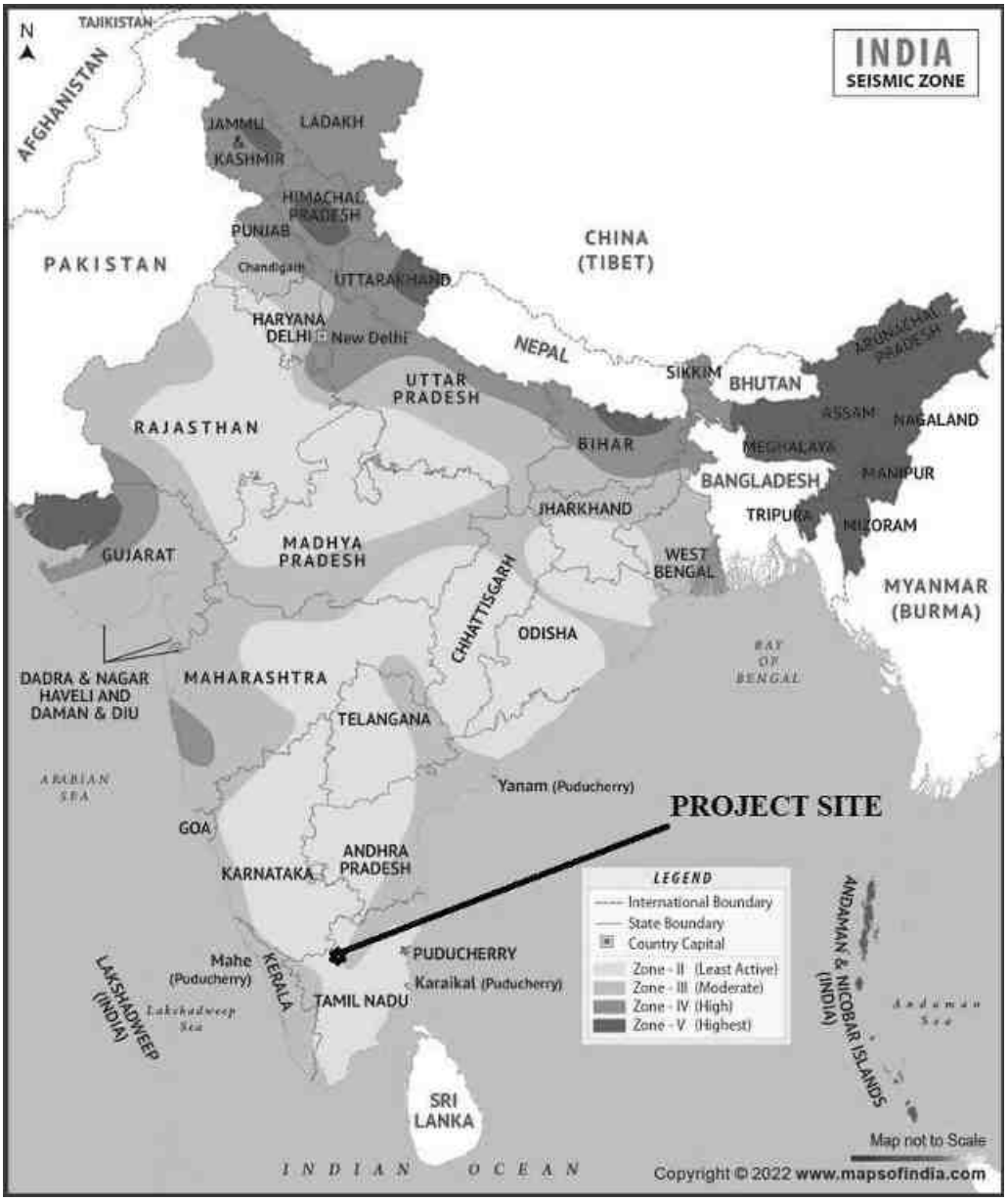


Source: Geology Survey of India

Figure 3-12 Geology Map of Tamilnadu

3.3.10 Seismicity

As per Earthquake hazard map of India, The project location/study area falls in Zone II, which is categorized as a Moderate Damage Risk Zone. The Earthquake hazard map of India is shown in **Figure 3-13.**



Source:Maps of India

Figure 3-13 Seismicity Map of India

3.3.11 Soils in PIA District

The district has a wide range of soil types. In general, the soil in the district is quite loose and fresh with its colour varying from red to dark brown. The soils are mostly in-situ in nature, lateritic, earthy and pale reddish in colour. The soil has low nitrogen and phosphate content with marked variations between different taluks.

Different types of the soils such as black or mixed loams, red ferruginous and gravel are found in the district. The black or red loam is very fertile due to its moisture absorbing character, which is found in Dharmapuri taluk. Red and sandy soil are seen in Harur taluk. Lateritic and sandy coastal alluvium soils are found in almost all blocks. Considerable stretches of good loam and black soil are found in Dharmapuri district.

Type of Soil	Places in the District
Lateritic Soil	Harur
Black Soil	Dharmapuri, Palacode, Pappireddipatti
Sandy Coastal Alluvium	Dharmapuri, Harur, Palacode
Red Sandy Soil	Pennagaram, Palacode, Harur

Source: District Statistical Handbook, 2010-11

Source*:* https://censusindia.gov.in/nada/index.php/catalog/1146

Ref: Census of India 2011 - Series 34 - District Census Handbook Tamil Nadu, Part A –Dharmapuri

3.3.12 Natural Hazards in PIA District

Dharmapuri District situated in TamilNadu is prone to multi hazards like earthquake, drought, flood, landslide and Road accidents. District Disaster management plan has been 24 developed which aims to improve district's response to disasters while improving its ability to mitigate the disaster risks and increasing community's resilience by implementing the preparedness plan.

According to GSHAP data, the state of Tamil Nadu falls mostly in a region of low seismic hazard with the exception of western border areas that lie in a low to moderate hazard zone. Puducherry lies in a low hazard region. As per the 2002 Bureau of Indian Standards (BIS) map, Tamil Nadu and Puducherry fall in Zones II and III. Historically, parts of this region have experienced seismic activity in the M5.0 range.

3.4 Establishment of Baseline for valued environmental components

3.4.1 Air Environment

Baseline ambient air quality assessment gives the status in the vicinity of site and is an indispensable part of environmental impact assessment studies. Significant changes, in predominant winds and weather conditions are observed in winter, summer and post-monsoon seasons apart from the local topographic influences. The baseline status of air environment in the study area is assessed through a systematic air quality surveillance programme

3.4.2 Meteorological Conditions

The regional air quality is influenced by the meteorology of that region. The principal weather parameters that influence the concentration of the air pollutants in the surroundings are wind speed, wind direction and temperature. The meteorological data is useful for proper interpretation of the baseline data.

3.4.3 Meteorological Data Collection

Available secondary data pertaining to the meteorological parameters was obtained from the IMD Climatological tables. In addition, baseline meteorological data was generated during the study period **March 2024 to May 2024**.The methodology adopted for monitoring surface observations is as per the standard norms laid down by Bureau of Indian Standards (BIS) i.e. IS:8829 and India Meteorological Department (IMD).

3.4.4 General Meteorological Scenario based on IMD Data

The nearest India Meteorological Department (IMD) station located to project site is Dharmapuri. The Climatological data of Dharmapuri (12° 08’ N and 78°02’ E), published by the IMD, based on daily observations at 08:30 and 17:30 hour IST for a 30 year period (1991-2020), is presented in the following sections on the meteorological conditions of the region. The monthly variations of the relevant meteorological parameters are reproduced in **Table 3-4.**

Table 3-4 Climatological Summary– Dharmapuri (Tiruttani) (1991-2020)

Month	Temp (°C)		Rainfall		Relative Humidity (%)		Vapour Pressure hPa		Mean Wind Speed (Kmph)	Predominant Wind Directions (From)*	
	Daily Max.	Daily Min.	Total (mm)	No. of days	08:30	17:30	08:30	17:30		08:30	17:30
Jan	29.7	17.7	2.6	0.3	81	50	20.1	18.1	5.1	NE	E
Feb	32.7	18.9	2.3	0.2	75	41	20.9	17.9	5.0	NE	E
Mar	35.8	20.8	16.4	0.9	68	33	22.3	17.3	4.6	NE	E
Apr	36.8	23.8	52.9	2.8	68	38	25.5	20.0	4.3	SW	E
May	36.5	24.5	120.3	6.6	66	48	25.9	23.5	5.3	SW	SW
Jun	34.2	23.9	71.8	3.9	67	52	24.7	23.3	6.7	SW	SW
Jul	33.2	23.4	73.9	4.1	69	56	24.2	23.5	6.8	SW	SW
Aug	32.5	23.1	113.9	6.2	73	58	24.5	24.0	6.2	SW	W
Sep	32.3	22.6	143.5	7.0	76	61	25.0	24.9	4.7	SW	SW
Oct	30.7	21.9	193.2	9.7	82	71	25.6	25.6	3.7	NE	E
Nov	29.0	20.4	110.9	6.5	83	69	23.7	23.4	4.3	NE	E
Dec	27.9	18.3	40.3	2.7	82	62	20.8	20.0	4.8	NE	E
Max.	**36.8**	**24.5**	**2.3**	**9.7**	**83**	**71**	**25.9**	**25.6**	**6.8**	**Annual Predominant wind direction is North East**	
Min.	**27.9**	**17.7**	**193.2**	**0.2**	**66**	**33**	**20.1**	**17.3**	**3.7**		
Annual Avg/Total	**32.7**	**21.6**	**942.0**	**50.8**	**74**	**53**	**23.6**	**21.8**	**5.1**		

The observations drawn are as follows

- Highest Daily maximum temperature is 36.8^{o}C and the Lowest daily minimum temperature is 17.7^{o}C were recorded in the months of January and April respectively
- Maximum and minimum relative humidity of 83% and 33% were recorded in the months of November and March respectively.
- Maximum and minimum rainfall of 462.6mm and 49mm was recorded in the months of October and January respectively.
- Maximum and minimum Mean wind speed is 6.8 Km/hr and 3.7 Km/hr was recorded in the months of August and October respectively. Annual Wind predominant direction is North East.

3.4.5 Meteorological data during Study Period

The meteorological scenario in and around the project site is an essential requirement during study period for proper interpretation of baseline air quality status. Meteorological data was collected during the study period **March 2024 to May 2024** and is presented in **Table 3-5.** The wind rose for the study period is given as **Figure 3-14.**

Table 3-5 Meteorology Data for the Study Period

(March 2024 to May 2024)

S. No	Parameter	Observation
1	Temperature	Max. Temperature: 40°C Min. Temperature: 21°C Avg. Temperature: 33.10°C
2	Average Relative Humidity	45.55%
3	Average Wind Speed	2.75 m/s
4	Average Solar Radiation	234.08W/m^2
5	Predominant Wind Direction	SE

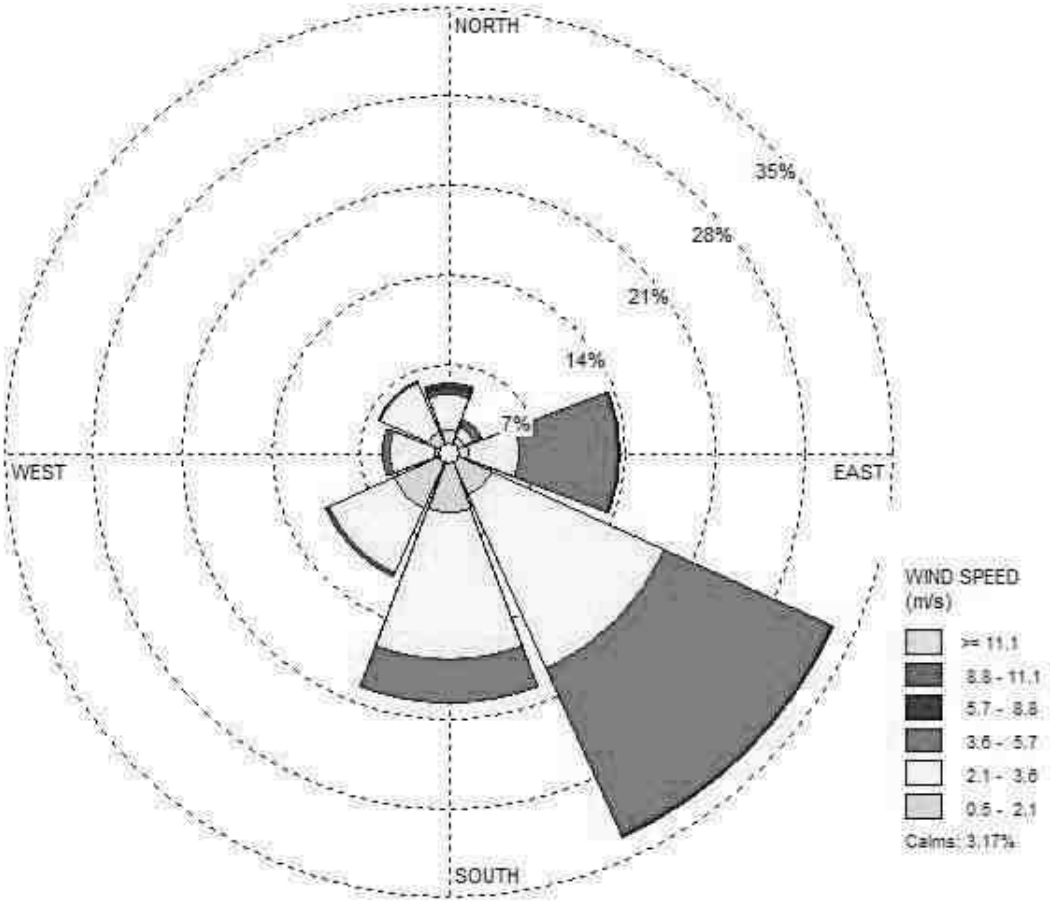


Figure 3-14 Wind Rose during March 2024 to May 2024

3.4.6 Atmospheric Inversion

Atmospheric inversion level at the project site was monitored; the results observed at the site during the study period are as follows

- Average atmospheric temperature: 33.10°C
- Average Relative humidity:45.55%
- Average Wind speed: 2.75 m/s

The daily inversion level calculated based on the average temperature and average wind speed at the project site and the maximum inversion height is derived by the graph plotted based on the average temperature and average wind speed. The daily inversion level at the project site varies from 50 to 3626 m during 6 AM to 4 PM, the maximum recorded at 2698 m during April 2024. This is shown in the following **Figure 3-15.**

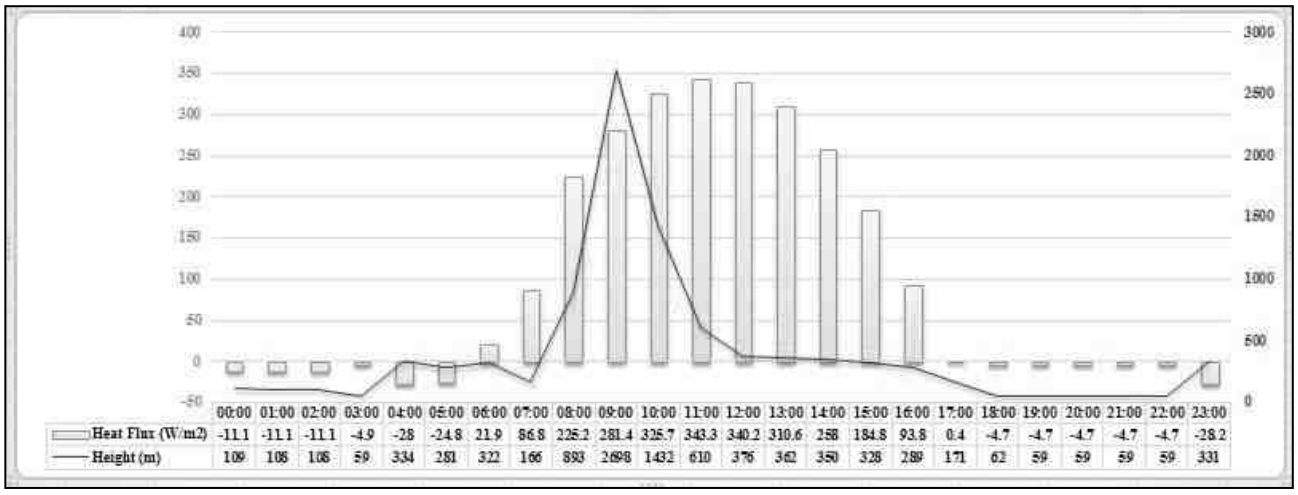


Figure 3-15 Atmospheric inversion level at the project site

3.5 Ambient Air Quality

The selection criteria for monitoring locations are based on the following:

- Topography/Terrain
- Meteorological conditions
- Residential and sensitive areas within the study area
- Representatives of regional background air quality/pollution levels and
- Representation of likely impacted areas

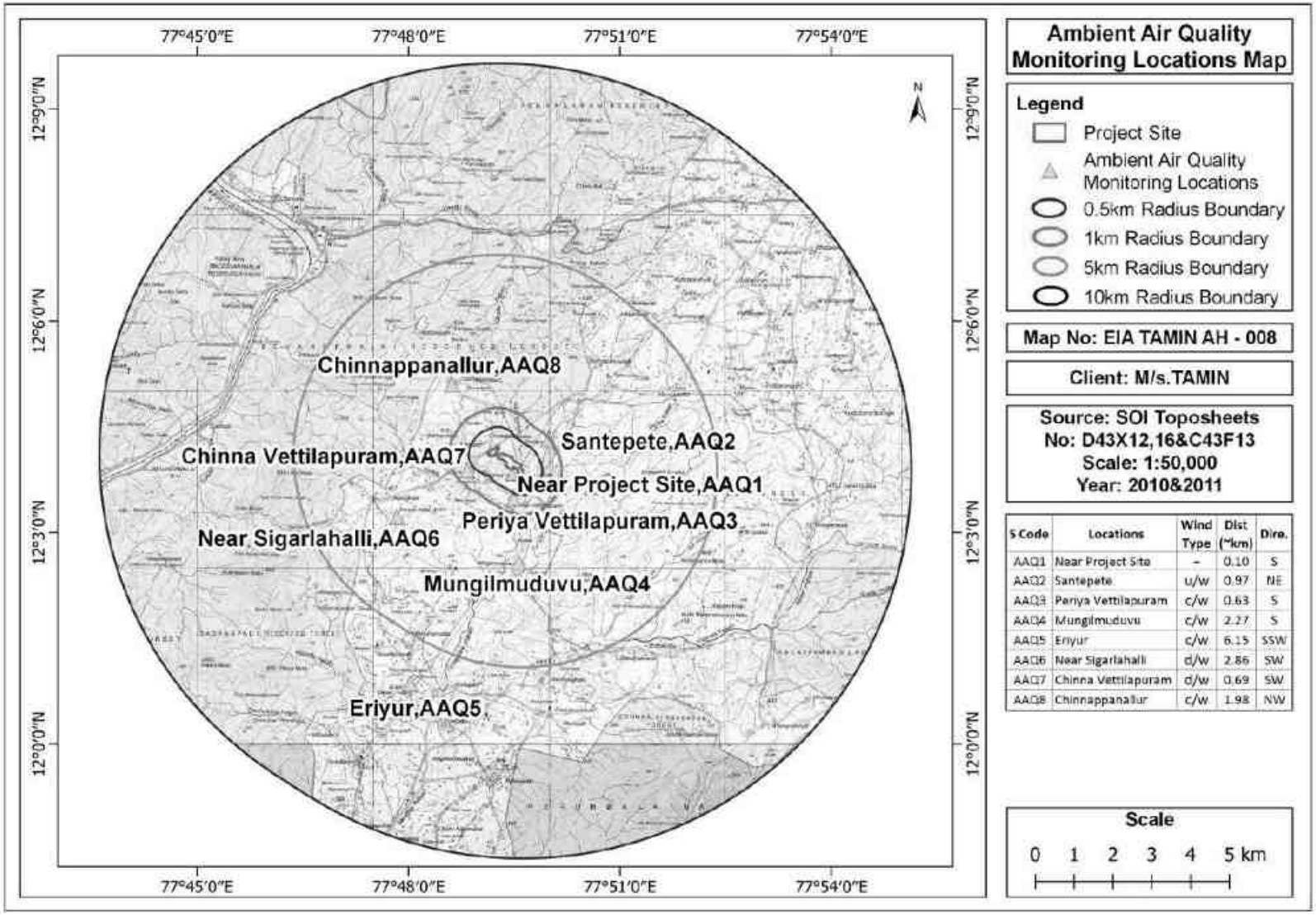
3.5.1 Ambient Air Quality Monitoring Stations

To evaluate the baseline air quality of the study area, Eight (08) monitoring locations have been identified as per annual wind predominance of Thiruvallur (Tirutanni) from IMD data (1991-2020). The wind

predominance during study period **(March 2024 to May 2024)** is from South West.AAQ monitoring locations are selected based on Annual wind predominance, map showing the AAQ monitoring locations is given in **Figure 3-16** and the details of the locations are given in below table.

Table 3-6 Details of Ambient Air Quality Monitoring Locations

Station Code	Location	Type of Wind	Distance (~km) from Project boundary	Azimuth Directions
A1	Near Project Site	-	0.10	S
A2	Santepete	U/W	0.97	NE
A3	Periya Vettilapuram	C/W	0.63	S
A4	Mungilmuduvu	C/W	2.27	S
A5	Eriyur	C/W	6.15	SSW
A6	Near Sigarlahalli	D/W	2.86	SW
A7	Chinna Vettilapuram	D/W	0.69	SW
A8	Chinnappanallur	C/W	1.98	NW



S Code	Locations	Wind Type	Dist (*km)	Dire.
AAQ1	Near Project Site	-	0.10	S
AAQ2	Santepete	u/w	0.97	NE
AAQ3	Periya Vettilapuram	c/w	0.63	S
AAQ4	Mungilmuduvu	c/w	2.27	S
AAQ5	Eriyur	c/w	6.15	SSW
AAQ6	Near Sigarlahalli	d/w	2.86	SW
AAQ7	Chinna Vettilapuram	d/w	0.69	SW
AAQ8	Chinnappanallur	c/w	1.98	NW

Figure 3-16 Map showing the Ambient Air Quality monitoring locations

3.5.2 Ambient Air Quality Monitoring Techniques and Frequency

Ambient air quality was monitored twice in a week for One (01) season (shall cover 12 weeks), i.e. during **March 2024 to May 2024)**. PM_{10}, $PM_{2.5}$, SO_2, NO_x, CO, Pb, O_3, NH_3, C_6H_6, $C_{20}H_{12}$, As, Ni, TVOC,Methane Hydrocarbon and Non-Methane Hydrocarbon were monitored. Sampling was carried out as per Central Pollution Control Board (CPCB) monitoring guidelines at each location. Analytical methods used for analysis of parameters are given in **Table 3-7.**

Table 3-7 Analytical Methods for Analysis of Ambient Air Quality Parameters (NAAQ)

S. No	Parameters	Analytical method	NAAQ standards: 2009		Sampling Time
1	Sulphur Dioxide (SO_2), $\mu g/m^3$	IS 11255: (Part 2) / USEPA Method 6	50 (Annual)	80 (24 Hours)	24 Hours
2	Nitrogen Dioxide (NO_2), $\mu g/m^3$	IS: 5182 (Part - 6): 2006 / CPCB guidelines Volume1	40 (Annual)	80 (24 Hours)	24 Hours
3	Particulate Matter ($PM_{2.5}$), $\mu g/m^3$	In house method (Gravimetric method) based on CPCB guidelines Volume1	40 (Annual)	60 (24 hours)	24 Hours
4	Particulate Matter (PM_{10}), $\mu g/m^3$	IS:5182 (Part– 23): 2006 CPCB guidelines Volume1	60 (Annual)	100 (24 hours)	24 Hours
5	CO, mg/m^3	IS:5182(Part–10):1999 (Reaff:2006) CPCB guidelines Volume1	2 (8 hours)	4 (1hour)	8 Hours
6	Pb, $\mu g/m^3$	IS:5182(Part–22):2004 (Reaff:2006) CPCB guidelines Volume1	0.5(Annual)	1(24 hours)	24 Hours
7	O_3, $\mu g/m^3$	In house method (Spectrophotometric method) based on CPCB guidelines Volume1	100(8hours)	180 (1hour)	8 Hours
8	NH_3, $\mu g/m^3$	In house method (Spectrophotometric method) based on CPCB guidelines Volume1	100(Annual)	400(24 hours)	8 Hours
9	Benzene, $\mu g/m^3$	GC FID/ GC MS based on IS 5182 (Part:12)/ CPCB guidelines Volume1	5 (Annual)	5 (Annual)	24 Hours
10	Benzo (a) pyrene, ng/m^3	In House Validated method By HPCL , UV & GC MS Based on IS:5182(Part–12) CPCB guidelines Volume1	1 (Annual)	1 (Annual)	24 Hours
11	Arsenic, ng/m^3	In house method (AAS method) Based on CPCB guidelines Volume 1	6 (Annual)	6 (Annual)	24 Hours
12	Nickel, ng/m^3	In house method (AAS method) Based on CPCB guidelines Volume 1	20(Annual)	20 (Annual)	24 Hours

3.5.2.1 Results and Discussions

The variations of the pollutants Particulate matter <10 micron size (PM_{10}),Particulate matter <2.5 micron size ($PM_{2.5}$), Sulphur Dioxide (SO_2), Nitrogen Dioxide (NO_2),Carbon Monoxide (CO), Lead (Pb),Ozone (O_3),Benzene (C_6H_6), Benzo (a) pyrene ($C_{20}H_{12}$), Arsenic (As), Nickel (Ni),Ammonia (NH_3) are compared with National Ambient Air Quality Standards (NAAQS), MoEF&CC Notification, November 2009. Ambient Air Quality Monitoring Data (**March 2024 to May 2024)** for the study area is given in **Table 3-8** and trends of measured ambient concentration in the study area were graphically represented in **Figure 3-17.**

Table 3-8 Summary of the average baseline concentrations of pollutants

Parameters	Conc.	NAAQ Standards	Locations							
			Near Project Site	Sante pete	Periya vathalapuram	Moongil maduvu	Eriyur	Near Sigaral halli	Chinna vathalapuram	Chinnappa nallur
			A1	A2	A3	A4	A5	A6	A7	A8
PM_{10} Conc. (µg/m³)	Min.	100 (24 Hours)	36.00	31.58	33.97	33.27	31.24	40.24	37.00	29.47
	Max.		51.30	45.01	48.41	47.42	44.52	57.35	52.73	42.00
	Avg.		**43.17**	**37.87**	**40.74**	**39.91**	**37.46**	**48.26**	**44.37**	**35.34**
	98th 'tile		51.00	44.74	48.13	47.15	44.26	57.01	52.42	41.75
$PM_{2.5}$ Conc. (µg/m³)	Min.	60 (24 Hours)	20.88	18.61	20.14	20.00	18.21	22.98	20.98	17.59
	Max.		29.76	26.53	28.70	28.50	25.95	32.75	29.90	25.06
	Avg.		**25.05**	**22.32**	**24.16**	**23.99**	**21.84**	**27.56**	**25.17**	**21.09**
	98th 'tile		29.59	26.37	28.54	28.34	25.80	32.56	29.73	24.92
SO_2 Conc. (µg/m³)	Min.	80 (24 Hours)	7.87	7.41	7.63	7.30	7.09	8.86	8.33	5.99
	Max.		11.22	10.56	10.88	10.40	10.10	12.63	11.88	8.53
	Avg.		**9.45**	**8.89**	**9.16**	**8.76**	**8.51**	**10.63**	**10.00**	**7.18**
	98th 'tile		11.16	10.49	10.81	10.34	10.04	12.55	11.81	8.48
NO_2 Conc. (µg/m³)	Min.	80 (24 Hours)	15.97	14.14	15.21	14.79	13.84	17.64	16.64	11.77
	Max.		22.75	20.16	21.67	21.07	19.73	25.13	23.72	16.78
	Avg.,		**19.15**	**16.97**	**18.24**	**17.74**	**16.61**	**21.15**	**19.96**	**14.12**
	98th 'tile		22.62	20.04	21.54	20.95	19.62	24.99	23.58	16.68
Lead (Pb) (µg/m³)	Avg.	1 (24 hour)	BLQ (LOQ 0.05)	BLQ (LOQ 0.05)	BLQ (LOQ 0.05)	BLQ (LOQ 0.05)	BLQ (LOQ 0.05)	BLQ (LOQ 0.05)	BLQ (LOQ 0.05)	BLQ (LOQ 0.05)
Carbon monoxide (CO) (mg/m³)	Avg.	4 (1hour)	0.4	0.31	0.39	0.34	BLQ (LOQ0.05)	0.51	0.47	BLQ (LOQ0.05)

Parameters	Conc.	NAAQ Standards	Locations							
			Near Project Site	Sante pete	Periya vathalapuram	Moongil maduvu	Eriyur	Near Sigaral halli	Chinna vathalapuram	Chinnappa nallur
			A1	A2	A3	A4	A5	A6	A7	A8
Ozone O_3 ($\mu g/m^3$)	**Avg.**	**180 (1hour)**	BLQ (LOQ10)	BLQ (LOQ10)	BLQ(LOQ 10)	BLQ(LOQ10)	BLQ (LOQ10)	BLQ (LOQ10)	BLQ (LOQ10)	BLQ(LOQ 10)
Benzene (C_6H_6) ($\mu g/m^3$)	**Avg.**	**5(Annual)**	BLQ (LOQ 1)	BLQ (LOQ 1)	BLQ (LOQ 1)	BLQ (LOQ 1)	BLQ (LOQ 1)	BLQ (LOQ 1)	BLQ (LOQ 1)	BLQ (LOQ 1)
Benzo (a) Pyrene ($C_{20}H_{12}$ (a)) , (ng/m^3)	**Avg.**	**1 (Annual)**	BLQ (LOQ 1)	BLQ (LOQ 1)	BLQ (LOQ 1)	BLQ (LOQ 1)	BLQ (LOQ 1)	BLQ (LOQ 1)	BLQ (LOQ 1)	BLQ (LOQ 1)
Arsenic (As) (ng/ m^3)	**Avg.**	**6 (Annual)**	BLQ (LOQ 2)	BLQ (LOQ 2)	BLQ (LOQ 2)	BLQ (LOQ 2)	BLQ (LOQ 2)	BLQ (LOQ 2)	BLQ (LOQ 2)	BLQ (LOQ 2)
Nickel as Ni (ng/m^3)	**Avg.**	**20 (Annual)**	BLQ (LOQ 10)	BLQ (LOQ 10)	BLQ (LOQ 10)	BLQ (LOQ 10)	BLQ (LOQ 10)	BLQ (LOQ 10)	BLQ (LOQ 10)	BLQ (LOQ 10)
Ammonia (NH_3) ($\mu g/m^3$)	**Avg.**	**400 (24 hour)**	BLQ (LOQ5)	BLQ (LOQ5)	BLQ (LOQ5)	BLQ (LOQ5)	BLQ (LOQ5)	BLQ (LOQ5)	BLQ (LOQ5)	BLQ (LOQ5)
Free Silica (mg/m^3)	**Avg.**	**0.05**	BLQ(LOQ0.01)	BLQ (LOQ0.01)	BLQ (LOQ0.01)	BLQ (LOQ0.01)	BLQ (LOQ0.01)	BLQ(LOQ0.01)	BLQ(LOQ0.01)	BLQ (LOQ0.01)

Note: *BDL (Below detection limit), DL (Detection limit), BLQ (Below Limit Of Quantification), LOQ (Limit of Quantification)*

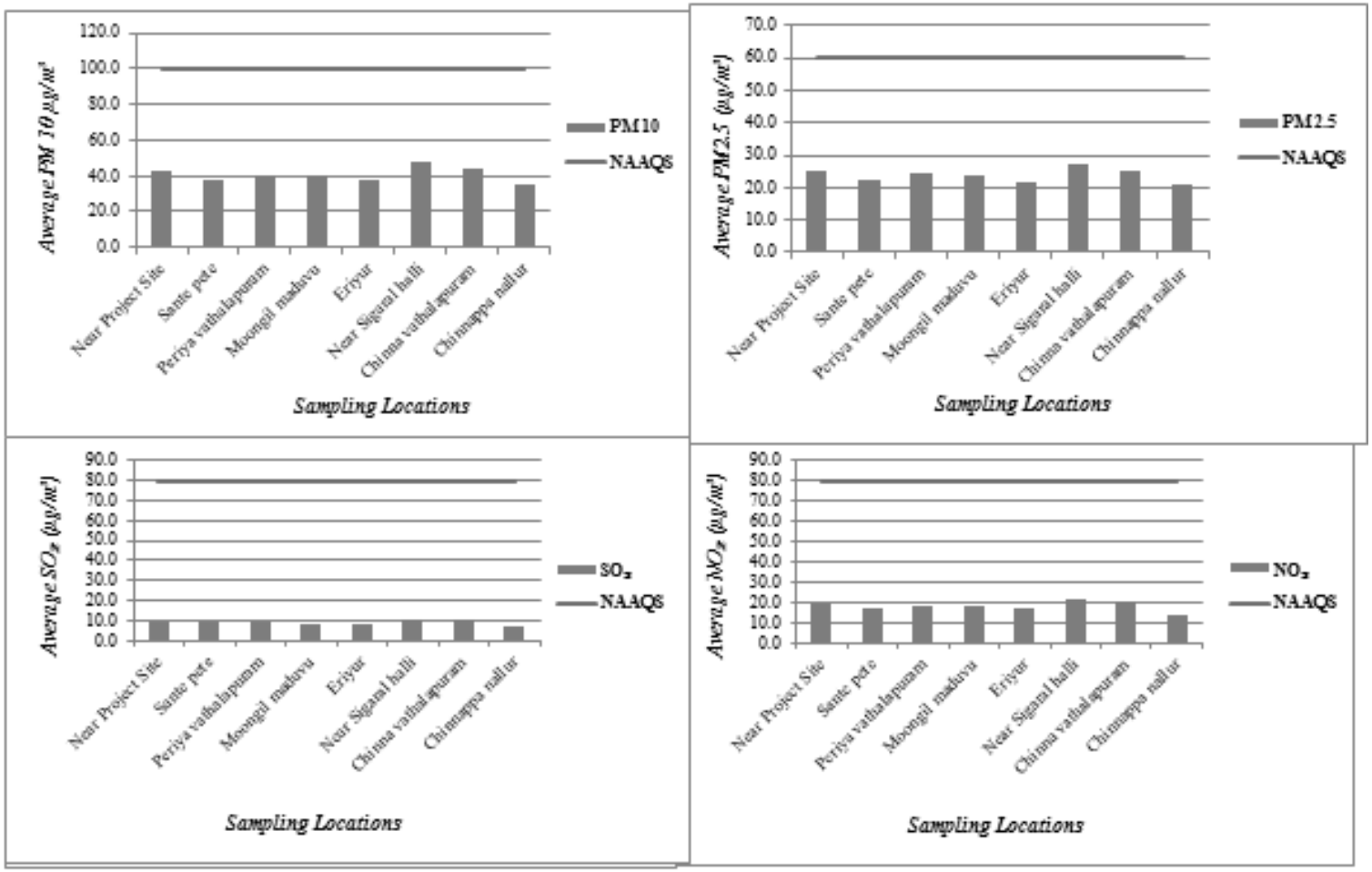


Figure 3-17 Trends of Measured Ambient Concentrations in the Study Area

3.5.2.2 Observations

The ambient air quality has been monitored at 8 locations as per NAAQS, 2009 within the study area. The results obtained are summarised as below:

- The average baseline levels of PM_{10} vary from **35.34 µg/m³** to **48.26 µg/m³.** These locations (A1, A8) are nearby crushing units.
- The average baseline levels of $PM_{2.5}$ vary from **21.09 to 27.56** µg/m³.
- The average baseline levels of SO_2 vary from **7.18 to 10.63** µg/m³.
- The average baseline levels of NO_2vary from **14.12 to 21.15** µg/m³

3.6 Noise Environment

The prevailing ambient noise level at a particular location is nothing but the resultant (total) of all kinds of noise sources existing at various distances around that location. The ambient noise level at a location varies continuously depending on the type of surrounding activities.

Ambient noise levels have been established by monitoring noise levels at Eight (08) locations in and around 10Km distance from project area during the study period using precision noise level meter. The noise monitoring locations in the study area were selected after giving due consideration to the various land use categories. The land use categories include commercial, residential, rural and sensitive areas. Noise levels were recorded on an hourly basis for one complete day at each location using pre- calibrated noise levels. Map showing noise monitoring locations is **Figure 3-18**

3.6.1 Results and Discussions

Based on the recorded hourly noise levels at each monitoring location, the day equivalent (Ld) and night equivalent (Ln) were calculated;

Ld: Average noise levels between 6:00 hours to 22.00 hours

The day and night equivalent noise levels given in **Table 3-9**

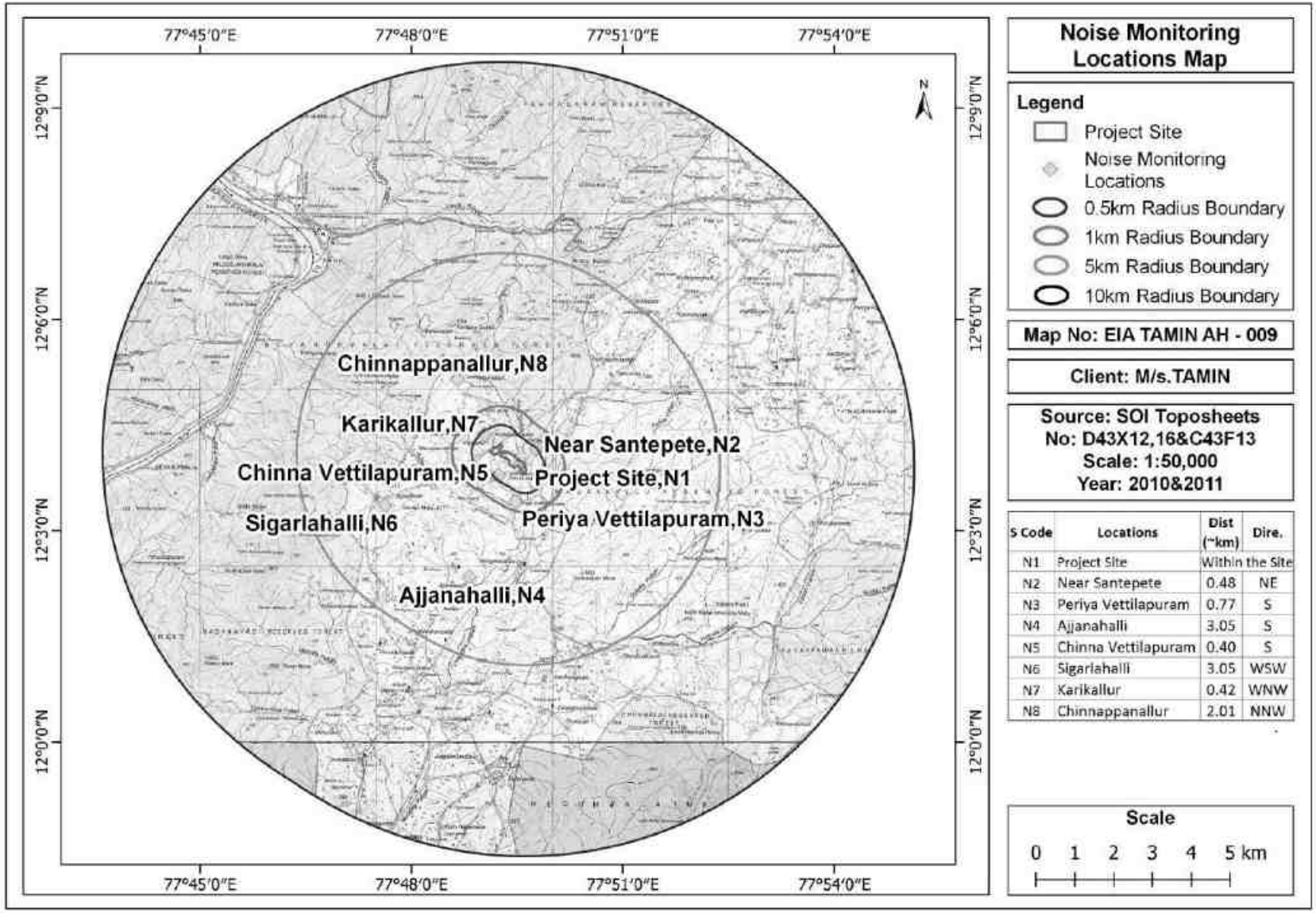
Table 3-9 Day and Night Equivalent Noise Levels

S. No	Location	Location Code	Distance (~km) from Project boundary	Azimuth Direction	Noise level in dB(A) Leq		CPCB Standard		Environmental Setting
					Day	Night	Lday (Ld)	LNight (Ln)	
1	Project Site	N1	Within site		68.0	65.45	75	70	Industrial Area
2	Near Santepete	N2	0.48	NE	42.9	38.1	55	45	Residential Area
3	Periya Vettilapuram	N3	0.77	S	45.2	41.3	55	45	Residential Area
4	Ajjanahalli	N4	3.05	S	43.9	39.6	55	45	Residential Area
5	Chinna Vettilapuram	N5	0.40	S	47.1	41.4	55	45	Residential Area
6	Sigarlalhalli	N6	3.05	WSW	46.4	40.7	55	45	Residential Area
7	Karikallur	N7	0.42	WNW	42.7	38.3	55	45	Residential Area
8	Chinnappanallur	N8	2.01	NNW	40.2	37.1	55	45	Residential Area

3.6.1.1 Observations

It is observed that the day equivalent and night equivalent noise levels at all locations are within prescribed CPCB standards

- In Industrial area (Project site), day time noise level was about 68 dB (A) and 65.45 dB(A) during night time, which is within prescribed limit by CPCB for Industrial area (75 dB(A) Day time & 70 dB(A)Night time).
- In Residential area day time noise levels varied from 40.2 dB (A) to 47.1 dB (A) and night time noise levels varied from37.1 dB(A) to 41.4 dB(A) across the sampling stations. The field observations during the study period indicate that the ambient noise levels in Residential area are within the limit prescribed by CPCB for Residential area (55 dB (A) Day time & 45 dB(A) Night time).



S Code	Locations	Dist (~km)	Dire.
N1	Project Site	Within the Site	
N2	Near Santepete	0.48	NE
N3	Periya Vettilapuram	0.77	S
N4	Ajjanahalli	3.05	S
N5	Chinna Vettilapuram	0.40	S
N6	Sigarlahalli	3.05	WSW
N7	Karikallur	0.42	WNW
N8	Chinnappanallur	2.01	NNW

Figure 3-18 Map showing the noise monitoring locations

3.7 Water Environment

The district is part of the composite east flowing river basin "Between Cauvery and Ponnaiyar as per the Irrigation Atlas of India.

3.7.1 Surface Water Resources

Dharmapuri district is drained by Cauvery and Ponnaiyar rivers and their tributaries. Cauvery river flows along the south western boundary of the district. It flows in an easterly direction up to Bellgundla and then takes a more or less southerly course till it reaches the Stanley Reservoir. The Doddahalla and the Chinnar are important tributaries of Cauvery river in the district.

Ponnaiyar is the major river draining the district and is ephemeral in nature. It originates from Nandhi hills in Karnataka, enters Tamil Nadu west of Bagalur and flows almost in a south easterly direction till it reaches Daddampatti from where it takes an easterly course. Pambar, Vaniyar and Kallar are t he import an tributaries of Ponnaiyar draining the eastern part of the district whereas the Chinnar and Markandeya Nadhi drain the northern part of the district.

Source:http://cgwb.gov.in/sites/default/files/2022-10/dharmapuri.pdf

(**Ref**: Government of India Ministry of Water Resources Central Ground Water Board South Eastern Coastal Region Chennai, "District Ground Water Brochure Dharmapuri District")

3.7.2 Surface Water Quality Assessment

Water quality monitoring and assessment can be used to determine ambient water quality, the extent and causes of a water quality problem, or to measure the effectiveness of best management practices being implemented in water system. Monitoring helps to determine the trends in the quality of the aquatic environment and the impact due to the release of contaminants, other anthropogenic activities, and/or by waste treatment operations (impact monitoring).To establish the baseline status of water environment, the representative sampling locations for surface water within a radial distance of 10Km from project site have been selected as per CPCB guidelines of Water Quality Monitoring through an adequate survey of the project area. Test methods used for the analysis of water quality parameters is given **Table 3-10.** Water sampling and map of sampling location are given in **Table 3-11** and **Figure 3-19.** Physicochemical Parameters of Surface water samples from the study area given in **Table 3.12.**

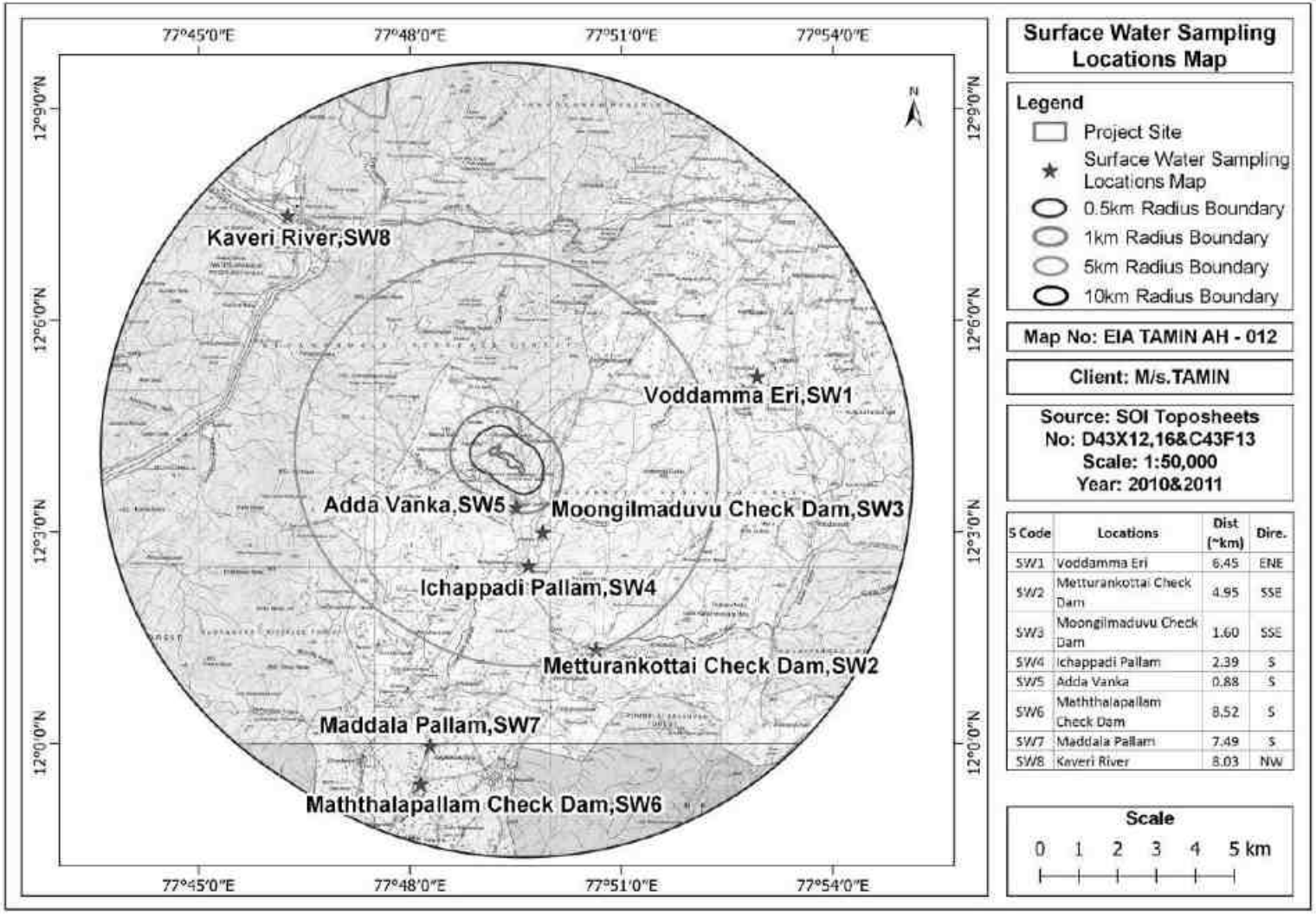
Table 3-10 Test methods used for the analysis of water quality parameters

Sl. No	Parameter Measured	Test Method
1	Ammonical Nitrogen as NH3-N	IS 3025 Part 34 Sec 2: 2021
2	Bi carbonate	IS 3025 Part 51: 2001
3	Biological Oxygen Demand (BOD)@ 27°C For 3 days	IS 3025 Part 44: 1993
4	Boron as B	IS 3025 Part 57: 2021 (Curcumin Method)
5	Calcium as Ca	IS 3025 Part 40: 1991(EDTA Titrimetric Method)

Sl. No	Parameter Measured	Test Method
6	Chemical Oxygen Demand (COD)	IS 3025 Part 58: 2006
7	Chloride as Cl	IS 3025 Part 32: 1988 (Argentometric Method)
8	Colour	IS 3025 Part 4: 2021
9	Dissolved oxygen	IS 3025 Part 38: 1989
10	Electrical Conductivity at 25°C	IS:3025 Part 14: 2013
11	Fluoride as F	APHA 23rd edition Method 4500 F-B,D: 2017
12	Iron as Fe	IS 3025 Part 53: 2003
13	Nitrate as NO3	APHA 23rd edition Method 4500 NO3B: 2017
14	Nitrite as NO2	IS 3025 Part 34 Sec 3 : 2021
15	Odour	IS 3025 Part 5: 2018
16	Oil and Grease	IS 3025 Part 39: 2021
17	pH at 25°C	IS 3025 Part 11: 2022 (Electrometric Method)
18	Total dissolved solids	IS 3025 Part 16: 1984
19	Carbonate	IS 3025 Part 51: 2001
20	Cyanide as CN	IS 3025 Part 27 sec 1: 2021
21	Magnesium as Mg	IS 3025 Part 46: 1994 (Volumetric Method using EDTA)
22	Potassium as K	IS 3025 Part 45: 1993
23	Sodium as Na	IS 3025 Part 45: 1983
24	Sulphate as SO4	IS 3025 Part 24 Sec 1: 2022
25	Temperature(°C)	IS 3025 Part 9: 1984
26	Total Hardness as CaCO3	IS 3025 Part 21: 2009
27	Total Phosphorous as P	IS 3025 Part 31 Sec 1: 2022
28	Turbidity	IS 3025 Part 10: 1984
29	Arsenic	USEPA 200.8 : 1994
30	Cadmium	USEPA 200.8 : 1994
31	Chromium	USEPA 200.8 : 1994
32	Copper	USEPA 200.8 : 1994
33	Lead	USEPA 200.8 : 1994
34	Mercury	USEPA 200.8 : 1994
35	Nickel	USEPA 200.8 : 1994
36	Zinc	USEPA 200.8 : 1994
37	Faecal Coliform	IS 1622 : 1981
38	Total Coliform	IS 1622 : 1981

Table 3-11 Details of Surface water sampling locations

S.No	Location	Location Code	Distance in Km	Direction
1	Voddamma Eri	SW1	6.45	ENE
2	Metturankottai Check Dam	SW2	4.95	SSE
3	Moongilmaduvu Check Dam	SW3	1.60	SSE
4	Ichappadi Pallam	SW4	2.39	S
5	Adda Vanka	SW5	0.88	S
6	Maththalapallam Check Dam	SW6	8.52	S
7	Maddala Pallam	SW7	7.49	S
8	Kaveri River	SW8	8.03	NW



S Code	Locations	Dist (~km)	Dire.
SW1	Voddamma Eri	6.45	ENE
SW2	Metturankottai Check Dam	4.95	SSE
SW3	Moongilmaduvu Check Dam	1.60	SSE
SW4	Ichappadi Pallam	2.39	S
SW5	Adda Vanka	0.88	S
SW6	Maththalapallam Check Dam	8.52	S
SW7	Maddala Pallam	7.49	S
SW8	Kaveri River	8.03	NW

Figure 3-19 Map showing the surface water monitoring locations

Table 3-12 Physicochemical Parameters of Surface water samples from the study area

SI NO	Parameter	Unit	Surface water standards (IS 2296 Class-A)	Vaddamma Eri	Mettukarankottai Check dam	Moongilmaduvu Checkdam	Ichappadi Pallam	Adda Vanka	Mathalappallam Check dam	Maddalapallam	Kaveri River
				SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8
1	pH (at 25°C)	--	6.5-8.5	7.97	7.71	7.79	7.88	7.46	7.62	8.26	7.3
2	Turbidity	NTU	1	22.9	21.7	24.7	23.8	19.9	23.8	25.1	41.7
3	Electrical Conductivity	µS/cm	NA	1611	1608	1270	1605	1480	1686	1413	911
4	Total Dissolved Solids	mg/l	500	854	852	673	851	784	894	749	483
5	Total Suspended Solids	mg/l	-	28.0	57.0	54.0	35.0	31.0	49.0	43.0	92.0
6	Total Alkalinity as $CaCO_3$	mg/l	-	130	125	110	110	102	210	80	270
7	Total Hardness as $CaCO_3$	mg/l	300	407.6	564.6	417.9	461.4	381.6	543.1	414.0	204
8	Sodium as Na	mg/l	-	194	142	130	191	198	160	194	85
9	Potassium as K	mg/l	-	14	13	12	18	16	12	20	7
10	Calcium as Ca	mg/l	0.001	BLQ(LOQ 0.005)	BLQ(LOQ 0.1)	BLQ(LOQ 0.005)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)
11	Magnesium as Mg	mg/l	24.28	65.05	77.76	48.04	72.67	61.16	70.47	66.17	24.30
12	Chloride as Cl	mg/l	250	336.32	386.92	262.08	349.31	308.87	341.98	329.21	113.82
13	Sulphate as SO_4	mg/l	400	73..05	24.03	31.02	57.74	62.79	26.1	20.05	17.32
14	Nitrate as NO_3	mg/l	20	9.21	7.35	7.77	8.78	8.19	7.58	10.82	5.47
15	Fluorides as F	mg/l	1.5	.0.48	0.39	0.41	0.41	0.45	0.44	0.47	0.37
16	Cyanide	mg/l	0.05	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)
17	Arsenic	mg/l	0.05	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)

SI NO	Parameter	Unit	Surface water standards (IS 2296 Class-A)	Vaddamma Eri	Mettukarankottai Check dam	Moongilmaduvu Checkdam	Ichappadi Pallam	Adda Vanka	Mathalappallam Check dam	Maddalapallam	Kaveri River
				SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8
18	Boron as B	mg/l	-	BLQ(LOQ 0.005)	BLQ(LOQ 0.1)	BLQ(LOQ 0.005)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)
19	Cadmium as Cd	mg/l	0.01	BLQ(LOQ 0.001)	BLQ(LOQ 0.001)	BLQ(LOQ 0.001)	BLQ(LOQ 0.001)	BLQ(LOQ 0.001)	BLQ(LOQ 0.001)	BLQ(LOQ 0.001)	BLQ(LOQ 0.001)
20	Chromium, Total	mg/l	0.05	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)
21	Copper as Cu	mg/l	1.5	BLQ(LOQ 0.005)	BLQ(LOQ 0.01)	BLQ(LOQ 0.005)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)
22	Lead as Pb	mg/l	0.1	BLQ(LOQ 0.05)	BLQ(LOQ 0.005)	BLQ(LOQ 0.05)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)
23	Manganese as Mn	mg/l	0.5	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)
24	Mercury	mg/l	0.001	BLQ(LOQ 0.0005)	BLQ(LOQ 0.0005)	BLQ(LOQ 0.0005)	BLQ(LOQ 0.0005)	BLQ(LOQ 0.0005)	BLQ(LOQ 0.0005)	BLQ(LOQ 0.0005)	BLQ(LOQ 0.0005)
25	Nickel as Ni	mg/l	-	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)
26	Selenium as Se	mg/l	0.01	BLQ(LOQ 0.1)	BLQ(LOQ 0.005)	BLQ(LOQ 0.1)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)
27	Zinc as Zn	mg/l	15	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)
28	Dissolved Oxygen	mg/l	6	5.9	6.1	6.3	6.2	6.4	6.1	5.8	6.4
29	Chemical Oxygen Demand as O_2	mg/l	-	32	24	28	20	24	20	28	16
30	BOD, 3 days @ 27°C as O_2		2	4.3	2.3	4.1	2.6	2.2	3.4	2.1	1.4

Note: BLQ – Below Limit of Quantification; LOQ – Limit Of Quantification

3.7.2.1 Results and Discussions

Surface water sample results are discussed below:

- Water sampling results are compared with Surface water standards IS 2296:1992.
- pH in the collected surface water samples varies between 7.3 to 8.26 which is within the limit of IS 2296:1992.
- The Total Dissolved Solids (TDS) value of collected surface water sample ranges from 483 mg/l to 894 mg/l.
- The Total hardness value of the collected surface water sample ranges between 204.0 mg/l to 564.6 mg/l.
- BOD value of surface water varies from 1.4 mg/l to 4.3 mg/l respectively.
- COD value of surface water varies from 16 to 32 mg/l.

Surface water standards (IS 2296:1992) given in **Table 3-13.**

Table 3-13 Surface water Standards (IS 2296:1992)

S.No	Parameters	Unit	A	B	C	D	E
1	Turbidity	NTU	---	---	---	---	---
2	pH	--	8.5	8.5	8.5	8.5	8.5
3	Conductivity	µS/cm	---	---	---	1000	2250
4	Total Dissolved Solids	mg/l	500	---	1500	---	2100
5	Alkalinity as $CaCO_3$	mg/l	---	---	---	---	---
6	Total Hardness as $CaCo_3$	mg/l	300	---	---	---	---
7	Calcium as Ca	mg/l	80.10	---	---	---	---
8	Magnesium as Mg.	mg/l	24.28	---	---	---	---
9	Sodium Na	mg/l	---	---	---	---	---
10	Potassium	mg/l	---	---	---	---	---
11	Chloride as Cl	mg/l	250	---	600	---	600
12	Sulphate as SO4	mg/l	400	---	400	---	1000
13	Phosphate	mg/l	---	---	---	---	---
14	Nitrate as NO_3	mg/l	20	---	50	---	---
15	Fluorides as F	mg/l	1.5	1.5	1.5	---	---
16	Cyanide	mg/l	0.05	0.05	0.05	---	---
17	Arsenic	mg/l	0.05	0.2	0.2	---	---
18	Cadmium	mg/l	0.01	---	0.01	---	---
19	Chromium, Total	mg/l	0.05	0.05	0.05	---	---
20	Copper	mg/l	1.5	---	1.5	---	---
21	Iron	mg/l	0.3	---	50	---	---
22	Lead	mg/l	0.1	---	0.1	---	---
23	Zinc	mg/l	15	---	15	---	---
24	Manganese	mg/l	0.5	---	---	---	---

S.No	Parameters	Unit	A	B	C	D	E
25	Selenium	mg/l	0.01	---	0.05	---	---
26	Mercury	mg/l	0.001	---	---	---	---
27	Dissolved Oxygen	mg/l	6	5	4	4	---
28	COD	mg/l	---	---	---	---	---
29	BOD	mg/l	2	3	3	---	---

Class A – Drinking water without conventional treatment but after disinfection.

Class B –Water for outdoor bathing.

Class C – Drinking water with conventional treatment followed by disinfection.

Class D – Water for fish culture and wild life propagation.

Class E – Water for irrigation, industrial cooling and controlled waste disposal

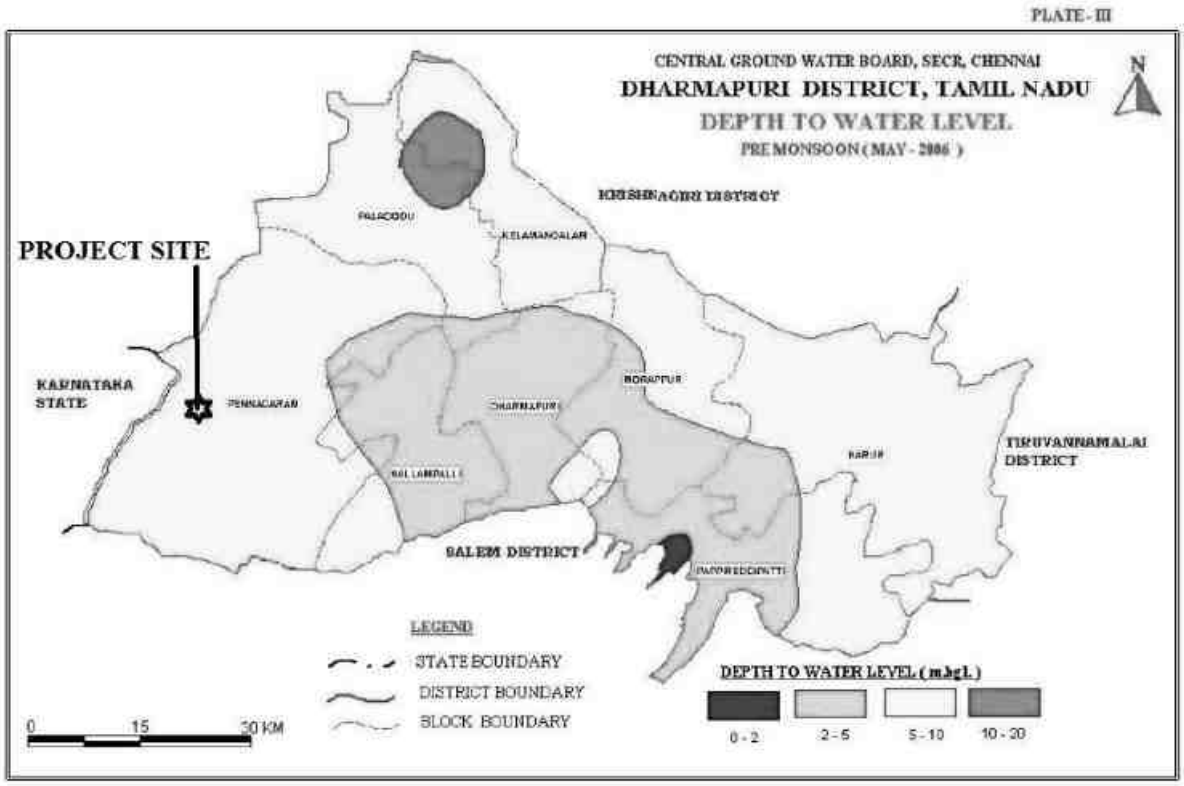
3.7.3 Groundwater resources

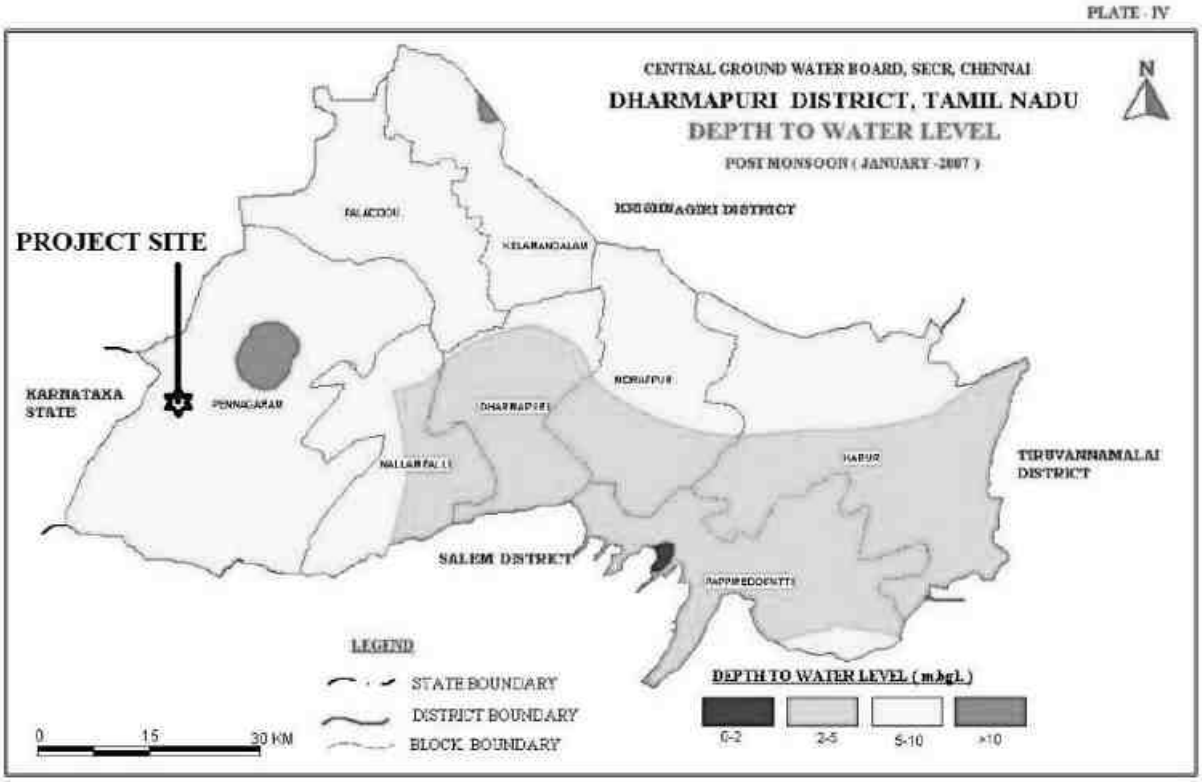
The estimation of groundwater resources for the district has shown that all block is under "Semi Critical" category. The shallow alluvial aquifers along Cauvery and Ponnaiyar rivers serve as an important source of drinking water irrigation development for Dharmapuri district. Dug wells are the most common ground water abstraction structures used for irrigation in the district. The yield of dug wells range from 150 to 200 m^3/day in weathered crystalline rocks and 20 to 200 m^3/day in Recent alluvial formations along major drainage courses. Depth of water level in premoonsoon season for project site is **5 to 10 mbgl** and depth of water level in post moonsoon season is **5 to 10 mbgl.** Depth to water level during Pre Monsoon & Post Monsoon for project site in Dharmapuri District, Tamil Nadu, is given in **Figure 3-20.**

Source : http://cgwb.gov.in/sites/default/files/2022-10/dharmapuri.pdf

"National Compilation on Dynamic Ground Water Resources of India 2024"

(**Ref**:Government of India Ministry of Water Resources Central Ground Water Board South Eastern Coastal Region Chennai, "District Ground Water Brochure Dharmapuri District")





Source: *http://cgwb.gov.in/District_Profile/TamilNadu/TIRUVALLUR.pdf*

Figure 3-20 Depth to water level during Post-Monsoon & Pre-Monsoon in Dharmapuri District

3.7.4 Groundwater Quality

The chemical characteristics of ground water in the phreatic zone in Dharmapuri district has been studied using the analytical data of ground water samples collected from Network Hydrograph Stations of Central Ground Water Board. The study of quality of ground water in deeper aquifers in the district has been attempted using the data collected from exploratory bore\ tube wells constructed in the district.

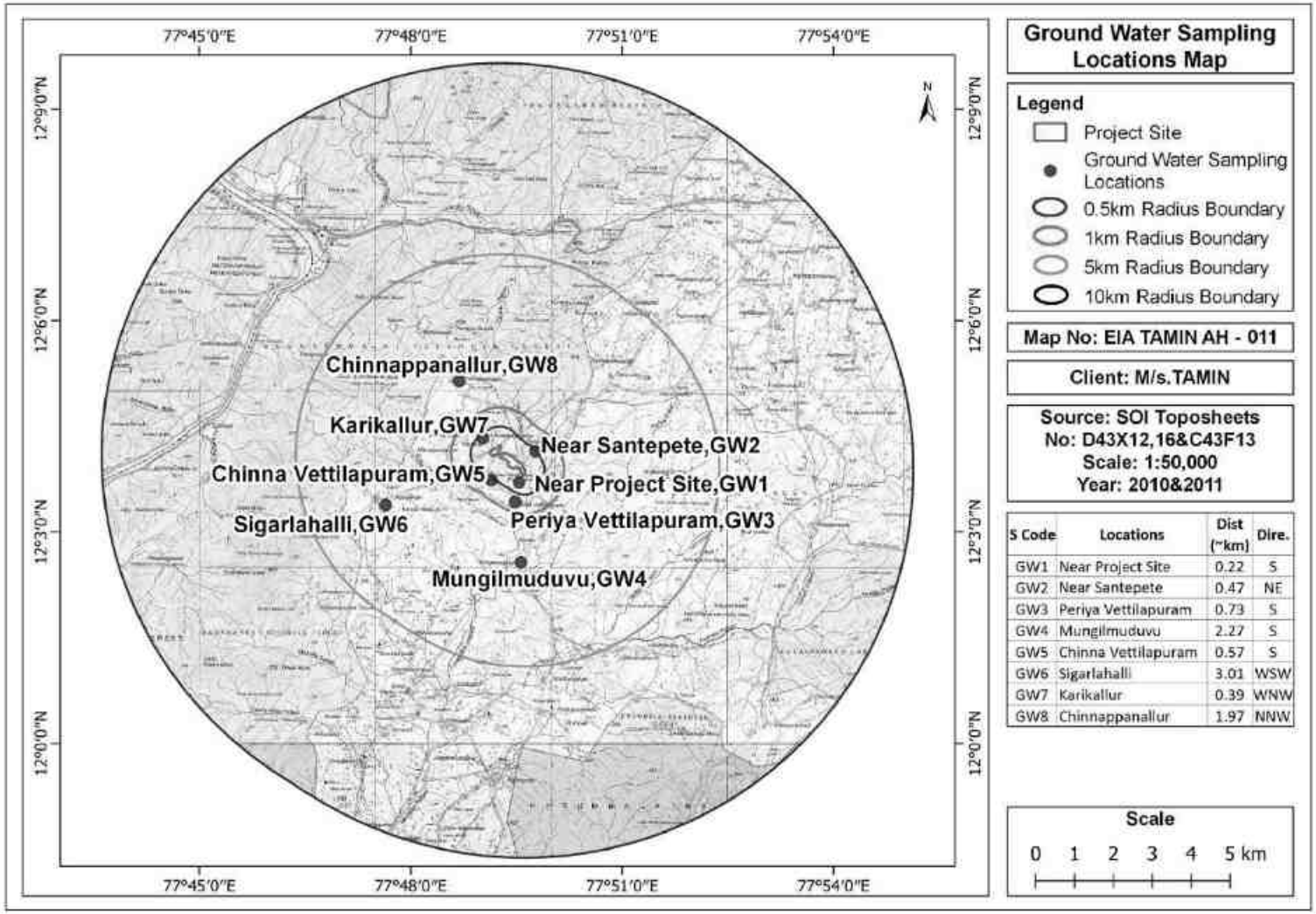
Ground water in phreatic aquifers in Dharmapuri district in general, is colourless, odourless and slightly alkaline in nature. The specific electrical conductance of ground water in phreatic zone (in MicroSeimens at 25ºC) during May 2006 was in the range of 320 to 6010 in the district. It is between 750 and 2250 µS/cm at 25ºC in the major part of the district. Conductance below 750 µS/cm have been observed in ground water in only one sample is Dharmapuri block Whereas Conductance exceeding 2250µS/cm have been observed in parts of Papireddipatti, Pennagaram and Morappur block.

It is observed that the ground water is suitable for drinking and domestic uses in respect of all the constituents except total hardness and Nitrate in more than 90percent of samples analysed. Total Hardness as CaCO3 is observed in all samples have within the excess of permissible limits in about 40 percent of samples analysed whereas Nitrate is found in excess of 45 mg/l in about 32 percent samples. The incidence of high total hardness is attributed to the composition of lithounits constituting the aquifers in the district, whereas the Nitrate pollution is most likely due to the use of pesticides and fertilizers for agriculture.

With regard to irrigation suitability based on specific electrical conductance and Sodium Adsorption Ratio (SAR), it is observed that ground water in the phreatic zone may cause high to very high salinity hazard and medium to high alkali hazard when used for irrigation. Proper soil management strategies are to be adopted in the major part of the district while suing ground water for irrigation. Map showing the groundwater monitoring locations are given in **Figure 3-21.**

Table 3-14 Details of Groundwater Quality Monitoring Locations

S.No	Location	Location Code	Distance in Km	Direction
1	Near Project Site	GW1	0.22	S
2	Near Santepete	GW2	0.47	NE
3	Periya Vettilapuram	GW3	0.73	S
4	Mungilmuduvu	GW4	2.27	S
5	Chinna Vettilapuram	GW5	0.57	S
6	Sigarlahalli	GW6	3.01	WSW
7	Karikallur	GW7	0.39	WNW
8	Chinnappanallur	GW8	1.97	NNW



S Code	Locations	Dist (~km)	Dire.
GW1	Near Project Site	0.22	S
GW2	Near Santepete	0.47	NE
GW3	Periya Vettilapuram	0.73	S
GW4	Mungilmuduvu	2.27	S
GW5	Chinna Vettilapuram	0.57	S
GW6	Sigarlahalli	3.01	WSW
GW7	Karikallur	0.39	WNW
GW8	Chinnappanallur	1.97	NNW

Figure 3-21 Map showing the groundwater monitoring locations

Table 3-15 Physico chemical analysis of Ground water samples from study area

SI NO	Parameters	Unit	Drinking water Standard (IS 10500: 2012)		Near Project Site	Near Santepete	Periya Vettila puram	Mugil muduvu	Chinna Vettila puram	Sigalahalli	Kari kallur	Chinnap panallur
			Acceptable Limit	Permissible Limit	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
1	Total Alkalinity as $CaCO_3$	mg/l	200	600	300	300	340	260	200	250	70	240
2	Boron as B	mg/l	0.5	2.4	BLQ(LOQ :0.1)	BLQ(LOQ :0.1)	BLQ(LOQ :0.1)	BLQ(LOQ :0.1)	BLQ(LOQ :0.1)	BLQ(LOQ :0.1)	BLQ(LOQ :0.1)	BLQ(LOQ :0.1)
3	Calcium as Ca	mg/l	75	200	136.35	206.51	62.1	122.28	180.36	74.17	102.42	194.45
4	Chloride as Cl	mg/l	250	1000	256.88	332.21	212.79	239.19	287.03	216.15	227.65	305.80
5	Colour	Hazen units	5	15	BLQ(LOQ :1.0)	BLQ(LOQ :1.0)	BLQ(LOQ :1.0)	BLQ(LOQ :1.0)	BLQ(LOQ :1.0)	BLQ(LOQ :1.0)	BLQ(LOQ :1.0)	BLQ(LOQ :1.0)
6	Cyanide as CN	mg/l	0.05	No relaxation	BLQ(LOQ :0.01)	BLQ(LOQ :0.01)	BLQ(LOQ :0.01)	BLQ(LOQ :0.01)	BLQ(LOQ :0.01)	BLQ(LOQ :0.01)	BLQ(LOQ :0.01)	BLQ(LOQ :0.01)
7	Electrical Conductivity at 25°C	µS/cm	NA	NA	1775	2931	1390	1587	2357	1339	1259	2572
8	Fluoride as F	mg/l	1.0	1.5	0.45	0.52	0.38	0.42	0.45	0.42	0.42	0.48

SI NO	Parameters	Unit	Drinking water Standard (IS 10500: 2012)		Near Project Site	Near Santepete	Periya Vettila puram	Mugil muduvu	Chinna Vettila puram	Sigalahalli	Kari kallur	Chinnap panallur
			Acceptable Limit	Permissible Limit	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
9	Magnesium as Mg	mg/l	30	100	83.63	120.2	64.12	67.04	102.35	67.04	70.17	111.29
10	Nitrate as NO3	mg/l	45	No relaxation	24.17	40.52	10.95	12.69	34.6	12.69	15.62	37.45
11	Total Suspended Solids	mg/l	NA	NA	49	27	3	5	BLQ(LOQ :2.0)	5	BLQ(LOQ :2.0)	18
12	pH at 25°C	-	6.5-8.5	No relaxation	7.32	7.83	6.84	6.90	7.45	6.90	7.19	7.66
13	Potassium as K	mg/l	NA	NA	18	28.0	10	10	20	10	11	24
14	Sodium as Na	mg/l	NA	NA	145	330	105	110	290.0	110	120	310
15	Sulphate as SO4	mg/l	200	400	86.39	317.14	53.59	55.16	210.24	55.16	62.96	233.8
16	Total dissolved solids	mg/l	500	2000	958	1583	751	723	1273	723	680	1389

SI NO	Parameters	Unit	Drinking water Standard (IS 10500: 2012)		Near Project Site	Near Santepete	Periya Vettila puram	Mugil muduvu	Chinna Vettila puram	Sigalahalli	Kari kallur	Chinnap panallur
			Acceptable Limit	Permissible Limit	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
17	Manganese as Mn	mg/l	0.1	0.3	BLQ(LOQ :0.05)	BLQ(LOQ :0.05)	BLQ(LOQ :0.05)	BLQ(LOQ :0.05)	BLQ(LOQ :0.05)	BLQ(LOQ :0.05)	BLQ(LOQ :0.05)	BLQ(LOQ :0.05)
18	Total hardness as CaCO3	mg/l	200	600	584	580	210	270	525	270	326	535
19	Turbidity, NTU	NTU	1	5	1.3	23.2	0.3	0.5	15.6	0.5	0.7	19.4
20	Arsenic	mg/l	0.01	No relaxation	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)
21	Cadmium	mg/l	0.003	No relaxation	BLQ(LOQ 0.001)	BLQ(LOQ 0.001)	BLQ(LOQ 0.001)	BLQ(LOQ 0.001)	BLQ(LOQ 0.001)	BLQ(LOQ 0.001)	BLQ(LOQ 0.001)	BLQ(LOQ 0.001)
22	Chromium	mg/l	0.05	No relaxation	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ LOQ 0.01)
23	Copper	mg/l	0.05	1.5	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ LOQ 0.01)	BLQ LOQ 0.01)	BLQ(LOQ 0.01)	BLQ LOQ 0.01)	BLQ LOQ 0.01)	BLQ LOQ 0.01)

SI NO	Parameters	Unit	Drinking water Standard (IS 10500: 2012)		Near Project Site	Near Santepete	Periya Vettila puram	Mugil muduvu	Chinna Vettila puram	Sigalahalli	Kari kallur	Chinnap panallur
			Acceptable Limit	Permissible Limit	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
24	Lead	mg/l	0.01	No relaxation	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)
25	Mercury	mg/l	0.001	No relaxation	BLQ(LOQ 0.0005)	BLQ(LOQ 0.0005)	BLQ(LOQ 0.0005)	BLQ(LOQ 0.0005)	BLQ(LOQ 0.0005)	BLQ(LOQ 0.0005)	BLQ(LOQ 0.0005)	BLQ(LOQ 0.0005)
26	Nickel	mg/l	0.02	No relaxation	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)	BLQ(LOQ 0.01)
27	Zinc	mg/l	5	15	BLQ(LOQ :0.01)	BLQ(LOQ :0.01)	BLQ(LOQ :0.01)	BLQ(LOQ :0.01)	BLQ(LOQ :0.01)	BLQ(LOQ :0.01)	BLQ(LOQ :0.01)	BLQ(LOQ :0.01)
28	Selenium as Se	mg/l	0.01	No Relaxation	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)	BLQ(LOQ 0.005)

Note: *BLQ – Below Limit of Quantification; LOQ – Limit Of Quantification; NR – No Relaxation*

3.7.5 Results and Discussions

A summary of analytical results are presented below:

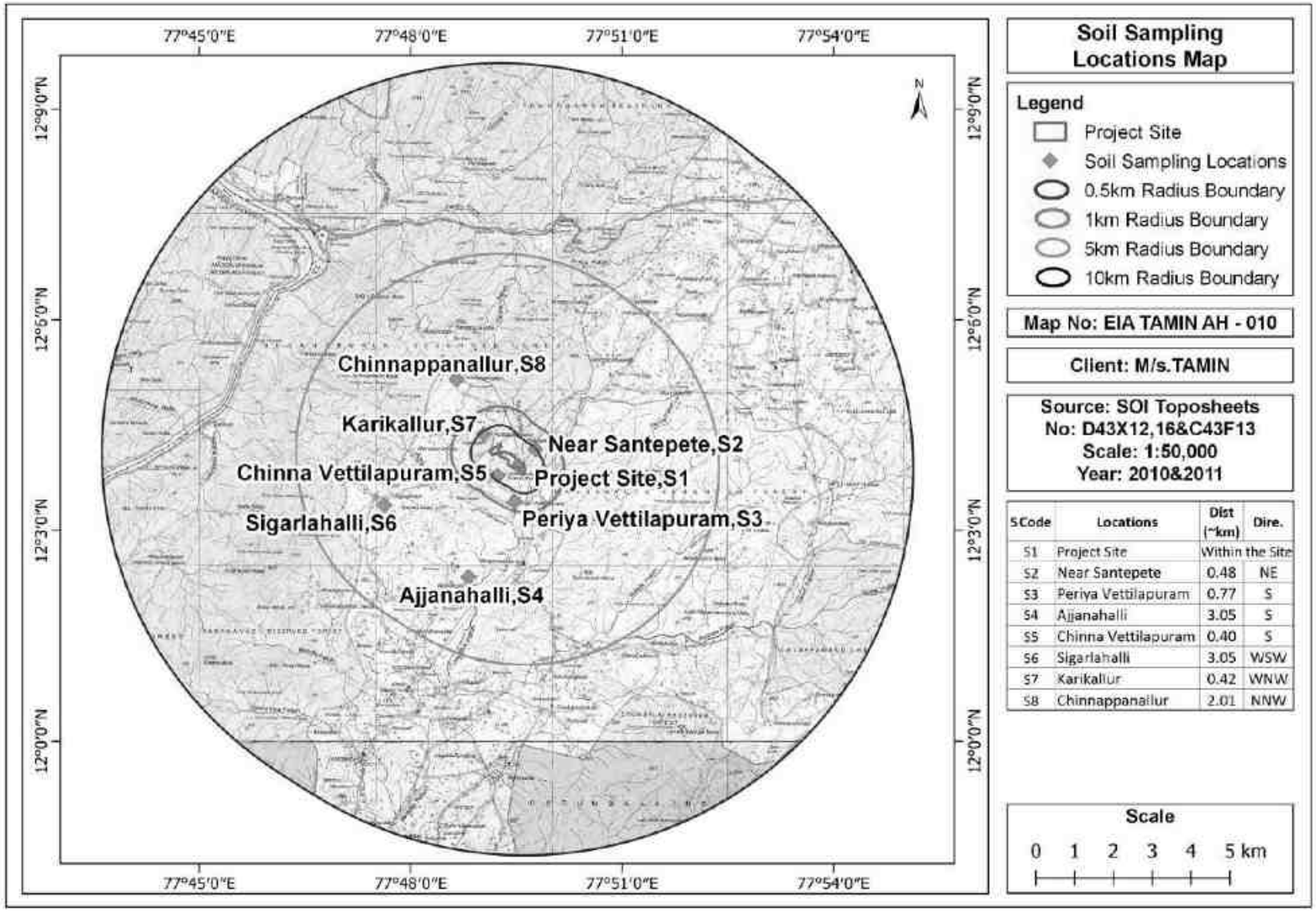
- The pH of the collected ground water sample ranges from 6.84 to 7.83.
- The concentrations of Chloride in the collected ground water sample ranges from 212.79 to 332.21 mg/l.
- Total Dissolved Solids (TDS) value of the collected ground water sample varies from 680 mg/l to 1583 mg/l.
- Total Hardness of the collected ground water sample ranges from 210 mg/l to 584 mg/l.
- The concentrations of Sulphate in the collected ground water sample ranges from 53.59 to 317.14 mg/l.

3.8 Soil Quality

Soil quality monitoring locations & results are given in **Table 3-16 & Table 3-17.** Map showing the soil monitoring locations are given in **Figure 3-22.**

Table 3-16 Soil & Sediment Quality Monitoring Locations

S.No	Location	Location Code	Distance in Km	Direction
1	Project Site	S1	Within the site	
2	Near Santepete	S2	0.48	NE
3	Periya Vettilapuram	S3	0.77	S
4	Ajanahalli	S4	3.05	S
5	Chinna Vettilapuram	S5	0.40	S
6	Sigarlahalli	S6	3.05	WSW
7	Karikallur	S7	0.42	WNW
8	Chinnappanallur	S8	2.01	NNW



SCode	Locations	Dist (~km)	Dire.
S1	Project Site	Within the Site	
S2	Near Santepete	0.48	NE
S3	Periya Vettilapuram	0.77	S
S4	Ajjanahalli	3.05	S
S5	Chinna Vettilapuram	0.40	S
S6	Sigarlahalli	3.05	WSW
S7	Karikallur	0.42	WNW
S8	Chinnappanallur	2.01	NNW

Figure 3-22 Map Showing the Soil Monitoring Location

Table 3-17 Physico Chemical parameters of soil samples from the study area

Sl. No	Parameters	Units	Near Project Site	Near Santepete	Periya Vettila puram	Ajanahalli	Chinna Vettila puram	Sigarlahalli	Karikallur	Chinnap panallur
			S1	S2	S3	S4	S5	S6	S7	S8
1	Cadmium	mg/kg	BLQ(LOQ: 0.1)	BLQ(LOQ : 0.1)	BLQ(LOQ: 0.1)	BLQ(LOQ: 0.1)	BLQ(LOQ: 0.1)	BLQ (LOQ: 0.1)	BLQ(LOQ: 0.1)	BLQ(LOQ: 0.1)
2	Chromium	mg/kg	11.17	8.57	8.67	9.85	7.10	8.96	9.27	7.94
3	Copper	mg/kg	40.83	67.89	30.98	36.64	61.11	31.59	32.94	65.67
4	Nickel	mg/kg	7.11	4.64	5.52	5.43	4.01	5.62	5.98	4.06
5	Selenium	mg/kg	BLQ(LOQ: 0.1)	BLQ(LOQ : 0.1)	BLQ(LOQ: 0.1)	BLQ(LOQ: 0.1)	BLQ(LOQ: 0.1)	BLQ(LOQ: 0.1)	BLQ(LOQ: 0.1)	BLQ(LOQ: 0.1)
6	Zinc	mg/kg	6.02	4.98	5.83	5.20	4.05	5.45	5.15	4.11
7	Soil Texture	-	Loam	Clay Loam	Loam	Loam	Clay Loam	Loam	Loam	Clay Loam
8	Soil Texture i)Sand	%	48.3	39.7	43.1	45.1	31.7	43.4	44.7	37.6
9	Soil Texture ii) Clay	%	13.3	32.4	13.4	12.2	33.4	12.8	12.4	31.3
10	Soil Texture iii) Silt	%	38.4	27.9	43.5	42.7	34.9	43.8	42.9	31.1
11	pH Value @ 25 ° C (1 : 2.5)	-	7.38	8.31	6.95	7.24	8.24	7.12	7.06	8.47
12	Electrical conductivity @ 25 ° C (1 : 2)	µS/cm	64.3	91.5	47.8	56.5	85.4	48.3	56.7	87.8
13	Bulk Density	gm/cm 3	1.14	1.31	1.02	1.08	1.19	1.02	1.06	1.24
14	Organic Carbon	%	0.48	0.61	0.26	0.44	0.52	0.37	0.39	0.58

Sl. No	Parameters	Units	Near Project Site	Near Santepete	Periya Vettila puram	Ajanahalli	Chinna Vettila puram	Sigarlahalli	Karikallur	Chinnap panallur
			S1	S2	S3	S4	S5	S6	S7	S8
15	Organic Matter	%	0.83	1.04	0.45	0.76	0.88	0.64	0.67	0.98
16	Available Phosphorous as P	µg/g	8.49	5.15	BLQ(LOQ 5.0)	6.67	BLQ(LOQ 5.0)	5.76	5.91	BLQ(LOQ 5.0)
17	Available Potassium	mEq / 100g	8.78	2.38	4.18	4.44	2.03	4.19	4.36	2.12
18	Boron as B	mg/kg	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)
19	Iron	mg/kg	8.12	9.76	5.97	10.39	8.16	6.06	12.74	8.87
20	Total Nitrogen as N	%	0.01113	0.01327	0.00939	0.0109	0.01193	0.00945	0.00972	0.0128
21	Exchangable Calcium as Ca	mEq/L	16.48	21.54	13.16	14.75	16.22	13.41	14.7	18.27
22	Exchangable Magnesium as Mg	mEq/L	54.82	58.64	45.86	50.12	52.59	46.12	47.56	55.77
23	Available Sodium as Na	mg/kg	135.42	146.12	121.12	134.16	136.24	125.52	128.64	141.26
24	Infiltration Rate	-	0.85	0.41	0.61	0.76	0.35	0.64	0.70	0.38
25	Cation Exchange Capacity	mEq/100g	7.2	8.0	5.9	6.5	6.9	6.0	6.2	7.4
26	Moisture	%	4.12	1.96	2.87	3.57	1.69	2.94	3.11	1.82
27	Water Holding capacity	%	33.1	20.2	28.2	30.4	17.8	28.3	29.6	19.3
28	Porosity	-	0.41	0.76	0.42	0.41	0.77	0.43	0.42	0.78

Note: *BLQ – Below Limit of Quantification; LOQ – Limit Of Quantification*

3.8.1 Results and Discussions

Summary of analytical results

- The pH of the soil samples ranged from 6.95 to 8.47.
- Nitrogen content ranged from 0.00939 % to 0.01327%
- Phosphorous ranged from BLQ to 8.49 µg/g.
- Potassium content ranges from 2.03 mEq / 100g to 8.78 mEq / 100g .

3.9 Biological Environment

An ecological study of the ecosystem is essential to understand the impact of industrialization and urbanization on existing flora and fauna of the study area. Studies on various aspects of ecosystem play an important role in identifying sensitive issues for under taking appropriate action to mitigate the impact, if any. The biological study was under taken as a part of the EIA study report to understand the present status of ecosystem prevailing in the study area, to compare it with past condition with the help of available data, to predict changes in the biological environment as a result of present activities and to suggest measures for maintaining its health. Secondary source information was conducted to study the flora & fauna in 10 km radius. Some of the information was gathered from the local habitants. The entire secondary data were classified to interpret the impact of pollution on the flora and fauna of that region. Survey of the wild plants as well as cultivated crop plants was made and all the available information was recorded.

During the collection of secondary information, following aspects were considered for ecological studies:

- ❖ Assessment of present status of flora and fauna;
- ❖ Identification of rare and endangered species of plants and animals (if any);
- ❖ Identification of ecologically sensitive areas within the study area;
- ❖ Assessment of migratory route of wildlife (if any); and
- ❖ Assessment of Aquatic Ecology with specific reference to aquatic birds and plankton resources.

3.9.1 Methodology

Terrestrial investigations for flora and fauna records were collected by secondary information like research article, periodicals, floras and forest checklist.

3.9.2 Flora

- ❖ Plants species were identified based on their specific diagnostics characters of family, genus and species using available floral, other related literature.
- ❖ Besides the identification of plant species, information was collected on the vernacular names and uses of plants made by local inhabitants.

3.9.3 Floristic composition within the study area

For secondary information based on a total 126 species under 28 family found in the study area. The detailed list of plant species found in each quadrat provided in **Table 3-18.**

Table 3-18 Checklist of Flora -biodiversity

Sl. No.	Species	Family	Common Name	Habit	IUCN
1	*Abrus precatorius*	Fabaceae	Kundumani	Shrub	NA
2	*Abutilon indicum*	Malvaceae	Perun thuthi	Shrub	NA
3	*Acacia nilotica*	Mimosaceae	Karuvelam	Tree	LC
4	*Acacia planifrons*	Mimosaceae	Kodaivelam	Tree	NA
5	*Acalypha indica*	Euphorbiaceae	Kuppaimeni	Herb	NA
6	*Acanthospermum hispidum*	Compositae	--	Herb	NA
7	*Achyranthes aspera*	Amaranthaceae	Nayurivi	Herb	NA
8	*Aegle marmelos*	Rutaceae	Vilvam	Tree	NA
9	*Aerva lanata*	Amaranthaceae	Sirupeelai	Shrub	NA
10	*Aerva persica*	Amaranthaceae	Perumpeelai	Shrub	NA
11	*Aeschynomene americana*	Fabaceae	--	Herb	NA
12	*Aeschynomene aspera*	Fabaceae	Thakkai	Shrub	NA
13	*Ageratum conyzoides*	Compositae	Poom pillu	Herb	NA
14	*Alloteropsis cimicina*	Poaceae	--	Grass	NA
15	*Alternanthera sessilis*	Amaranthaceae	Ponnanganni	Herb	NA
16	*Anisomeles indica*	Labiatae	--	Herb	NA
17	*Annona squamosa*	Annonaceae	Seetha	Tree	NA
18	*Arachis hypogaea*	Fabaceae	Verkadalai	Herb	NA
19	*Argemone mexicana*	Papaveraceae	Braman Thandu	Herb	NA
20	*Aristida adscensionis*	Poaceae	--	Grass	NA
21	*Aristida hystrix*	Poaceae	--	Grass	NA
22	*Aristolochia bracteolata*	Aristolochiaceae	Aduthinnappalai	Herb	NA
23	*Barleria acuminata*	Acanthaceae	Vellai kurinji	Shrub	NA
24	*Barleria longiflora*	Acanthaceae	--	Shrub	NA
25	*Barleria noctiflora*	Acanthaceae	Barleria	Shrub	NA
26	*Boerhavia diffusa*	Nyctaginaceae	Mookarattai	Herb	NA
27	*Boerhavia erecta*	Nyctaginaceae	Seemai mookarattai	Herb	NA
28	*Carica papaya*	Caricaceae	Pappali	Tree	NA
29	*Carissa carandas*	Apocynaceae	Kalaa, Perun kala	Shrub	NA
30	*Cassia fistula*	Caesalpiniaceae	Kondrai	Tree	NA
31	*Celosia argentea*	Amaranthaceae	Pannai keerai	Herb	NA
32	*Cissus quadrangularis*	Vitaceae	Pirandai	Shrub	NA
33	*Citrullus colocynthis*	Cucurbitaceae	Peikkumatti	Herb	NA
34	*Citrus aurantifolia*	Rutaceae	Elumichai	Tree	NA
35	*Cleome viscosa*	Capparidaceae	Nai kadugu	Herb	NA
36	*Coccinia grandis*	Cucurbitaceae	Kovai	Climber	NA
37	*Croton bonplandianum*	Euphorbiaceae	Rail poondu	Herb	NA
38	*Cucumis sativus*	Cucurbitaceae	Vellarikkaai	Climber	NA
39	*Cyperus bulbosus*	Cyperaceae	–	Sedge	NA
40	*Eclipta prostrata*	Compositae	Karisaalai	Herb	NA
41	*Eleocharis acutangula*	Cyperaceae		Sedge	NA
42	*Eragrostis tenella*	Poaceae		Grass	NA
43	*Euphorbia antiquorum*	Euphorbiaceae	Sadura-kalli	Tree	NA

Sl. No.	Species	Family	Common Name	Habit	IUCN
44	*Euphorbia hirta*	Euphorbiaceae	Ammanpacharisi	Herb	NA
45	*Euphorbia indica*	Euphorbiaceae	Ammanpacharisi	Herb	NA
46	*Evolvulus alsinoides*	Convolvulaceae	Vishnukarandi	Herb	NA
47	*Ficus benghalensis*	Moraceae	Aala maram	Tree	NA
48	*Ficus religiosa*	Moraceae	Arasu	Tree	NA
49	*Fimbristylis ovata*	Cyperaceae		Sedge	NA
50	*Glinus lotoides*	Molluginaceae	Siruseruppadai	Herb	NA
51	*Gynandropsis gynandra*	Capparidaceae	Nal vaelai, Vaelai	Herb	NA
52	*Hedyotis aspera*	Rubiaceae		Herb	NA
53	*Heliotropium indicum*	Boraginaceae	Thael kodukku	Herb	NA
54	*Hibiscus surattensis*	Malvaceae		Undershrub	NA
55	*Hybanthus enneaspermus*	Violaceae	Orilai thamarai	Herb	NA
56	*Hygrophila schulli*	Acanthaceae	Neermulli	Herb	NA
57	*Hyptis suaveolens*	Labiatae		Shrub	NA
58	*Indigofera aspalathoides*	Fabaceae	Sivanaar vaembu	Herb	NA
59	*Indigofera linnaei*	Fabaceae		Herb	NA
60	*Indigofera tinctoria*	Fabaceae	Avuri, Neeli	Herb	NA
61	*Ipomoea pes-caprae*	Convolvulaceae	Kudhirai Kulambu	Creeper	NA
62	*Jasminum sambac*	Oleaceae	Peru malli	Climbing Shrub	NA
63	*Jatropha curcas*	Euphorbiaceae	Kaatu-amanakku	Shrub	NA
64	*Jatropha gossypifolia*	Euphorbiaceae	Kaatu-amanakku	Shrub	NA
65	*Justicia adhatoda*	Acanthaceae	Adathodai	Shrub	NA
66	*Justicia simplex*	Acanthaceae		Herb	NA
67	*Kylinga bulbosa*	Cyperaceae		Sedge	NA
68	*Lagenaria siceraria*	Cucurbitaceae	Surakkaai	Climber	NA
69	*Lantana camara*	Verbenaceae	Unnichedi	Shrub	NA
70	*Leucaena leucocephala*	Mimosaceae	Soundil	Tree	NA
71	*Leucas aspera*	Labiatae	Thumbai	Herb	NA
72	*Ludwigia perennis*	Onagraceae		Herb	NA
73	*Martynia annua*	Martyniaceae	Thael Kodukku	Herb	NA
74	*Melia azedarach*	Meliaceae	Malai vaembu	Tree	NA
75	*Merremia hederacea*	Convolvulaceae		Herb	NA
76	*Nyctanthes arbor-tristis*	Nyctanthaceae	Parijaatham	Tree	NA
77	*Ocimum americanum*	Labiatae	Ganjaankorai	Herb	NA
78	*Pavonia odorata*	Malvaceae	Peramutti	Herb	NA
79	*Pedalium murex*	Pedaliaceae	Perunerunji	Herb	NA
80	*Phyllanthus acidus*	Euphorbiaceae	Aranelli	Tree	NA
81	*Phyllanthus amarus*	Euphorbiaceae	Kizha-nelli	Herb	NA
82	*Phyllanthus emblica*	Euphorbiaceae	Muzhu nelli	Tree	NA
83	*Phyllanthus reticulatus*	Euphorbiaceae	Inki pazham	Shrub	NA
84	*Pithecellobium dulce*	Mimosaceae	Kodukkaai puli	Tree	NA
85	*Plumbago zeylanica*	Plumbaginaceae	Chitthiragam	Herb	NA
86	*Polygala javana*	Polygalaceae		Shrub	NA

Sl. No.	Species	Family	Common Name	Habit	IUCN
87	*Pongamia pinnata*	Fabaceae	Punga maram	Tree	NA
88	*Portulaca oleracea*	Portulacaceae	Kari keerai	Herb	NA
89	*Prosopis juliflora*	Mimosaceae	Velikkaathaan	Tree	NA
90	*Psidium guajava*	Myrtaceae	Koyya	Tree	NA
91	*Punica granatum*	Punicaceae	Madhulai	Shrub	NA
92	*Rhynchosia viscosa*	Fabaceae		Climber	NA
93	*Ricinus communis*	Euphorbiaceae	Amanakku	Shrub	NA
94	*Rivea hypocrateriformis*	Convolvulaceae	Boodhikeerai	Climber	NA
95	*Ruellia tuberosa*	Acanthaceae		Herb	NA
96	*Sansevieria roxburghiana*	Dracaenaceae	Mottamamji	Herb	NA
97	*Senna auriculata*	Caesalpiniaceae	Avaram	Shrub	NA
98	*Senna occidentalis*	Caesalpiniaceae	Peiyavarai	Tree	NA
99	*Sesamum indicum*	Pedaliaceae	Ellu	Herb	NA
100	*Sida acuta*	Malvaceae	Malai thangi	Herb	NA
101	*Sida cordata*	Malvaceae	Pazhampaasi	Herb	NA
102	*Sida cordifolia*	Malvaceae	Nilatutthi	Herb	NA
103	*Solanum americanum*	Solanaceae	Manatakkali	Herb	NA
104	*Solanum melongena*	Solanaceae	Kathiri	Herb	NA
105	*Solanum torvum*	Solanaceae	Chundai	Shrub	NA
106	*Solanum trilobatum*	Solanaceae	Thoodhuvalai	Climber	NA
107	*Solanum virginianum*	Solanaceae	Kandankathiri	Herb	NA
108	*Spermacoce hispida*	Rubiaceae	Nathaichoori	Herb	NA
109	*Spermacoce ocymoides*	Rubiaceae	Button Weed	Herb	NA
110	*Tamarindus indica*	Caesalpiniaceae	Puliya maram	Tree	NA
111	*Tectona grandis*	Verbenaceae	Thekku	Tree	NA
112	*Tephrosia purpurea*	Fabaceae	Kozhinji	Undershrub	NA
113	*Terminalia catappa*	Combretaceae	Badam	Tree	NA
114	*Thespesia populnea*	Malvaceae	Poovarasu	Tree	NA
115	*Thevetia peruviana*	Apocynaceae	Thangaarali	Shrub	NA
116	*Tinospora cordifolia*	Menispermaceae	Seenthilkodi	Climber	NA
117	*Toddalia asiatica*	Rutaceae	Mizhakaranai	Shrub	NA
118	*Trachys muricata*	Poaceae	Vennai thiratti pul	Grass	NA
119	*Tridax procumbens*	Asteraceae	Vettukayapoonduthalai	Herb	NA
120	*Tribulus lanuginosis*	Zygophyllaceae	Nerungi	Herb	NA
121	*Tylophora indica*	Asclepiadaceae	Naippalai	Climber	NA
122	*Vernonia cinerea*	Asteraceae	Mookuthipoodu	Herb	NA
123	*Vitex negundo*	Verbenaceae	Nochi	Tree	NA
124	*Waltheria indica*	Sterculiaceae	Chempoodu	Herb	NA
125	*Wrightia tinctoria*	Apocynaceae	Vetpaalai	Tree	NA
126	*Ziziphus mauritiana*	Rhamnaceae	Illandhai	Tree	NA

3.9.4 Fauna

- Secondary information collected from published government data etc.

- List of the endangered and endemic species as per the schedule of The Wildlife Protection Act, 1972.
- Emphasis is given to identify avifauna and mammals to determine the presence and absence of Schedule-1 species, listed in The Wildlife Protection Act 1972, as well as in Red List of IUCN.

3.9.5 Fauna Diversity

Fauna diversity were collected from secondary information and cross check with relevant literatures (Smith 1933-43, Ali and Ripley 1983, Daniel 1983, Prater 1993,Murthy and Chandrasekhar 1988).

3.9.6 Bird species

A total of 90 species belonging to 21 families have been identified from Agricultural area. A comparative chart of the total bird species belonging to different families along with their feeding preference and abundance are provided in **Table 3-19**

Table 3-19 Birds from the site

S.No	Scientificname	Commonname	Family	IUCN/WPA
1.	*Acridotheresfuscus*	JungleMyna	Sturnidae	LC/ IV
2.	*Acridotherestristis*	CommonMyna	Sturnidae	LC/ IV
3.	*Acritillasindica*	YellowbrowedBulbul	Pycnonotidae	LC/ IV
4.	*Anthustrivialis*	TreePipit	Motacillidae	LC/ IV
5.	*Apusaffinis*	LittleSwift	Apodidae	LC/ IV
6.	*Athenebrama*	Spottedowlet	Strigidae	LC/ IV
7.	*Butasturteesa*	White-eyedBuzzard	Accipitridae	LC/IV
8.	*Cacomantispasserinus*	GreybelliedCuckoo	Cuculidae	LC/ IV
9.	*Chloropsisjerdoni*	Jerdon'sLeafbird	Chloropseida	LC/ IV
10.	*Chrysocolapteslucidus*	GreaterFlameback	Picidae	LC/ IV
11.	*Chrysommasinense*	YelloweyedBabbler	Timaliidae	LC/ IV
12.	*Cinnyrisasiaticus*	PurpleSunbird	Nectariniidae	LC/ IV
13.	*Coraciasbenghalensis*	IndianRoller	Coraciidae	LC/ IV
14.	*Coracinamacei*	LargeCuckooshrike	Campephagidae	LC/ IV
15.	*Coracinamelanoptera*	BlackheadedCuckooshrike	Campephagidae	LC/ IV
16.	*Corvusculminatus*	IndianJungleCrow	Corvidae	LC/ IV
17.	*Corvussplendens*	HouseCrow	Corvidae	LC/V
18.	*Cuculusmicropterus*	IndianCuckoo	Cuculidae	LC/ IV
19.	*Cyornistickelliae*	Tickell'sBlueFlycatcher	Muscicapidae	LC/ IV
20.	*Cypsiurusbalasiensis*	AsianPalmSwift	Apodidae	LC/ IV
21.	*Dendrocittavagabunda*	RufousTreepie	Corvidae	LC/ IV
22.	*Dendrocoposmahrattensis*	YellowcrownedWoodpecker	Picidae	LC/ IV
23.	*Dendrocoposnanus*	BrowncappedPygmyWoodpecker	Picidae	LC/ IV
24.	*Dicrurusmacrocercus*	BlackDrongo	Cuculidae	LC/ IV
25.	*Elanuscaeruleus*	BlackwingedKite	Accipitridae	LC/IV
26.	*Eudynamysscolopaceus*	AsianKoel	Cuculidae	LC/ IV
27.	*Glaucidiumradiatum*	*JungleOwlet*	*Strigidae*	LC/IV
28.	*Haliasturindus*	*BrahminyKite*	*Accipitridae*	LC/IV
29.	*Harpactesfasciatus*	*MalabarTrogon*	*Trogonidae*	LC/IV

S.No	Scientificname	Commonname	Family	IUCN/WPA
30.	*Idunaaedon*	ThickbilledWarbler	Sylviidae	LC/ IV
31.	*Irenapuella*	AsianFairybluebird	Irenidae	LC/ IV
32.	*Laniuscristatus*	BrownShrike	Laniidae	LC/ IV
33.	*Lonchuramalacca*	TricolouredMunia	Estrildidae	LC/ IV
34.	*Lonchurapunctulata*	ScalybreastedMunia	Estrildidae	LC/ IV
35.	*Lonchurastriata*	WhiterumpedMunia	Estrildidae	LC/ IV
36.	*Loriculusvernalis*	VernalHangingParrot	Psittacidae	LC/ IV
37.	*Lusciniasvecica*	Bluethroat	Muscicapidae	LC/ IV
38.	*Megalaimahaemacephala*	CoppersmithBarbet	Megalaimidae	LC/ IV
39.	*Megalaimamalabarica*	MalabarBarbet	Megalaimidae	LC/ IV
40.	*Megalaimaviridis*	WhitecheekedBarbet	Megalaimidae	LC/ IV
41.	*Megalaimazeylanica*	BrownheadedBarbet	Megalaimidae	LC/ IV
42.	*Meropsorientalis*	GreenBee-eater	Meropidae	LC/ IV
43.	*Meropsphilippinus*	BluetailedBee-eater	Meropidae	LC/ IV
44.	*Milvusmigrans*	BlackKite	Accipitridae	LC/IV
45.	*Motacillacinerea*	GreyWagtail	Muscicapidae	LC/ IV
46.	*Muscicapadauurica*	AsianBrownFlycatcher	Muscicapidae	LC/ IV
47.	*Myophonushorsfieldii*	MalabarWhistlingThrush	Turdidae	LC/ IV
48.	*Nisaetuscirrhatus*	CrestedHawkEagle	Accipitridae	LC/IV
49.	*Nyctyornisathertoni*	BluebeardedBee-eater	Meropidae	LC/ IV
50.	*Orthotomussutorius*	CommonTailorbird	Sylviidae	LC/ IV
51.	*Parusaplonotus*	IndianYellowTit	Paridae	LC/ IV
52.	*Passerdomesticus*	HouseSparrow	Passeridae	LC/ IV
53.	*Pavocristatus*	IndianPeafowl	Phasianidae	LC/ I
54.	*Pellorneumruficeps*	PuffthroatedBabbler	Timaliidae	LC/ IV
55.	*Phylloscopustrochiloides*	GreenishWarbler	Sylviidae	LC/ IV
56.	*Picumnusinnominatus*	SpeckledPiculet	Picidae	LC/ IV
57.	*Pittabrachyura*	IndianPitta	Pittidae	LC/ IV
58.	*Ploceusmanyar*	StreakedWeaver	Ploceidae	LC/ IV
59.	*Ploceusphilippinus*	BayaWeaver	Ploceidae	LC/ IV
60.	*Pomatorhinushorsfieldii*	IndianScimitarBabbler	Timaliidae	LC/ IV
61.	*Priniahodgsonii*	GreybreastedPrinia	Cisticolidae	LC/ IV
62.	*Priniainornata*	PlainPrinia	Cisticolidae	LC/ IV
63.	*Priniasocialis*	AshyPrinia	Cisticolidae	LC/ IV
64.	*Psittaculacolumboides*	BluewingedParakeet	Psittacidae	LC/ IV
65.	*Psittaculacyanocephala*	PlumheadedParakeet	Psittacidae	LC/ IV
66.	*Psittaculakrameri*	RoseringedParakeet	Psittacidae	LC/ IV
67.	*Ptyonoprogneconcolor*	DuskyCragMartin	Hirundinidae	LC/ IV
68.	*Pycnonotuscafer*	RedventedBulbul	Pycnonotidae	LC/ IV
69.	*Pycnonotusgularis*	Flame-throatedBulbul	Pycnonotidae	LC/IV
70.	*Pycnonotusjocosus*	RedwhiskeredBulbul	Pycnonotidae	LC/ IV
71.	*Pycnonotusluteolus*	WhitebrowedBulbul	Pycnonotidae	LC/ IV
72.	*Rhipiduraalbogularis*	WhitespottedFantail	Rhipiduridae	LC/ IV
73.	*Rhopocichlaatriceps*	DarkfrontedBabbler	Timaliidae	LC/ IV
74.	*Saxicolacaprata*	PiedBushchat	Muscicapidae	LC/ IV
75.	*Saxicoloidesfulicatus*	IndianRobin	Muscicapidae	LC/ IV

S.No	Scientificname	Commonname	Family	IUCN/WPA
76.	*Sittafrontalis*	VelvetfrontedNuthatch	Sittidae	LC/ IV
77.	*Spilopeliachinensis*	SpottedDove	Columbidae	LC/ IV
78.	*Streptopeliadecaocto*	EurasianCollaredDove	Columbidae	LC/ IV
79.	*Streptopeliaorientalis*	OrientalTurtleDove	Columbidae	LC/ IV
80.	*Tephrodornisgularis*	LargeWoodshrike	Tephrodornithidae	LC/ IV
81.	*Tephrodornispondicerianus*	CommonWoodshrike	Tephrodornithidae	LC/ IV
82.	*Tephrodornissylvicola*	MalabarWoodshrike	Tephrodornithidae	LC/ IV
83.	*Terpsiphoneparadisi*	AsianParadiseFlycatcher	Monarchidae	LC/ IV
84.	*Treronbicinctus*	OrangebreastedGreenpigeon	Columbidae	LC/ IV
85.	*Turdoidesstriata*	JungleBabbler	Timaliidae	LC/ IV
86.	*Turdussimillimus*	IndianBlackbird	Turdidae	LC/ IV
87.	*Turnixsuscitator*	BarredButtonquail	Turnicidae	LC/ IV
88.	*Turnixtanki*	YellowleggedButtonquail	Turnicidae	LC/ IV
89.	*Upupaepops*	Hoopoe	Upupidae	LC/ IV
90.	*Zootheracitrina*	OrangeheadedThrush	Turdidae	LC/ IV

LC- Least Concern, NT- Near Threatened, EN- Endangered, NE-Not Evaluated, DD -Data Deficient, VU- Vulnerable, IUCN- International Union for Conservation of Nature.

3.9.7 Mammals:

Based on secondary information**.** Mammals recorded from the Primary Survey in the Study area and their Conservation Status in **Table 3-20.**

Table 3-20 Mammals recorded from the Primary Survey in the Study area and their Conservation Status

S.No	Species name	Common name	IUCN Conservation Status
1	Mus musculus	Common Mouse	Not assessed
2	Funambulus pennanti	Palm -Squirrel	Not assessed
3	Mus rattus	Indian rat	Not assessed
4	Lepus nigricollis	Indian Hare	Least Concern
5	Rattus norvegicus	Brown Rat	Least Concern
6	Felis catus	Cat	Not assessed

3.9.8 Reptiles & Amphibians

Reptiles and amphibian species were prepared secondary information. Reptiles & Amphibians recorded from the Primary Survey in the Study area and their Conservation Status is given in **Table 3-21.**

Reptiles and amphibian species were prepared secondary information.

Table 3-21 Reptiles & Amphibians recorded from the Primary Survey in the Study area and their Conservation Status

S.No	Species name	Common name	IUCN Conservation Status
1	*Eutropis macularia*	Common skink	Not assessed
2	*Plyas mucosus*	Rat Snake	Not assessed
3	*Nerodia sipedon*	Fresh water snake	Not assessed
4	*Rana tigrina*	Common yellow frog	Least Concern

5	*Calotes versicolor*	Common Garden Lizard	Not assessed
6	*Hemidactylus sp.*	House lizard	Not assessed
7	*Ophisops leschenaultiix*	Snake-eyed lizard	Not assessed
8	*Rana hexadactyla*	Frog	Least Concern

3.9.9 Butterfly Species

Butterfly can also serve as useful indicators of habitat biodiversity. They are responsible for a large part of the complex interconnections that characterize natural ecosystems. The butterfly communities that are present in forests help to maintain crucial ecological processes and preserve biodiversity as a whole. They participate in most of the ecological processes that sustain ecosystems. A totally 26 species belonging to five families of butterflies recorded. The Nymphalidae were more dominant family followed by Lycaenidae, Pieridae, Papilionidae and Hesperiidae. Occurrence of butterfly species in buffer zone is given in **Table 3-22.**

Table 3-22 Occurrence of butterfly species in buffer zone

S.No	Family	Species name	Common name	Status	WPA 72 Shedule
1	Nymphalidae	Danaus chrysippus	Plain Tiger	LC	Sch-IV
2	Nymphalidae	Danaus genutia	Striped Tiger	LC	Sch-IV
3	Nymphalidae	Ariadne merione	Common Caster	LC	Sch-IV
4	Nymphalidae	Neptis hylas	Common Sailor	LC	Sch-IV
5	Nymphalidae	Phalanta phalantha	Common Leopard	LC	Sch-IV
6	Nymphalidae	Melanitis leda	Common Evening Brown	LC	Sch-IV
7	Nymphalidae	Mycalesis perseus	Common Bush Brown	LC	Sch-IV
8	Nymphalidae	Ypthima asterope	Common Three Ring	LC	Sch-IV
9	Nymphalidae	Euthala nais	Baronet	LC	Sch-IV
10	Nymphalidae	Argynnis hyperbius	Indian Fritillary	LC	Sch-IV
11	Nymphalidae	Byblia ilithya	Joker	LC	Sch-IV
12	Pieridae	Colotis danae	Crimson Tip	LC	Sch-IV
13	Pieridae	Colotis etrida	Small Orange Tip	LC	Sch-IV
14	Pieridae	Eurema hecabe	Common Grass Yellow	LC	Sch-IV
15	Pieridae	Catopsillia pomona	Common Emigrant	LC	Sch-IV
16	Pieridae	Cepora nerissa	Common Gull	LC	Sch-IV
17	Pieridae	Leptosia nina	Psyche	LC	Sch-IV
18	Lycaenidae	Castalius rosimon	Common Pierrot	LC	Sch-IV
19	Lycaenidae	Arhopala centaurus	Large Obakblue	LC	Sch-IV
20	Lycaenidae	Euchrysops cnejus	Gram Blue	LC	Sch-IV
21	Lycaenidae	Jamides celeno	Common Cerulin	LC	Sch-IV
22	Lycaenidae	Freyeria trochylus	Grass Jewel	LC	Sch-IV
23	Papilionidae	Papilio polytes	Common Mormon	LC	Sch-IV
24	Papilionidae	Papilio demoleus	Lime Butterflies	LC	Sch-IV
25	Papilionidae	Atrophaneura aristolochiae	Common Rose	LC	Sch-IV
26	Hesperiidae	Borbo cinnara	Rice Swift	LC	Sch-IV

LC- Least Concern, NT- Near Threatened, EN- Endangered, NE-Not Evaluated, DD -Data Deficient, VU- Vulnerable, IUCN- International Union for Conservation of Nature.

3.9.10 Conservation Plan for Indian Peafowl (Peacock)

An Indian Peafowl or Peacock *(Pavo cristatus)* is a large pheasant justifiably declared as the National Bird of India in 1963 due to its flagship value founded on its glorious position in mythology and its widespread distribution and grandeur. In India, it is given the utmost protection by inclusion in Schedule 1 of Indian Wildlife Act, 1972 (2002). Being a wide spread species, apart from the various urban habitats, it is also found in agriculture field, along stream with good vegetation and close to human habitation in semi – feral conditions. In the present study area this species have been confirmed from various habitats located near the village periphery.

Management Plan

The presence of industry may not have direct impacts on the wildlife habitat since the dominant mega faunal species are already being conserved by the Forest Department. However, the following steps will be carried out to reduce the impacts on the wildlife and environment;

Provision for construction of waterholes

Wildlife, like any other living species require the primary needs of food, shelter, water and territory to roam, hunt, search for food etc. Daily, weekly or seasonal movements across landscape is necessary for the most terrestrial species. Hence, water holes of not less than 700 Sq. m. area will be proposed (within project site and nearby areas) in the places recommended by the Forest Department to increase the water availability to the wildlife and will be supplied with water through private tankers.

Capacity Building: Capacity building program on protection would be of high significance. Creation of awareness among local people as well as employees about the importance of protecting the habitat and foraging grounds.

Anti-Poaching Plan: Poaching being one of the causes for depletion of wildlife in general and it being one of the main reasons for the poor faunal assemblage, it is necessary to increase protection for the RET species. The people living in the surrounding area should be rewarded for timely information about disturbing and/or poaching of the bird more specifically the threatened species.

Habitat Improvement: Sufficient food, water resources, vegetation cover, and breeding sites must be available at the release location. The mass public of the areas should be informed with the value of the species as bio-indicator for the wetland condition. The public of the studied area were covered by several public meeting for their awareness.

3.9.11 Further suggestion/ recommendation:

- Restricted uses of pollutants in their habitat.
- Stopping the increased vehicle pollution, wildlife road fatalities and damaged to precious habitat by people to start movement towards these areas.

- To carry annual census research project to ecology and habitat use by peacock.
- By making provision of veterinary care and cages for injurious or sick deformed birds.
- Sufficient food, water resources, vegetation cover, and breeding sites must be available at the release location.

The proponent has proposed a sum of Rs. 4,62,500/-for the "Schedule – I species" conservation plan under the following heads in **Table 3-23.**

Table 3-23 Budget for Conservation Plan

S.No	Work or Activity	Approximate Cost. Rs.				
		Year 1	Year 2	Year 3	Year 4	Year 5
1	Plantation-350 tree plants (@ 150/-per plant)	52,500/-	52,500/-	52,500/-	52,500/-	52,500/-
2	Small water tank –20 in number @ 5000/- per tank	1,00,000/-	-	-	-	-
3	One awareness programme	20,000/-	20,000/-	20,000/-	20,000/-	20,000/-
	Total	**1,72,500/-**	**72,500/-**	**72,500/-**	**72,500/-**	**72,500/-**

(Not including water supply, grass seed collection and plantation)

Source:

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8. List of Birds: Ali, S. (2002). The Book of Indian Birds (13th Revised Edition). Oxford University Press, New Delhi, 326pp.
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11. List of Reptiles: Aengals, R., Sathish Kumar, V.M., Palot, M.J. & Ganesh, S.R. (2018). A Checklist of Reptiles of India. 35 pp. Version 3.0. Online publication is available at www.zsi.gov.in (Last update: May 2018)

3.10 Socio Economic Aspects

A socio-economic study was undertaken in assessing aspects which are dealing with social and cultural conditions, and economic status in the study area. The study provides information such as demographic structure, population dynamics, infrastructure resources, and the status of human health and economic attributes like employment, per-capita income, agriculture, trade, and industrial development in the study area. The study of these characteristic helps in identification, prediction and evaluation of impacts on socio-economic and parameters of human interest due to proposed project developments. The parameters are:

- Demographic structure
- Infrastructure Facility
- Economic Status
- Health status
- Cultural attributes
- Awareness and opinion of people about the project and Industries in the area.

The following **Table 3-24** provides the certain important social indicators of Thiruvallur district in Tamil Nadu.

Table 3-24 Social Indicators

S.No	Social Indicators	Dharmapuri District	Unit
1	Decadal growth rate	16.34	%
2	Urban population	17.3	%
3	Sex ratio	946	-
4	0-6 age group	10.02	%
5	Population density	335	Persons per square Km
6	Scheduled caste population	16.30	%
7	Scheduled tribe population	4.18	%
8	Literacy rate	68.50	%
9	Work Participation rate	49.9	%
10	Main Workers	86.90	%
11	Marginal Workers	13.10	%
12	Cultivators	26.80	%
13	Agricultural labourers	35.59	%
14	Workers in household industries	2.04	%
15	Other workers	35.57	%

Source: https://censusindia.gov.in/nada/index.php/catalog/1146

Ref: Census of India 2011 - Series 34 - District Census Handbook Tamil Nadu, Part A –Dharmapuri

3.10.1 *Population and Household Size*

Dharmapuri district having a population of 1506843 consists of 774303 male populations and 732540 female populations.

Source: https://censusindia.gov.in/nada/index.php/catalog/1146

Ref: Census of India 2011 - Series 34 - District Census Handbook Tamil Nadu, Part A –Dharmapuri

3.10.2 *Sex Ratio*

As per 2011 Census the sex ratio was 946 for every 1,000 males, lower when compared to the State Sex Ratio of 996 in Dharmapuri district.

Source: https://censusindia.gov.in/nada/index.php/catalog/1146

Ref: Census of India 2011 - Series 34 - District Census Handbook Tamil Nadu, Part A –Dharmapuri

3.10.3 *Scheduled Caste (SC)*

Dharmapuri has a population of 245392 persons belonging to Scheduled Castes which represents 16.30% of the total population of the district.

Source: https://censusindia.gov.in/nada/index.php/catalog/1146

Ref: Census of India 2011 - Series 34 - District Census Handbook Tamil Nadu, Part A –Dharmapuri

3.10.4 *Education & Literacy*

The study of the education and literacy profile in the region is relevant in order to have an understanding whether the proposed project can utilize skilled human resources available within the area. According to 2011 census data, the literacy rate in the Dharmapuri district is **68.50%.**The literacy rate has been the major determinant of the rise or fall of the other indicators. The accessibility of Primary and Upper Primary education has increased the literacy rate as well as reducing the dropout rate is given in **Table 3-25**. Show the details of education infrastructures in Dharmapuri District.

Table 3-25 Education Infrastructures in Dharmapuri district

Type of school	Total schools		Rural Schools		Unit
	Government	Private	Government	Private	
Primary	829	117	783	90	No's
Primary + Upper Primary	328	13	316	13	No's
P + UP+ Secondary + Higher Secondary	5	48	3	48	No's
UP only	4	1	2	1	No's
UP + Secondary + Higher Secondary	95	10	75	9	No's
P + UP + Secondary	3	24	3	20	No's
UP + Secondary	119	10	115	9	No's

Source:*http://udise.in/Downloads/Publications/Documents/District_Report_Cards-2016-17-Vol-II.pdf))*

3.10.5 *Health Facilities*

Primary Health Centers (PHCs) and Sub-centers (SCs) are providing the preventive, curative and rehabilitative health care services to the rural people. The district has good number of public health systems accessible and affordable apart from the private health facilities. The Health Facilities given in Dharmapuri district is given in **Table 3-26.**

Table 3-26 Socio Economic Analysis: Health care

Name of the District	Type of Facility	Facilities Unit: Numbers
Dharmapuri	SC	218
	PHC	43
	CHC	8
	SDH	3
	DH	1
	Total	**273**

*(**Note:** SC – Sub Center; PHC – Primary Health Center; CHC – Community Health Center; SDH – Sub District Hospital; DH – District Hospital)*
*(**Source:** National Health Mission)*

3.10.6 *Economic Activity & Livelihood Pattern*

In Dharmapuri district, as per the Census 2011, there were a total of 751170 workers, comprising 201328 cultivators, 267345 agricultural labourers, 15341 household Industry workers and 267156 other workers.

***Source**:* https://censusindia.gov.in/nada/index.php/catalog/1146

Ref: Census of India 2011 - Series 34 - District Census Handbook Tamil Nadu, Part A –Dharmapuri

3.10.7 *Social Economic Profile of the study area*

The villages and towns covering 10 km radius from the boundary of the project site is taken for the study. **Table 3.27** shows the list of locations which comes under the study area.

Table 3-27 Population profile within the study area

Sl. No	Name	Households	Total Population	Male	Female	Children below 6	Scheduled Caste	Scheduled Tribe
0 -1 km								
DHARMAPURI DT PENNAGARAM TALUK								
1.	Ajjanahalli	2609	10481	5774	4707	1336	986	159
	Sub – Total -1	**2609**	**10481**	**5774**	**4707**	**1336**	**986**	**159**
1 - 5 km								
DHARMAPURI DT PENNAGARAM TALUK								
2.	Sunchalnatham	2337	9548	5088	4460	1120	1300	232
	Sub – Total -2	**2337**	**9548**	**5088**	**4460**	**1120**	**1300**	**232**
5-10km								
DHARMAPURI DT PENNAGARAM TALUK								
3.	Senganur	1341	5603	2944	2659	682	674	708
4.	Kodihalli	820	3404	1803	1601	399	491	534
5.	Koothapadi	3106	12859	6811	6048	1493	1959	961
6.	Kukuttamaruthahalli	825	3456	1835	1621	358	666	87
7.	Donnakuttahalli	1922	7760	4138	3622	950	1463	10
8.	Ramakondahalli	1786	6635	3548	3087	812	782	10
9.	Pennagaram (TP)	4252	17480	8980	8500	1994	2802	661
	Sub – Total -3	**14052**	**57197**	**30059**	**27138**	**6688**	**8837**	**2971**
	Grand Total	**18998**	**77226**	**40921**	**36305**	**9144**	**11123**	**3362**

(Source: Census 2011)

3.10.8 *Employment and Livelihood within study area*

Majority of population in the study area comes under other working categories. As agriculture cannot be a main sustenance for most of farmers, they have dual professions. Farming is mostly seasonal, they involve in other livelihood activities like business, non-agriculture labour, agriculture labour and other service sectors. Fragmentation of landholding leads to adopt to have additional occupation. Summaries of employment and livelihood within the study are given in **Table 3-28.**

Table 3-28 Summaries of Employment and Livelihood within the study area

Sl. No	Name	Total Workers	Main Workers	Marginal Workers	Agriculture Workers				Household Industry Workers		Other Workers	
					Cultivators		Agri. Labourers					
					Main	Marginal	Main	Marginal	Main	Marginal	Main	Marginal
0 -1 km												
DHARMAPURI DT PENNAGARAM TALUK												
1)	Ajjanahalli	5110	4729	381	1421	9	1774	106	15	15	1519	251
Sub – Total -1		**5110**	**4729**	**381**	**1421**	**9**	**1774**	**106**	**15**	**15**	**1519**	**251**
1 - 5 km												
DHARMAPURI DT PENNAGARAM TALUK												
2)	Sunchalnatham	4387	3621	766	717	201	1241	397	82	7	1581	161
Sub – Total -2		**4387**	**3621**	**766**	**717**	**201**	**1241**	**397**	**82**	**7**	**1581**	**161**
5-10km												
DHARMAPURI DT PENNAGARAM TALUK												
3)	Senganur	1665	2398	359	818	15	820	280	23	7	737	57
4)	Kodihalli	1052	1595	74	676	6	252	34	31	0	636	34
5)	Koothapadi	3998	5055	1148	1087	70	1437	319	81	12	2450	747
6)	Kukuttamaruthahalli	1051	1694	235	790	24	543	98	11	4	350	109
7)	Donnakuttahalli	2457	3819	353	1989	16	1124	175	35	6	671	156
8)	Ramakondahalli	2088	2510	563	746	42	774	173	16	6	974	342
9)	Pennagaram (TP)	5159	7025	657	618	45	1432	130	676	68	4299	414
Sub – Total -3		**17470**	**24096**	**3389**	**6724**	**218**	**6382**	**1209**	**873**	**103**	**10117**	**1859**
Grand Total		**26967**	**32446**	**4536**	**8862**	**428**	**9397**	**1712**	**970**	**125**	**13217**	**2271**

*(**Source:** Census 2011)*

3.10.9 Educational Infrastructure within study area

The district has good primary , middle and secondary education infrastructure in urban and rural areas. The people around the study area have well connected to educational infrastructures. The educational facilities in the study area are summarized in below table.

Table 3-29 Details of Education facilities within study area

S. No	Type of School	0-1 km	1-5 km	5-10 km	0-10 km	Units
1	Government Pre-Primary school	5	3	22	30	No's
2	Private Pre-Primary school	0	0	1	1	No's
3	Government Primary school	8	6	29	43	No's
4	Private Primary school	0	0	1	1	No's
5	Government Middle school	5	3	22	30	No's
6	Private Middle school	0	0	1	1	No's
7	Government Secondary school	1	1	9	11	No's
8	Private Secondary school	0	0	1	1	No's
9	Government Senior Secondary school	0	1	2	3	No's
10	Private Senior Secondary school	0	0	0	0	No's

*(**Source:** Census 2011)*

The following **Table 3-32** shows the literates population and the percentage within the study area

Table 3-30 Literates population and the percentage within the study area

Sl. No	Name	Total Population	Literates Population	Literates Population Male	Literates Population Female	% Literates	Illiterates Population	Illiterates Population Male	Illiterates Population Female	% Illiterates
0 -1 km										
DHARMAPURI DT PENNAGARAM TALUK										
1.	Ajjanahalli	10481	5688	3573	2115	54.27	4793	2201	2592	45.73
Sub – Total -1		**10481**	**5688**	**3573**	**2115**	**54.27**	**4793**	**2201**	**2592**	**45.73**
1 - 5 km										
DHARMAPURI DT PENNAGARAM TALUK										
2.	Sunchalnatham	9548	5383	3248	2135	56.38	4165	1840	2325	43.62
Sub – Total -2		**9548**	**5383**	**3248**	**2135**	**56.38**	**4165**	**1840**	**2325**	**43.62**
5-10km										
DHARMAPURI DT PENNAGARAM TALUK										
3.	Senganur	5603	3199	1892	1307	57.09	2404	1052	1352	42.91
4.	Kodihalli	3404	1863	1102	761	54.73	1541	701	840	45.27
5.	Koothapadi	12859	7389	4372	3017	57.46	5470	2439	3031	42.54
6.	Kukuttamaruthahalli	3456	1802	1068	734	52.14	1654	767	887	47.86
7.	Donnakuttahalli	7760	3816	2325	1491	49.18	3944	1813	2131	50.82
8.	Ramakondahalli	6635	3522	2192	1330	53.08	3113	1356	1757	46.92
9.	Pennagaram (TP)	17480	11416	6385	5031	65.31	6064	2595	3469	34.69
Sub – Total -3		**57197**	**33007**	**19336**	**13671**	**55.57**	**24190**	**10723**	**13467**	**44.43**
Grand Total		**77226**	**44078**	**26157**	**17921**	**55.52**	**33148**	**14764**	**18384**	**44.48**

(Source: Census 2011)

3.10.9.1 Health facility within the study area

The majority of people visit nearby Hospitals/health services provided by the Government. The area has got good public health facilities at easily reachable distances. There was no major health issues reported in our survey. Even for any minor ailments they contact medical facilities immediately as it is very accessible to them. The local transport facilities and the communication facilities are the main reasons to get immediate medical attention. The incidents of institutional delivery are high due to awareness, education, economic development, proximity to health delivery system. The Infant mortality rate and the maternal mortality rate have significantly reduced. The health facilities within the study area are given in below table.

Table 3-31 Health facility within the study area

Sl.No	Type	0-1 km	1-5 km	5-10 km	0-10 km	Units
1	Community health centre	0	1	0	1	No's
2	Primary health centre	2	1	2	5	No's
3	Primary health sub-centre	1	1	13	15	No's
4	Maternity and Child Welfare Centre	2	1	4	7	No's
5	TB hospital/Clinic	2	1	3	6	No's
6	Hospital Allopathic	0	0	1	1	No's
7	Hospital Alternative Medicine	0	0	1	1	No's
8	Dispensary Health Centre	2	1	3	6	No's
9	Veterinary hospital	0	1	1	2	No's
10	Mobile health clinic	0	0	1	1	No's
11	Family Welfare Centre	2	1	3	6	No's
12	Non-Government Medical facilities Out Patient	2	0	5	7	No's

(Source: Census 2011)

3.10.10 Summary

The Socioeconomic profile of the study area shows that the majority of people in the study area work in non-agricultural sector, however in rural area majority of the people in the rural area depends on agricultural sector. They have good educational infrastructures and the people in the study area are well connected to the educational infrastructures. The average literacy rate of the study area is 57.08%. The people in the study area are well connected to Government primary health centres and Primary health sub-centres shows the socio-economic indicators within the study area given in below table..

Table 3-32 Summaries of Socio-economic indicators within the study area

S.No	Particulars	0-1 km	1-5 km	5-10 km	0-10 km	Unit
1.	Number of villages in the Study Area	1	1	7	9	Nos.
2.	Total Households	2609	2337	14052	18998	Nos.
3.	Total Population	10481	9548	57197	77226	Nos.
4.	Children Population (<6 Years Old)	1336	1120	6688	9144	Nos.
5.	SC Population	986	1300	8837	11123	Nos.

6.	ST Population	159	232	2971	3362	Nos.
7.	Total Working Population	5110	4387	17470	26967	Nos.
8.	Main Workers	4729	3621	24096	32446	Nos.
9.	Marginal Workers	381	766	3389	4536	Nos.
10.	Cultivators	1430	918	6942	9290	Nos.
11.	Agricultural labours	1880	1638	7591	11109	Nos.
12.	Household Industries	30	89	976	1095	Nos.
13.	Other Workers	1770	1742	11976	15488	Nos.
14.	Literates	5688	5383	33007	44078	Nos.
15.	Illiterates	4793	4165	24190	33148	Nos
16.	Literates	54.27	56.38	57.71	57.08	%
17.	Illiterates	45.73	43.62	42.29	42.92	%

4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 Details of Investigated Environmental impacts due to project location, possible accidents, project design, project construction, regular operations, final decommissioning or rehabilitation of a completed project

The impacts due to mining operation and its mitigation measures adopted are detailed in this chapter. The opencast mining operations involve development of benches, approach roads, haul roads, blasting, excavation and handling & transportation of materials operations cause environmental problems such as degradation of land, air, water, soil, also affecting the biological and socio-economic environment of the study area. So adequate control measures will be implemented to mitigate the adverse environmental impacts caused due to mining operation. Various environmental impacts, which have been identified due to the mining operation of the proposed project, are discussed in the following sections. The environmental parameters most commonly affected by mining activities are:

- Land Environment
- Air Environment
- Noise Environment
- Water Environment
- Biological Environment
- Socio-Economic Environment

4.2 Impact of Land Environment

Potential impacts envisaged due to mining operations on land environment are

- The topsoil and bushes observed in the hill slides over the dyke will be removed completely. Hence the top hill ridge will be excavated which will interrupt the aesthetic view of the locality.
- The proposed quarrying operation will alters the hill lock slope and natural drainage pattern.
- Due to the proposed mining activity a pit will be created over the hill lock and left open with the approximate dimension as follows.

Table 4-1 Ultimate Pit Dimension

S. No	Description	Ultimate Pit Dimensions (m)		
		Length	Average Width	Depth
1	Top	734	65	30m
2	Bottom	529	23.17	

- The granite waste to be generated during the five years of mining plan period will be around 62,464m^3. These wastes are proposed to be dumped on the Southern side of lease area.
- Usage of chemicals like Rock Breaking Powder ($Ca(OH)_2$ for secondary blasting, fuel and lubricants used for machineries will affect the soil quality and fertility.
- Generation of hazardous and non-hazardous wastages.
- Creation of infrastructure facilities like office building, rest shelter, first-aid centre, toilets and other service facilities.

4.3 Impact on Air Environment

The major sources of air pollution due to mining operations are DG sets, Machineries and Vehicular transportation. The activities causing air pollution due to the mining operations will be excavation, drilling, blasting and transportation. The sources of air emission are given below in **Table 4-2.**

Table 4-2 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, NOx, CO

Impacts

- Due to mining activity, Air pollution will cause respiratory problems.
- Air pollution will affect nearby ecosystems, vegetation, livestock habitats and water sources.

4.2.1 Meteorological Data

The meteorological data for three months, i.e. from **March 2024 to May 2024**was considered for the study. Data included for AERMET were daily wind speed, wind direction, temperature, relative humidity, air pressure, precipitation, and solar radiation recorded during the period. AERMET reformats meteorological data so that it can be used as input for AERMOD model. Meteorology consideredformodeling is shown below.

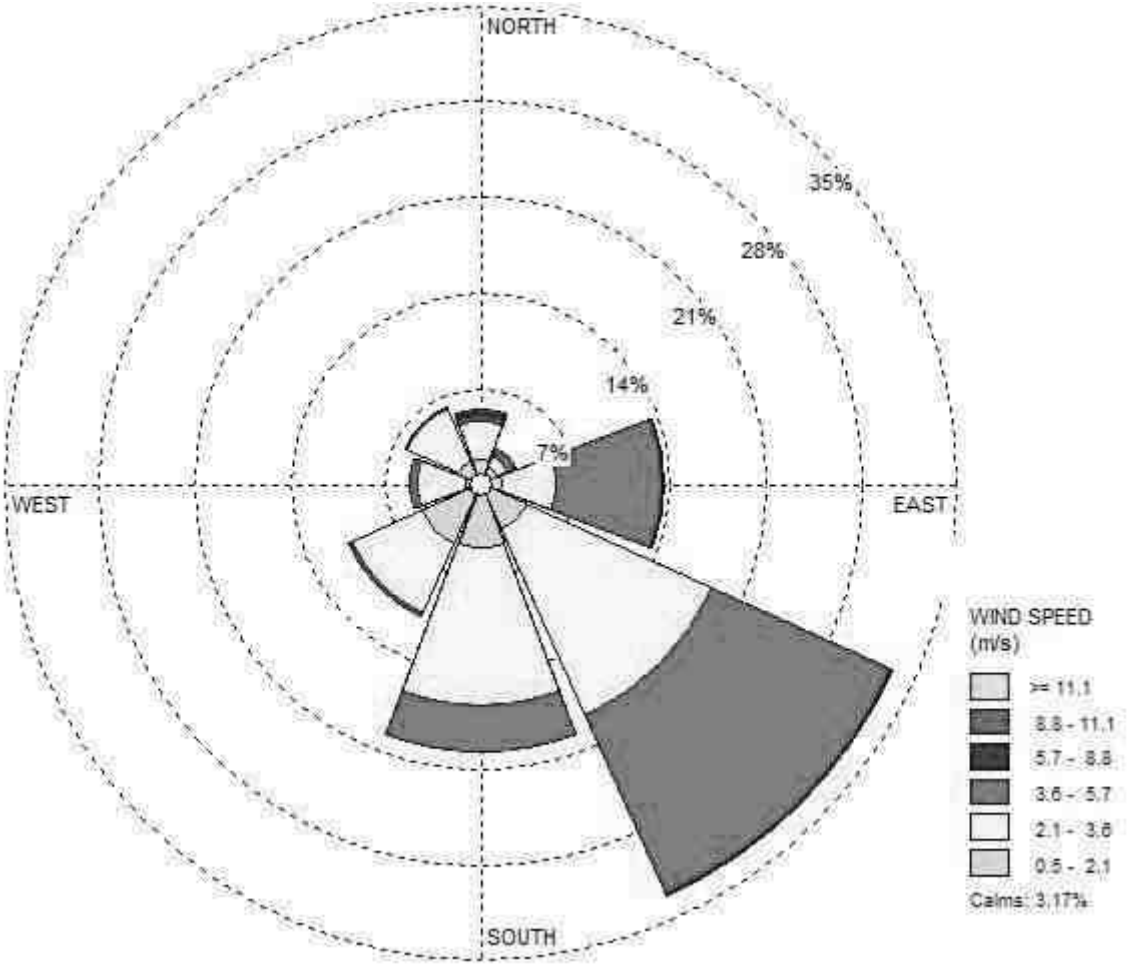

Figure 4-1 Wind Rose Diagram Considered for Dispersion Modeling(March 2024 to May 2024)

4.1.1.1 AERMET Process

For the 3 phase AERMET processing of the meteorological data, specifications of the land use in the area are required to determine the terrain roughness for modeling. The land use was characterized for in and around the site. The surface characteristics for the site and surroundings were selected and used to calculate the Albedo, Bowen ratio and surface roughness parameter.The meteorological data were processed in the AERMET software to generate wind flow pattern & to generate surface meteorological data and profile meteorological data in a prescribed format that can be fed to AERMOD for modeling.

4.1.1.2 AERMOD Process

AERMOD Software Version 8.0.5 was used for air dispersion modeling and is applicable to a wide range of buoyant or neutrally buoyant emissions up to a range of 50 km. In addition to more straight forward cases, AERMOD is also suitable for complex terrain and urban dispersion scenarios.

AERMOD is a steady-state plume model. In the Stable Boundary Layer (SBL), it assumes the concentration distribution to be Gaussian in both the vertical and horizontal. In the Convective Boundary Layer (CBL), the horizontal distribution is also assumed to be Gaussian, but the vertical

distribution is described with a bi-Gaussian probability density function (pdf). This behavior of the concentration distributions in the CBL was demonstrated by Willis and Deardorff (1981) and Briggs (1993). Additionally, in the CBL, AERMOD treats "plume lofting," whereby a portion of plume mass, released from a buoyant source, rises to and remains near the top of the boundary layer before becoming mixed into the CBL. AERMOD also tracks any plume mass that penetrates into the elevated stable layer, and then allows it to re-enter the boundary layer when and if appropriate. For sources in both the CBL and the SBL, AERMOD treats the enhancement of lateral dispersion resulting from plume meander. The emissions mainly generated from the mining activities are Blasting, Drilling, Scrapping, Excavation, Loading, Unloading, and transportation etc. Machinery like compressors and jack hammers are used for Drilling are estimated and used as inputs for the air dispersion modeling as shown in**Table 4.5 to Table 4.7.**

Maximum incremental value for SO_2, NO_x and PM are shown in **Figure 4.2 to Figure 4.6** and Top 10 highest Ground Level Concentration (GLC) obtained from modeling are given in **Table 4.10 to Table 4.14** respectively.

4.1.1.3 Emission Calculations

Each mining activity is a source of emission and the estimation of emissions depends on parameters such as meteorological, topographic conditions and material characteristics. It is necessary to calculate the qty of emissions for work or a source on site to the atmosphere. The following emission formulas are used to calculate the emission rate for the different emission source.

Table 4-3 Overview of the Source Parameters

S. NO	Description	Symbol	Quantity
1	Moisture Content (%)	m	1.64
2	Silt Content (%)	s	6
3	Production / Day (Tonn/Day)		12.723
4	Waste Dumping Area (Sq.Km)	a	0.0161
5	Open Pit Area (Sq.Km)	Aa	0.0149

Source:

Emission Estimation Technique Manual for Mining and Processing of Non-Metallic Minerals by NPI, Nov 1999

Determination of the emission rate from various opencast mining operations, S. K. CHAULYA∗, M. K. CHAKRABORTY, et. Al. *Water, Air, and Soil Pollution 140: 21–55, 2002.*

Chaulya, S., 2006. Emission rate formulae for surface iron mining activities. *Environmental Modeling Assessment,* Issue 11, pp. 361-370.

EPA. August, 2004. Section 11.19.2, Crushed Stone Processing and Pulverized Mineral Processing. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.

4.1.1.4 Emission dispersion models

Each mining activity is a source of emission and the estimation of emissions depends on parameters such as meteorological, topographic conditions and material characteristics.

Table 4-4 Emission from Mining Equipment's

Source	Fuel used	Stack Details					Emissions (g/s)		
		No of Stack	Height (m) AGL	Dia (m)	Temp (°C)	Exit Velocity (m/s)	PM_{10}	SO_X	NO_X
125 KVA DG	Diesel	1	3	0.3	180	10	5.81E-03	5.38E-03	8.16E-02

Table 4-5Vehicular Source Emission details

Source	Emission (g/s)	
	PM	NO_X
4 Wheeler (1 no.)	6.94E-05	6.94E-04
Heavy Duty Vehicles (2 no.)	1.11E-04	1.94E-02
Total	**1.81E-04**	**2.01E-02**

Table 4-6 Emissions considered for mining

Activities	PM Emission rate
Wet Drilling (g/s)	1.44E-06
Haulage (g/s)	5.31E-05
Waste Dumping (g/s)	1.49E-06
Open Pit (g/s.m2)	7.34E-07

Table 4-7 Emission input for modelling

Activities	PM	SO_2	NO_x
Line Source (Haul Road) (g/s)	4.40E-05	-	-
Area Source (Open Pit) (g/s.m^2)	3.05E-07	-	-
Area Source (Waste Dumping)(g/s)	2.46E-06	-	-
Point Source (DG) (g/s)	5.81E-03	5.38E-03	8.16E-02
Point Source (Drilling) (g/s)	2.67E-07	-	-
Line Source (Vehicle)(g/s)	1.81E-04	-	2.01E-02

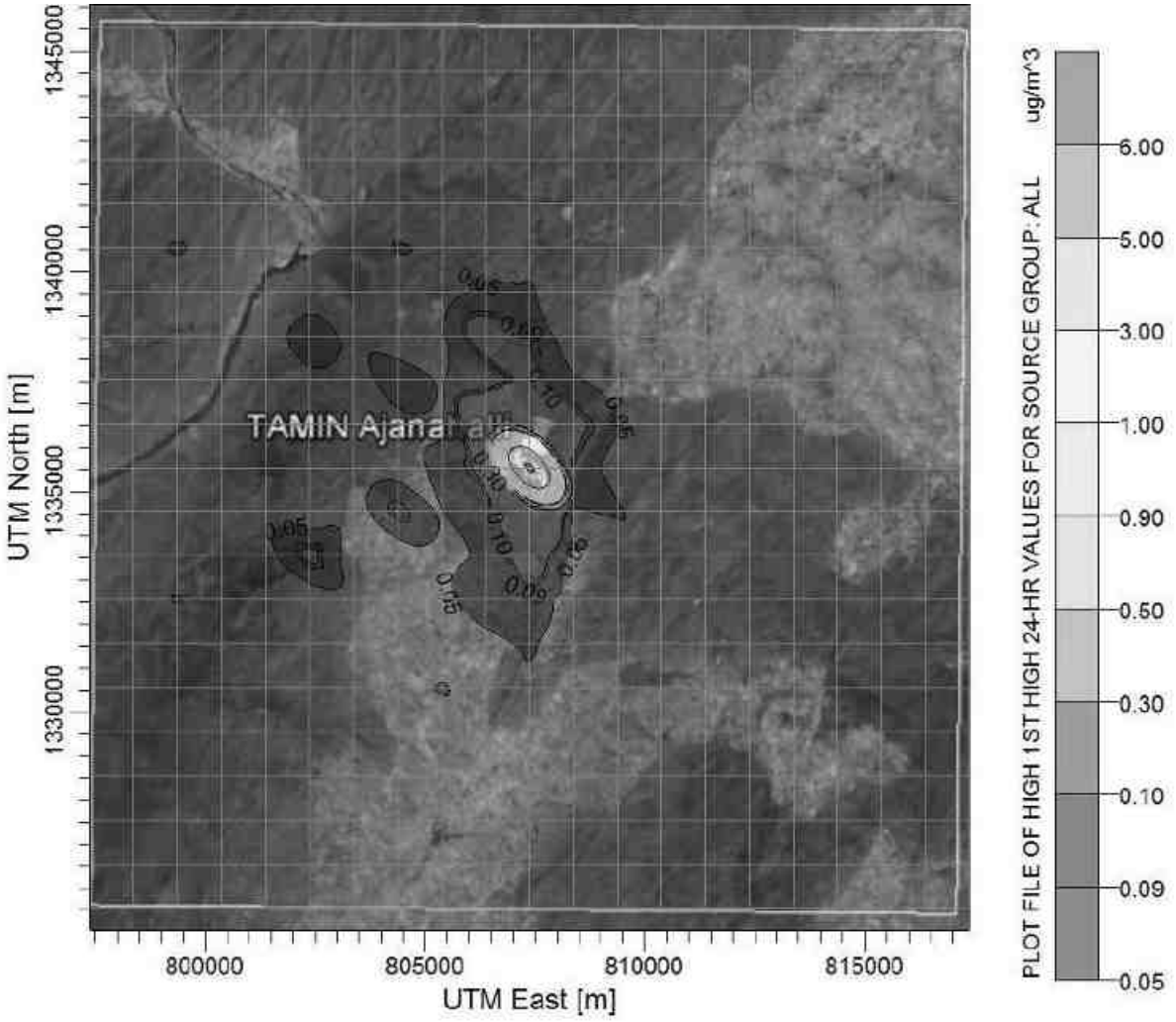

Figure 4-2 Predicted 24 Hrs GLC's of PM within 10km radius of the study area

Table 4-8 Predicted Top 10 Highest Concentrations Particulate Matter PM

S.No	UTM coordinates (m)		Conc. (µg/m^3)	Distance from Centre of the project (km)	Direction from project Centre
	E	N			
1.	807376.38	1335551.13	5.48635	Project Site	Project Site
2.	807376.38	1336551.13	0.26987	1.00	N
3.	806376.38	1335551.13	0.26762	1.00	W
4.	806376.38	1336551.13	0.1969	1.41	NW
5.	807376.38	1334551.13	0.14654	1.00	S
6.	807376.38	1337551.13	0.14593	2.00	N
7.	807376.38	1338551.13	0.12504	3.00	N
8.	804376.38	1340551.13	0.1209	5.83	NNW
9.	806376.38	1334551.13	0.11628	1.41	SW
10.	806376.38	1338551.13	0.11168	3.16	NNW

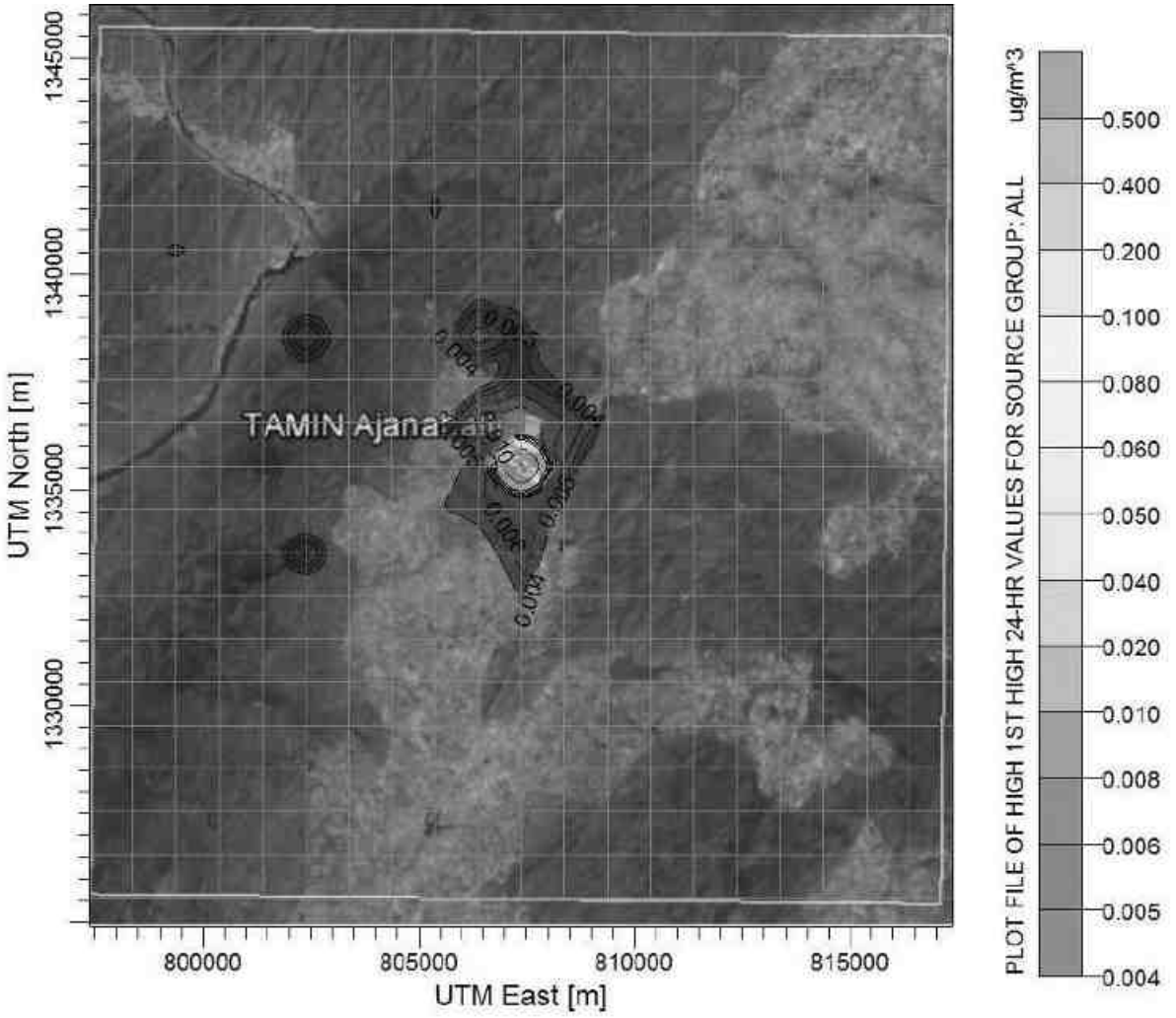

Figure 4-3Predicted 24-Hrs' GLC's of SO_2within 10 km Radius of the Study Area

Table 4-9 Predicted Top 10 Highest Concentrations of Sulphur Dioxide

S.NO	UTM coordinates (m)		Conc. (µg/m^3)	Distance from Centre of the project (km)	Direction from project Centre
	E	N			
1.	807376.38	1335551.13	0.41743	Project Site	Project Site
2.	806376.38	1336551.13	0.01268	1.41	NW
3.	806376.38	1335551.13	0.01102	1.00	W
4.	807376.38	1336551.13	0.00953	1.00	N
5.	806376.38	1338551.13	0.00864	3.16	NNW
6.	804376.38	1336551.13	0.00805	3.16	WNW
7.	807376.38	1337551.13	0.00799	2.00	N
8.	802376.38	1333551.13	0.00781	5.38	WSW
9.	802376.38	1338551.13	0.00626	5.83	WNW
10.	805376.38	1335551.13	0.00575	2.00	W

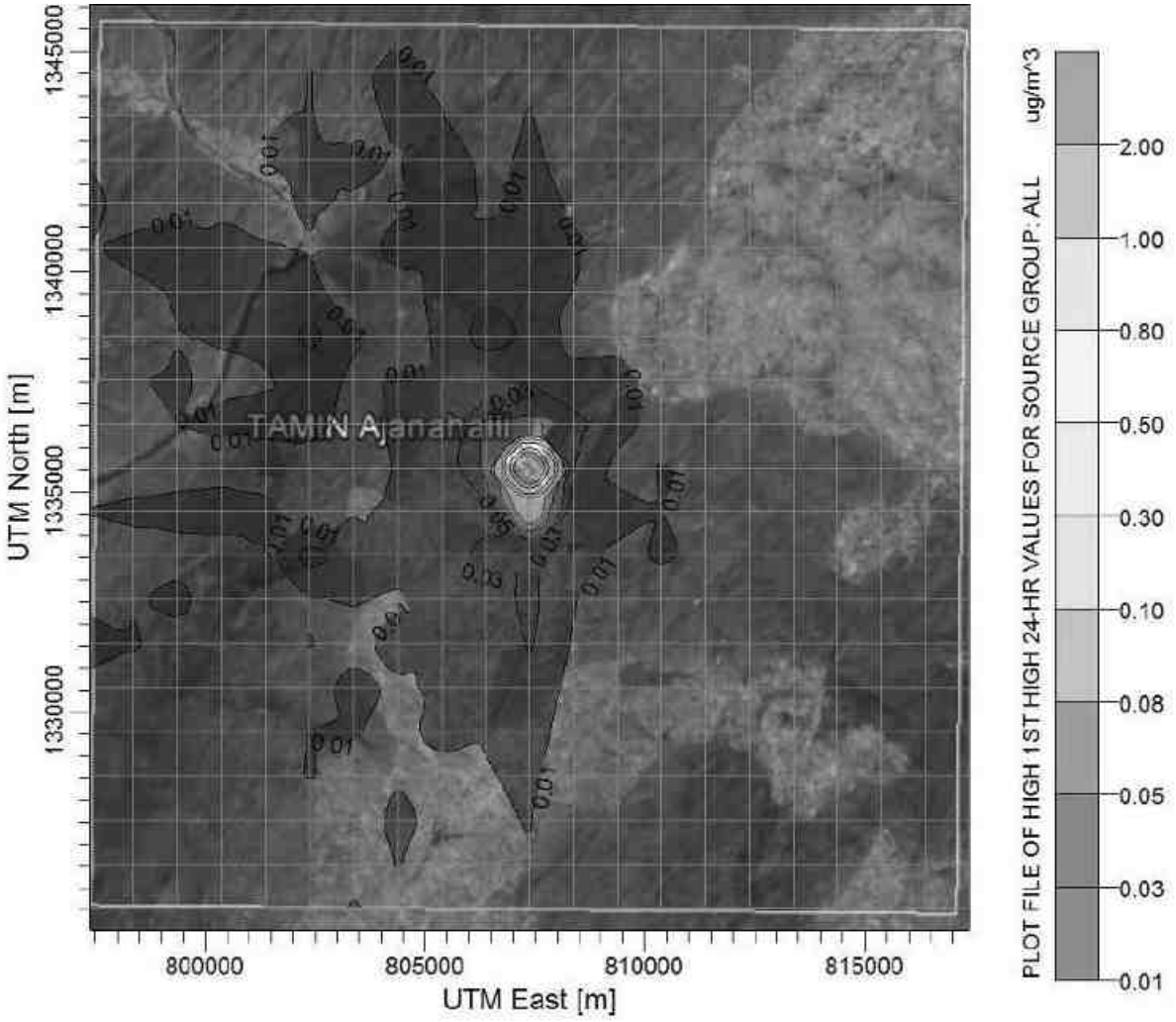

Figure 4-4 Predicted 24-Hrs' GLC's of NO_X within 10 km Radius of the Study Area

Table 4-10 Predicted Top 10 Highest Concentrations Nitrogen Oxide

S.NO	UTM coordinates (m)		Conc. (µg/m^3)	Distance from Centre of the project (km)	Direction from project Centre
	E	N			
1.	807376.38	1335551.13	1.87779	Project Site	Project Site
2.	807376.38	1334551.13	0.13946	1.00	S
3.	806376.38	1336551.13	0.05662	1.41	NW
4.	806376.38	1335551.13	0.05565	1.00	W
5.	807376.38	1336551.13	0.05428	1.00	N
6.	807376.38	1333551.13	0.04566	2.00	S
7.	805376.38	1339551.13	0.0407	4.47	NNW
8.	806376.38	1338551.13	0.0393	3.16	NNW
9.	804376.38	1336551.13	0.03822	3.16	WNW
10.	806376.38	1334551.13	0.03702	1.41	SW

4.1.2 Conclusion

The total increase in concentrations above baseline status to estimate the percentage increase is summarized in the below **Table 4.11.**

Table 4-11 Total maximum GLCs from emissions

Pollutant	Max. Base Line Conc. ($\mu g/m^3$)	Estimated Incremental Conc. ($\mu g/m^3$)	Total Conc. ($\mu g/m^3$)	NAAQ standard
PM10	57.35	5.48	62.83	100
SO2	12.63	0.41	13.04	80
NOX	25.13	1.87	27.0	80

4.2 Impacts due to Carbon emission

The proposed Quarry has the potential to generate various GHG emissions, including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), fluorinated gases, water vapour, and ozone. These emissions can arise from different phases of quarrying operations, such as excavation, transportation, energy consumption, and land-use changes. A detailed study has been conducted to analyse and mitigating these emissions for minimizing environmental impact and promoting sustainable quarrying practices.

Impacts on Above and Below Soil Carbon Stock:

Above Soil Carbon Stock: Deforestation and soil disturbance reduce above ground carbon stocks by releasing stored carbon from vegetation into the atmosphere.

Below Soil Carbon Stock: Soil erosion and disturbance associated with quarrying activities lead to the loss of soil organic carbon, compromising soil fertility and ecosystem health.

Operating a granite quarry can have several impacts on increasing carbon emissions and contributing to temperature rise, primarily through direct and indirect mechanisms. The key impacts are identified as:

Table 4-12 Impact Due to Carbon Emission

S.No	Activity	Impacts /Consequences	Mitigation Measures
1	Operation of Heavy Machinery and Equipment – Direct Emissions	The continuous operation of such machinery results in the direct release of CO_2 into the atmosphere, contributing to increased carbon emissions.	Implementing energy- efficient technologies and practices, such as using low-emission equipment or transitioning to cleaner fuels, can help reduce direct emissions from machinery.
2	Energy-intensive processes, such as drilling, cutting, and transportation of	The combustion of fossil fuels releases CO_2 and other GHGs, contributing to indirect emissions associated with quarry operations.	Transitioning to renewable energy sources, such as solar can reduce indirect emissions associated with energy consumption in quarry operations.

3	Land-Use Changes and Deforestation:	Deforestation results in the release of carbon stored in trees and soil into the atmosphere, thereby contributing to increased carbon emissions. Additionally, the loss of vegetative cover reduces the area's capacity to sequester carbon through photosynthesis.	Plantation in and around the quarry area can help offset carbon emissions and restore ecosystem functions.
4	Soil Disturbance, Excavation and Carbon Loss	Soil disturbance disrupts the natural carbon cycle by accelerating the decomposition of organic matter, releasing carbon dioxide into the atmosphere. Moreover, soil erosion reduces the soil's ability to retain carbon, further exacerbating carbon loss.	Implementing sustainable land management practices, such as minimizing soil disturbance and erosion control measures, can help preserve soil and reduce carbon loss.
5	All Operations-Impacts on Microclimate and Temperature	Quarry operations can alter local microclimates and contribute to temperature rise in the surrounding areas. Removal of vegetation and exposure of bare rock surfaces can increase surface temperatures through the absorption and retention of solar radiation. Additionally, the heat generated by machinery and equipment, as	Plantation in and around the quarry area can mitigate temperature rise and restore ecosystem balance.

4.4 Impact on climate change, temperature rise, pollution

The proposed quarry will have various impacts on climate change, temperature rise, pollution, and carbon stocks, both above and below the soil. A detailed study has been conducted the results are given below.

Table 4-13 Climate Change and Temperature Rise

Sl.No	Activity	Impacts /Consequences	Mitigation Measures
1	Operation of Heavy Machinery and Equipment – Direct Emissions	Quarrying activities involving machinery, diesel vehicles, and energy consumption emit greenhouse gases (GHGs) such as carbon dioxide (CO_2) and methane (CH_4), contributing to climate change. Carbon emissions.	Adopt energy-efficient technologies and practices to reduce energy consumption and associated GHG emissions in quarry operations. Transition to renewable energy sources such as solar power to power quarry operations, minimizing reliance on fossil fuels. The other mitigation measures given in the previous point.
2	Deforestation	Clearing vegetation for quarry operations releases stored carbon into the atmosphere, leading to reduced carbon sequestration capacity and contributing to climate change.	Greenbelt development will restore vegetation cover and sequester carbon, offsetting emissions from deforestation and land-use changes. Restore degraded areas within and around the quarry site to enhance carbon sequestration and biodiversity conservation.
3	Alteration of land cover and soil composition	Alteration of land cover and soil composition can disrupt local microclimates, affecting temperature, humidity, and precipitation patterns in the surrounding area.	Implement soil conservation measures such as erosion control, reclamation and soil stabilization to preserve soil carbon and maintain ecosystem integrity. Minimize soil

			disturbance during quarry operations to reduce carbon loss from soils and prevent erosion.

4.3 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 traffic study has been conducted in the Major District Road MDR 654 - Pennagaram – Nagamarai villages located 0.81km away from the project site in which is located in East direction. The traffic study was conducted for 1 hour in Peak hour of observation day. The vehicular movement for the proposed project is given in **Table 4-14.**

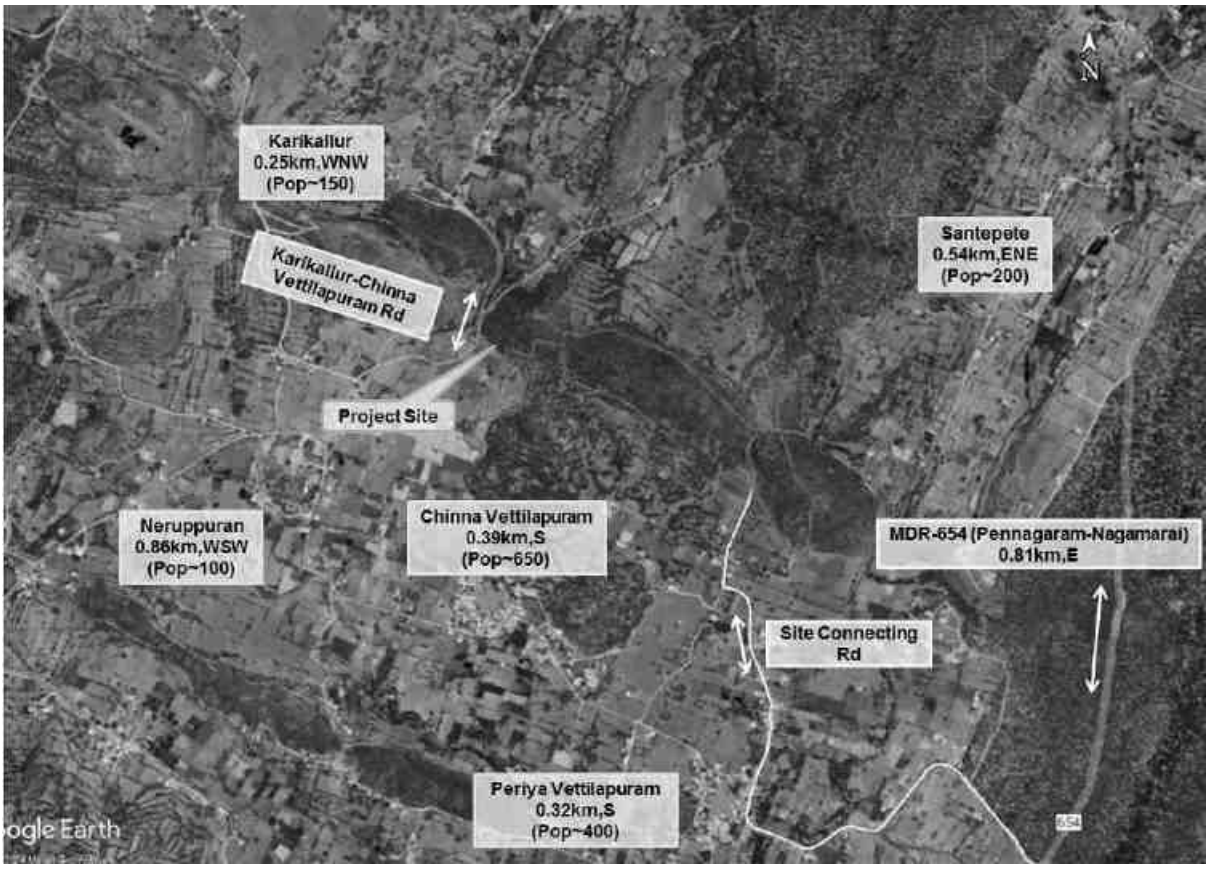

Figure 4-5 Site Connectivity

Table 4-14 Existing & proposed vehicular movement per Hour (Peak Hour) Major District Road MDR 654 - Pennagaram – Nagamarai

S. N	Type of Vehicle	Existing	Existing PCU	Proposed	Proposed PCU	Total vehicles after project	PCU Facto	Total PCU after project

o		vehicles		vehicles		implementation	rs IRC (SP 41)	implementation
1	2 wheelers	285	214	0	0	285	0.75	214
2	3 wheelers	104	208	0	0	104	2	208
3	4 wheelers/ cars	35	35	0	0	35	1	35
4	Trucks/ Bus/HCV	13	29	4	15	17	2.2	37
5	Agricultural tractor	6	24	0	0	6	4	24
6	Light emission vehicle-LCV	236	472	0	0	236	2.0	472
Total		**679**	**981**	**4**	**15**	**683**	**-**	**990**

Table 4-15 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	679	981	6000	0.26	"A"	Free Flow Traffic
After implementation	689	999	6000	0.17	"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.

4.4 Impact on Water Environment

Impacts envisaged due to wastewater generation during mining operations are

- There is an Odai running within the site. The mine surface runoff along with the chemicals, lubricants and granite particle sediments may enter into the canal which will affect the water quality.
- Explosive blasting in a mine can cause groundwater to seep to lower depths or connect aquifers, exposing them to contamination by toxic heavy metals.
- Runoff from mining wastewater can devastate surrounding vegetation..

4.4.1 Rainwater Harvesting

Impacts

Impacts envisaged due to rainwater on mining operations are

- Heavy rainfall can cause high water levels at a mining site, which can damage equipment and threaten worker safety.
- Rainwater can carry pollutants from a mining site into nearby water bodies; these pollutants can include heavy metals, acids, and other substances that can contaminate the water.
- When it rains, the loosened topsoil can be washed away, carrying sediments that pollute water bodies.

4.5 Impact of Noise

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

- Drilling
- Transportation vehicles
- Loading & unloading of minerals.
- Blasting

Impacts

- Due to mining activity, Noise pollution will cause hearing loss, cardiovascular problems, sleep disturbances, stress and anxiety to the workers.

4.5.1 Noise due to Mining Activity

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 4.16.**

Table 4-16Permissible 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

4.5.2 Impact of Vibration

Source

The main sources of vibration in the proposed mine are as follows:

- Drilling

- Blasting
- Loading & unloading of minerals.
- Transportation vehicles

Impacts

Due to mining activities, the following impacts of vibration are envisaged as follows:

- Structural damage to infrastructure facilities within the mine lease area.
- Ground Subsidence
- Vibrations cause human health impacts such as fatigue, muscle strain, joint pain, sleep disturbances, cardiovascular problems etc.

4.6 Impacts on Biological Environment

The impacts on biological environment is given in the below table.

Table 4-17 Impacts on Biodiversity

S. No	Activity	Examples of aspects	Examples of biodiversity impact
1	Extraction	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	Building power lines	Land clearing	Loss or fragmentation of habitat
7	Provision of accommodation	Land clearing, soil and water pollution, waste generation	Loss of habitat, sewage disposal and disease impacts
8	Access roads	Land clearing	Habitat loss or fragmentation, water logging upslope and drainage shadows down slope
9	Population growth	Land clearing or increased hunting	Loss of habitat or species, stress on local and regional resources, pest introduction, clearing
10	Water supply (potable or industrial)	Water abstraction or mine dewatering	Loss or changes in habitat or species composition

4.7 Impact on Agricultural, Forestry & Traditional Practices

We have observed some agricultural lands surrounding the proposed mine lease area. The major cultivation practices are

- Sorgum
- Millet
- Groundnut
- Coconut

The following livestock details near to the proposed mine lease area and within the study area are

Cattle:

1. Indigenous breeds:
    - Ongole
    - Kangeyam
    - Pulikulam
2. Crossbreed varieties:
    - Jersey
    - Holstein Friesian

Small Ruminants:

1. Sheep:
    - Mecheri
    - Vembur
    - Nali
2. Goats:
    - Tellicherry
    - Osmanabad

Poultry:

- Backyard poultry (desi birds)
- Commercial broilers
- Layers

Other Livestock:

- Buffalo (Murrah, Surti)
- Horses and Ponies
- Donkeys
- Rabbits
- Pigs

Mild impacts could occur around the mine pits and along transport route within a radius of 100m in the form of dust and air emissions. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly. No chances for any loss of biodiversity as there are no RET or schedule I species.

4.8 Hydrothermal Effect due to the Proposed Project

- Changes in groundwater flow and quality: Open-cast mining can alter groundwater flow patterns, leading to changes in water quality and potentially contaminating nearby water sources.
- Increased surface runoff: Removal of vegetation and soil can increase surface runoff, leading to erosion and sedimentation in nearby water bodies.
- Acid mine drainage (AMD): Exposure of sulfide-bearing rocks can lead to AMD, which can contaminate surface and groundwater with heavy metals and acidity.
- Mining operations can release heated water into nearby water bodies, altering aquatic ecosystems.

4.9 Geothermal Effects due to the Proposed Project

- Heat generation: Mining operations can generate heat through mechanical and chemical reactions, potentially altering local geothermal gradients.
- Subsidence and land deformation: Open-cast mining can lead to subsidence and land deformation, affecting local heat transfer and groundwater flow.
- Geochemical changes: Mining can alter geochemical reactions, potentially releasing greenhouse gases (e.g., CO2, CH4) and affecting local geothermal conditions.
- Thermal impact on ecosystems: Changes in soil temperature and moisture can impact local ecosystems, potentially altering plant and animal distributions.

4.10 Impact on Sediment Geochemistry in the Surface streams

- Acid Mine Drainage (AMD): Mining can expose sulfide-bearing rocks, leading to AMD, which can acidify surface streams and mobilize heavy metals.
- Increased turbidity: Mining-related sedimentation can increase stream turbidity, reducing light penetration and affecting aquatic plant growth.
- Changes in sediment grain size: Mining can alter the grain size distribution of sediments, potentially affecting stream morphology and aquatic habitats.
- Decreased nutrient availability: Mining can lead to decreased nutrient availability in streams, affecting aquatic productivity.
- Increased salinity: Mining can increase stream salinity due to the release of salts and minerals.
- Microbial community disruption: Mining can disrupt microbial communities in streams, affecting nutrient cycling and ecosystem function.
- Increased dissolved solids: Mining can increase dissolved solids, such as sulfate, chloride, and fluoride.
- Changes in redox conditions: Mining can alter redox conditions, affecting the speciation and mobility of metals.

4.11 Impacts on Occupational Health due to Project Operations

The following occupational health issues are observed due to mining operations.

- Exposure to chemicals
- Airborne hazards
- Dust
- Noise and vibration
- High temperatures and humidity
- Manual handling

4.12 Impact on Public Health due to proposed mining activity:

- Inhalation of dust and particulate matter can cause respiratory issues, such as asthma and chronic obstructive pulmonary disease (COPD).
- Exposure to carcinogenic substances like radon, arsenic, and heavy metals can increase cancer risk.
- Prolonged exposure to loud noises from mining activities can cause permanent hearing loss.
- Noise pollution can also contribute to stress, anxiety, and other mental health issues.

4.13 Impacts on Social Environment

The entire lease area of the project has no habitations or hutments, so no rehabilitation or resettlement problems are involved. By adopting various mitigation measures, the environmental scenario in respect of ambient air quality, water quality, Noise levels, water aspects, biological aspects etc. during the operation of the project will be maintained within the statutorily prescribed levels. As such, impact due to the projects will be positive on socio-economic aspects. It will be ensured that the buffer zone of the quarry will be properly preserved environmentally in all respects within sustainable limits through necessary monitoring. The project will be operated with care for minimizing environmental impacts with proper EMP measures for pollution control.

4.14 Impact on Sediment Geochemistry

- Implementation of sedimentation ponds and water treatment systems
- Monitoring of water and sediment quality
- Use of best management practices (BMPs) to minimize erosion and sedimentation

4.15 Land Degradation Control Measures

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 will be disposed through TNPCB authorized dealers.

- Dust suppression using water tankers.
- Greenbelt around infrastructure within the mine lease area and along the periphery of the mine lease area by using native plants.
- Proper fencing will be provided around the mine lease area.

4.16 Erosion Control Measures:

- Re-vegetation of unused areas to prevent erosion.
- Mulching or seeding of disturbed areas.
- Installation of sedimentation ponds and silt traps.
- Diversion of water flows to prevent erosion.
- Regular monitoring of water quality and sediment loads.
- Check dams or sedimentation basins.
- Riprap or rock armor to protect against water erosion.
- Gabions or wire mesh to stabilize slopes.
- Culverts and drainage systems.
- Terracing or benching to reduce slope length.
- Soil nailing or ground anchoring.

4.17 Air Environment Mitigation Measures

The mitigation measures due to the proposed mining activity for air environment is given below.

Table 4-18 Fugitive dust control in mine

S. No	Activities	Control Measures
1	Drilling	➢ Adopting wet drilling method ➢ Drilling machine should be provided with dust extractors
2	Blasting	➢ Use of control blasting technique ➢ Water spray before blasting ➢ Usage of Rock breaking powder($Ca(OH)_2$) ➢ Usage of Wire saw cutting method
3	Loading	➢ Water spray on granite material before loading
4	Transportation of material	➢ Covering of the trucks/dumpers to avoid spillage ➢ Water spray on the haul roads before and after transportation ➢ Maintenance of haul road ➢ Speed of vehicles will be limited upto 25km/hr ➢ Development of a green belt of suitable width on both sides of haul road

4.18 Mitigation measures to address these impacts may include development of Carbon Sinks

Carbon sinks are natural or artificial systems that absorb and store carbon dioxide (CO_2) from the atmosphere, helping to mitigate climate change by reducing the concentration of greenhouse gases. There are several options for carbon sinks, each with varying degrees of effectiveness and feasibility. Some common carbon sink options include:

- Implementing vegetation and afforestation programs to restore vegetative cover and sequester carbon.
- Adopting sustainable land management practices to minimize soil disturbance and erosion, thereby preserving soil carbon.
- Incorporating carbon offset projects, such as reforestation initiatives or carbon capture and storage (CCS) technologies, to offset emissions generated by quarry operations.
- Install renewable energy sources such as solar, in lieu of operating DGs, for non-quarrying operations.
- Expand afforestation (planting trees on lands that historically lacked forests) and reforestation (restoring degraded forests) efforts to enhance carbon sequestration and biodiversity conservation.
- Healthy soils have the capacity to store significant amounts of carbon in the form of organic matter. Implementing sustainable land management practices such as no-till agriculture, cover cropping, and agroforestry can enhance soil carbon sequestration and improve soil health, wherever possible.

4.19 Mitigation Measures of Climate Change & Temperature

- Implement vegetation and afforestation programs to restore vegetation cover and sequester carbon, offsetting emissions from deforestation and land-use changes.
- Adopt energy-efficient technologies and renewable energy sources like solar or wind power to reduce emissions from quarry operations and minimize environmental impact.
- Implement soil conservation measures such as erosion control, reclamation, and soil stabilization to preserve soil carbon and maintain ecosystem integrity.
- Install dust suppression systems, sedimentation ponds, and water treatment facilities to mitigate air and water pollution from quarrying activities.
- Implement habitat restoration and conservation measures to protect biodiversity and ecosystem services affected by quarry operations.
- Engage with local communities, stakeholders, and regulatory authorities to address concerns, promote transparency, and ensure sustainable quarrying practices.

By implementing these mitigation measures, it is possible to minimize the environmental impacts of the proposed quarry, reduce carbon emissions, preserve ecosystem health, and promote sustainable development in the region.

4.20 Mitigation Measures for Impacts due to Transportation

Proper mitigation measures are practiced during mining activities to control air pollution are as follows:

- Covering of the trucks/dumpers to avoid spillage
- Water spray on the haul roads before and after transportation
- Maintenance of haul road
- Speed control on vehicles
- Development of a green belt of suitable width on both sides of haul roads.

4.21 Water Environment Mitigation Measures

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.
- Construction of baffle wall or trenches nearby water bodies to prevent runoff water from mines.
- The dumping will be provided with slopes and covered with grasses, shrubs, etc to prevent erosion.

Ground Water Pollution Control Measures

- The domestic sewage of 1.2 KLD will be disposed through septic tank followed by soak pit.
- Regular monitoring of water levels and quality in the existing open wells and bore well in the vicinity will be carried out.

4.22 Rain Water Harvesting

Mitigation Measures

- Construct barriers at suitable intervals along the path of the drains to restrict the flow of water.
- Construction of baffle wall or trenches nearby water bodies to prevent runoff water from mines.
- Provide necessary overflow arrangement to maintain the natural drainage system.
- 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 and for dust suppression purpose.

4.23 Noise Environment Mitigation Measures

The following mitigation measures should be taken to control noise pollution:

- Controlled blasting with proper spacing, burden and stemming will be maintained, to reduce noise emission.
- 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 vehicle drivers shall be avoided.

- Minimum quantity of detonating fuse will be consumed by using alternatively excel non-electrical initiation system.
- Provision of sound insulated chambers for the workers deployed on machines.
- A thick green belt will be provided in phased manner around the periphery of the mine and on both sides of haul roads to attenuate noise.
- Usage of NONEL Blasting (Non-Electric Detonator).
- Usage of Rock breaking powder ($Ca(OH)_2$) for secondary splitting .
- Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and reducing the exposure time of workers to the higher noise levels.

4.24 Biological Environment 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.

- Renovation of ponds
- Construction of check dams and water holes; Engagement of fire watchers.
- Education and training etc.
- Logistic support in form of equipment, Vehicles etc as required by the implementing DFO will be extended.

The objectives of the green belt cover will cover the following

- Noise abatement
- Reuse of waste water to the extent possible
- Prevention of soil erosion
- Ecological restoration
- Aesthetic, biological and visual improvement of area due to improved vegetative and plantation covers.
- Green belt around mine, dumps, etc
    - Tall growing, closely spaced, evergreen trees native to the area
    - Easy, quick early growth and establishment
    - Uniform spreading of crown habit.
    - Timber trees having long gestation period.
    - Trees with high foliage density, leaves with larger leaf area
    - Attractive appearance with both good flowering and fruit bearing.
    - Bird and insect attracting species
    - Suitable green cover with minimal maintenance

- Avenue Trees:
  - Trees with conical canopy and with attractive flowering
  - Trees with medium spreading branches to avoid obstruction to the traffic
  - Trees with branching at 10 feet and above.

Table 4-19 Conservation Plan for Peacock for five years

S.No	Work or Activity	1 to 5 years	Location
1.	Plantation	100 trees per year plant of local plant species for five years in villages.	Villages covered in 10 km study area
2.	Water filling	5 number in water hole filing during summer.	Ponds covered in 10 km study area
3.	Awareness	In school of nea/rby villages for peacock conservation as Drawing Competition. (Peacock Picture) & Essay Writing on Peacock.	Villages covered in 5 km study area
***All above activity will be carried out with the consultation of Ecologist*			
Plant Species will be suggested by the Ecologist and plant saplings will be distributed in project villages as per the above mentioned schedule (year wise).			

4.25 Green Belt Development

TAMIN is proposing to plant 2,200 rees are proposed to plant within the 7.5m safety buffer zone mine lease area and also in the proposed green belt area of 0.26.0Ha

Table 4-20 Proposed Greenbelt Development Details

Year	No of trees proposed to plant	Name of the species to be plant	Survival rate expected	No of trees expected to grow
2025-2026	2,200	Neem, Vilvam, Aathi, Panai	80%	1,750

4.26 Mitigation Measures for Occupational Health and Public Health

The mitigation measures for occupational health are as follows,

Table 4-21 Mitigation for occupational health and safety

S. No	Activity	Mitigation measures
1	Excavation	Planned excavation, avoid haphazard mining
2	Drilling and blasting	➢ Driller should be equipped with a closed cabin to reduce exposure to noise and dust. ➢ In addition, the operators and other workers should be provided with masks, helmets, gloves and earplugs.

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 blasting 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.
5	Workers 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.
6.	Regular Health Camps	➢ By conducting regular health camps to analyse the health condition of the workers as well as the public with in 500m radius.

4.27 Mitigation measures due to impact in agriculture

Mitigation Measures on agriculture and horticulture crops.

- The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas.
- In order to compensate the loss of vegetation cover, it is suggested to carry out afforestation program mainly inside and outside of the lease area in different phases.
- Mine approach roads are sprayed with water 3 times a day to control dust. Thus, the damage to the nearby farmlands is controlled.
- A green belt will be created in 7.5 m safety zone around the quarry to contain the dust from the quarry and prevent the dust from spreading to the adjacent agricultural land.
- 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 to < 20 km/hr to avoid generation of dust.

4.28 Mitigation Measures of Hydrothermal and Geothermal Effects

- Water management planning and implementation
- Rehabilitation and reclamation of mined land
- Implementation of AMD prevention and treatment technologies
- Energy efficiency and renewable energy integration
- Geotechnical monitoring and subsidence management
- Ecological restoration and biodiversity conservation

4.29 Irreversible and Irretrievable commitments of environmental components

Irreversible and Irretrievable commitments of environmental components are not envisaged in the proposed project.

4.30 Assessment of Significance of Impacts

This chapter comprises the information regarding the identified beneficially or adversely environmental impacts due to possible aspects predicted because of location of the plant, expected / predicted accidents scenario, conceptualization of project, preconstruction & construction activities and due to operation of machineries/equipment. Environmental aspect-impact relationship will be identified and quantified with its scale of magnitude and scale of importance, accordingly significance of impact will be determined along with mitigation measures.

The impact assessment essentially consists of three steps:

1. Impact Identification
2. Impact Predictions
3. Impact Analysis for determination of significance of impacts

Here, impact assessment has been done based on Leopold Matrix in which each action and its potential in creating impact is expressed in terms of its magnitude and importance. For quantitative representation, both magnitude & importance are represented by values as described below:

4.30.1 Scale of Importance:

Importance of an interaction is related to its significance, or an assessment of probable consequences of anticipated impact. It ranges from 1 to 10; with 10 representing a very important interaction and 1 of relatively low.

4.30.2 Scale of Magnitude:

Impact score or magnitude ranges from 0-5 with positive and negative values, depending upon the impact rising out of the project activity.

Table 4-22 Severity Criteria for Magnitude of Impacts

S. No	Category	Description of category	Impact	
			Adverse	Beneficial
1	No impact	-	0	0
2	No appreciable impact	Short term reversible	-1	1
3	Significant impact	Long term reversible	-2	2
4	Major impact	Irreversible but of lesser extent	-3	3
5	High impact	Irreversible but of medium extent	-4	4
6	Permanent impact	Severe irreversible impact	-5	5

Score of each of the component is to be multiplied by ‘’Importance factor” and totals core is to be obtained by summation of products. Score ranges of impact evaluation based on matrix score is given below

Table 4-23 Score ranges for Beneficial and Adverse Impacts

S. No	Total score	Outcome
1	+ve / -ve	Beneficial impact / adverse impact
2	0-300	No appreciable Beneficial impact / adverse impact
3	300-600	Appreciable but reversible adverse impact-mitigation measures are needed
4	600-900	Significant adverse impacts: most of the impacts are reversible. Mitigation measures are crucial.
5	900-1200	Major adverse impacts; most of the impacts are reversible. Alternative site selection to be considered.
6	>1200	Permanent irreversible impact; alternatives to the project need to be explored

Table 4-24 Aspect-Impact Identification from Proposed Project without EMP

S. No	Environmental components likely to be affected	Air quality			Noise & Vibration			Surface water			Ground water			Soil quality			Flora & fauna			Land use pattern			Socio economics			Impact score
		Magnitude	Importance	(M * I)	Magnitude	Importance	(M * I)	Magnitude	Importance	(M * I)	Magnitude	Importance	(M * I)	Magnitude	Importance	(M * I)	Magnitude	Importance	(M * I)	Magnitude	Importance	(M * I)	Magnitude	Importance	(M * I)	(Sum of M * I)
1	Site clearance and removal of vegetation	-	-	0	-	-	0	-	-	0	-	-	0	-3	5	-15	-1	4	-4	-4	6	-24	-	-	0	-43
2	Drilling and blasting operation	-5	8	-40	-5	8	-40	-	-	0	-	-	0	-4	-6	24	-1	4	-4	-2	7	-14	-	-	0	-74
3	Dust generation due to mining activity	-5	8	-40	-	-	0	-3	5	-15	-	-	0	-	-	0	-2	4	-8	-	-	0	-5	6	-30	-93
4	Loading & Unloading of granite	-4	7	-28	-3	6	-18	-	-	0	-	-	0	-2	4	-8	-1	3	-3	-	-	0	-2	4	-8	-65
5	Fall in pit, Accidents, fall of side walls etc.	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-4	6	-24	-2	4	-8	-3	5	-15	-47
6	Change in Topography and slopes	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-3	6	-18	-	-	0	-18
7	Granite Resource	-	-	0	-	-	0	-	-	0	-	-	0	-3	8	-24	-	-	0	-2	8	-16	-	-	0	-40

	Depletion																								
8	Stacking and handling of Mineral Rejects and Overburden	-2	5	-10	-	-	0	-	-	0	-	-	0	-3	6	-18	-	-	0	-2	7	-14	-	-	0	-42
9	Noise generation due to vehicular movement	-	-	0	-3	5	-15	-	-	0	-	-	0	-	-	0	-1	4	-4	-	-	0	-2	4	-8	-27
10	Usage of DG sets	-2	5	-10	-2	5	-10	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-20
11	Sewage Generation	-	-	0	-	-	0	-3	6	-18	-2	6	-12	-3	5	-15	-	-	0	-	-	0	-	-	0	-45
12	Consumption of water	-	-	0	-	-	0	-1	5	-5	-2	5	-10	-	-	0	-	-	0	-	-	0	-1	2	-2	-17
13	Employment opportunities	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	3	6	18	18
14	Greenbelt development	2	7	14	2	7	14	-	-	0	-	-	0	2	4	8	2	5	10	2	4	8	-	-	0	46
Total impact score		-16	40	-114	-11	31	-69	-7	16	-38	-4	11	-22	-16	26	-48	-8	30	-37	-13	42	-86	-10	27	-45	-459

Interpretation:

Based on assumption of importance and magnitude, the final impact score without EMP is -459 which concludes that the proposed project has, **"Appreciable but reversible adverse impact-mitigation measures are needed".**

Table 4-25 Aspect-Impact Identification from Proposed Project with EMP

S. No	Environmental components likely to be affected	Air quality			Noise & Vibration			Surface water			Ground water			Soil quality			Flora & fauna			Land use pattern			Socio economics			Impact score	Mitigation Measures
		Magnitude	Importance	(M * I)	Magnitude	Importance	(M * I)	Magnitude	Importance	(M * I)	Magnitude	Importance	(M * I)	Magnitude	Importance	(M * I)	Magnitude	Importance	(M * I)	Magnitude	Importance	(M * I)	Magnitude	Importance	(M * I)	(Sum of M * I)	
1	Site clearance and removal of vegetation	-	-	0	-	-	0	-	-	0	-	-	0	-2	5	-10	-1	4	-4	-2	6	-12	-	-	0	-26	Development of green belt and plantation
2	Drilling and blasting operation	-3	8	-24	-3	8	-24	-	-	0	-	-	0	-2	-6	12	-1	4	-4	-2	7	-14	-	-	0	-54	1. Ensure to use PPEs and well-maintained vehicles 2. Regular Water Sprinkling 3. Safe blasting zones are kept around the periphery of the quarry
3	Dust generation due to mining	-2	8	-16	-	-	0	-1	5	-5	-	-	0	-	-	0	-1	4	-4	-	-	0	-1	3	-3	-23	Water Sprinkling to

	activity																									control dust emission
4	Loading & Unloading of granite	-3	7	-21	-2	6	-12	-	-	0	-	-	0	-	-	0	-1	3	-3	-	-	0	-2	4	-8	-44	1. Dust filter mask to be provided to all workers 2. Vehicles will be covered by Tarpaulin sheets 3. Speed limits of vehicles will be maintained
5	Fall in pit, Accidents, fall of side walls etc.	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-1	6	-6	-1	4	-4	-1	5	-5	-15	Proper fencing and PPE's will be provided.
6	Change in Topography and slopes	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-2	5	-10	-	-	0	-10	Mine closure plan will be implemented after completion of mining

																										activity.
7	Granite Resource Depletion	-	-	0	-	-	0	-	-	0	-	-	0	-2	8	-16	-	-	0	-2	8	-16	-	-	0	-32	Deletion of granite has positive & negative impacts. Even though it plays a vital role in improvement of country's economic development.
8	Stacking and handling of Mineral Rejects and Overburden	-1	5	-5	-	-	0	-	-	0	-	-	0	-2	6	-12	-	-	0	-2	7	-14	-	-	0	-31	1. Garland drains will be provided to prevent the back flow of OB material into nearby water bodies. 2. Granite rejects will be dumped into southwest

																										side of the quarry
9	Noise generation due to vehicular movement	-	-	0	-1	5	-5	-	-	0	-	-	0	-	-	0	-1	4	-4	-	-	0	-1	4	-4	-13	1. All vehicles and machinery will be properly lubricated and maintained regularly. 2. Speed of the vehicles entering and leaving the quarrying lease will be limited to 25 kmph.
10	Usage of DG sets	-2	5	-10	-1	5	-5	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-15	The DG set are provided with stacks of adequate height so as to disperse the emanating flue gases containin

																										g suspended particulate matters, oxides of sulphur and nitrogen without affecting the ground level concentrations.
11	Sewage Generation	-	-	0	-	-	0	-1	6	-6	-1	6	-6	-	-	0	-	-	0	-	-	0	-	-	0	-12	Sewage will be disposed in soak pit Garland drains are provided
12	Consumption of water	-	-	0	-	-	0	-1	5	-5	-1	5	-5	-	-	0	-	-	0	-	-	0	-1	1	-1	-11	Water requirement will be met by private tankers Rain water management will be provided

13	Employment opportunities	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	3	6	18	18	Employment will be provided to local workers
14	Greenbelt development	2	7	14	2	7	14	-	-	0	-	-	0	-	-	0	2	5	10	-	-	0	-	-	0	38	1. The plantation will be developed around 7.5m safety zone of the quarry. 2. Plants are chosen to provide aesthetic, ecological and economical value.
Total impact score		-9	40	-62	-5	31	-32	-3	16	-16	-2	11	-11	-8	13	-26	-4	30	-15	-11	37	-70	-3	23	-3	**-235**	

Interpretation:

Based on the assumption of importance and magnitude, the final impact score with the implementation of mitigation measures is -235, which concludes that the proposed project has, "**No appreciable beneficial impact / adverse impact**".

5 ANALYSIS OF ALTERNATIVES

5.1 Introduction

The Proposed Ajjanahalli Black Granite Quarry is over an extent of 17.50.0 Ha located in S.F.No.896, Ajjanahalli Village, located at Pennagaram Taluk, Dharmapuri District.

5.2 Selection & Description of each alternatives with its adverse impacts

Alternative site is not considered, since the project is site specific because of the availability of mineral in this location. The total geological reserves of black granite is 8,87,700 m^3.

5.3 Site Connectivity

The Site connectivity details are given in **Table 5-1**.

Table 5-1 Site Connectivity Details

Nearest State Highway	SH-60 (Hogenakkal Pennagaram-Thirupathur),~5.34km, NNE
Nearest National Highway	NH-544H(Erode-Thoppur)~ 24.76km, SE
Nearest Railway Station	Mettur Dam Railway Station, ~ 28.51 km, S
Nearet Town	Pennagaram Town, ~10 km, NE, Population 17,480

5.4.1 Technology Alternatives

The various alternative technologies adopted in quarry operations are given below

Table 5.1 Alternative Technology Analysed

S.No	Activity involved in mining Operation	Technology	Impact
1.	Cutting	Burner Cutting	Adverse level of Noise
		Wire Saw Cutting	No adverse impact to environment
2.	Drilling	Manual Drilling using jack hammer	Dust emission and Noise
		Wet drilling	Negligible dust emission
		Tamrac – Machine Drilling	Negligible dust emission and Noise
		Wagon Drill	Dust emission and Noise
		LD Bore	Dust emission
		PRD Drilling	Negligible dust emission
3.	Blasting	Conventional Blasting	Noise
		Muffle Blasting	Minimal Noise impact
		Rock Breaking Powder or Expansive Mortar for secondary breaking	Negligible impact on noise

6 ENVIRONMENTAL MONITORING PROGRAMME

6.1 Introduction

Environmental monitoring is an essential tool for sustainable development & ensuring effective implementation of environmental management plan & mitigation measures adopted. The monitoring schedules are planned for systematic study of various pollution levels with respect to air and water qualities, noise levels, etc. to ensure that they conform to the standards laid down by Environmental Protection Act and various Central and State Pollution Control Board Limits. The various methodologies and frequency of studies of all environmental quality parameters also conform to norms laid down by MOEF, CPCB and SPCB in this respect.

The Project proponent will be overseeing/reviewing following activities:

- To observe the implementation of environmental control measures.
- To ensure implementation of planned plantation programme with monitoring of survival rate, etc.
- To keep monitoring records properly for submission of periodical returns to statutory authorities and for checking by them.
- To evaluate periodically the performance of existing pollution control equipment and systems for taking prompt action in this respect to rectify the defects.
- Conducting safety audits and programmes to create safety awareness in workers/staff.
- Monitoring of dumps and benches for slope stability, monitoring of OB dumps, laying of check dams, garland drains around the dumps and excavated areas and their regular maintenance for de-silting.
- To study the effects of project activities on the environment.
- To interact and liaise with State and Central Government Departments.
- To take immediate preventive action in case of some unforeseen environmental pollution attributable to the project.
- Imparting training on safety and conduct safety drills to educate employees.
- To ensure that firefighting equipment, etc, are kept in ready-to-use condition.

For each of the environmental attributes, the monitoring plan specifies the parameters to be monitored, location of monitoring sites, frequency and duration of monitoring and it also denotes the applicable standards, implementation and supervising responsibilities.

6.2 Technical Aspects of Post Project Environmental Monitoring Program

The summarized forms of post monitoring details are presented in **Table 6-1**.

Table 6-1 Post Project Environmental Monitoring Program

S. No	Area of Monitoring	Number of Sampling Stations	Frequency of Sampling	Parameters to be Analyzed	Monitoring Budget Per Year (Rs)
1.	Meteorology	One	Hourly and Daily basis	Wind speed and direction, Temperature, Relative Humidity, Atmospheric pressure, Rainfall.	1000
2.	Ambient Air Quality	2 Stations (one in up wind and one in downwind)	Twice a week:24 hourly period	All the 12 parameters as per NAAQ Standards	6000
3.	Noise	2 (one within core area and one in buffer area)	Once every season	Ambient Equivalent continuous Sound Pressure Levels (Leq) at day and Night time.	1300
4	Exhaust from DG set	Stack of DG set	Quarterly	PM, SO_2, NO_x & CO	2000
5	Soil	Two Locations within the Project Site	Yearly Once	Physico chemical properties, Nutrients and Heavy metals	4500
6	Terrestrial Ecology	Within 10km radius around the project	Once in three years	Flora & Fauna	20000
7	Surface/ Ground water quality	Two Locations within the study area	Yearly Once	As per ISO 10500:2012 & IS 2996:1992 Standard parameters	2500
Total					**37,300**

6.3 Measurement Methodologies

The monitoring schedules are planned for systematic study of various pollution levels with respect to air and water qualities, noise levels, etc. to ensure that they conform to the standards laid down by Environmental Protection Act and various Central and State Pollution Control Board Limits. The various methodologies and frequency of studies of all environmental quality parameters also conform to norms laid down by MOEF, CPCB and SPCB in this respect.

6.4 Emergency procedures on reporting & documentation

All the necessary reports and documents shall be prepared complying with the statutory rules & regulations. Proper and due care shall be taken to adhere to the laid down rules and regulation by the government. Regular and periodic record shall be kept in order to ensure easier, comparable and brisk review and projection of past, present and future performances. Also, the management shall ensure to

prepare separate records for water, wastewater, solid waste, air, emission, regularly and periodically in order to provide better and smooth vigilance.

The management shall look into the fact that as soon as the preparation of reports gets over it shall be forwarded to the concerned authority with due care for the purpose of reviewing. Adhering to the rules and regulations the management shall ensure that the outcome of the reports and the conclusions been drawn shall be prepared as per the laid down regulations and procedures. No breach of any convention shall be availed.

These reports/documents shall be regularly and periodically reviewed and any changes/discrepancies found in mitigation measures/ operation/ management/ technology shall be brought into notice instantaneously and all possible corrective actions shall be taken to match the discrepancies been witnessed.

7 ADDITIONAL STUDIES

7.1 Public Consultation

The proposed project is categorized as 'B1' category Schedule 1(a) as per EIA Notification 2006 and its amendments thereafter. The total area of the quarry is 17.50.0 Ha.

However, the proposed project falls under 'B1' category, Schedule 1(a), Public Hearing is Mandatory. So, EIA report has been prepared as per the obtained Terns of Reference Identification No. TO24B0108TN5399141N Dated 22.04.2024.

Based on this, the ToR was obtained the draft EIA will be prepared and the draft EIA report will be submitted for Public Hearing. After completion of Public Hearing, the final EIA report will be prepared by incorporating the public hearing minutes along with compliance. The final EIA report will be submitted for the appraisal Tamil Nadu SEAC/SEIAA for seeking Environmental Clearance.

7.2 Risk Identification & Management

7.2.1 Introduction

Mining and allied activities are associated with several potential hazards both to the employees and the public at large. A worker in a mine should be able to work under conditions that are adequately safe and healthy. At the same time the environmental conditions should be such as not to impair his working efficiency. The various safeguards to be taken to ensure the safety of the mine and that of employees are provided in the Mines Act, 1952. Risk involves the occurrence or potential occurrence of some accidents consisting of an event or sequence of events. The risk assessment study covers the following:

- Identification of potential hazard areas.
- Identification of representative failure cases.
- Visualization of the resulting scenarios in terms of fire (thermal radiation) and explosion.
- Assess the overall damage potential of the identified hazardous events and theimpact zones from the accidental scenarios
- Assess the overall suitability of the site from hazard minimization and disaster mitigation point of view
- Furnish specific recommendationson the minimization of the worst accidentpossibilities.
- Preparation of broad DMP, On-site and Off-site Emergency Plan.
- Occupational Health and Safety Plan.

The complete mining will be carried out under the management control and direction of aqualified mine manager holding a first class manager'scertificate ofcompetency. Moreover, mining staff will be

sent to refresher courses from time to time to keep them alert .However, following natural/industrial hazards may occur during norml operation:

- Accident due to explosives
- Accident due to heavy mining equipment; and
- In order to take care of above hazard/disasters, the following control measures will be adopted.
- All safety precautions and provisions of the Mine Act, 1952, the MMR 1961 and the Mines Rules, 1955 will be strictly followed during all mining operations
- Entry of unauthorized persons will be prohibited
- Firefighting and first-aid provisions in the mines office complex and mining area;
- Provisions of all the safety appliances such as safety boot, helmets, goggles etc. will be made available to the employees and regular check for their use
- Training and refresher courses for all the employees working in hazardous premises; Under mines rules all employees of mines will have to undergo the training at a regular interval
- Working of mine, as per approved plans and regularly updating the mine plans;
- Cleaning of mine faces will be regularly done
- Handling of explosives, charging and blasting will be carried out by competent persons only.
- Regular maintenance and testing of all mining equipment as per manufacturer's guidelines.
- Suppression of dust on the haulage roads
- Increasing the awareness of safety and disaster through competitions, posters and other similar drives.
- For any type of above disaster, a rescue team will be formed by training the mining staff with specialized training.

7.2.2 Identification of Hazards in Open Cast Mining

There are various factors, which can cause disaster in the mines. These hazards are as follows:

- Drilling
- Blasting
- Overburden handling
- Heavy Machinery

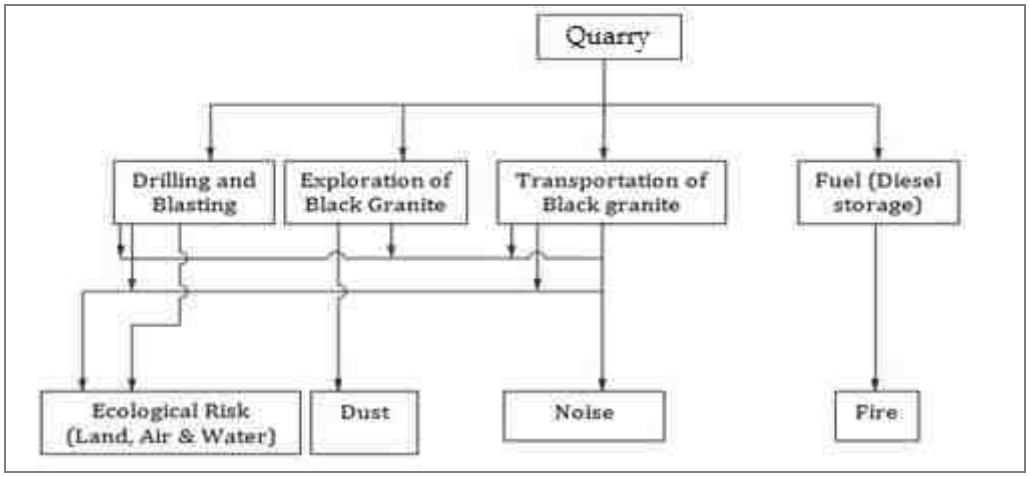

Figure 7-1 Identification of Hazards in opencast mine

7.2.2.1 Drilling

Drilling is an important activity in mining. This activity releases particulate matter into the air and noise in the vicinity of the operation. The particulate matter/dust can be arrested by employing dust extractor, wet or dry type. The usage of standard drill bits also reduces the dust formation. The noise is also arrested by the usage of dust extractors. The compressors which feed the compressor air to the drilling jack hammers can be covered in acoustic enclosures which reduce the dust and noise. The hard strata will be excavated after drilling and blasting. Drilling will be done with jack hammers up to 1.2 to1.5m depth having a diameter of 30-32 mm.

7.2.2.2 Blasting

Most of the accidents from blasting occur due to the projectiles, as they may sometimes go even beyond the danger zone, mainly due to overcharging of the shot-holes as a result of certain special features of the local ground. Flying rocks are encountered during initial and final blasting operations. Vibrations also lead to displacement of adjoining areas. Dust and noise are also problems commonly encountered during blasting operations.

- The damaging impacts on environment are evident noise, gas, and flyrock and ground vibration.
- The last factor is most important for safety of constructions, buildings and various natural objects in the vicinity of mining area.
- The ground vibration parameters, crucial for safety of endangered objects have a significant correlation with charge weight and distance of blasting.
- This study tried to associate the main vibration parameter, particle velocity with blasting parameters and properties of vibration medium.

7.2.2.3 Precautionary Measures to Avoid Accidents Due to Blasting

- The provisions laid down in the MMR 1961 related to Blasting shall strictly be followed. However, some of the main provisions are written here
- The Wire saw and crack powder will be utilized extensively to reduce the requirement for blasting.
- The blasting will be done under supervision of blaster/mine mate/mine foreman/mine manager
- Shots shall not be fired except during the hours of daylight.
- The holes charged on any particular day shall be fired on the same day.
- Adequate blasting shelters or other protection shall be provided at mines.
- The shot-firer shall give sufficient warning by effective signals over the entire area falling within a radius of danger zone.
- Multi-shot exploder shall be used. A shot-firer will fire maximum 120 Shots.
- During the approach and progress of electrical storm, adequate precautions shall be taken.

7.2.2.4 Overburden Handling

No overburden will be generated in the proposed project and side burden dump may cause landslides. High side burden dump created at the quarry edge may cause sliding of the side burden dump or may cause failure of the pit slope due to excessive loading, thereby causing loss of life and property.

7.2.2.5 Heavy Machinery

Most of the accidents during transport of dumpers, trucks, proclaim, ripper dozers and other heavy vehicles are often attributable to mechanical failures and human errors.

7.2.2.6 Precautionary Measures to Prevent Accidents due to Trucks and Dumpers

- All transportation within the main working shall be carried out directly under the supervision and control of the management.
- The vehicles must be maintained in good conditions and checked thoroughly at least once a week by the competent person authorized for the purpose by the Management.
- Road signs shall be provided at each and every turning point especially for the guidance of the drivers.
- To avoid danger while reversing of vehicles especially at the embankment and tipping points, all areas for reversing of lorries should as far as possible be made man free. A statutory provision of the fences, constant education, training etc. will go a long way in reducing the incidents of such accidents.
- Generally, oversize rocks shall be dealt with in the pit by secondary blasting.
- A Load consisting of large rocks must not be over the edge. This is unsafe and may damage equipment.

- The movement of the dumpers will be governed under the Code of Traffic rule, this is already formulated & implemented.

7.2.2.7 Storage of Explosives

The explosive requirement of the quarry operation is minimal. The blasting requirement will be carried out using contractors approved by the Controller of Explosives. No Explosive storage is envisaged in this quarry.

7.2.2.8 Safety Measures at the quarry

- Adequate care has been taken in deciding the size of the bench for the working pit.
- The benches are properly sloped at an angle of 60 degree to avoid any spillage of benches.
- Adequate drainage system at the top of the pit and also on the benches shall be made to prevent erosion of the benches.
- The quarries will be protected by garland drains around the periphery for storm water drainage.

7.2.3 Disaster Management Plan

The disaster management plans aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. For effective implementation of the disaster management plan, it should be widely circulated and personnel training through rehearsals/drills. The objectives of the disaster management plan isto make use of the combined resources of the mining operation and the outside services to achieve the following:

- Effect the rescue and medical treatment of casualties
- Safeguard other people
- Minimize damage to property and the environment
- Initially contain and ultimately bring the incident under control
- Identify any dead
- Provide for the needs of relatives
- Provide authoritative information to the news media
- Secure the safe rehabilitation of affected area
- Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency
- In effect, it is to optimize operational efficiency to rescue rehabilitation and render medical help and to restore normalcy.

7.2.3.1 EmergencyOrganization (EO)

It is recommended to setup an emergency organization. A senior executive (Mine Manager) who has control over the affairs of the mine would be heading the emergency organization. He would be

designated as site controller. As per the general organization chart, in the mines, the Mines Foreman would be designated as the Incident Controller (IC). The incident controller would be reporting to the site controller. Emergency coordinators would be appointed who would undertake the responsibilities like firefighting, rescue, rehabilitation, transport and provide essential and support services.

7.2.3.2 Emergency Communication (EC)

Whoever notices an emergency situation such as fire, growth of fire etc. would inform the Mines Foreman. The Mines Foreman would appraise the site controller. Site Controller verifies the situation from the incident controller takes a decision about an impending on site emergency. Simultaneously, the emergency warning system would be activated on the instructions of the site controller.

In order to handle disaster/emergency situations, the following personnel shall deal with the disaster/Emergency

- Mines Manager-site controller
- Mines Forman-incident controller
- Mine mate –Fire controller
- Senior most Driver-Transport coordinator
- Senior most operator- Medical coordinator

7.2.3.3 Emergency Services

This includes the fire-fighting system, first aid center, etc. Alternate sources of power supply for operating fire pumps, communication with local bodies, fire brigade etc. will also be clearly identified. Adequate number of external and internal telephone connections shall be installed.

1. Fire Protection System
2. Off Site Emergency Plan

7.2.3.4 Fire Protection System

The fire protection system for the project maintained will consist of Portable hand appliances of suitable types/capacities for extinguishing small fires in selected mine areas, storages areas such as that of Diesel, Explosives, etc.

7.2.3.5 Off-Site Emergency Plan

The offsite emergency plan defining the various steps to tackle any offsite emergencies, which may affect surrounding areas of the project, has to be prepared after due finalizing discussion in this respect with local Panchayat official, Revenue officials and District Collector. As per this off site

plan, in case of any off site emergencies, actions have to be promptly initiated to deal with the situation in consultation with Collector and other revenue officials.

7.2.4 Mine Closure Plan

Land degradation is one of the major adverse impacts of opencast mining in the form of excavated voids and also in the form of waste dumps. As per the petro genetic character, the depth persistence of the black granite body in the area is beyond the workable limits. However, it is very difficult to operate granite dimensional stone mine economically below a depth of 30m by observing the statutory of mine safety rules and regulations. Hence in the proposed mining plan, only 30m depth has been envisaged as 'Workable depth' for safe and economic mining.

However, it is proposed not to back fill the ultimate pit, in as much as quantity of reserves is available below the workable depth of 30m and there is possibility of technology up-gradation in granite mining for greater depths. The site boundaries shall be safely fenced and used as a reservoir after mining activities are over.

There is no proposal for back filling, reclamation and rehabilitation. The quarried pits after the end of the life of lease will be fenced to prevent inherent entry of public and cattle. There is no proposal for back filling, reclamation and re habitation

7.2.4.1 Progressive Mine Closure Plan

The various schedules for mining activities regarding mining of granite block, waste disposal, proposed land use pattern, environmental preservation measures, disaster management plan, etc. have been fully covered in the earlier chapters in this EIA/EMP report.

Concurrent planning for various steps to be adopted for final mine closure, along with regular working schedules and systems of the mine, will facilitate to effect smooth switchover to final mine closure stages ultimately

7.2.4.2 Water Quality Management

The ground water quality in the region indicates neutral range with pH values. Most of the analytical results for ground and surface water showed parameter concentrations well within the permissible limits. Garland drains will be provided all along the periphery of the mining pit and along the toes of the side burden dumps. These drains will be aligned in such a way that all the surface drainage water will be carried away from the mining zone to settling tanks.

The mining pit's catchment water will be coursed to the main sump and used for dust suppression and green belt development & plantation activities.

7.2.4.3 Mines Seepage Water

The experience of mining during past three years suggests a very little, almost negligible seepage of water in the mining pit. It will be collected in a well guarded pond / sump for settling of solids. The treated water will be used for dust suppression on working faces, haul roads and dump surfaces.

7.2.4.4 Air Quality Management

Ambient air quality was monitored twice in a week for One (01) season (shall cover 12 weeks), i.e., during Pre-Monsoon season (**March 2024 to May 2024**). PM_{10}, $PM_{2.5}$, SO_2, NOx, Pb, NH_3, C6H6, $C_{20}H_{12}$, As, Ni, were monitored. Sampling was carried out as per Central Pollution Control Board (CPCB) monitoring guidelines at each location.

The following precautions have been considered for abatement of air pollution in theblack granite mine area:

- Water sprinkling shall be carried out at the active working faces, on all haul-roads and the dump surfaces.
- Regular cleaning and removal of spillage black granite from haul roads and weighbridge areas.
- Proper and regular maintenance of mining equipments.
- Development of comprehensive green belt around overburden dumps to reduce fugitive dust emissions in order to create clean and healthy environment.

7.2.4.5 Solid waste Management

As is stated earlier, mining will be carried out by opencast semi-mechanized method using conventional mining equipments i.e., hydraulic excavators / shovels and dumpers combination with ancillary mining equipment like compressor, wire cutting machine, generator etc.

The mine waste in the mine includes the over lain unrecoverable boulders / rock fragments and rubbles generated as granite rejects during the production works and the waste fragments generated during development works will be utilized for forming approach road and dumping yard purposes. Adequate space has been identified within the lease applied area for dumping such waste material on barren land covered with soil. The 7.5 m safety distance as well as the defective portion of the deposit may also be used for waste dumping purpose.

7.2.4.6 Stabilization of Dump

As the waste generation in the mine includes hard rock fragments of considerable size and irregular shape with varying angularity, the waste dump will be stable on its own even at higher slopes of the sides. However, suitable variety of soil will be identified and brought from outside and used for

increasing the stability of the sides of the waste dumps and also for planting trees over the dumps in a phased manner.

7.2.4.7 Mine Drainage

The lease applied area is hillock 40m height with slope towards northern and southern sides. Through the area receives scanty rainfall, the ground water level is at 10.2m depth. The Production faces are operated at shallow depths. During the rainy seasons the surface run of water and the gorund water are collected at one point called as sump and dewatered nearby agricultural field with the help of 10HP oil engines.

7.2.4.8 Disposal of Waste

The Mine waste in the mine includes the over burden, side burden, rock fragments and rubbles generated as mineral rejects during production works and the country rock fragments generated during development works as approach road formation, formation of dumping yard sites etc., During the first five years of Mining Plan period, such waste material are proposed to be dumped along the Southern part of the lease area where it comprises of country rock terrain.

7.2.4.9 Top Soil Management

Topsoil will be properly stacked at earmarked dump site with adequate measures. It will be used for growing plants along the fringes of the site roads and reclamation of external dump and backfilled area. The topsoil stockpiles will be low height and will be grassed to retain fertility. Besides these topsoil stacks there will be temporary stacks near the excavation area and area to be reclaimed which will be made use of for concurrent lying without bringing the topsoil to the soil stack near the OB dump.

7.2.4.10 Disposal of Mining Machinery

Mining operations are planned to be operated using Company owned machinery. The company has its own Excavators, Mining Tippers, compressors; wire saw machine, jack hammers, and other mining equipment. These machines are complaint to the RTO conditions and CPCB conditions. Further, the company also operates a central workshop at Salem, to cater to major repairs/Rectifications of company Equipment.

These machineries are written off and disposed on completion of their normal life as per the set guidelines of the Government and TAMIN Board. The surplus machinery in working order, will be transferred to Company's other projects.

7.2.4.11 Other Infrastructure

Mine office, store room, first-aid room etc, will be provided on semi-permanent structures within the lease applied area.

7.2.4.12 Safety & Security

The water ponds developed in the reclaimed areas shall be properly fenced for safety. The water from these ponds is likely to be potable and shall be used for human & cattle consumption and for agriculture purposes.

7.2.5 Social Impact Assessment R & R Action plan

There will be no Rehabilitation and Resettlement in this proposed project.

8 PROJECT BENEFITS

8.1 Benefits in the Physical Infrastructure

Carrying out various developmental works in the nearby region based on the need of the locals.

8.2 Benefits in the Social Infrastructure

- Improvement in Per Capita Income.
- The socio - economic conditions of the village will be enhanced due to the proposed 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 construction industry thereby indirectly benefiting the masses.

8.3 Employment potential- Skilled, Semi-Skilled and Unskilled

- The quarry activity will provide job opportunities, which will help them to develop economically
- The quarrying activities provide employment to the 30 No's of local people.
- The direct beneficiaries will be those who get employed in the mines as skilled and unskilled workers.

S.No	Description	No of persons
A	**Technical/Mining Personnel**	
1	Geologist/Agent (M.sc Qualified)	1
2	Mine Manager (Holder of Manager Certificate of Competency under MMR, 1961	1
3	Mining Mate cum Blaster	1
4	Machinery operator	6
5	Diesel Mechanic	1
B	**Workers**	
1	Skilled	1
2	Semi- Skilled	9
3	Un-skilled	10
	Total	**30**

8.4 CER Activity

Based on O.M F.No. 22-65/2017-IA.III dated: 01.05.2018, 2.0% of the Project cost need to be spent for CER activities i.e., Rs. 2.0 Lakhs. However, TAMIN is proposing for Rs. 4.0Lakhs which is 4.0% of Project cost under CER activities for the Ajjanahalli Government Higher Secondary School.

Table 8-1 Proposed CER activity

S.No	CER Activities for Ajjanahalli Government Hr. Secondary School	Amount in Lakhs
1.	Developing Drinking water facility within the school premises	1.0
2.	Toilet facilities for Government School	2.0
3.	Providing Library facility	0.5
4.	Greenbelt development within the school premises	0.5
	Total	**4.0**

8.5 Other tangible benefits

The proposed mine is likely to have other tangible benefits as given below.

- Indirect employment opportunities to local people in contractual works like construction of infrastructural facilities, transportation, sanitation, for supply of goods and services to the mine and other community services.
- Additional housing demand for rental accommodation will increase
- Cultural, recreation and aesthetic facilities will also improve
- Improvement in communication, transport, education, community development and medical facilities and overall change in employment and income opportunity
- The State Government will also benefit directly from the proposed mine, through increased revenue from royalties, CESS, DMF, GST etc.

9 ENVIRONMENTAL COST & BENEFIT ANALYSIS

(Not recommended during scoping stage)

10 ENVIRONMENTAL MANAGEMENT PLAN

Description of the administrative aspects of ensuring that mitigative measures are implemented and their effectiveness monitored, after approval of the EIA Management Plan

The Environmental Management Plan for Ajjanahalli Black Granite Quarry identifies the principles, procedures and methods that will be used to control and minimize the environmental imapocts for the proposed project.

10.1 EMP structure and organization

10.1.1 Environment Policy of TAMIN

The Emission sources are activities related to pits and quarries including, overburden operations, drilling, hauling, loading and unloading stockpiles. The emission sources may be subdivided into six broad categories:. Tamil Nadu Minerals Ltd, believes that good safety, Health & Pollution control practices contribute to individual well-being and organization morale. Our commitment to Safety, Health and Environment stretch beyond statutory obligations and we are committed to manage and continually improve the overall safety, Health and Environmental performance.

We M/s Tamil Nadu Minerals Ltd are committed to ensure that:

We develop safe working methods and practices, with as objective of no injuries and accidents at the work place and provide a safe work place for our employees, contractors and other who perform their duties. We shall provide adequate Health care to our employees, and create processes to reduce the adverse effect of the operations on the health of the employees.

- We provide safety appliances and continuous training in safety to our employees and contract workmen to ensure safe production and achieve the target of zero accidents. We are committed to supporting actions aimed at increase in employees‟ safety outside work hours.
- We protect the environment by control and prevention of pollution and promote green environment.
- We continuously evaluate and improve our conduct and carryout regular audit, analysis and studies to eliminate potential concerns and continuously improve upon our Safety, Health and Environmental standards.
- We communicate our Safety, Health and Environmental Policy to all our employees‟ contractors and to the public for better understanding and practice.
- Management has knowledge of relevant issues regarding Safety, Health and Environment and provides a foundation for setting objectives and targets. Management

shall fulfill its responsibility to inform, educate and motivate employees and others to understand and comply with this policy and applicable laws.

- M/s. Tamil Nadu Minerals Ltd shall use its resources in order to live up to this policy and thereby promote our business.

Besides, the company has formulated well-planned and integrated Environmental policies as shown below:

M/s Tamil Nadu Minerals Ltd is committed to welfare and development needs of the society around it.

- All rules and conditions prescribed in the Indian Mines Act, Metalliferrous Mines Regulation etc., will be adopted to ensure risks-free and safe mining operations. All personal protective devices supplied to workers and staff should be used while they work in the mines and any violation in this respect will be dealt with inflict of warnings first, followed subsequently by punitive punishments including fines and ultimately dismissal, if repeated continuously.
- Any infringement / violation of any rule or unsafe mining operations should be reported to Mines Manager / Mine Foremen /Mine Mate/ Blaster who will take immediate corrective measures for avoiding major disasters. The report will ultimately reach the Board of Directors through upwardly hierarchical communicative channels from the lowest level to superior levels in quick time bound duration.
- The Agent and the Mines Manager should exercise overall control over entire mining and connected operations and all infringements / violations on any count pertaining to unsafe operations, environmental degradation, etc., should be brought to the notice of the Board of Directors. Remedial measures for such violations and deviations should be taken by the Mines Manager to avoid any hazards or disasters in the mine and nearby areas. The persons responsible for such violations will be punished through appropriate disciplinarily penal actions.
- The EC conditions and stipulations will be strictly followed by all supervisory staff of the mine, and will co-ordinate in various issues like prescribed environmental monitoring schedules, vibration monitoring studies during blasting, green belt development, management of dumps etc.
- Penal actions will be taken by the company in cases of continuous negligence resulting in violations deviations in this respect.

A time schedule of once in 15 days for review of all operational factors as mentioned above is in force, for proper and quick corrective actions. Hierarchical System of the TAMIN is shown in Figure 10-1.

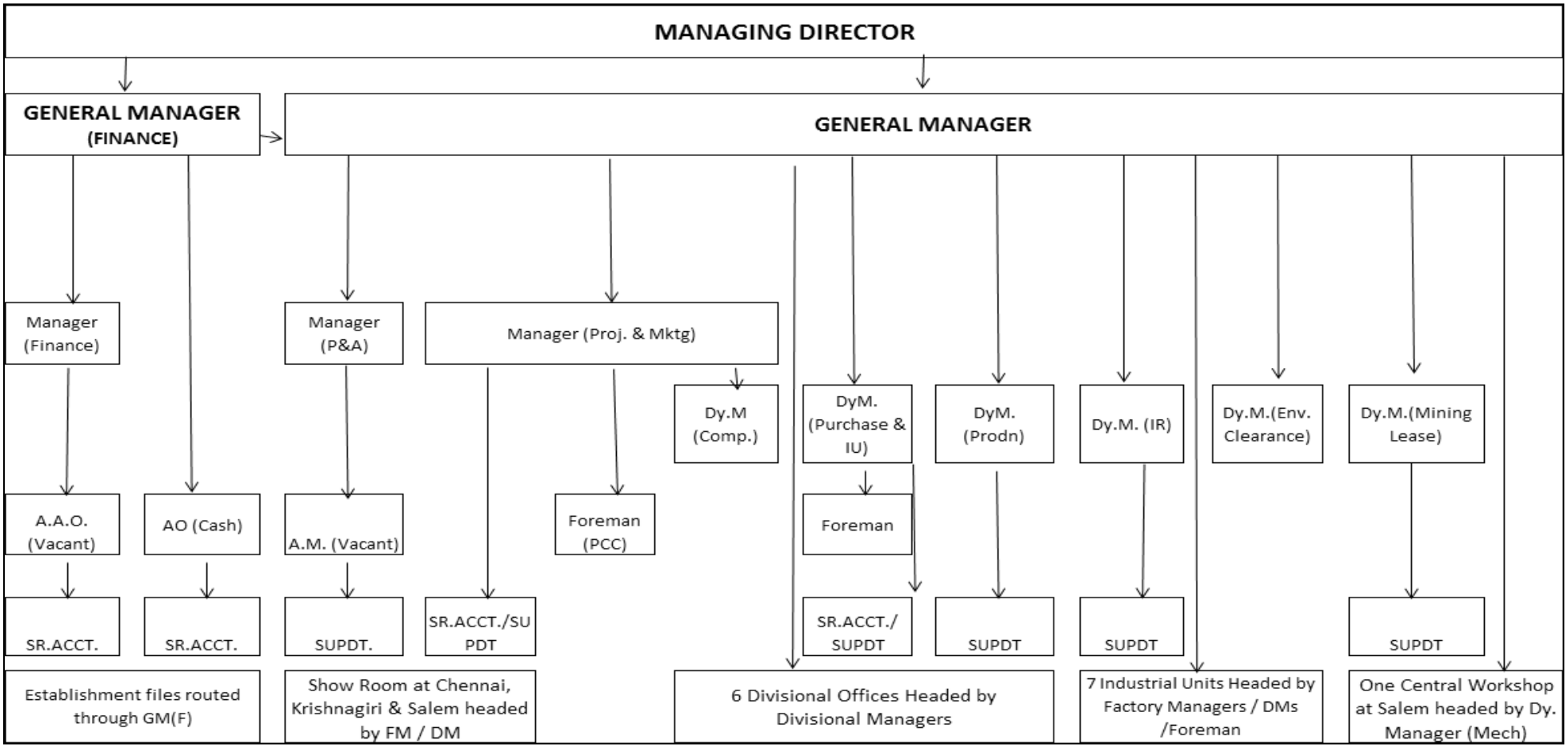

Figure 10-1 Hierarchical System of the TAMIN

Description of the Administration and Technical Setup Environment Management

The Environment Monitoring Cell will ensure effective implementation of environment management plan and to ensure compliance of environmental statutory guidelines through Mine Management Level of the proposed quarry.

The said team will be responsible for:

- Analysis of the water and air samples collected through external laboratory
- Monitoring of the water/ waste water quality, air quality and solid waste generated
- Implementation and monitoring of the pollution control and protective measures/ devices which shall include financial estimation, ordering, installation of air pollution control equipment, waste water treatment plant, etc.,
- Co-ordination of the environment related activities within the project as well as with outside agencies
- Collection of health statistics of the workers and population of the surrounding villages. And Green belt development
- Monitoring the progress of implementation of the environmental monitoring programme
- Compliance to statutory provisions, norms of State Pollution Control Board, Ministry of Environment and Forests and the conditions of the environmental clearance as well as the consents to establish and consents to operate.

10.2 Land Environment Management

Landscape of the area will be changed due to the quarrying operation, restoration of the land by converting the quarry pit into temporary reservoir and the remaining part of the area (un utilized areas, infrastructure, haul Roads) will be utilized for greenbelt development. Aesthetic of the Environment will not be affected. There is no major vegetation in the project area during the course of quarrying operation and after completion of the quarrying operation thick plantation will be developed under greenbelt development programme.

Table 10-1 Proposed Controls for Land Environment

Control	Responsibility
Designing vehicle wash-down system so that all washed water is captured and passed	Mines Manager
Re fuelling will be carried out in a safe location, away from vehicle movement pathways	Mine Foreman & Mining Mate
No external dumping i.e., outside the project area	Mine Foreman
Greenbelt on dumps and its maintenance	Environment Officer

Garland drains with catch pits to be provided all around the project area to prevent	Environment Officer
The periphery of Project area will be planted with thick plantation to arrest the fugitive dust, which will also act as acoustic barrier.	Mines Manager
Thick plantation using native flora spices will be carried out on the backfilled area.	Mines Manager
There will be formation of a small surface water body in the mined-out area, which can be used for watering the greenbelt at the conceptual	Environment Officer

10.3 Ground Vibration and Fly Rock Control

Table 10-2 Proposed Management Controls for Ground Vibration & Fly Rocks

Control	Responsibility
Controlled blasting using delay detonators will be carried out to maintain the PPV value (below 8mm/s) well within the prescribed standards of DGMS	Mines Manager
Drilling and blasting during initial stage will be carried under the supervision of qualified persons	Mines Manager
Proper stemming of holes should be carried out with statutory competent qualified blaster under the supervision of statutory mines manager to avoid any anomalies during blasting	Mines Manager
Prior to blasting within 500 meters of the lease boundary, establish a fly rock exclusion zone within adjacent properties and check with landholders that the area is not occupied by humans, blast clearance zones are applied for all blasts.	Environment Officer

10.4 Soil Management:

10.4.1 Granite Waste Management:

The waste generated during the mining operation i.e., side burden, granite rejects and the non-recoverable/un sized boulders and rubbles etc, will be dumped in the suitable area already selected. The granite waste generated during the mining operation is 62,464m^3 will be dumped in the suitable area already selected. The area of disposal of waste has been identified in southern portion of the lease area. The unsold blocks are kept within the boundary on the country rock area.

Table 10-3 Proposed Controls for Soil Management

Control	Responsibility
backfilling process during mine closure as per mining plan	Mines Manager
The dump slopes will be planted with deep rooting shrubs, grasses and creepers for stabilizing them	Environment Officer
Garland drains are to be paved around the dump area to arrest possible wash off in the rainy seasons	Mines Manager

Surface run-off from the surface dumps via garland drains will be diverted to the mine pits	Mine Foreman & Mining Mate
The backfilled area shall be covered with the soil for green belt development	Environment Officer
Design haul roads and other access roads with drainage systems to minimize concentration of flow and erosion risk	Environment Officer
keeping records of mitigation of erosion events, to improve on management techniques	Environment Officer
The overall slope of the dump is maintained at angle of repose not exceeding 37° from horizontal	Mines Manager
The retaining wall has to be made to arrest the waste dump spills	Mines Manager
A monitoring map with information including their GPS coordinates, erosion type, intensity, and the extent of the affected area, as well as existing control measures and assessment of their performance	Environment Officer
Empty sediment from sediment traps Maintain, repair or upgrade garland drain system	Environment Officer
Test soils for pH, EC, chloride, exchangeable cations, particle size and water holding capacity	Mines Manager

10.5 Water Management

Water is a key component in mining projects as it is required for, and affected by, mining activities. Effective water management is important for a variety of reasons including: uninterrupted operation of the mine, compliance with operational permissions and applicable legislation, and minimization of effects on the receiving environment.

This section focuses on actions for avoidance, mitigation, and control, as well as a water management monitoring program –

- To protect water-related resources, and avoid harmful impacts;
- To supply and retain water for mine operations;
- To define water-related environmental control structures; and
- To manage water to ensure that any discharges are following the applicable water quality levels and guidelines.

Table 10-4 Proposed Management Controls for Water management

Control	Responsibility
To maximize the reuse of pit water for water supply	Mines Manager

Temporary and permanent garland drain will be constructed to contain the catchments of the mining area and to divert runoff from undisturbed areas through the mining areas.	Environment Officer
Natural drains/nallahs/brooklets outside the project area should not be disturbed at any point of mining operations.	Mines Manager
Mine pit water is used for dust suppression and greenbelt development utilization of mine pit water is optimal and effective ways	Environment Officer
Ensure there is no process effluent generation or discharge from the project area	Environment Officer
Domestic sewage generated from the project area will be disposed in septic tank	Mines Manager
Fast growing grasses, small plants and bushes will be grown on the overburden	Mines Manager
Retention walls and garland drains will be constructed around toe of waste	Environment Officer
Rainwater harvesting measures will be adopted in the project area and in nearby	Environment Officer
Regularly assess and modify Water Management Plan to adapt to changing work	Environment Officer
Familiarize all site personnel with the purpose and content of the Water	Environment Officer
Water management and sediment control structures and facilities will be	Environment Officer
Monthly or after rainfall, inspection for performance of water management	Environment Officer
Conduct ground water and surface water monitoring for parameters specified by	Mines Manager

10.6 Air Quality Management

The proposed mining activity would result in the increase of particulate matter concentrations due to fugitive dust. Daily water sprinkling on the haul roads, approach roads in the vicinity would be undertaken and will be continued as there is possibility for dust generation due to truck mobility. It will be ensured that vehicles are properly maintained to comply with exhaust emission requirements.

Table 10-5 Proposed Controls for Air Environment

Control	Responsibility
Generation of dust during excavation is minimized by water sprinkling on working face.	Mines Manager

Develop thick Greenbelt with tall growing trees and thick foliage cover all along the boundary of the project (7.5 Meter Buffer Zone) to arrest dust spreading outside the project area and to be maintained. This plantation cover will also act as an acoustic barrier.	Environment Officer
Daily maintenance of haul roads and daily water sprinkling to minimize the generation of fugitive dust due to movement of heavy earth moving machineries on it.	Mines Manager
Handle the waste from the mine pit to respective dumps and backfilling during closure process, fugitive dust is anticipated. This fugitive emission can be controlled by well-maintained machineries, well maintained haul roads water sprinkling on haul roads twice a day. Besides it is also advised not to handle the waste during high windy periods	Mines Manager & Environment Officer
Wet drilling procedure drills with dust extractor system to control dust generation during drilling at source itself to be implemented	Environment Officer
Plantation will be carried out on surface dumps, backfilled area and top benches of the mined out area	Environment Officer
Water reservoir will be developed in the left over mined out pit, which will serve as additional surface water resources for the nearby villages	Environment Officer
Maintenance as per operator manual of the equipment and machinery in the mines to minimizing air pollution and noise generation	Mines Manager
Over loading of trucks should be avoided	Mines Manager
All the mining equipment and trucks has been controlled with emission norms	Environment Officer
The village roads used for mineral transport will be maintained weekly and monthly basis to avoid fugitive dust emissions	Mines Manager
Dust mask are provided to the workers working in high dust generating areas and continue to provide the same	Mines Manager
Weekly and Monthly maintenance of deployed machineries, to reduce gaseous emission	Mines Manager
Ambient Air Quality Monitoring carried out in the project area and in surrounding villages to access the impact due to the mining activities and the efficacy of the adopted air pollution control measures	Environment Officer
Monitor meteorological conditions (temperature, wind, rainfall)	Environment Office

10.7 Noise Management

There will be intermittent noise levels due to vehicular movement, trucks loading, drilling and blasting and cutting activities. No mining activities are planned during night time.

Table 10-6 Proposed Controls for Noise Management

Control	Responsibility
A thick greenbelt to be developed all along the Buffer Zone (7.5 Meters) of the project area to attenuate the noise and the same will be maintained	Mines Manager

Plantation activities to be carried out on surface dumps and infrastructure facilities, these plantations will help in attenuating the noise levels	Environment Officer
Preventive maintenance of mining machinery and replacement of worn-out accessories to control noise generation	Mines Manager
Deployment of mining equipment with an inbuilt mechanism to reduce noise	Environment Officer
Provision of earmuff / ear plugs to workers working in noise prone zones in the mines	Environment Officer
Provision of effective silencers for mining machinery and transport vehicles	Environment Officer
Controlled blasting technologies are adopted by using NONEL to minimize noise from blasting	Mines Manager
Annual ambient noise level monitoring to be carried out in the project area and in surrounding villages to access the impact due to the mining activities and the efficacy of the adopted noise control measures. Additional noise control measures will be adopted if required as per the observations during monitoring	Environment Officer
Undertake noise or vibration monitoring in response to a complaint (from any sensitive receptor).	Mines Manager
Change the burden and spacing by altering the drilling pattern and/or delay layout, or altering the hole inclination during initial stage of operation.	Mines Manager
If a noise or vibration complaint is received, follow the complaints and inquiries.	Environment Officer
Undertake noise or vibration monitoring half yearly	Environment Officer

10.8 Occupational Safety & Health Management

Occupational safety and health are very closely related to productivity and good employer -employee relationship. The main factors of occupational health in mines are fugitive dust and noise and vibration. Safety of employees during mining operation and maintenance of mining equipment will be taken care as per Mines Act 1952 and Rule 29 of Mines Rules 1955. To avoid any adverse effect on the health of workers due to dust, noise and vibration sufficient measures have been provided.

10.9 Medical Surveillance and Examinations

Identifying workers with conditions that may be aggravated by exposure to dust & noise and establishing baseline measures for determining changes in health.

- Evaluating the effect of noise on workers
- Enabling corrective actions to be taken when necessary
- Providing health education

The health status of workers in the mine shall be regularly monitored under an occupational surveillance program. Under this program, all the employees are subjected to a detail's medical examination at the time of employment. The medical examination covers the following tests under mines act 1952.

- General Physical Examination and Blood Pressure
- X-ray Chest and ECG
- Sputum test
- Detailed Routine Blood and Urine examination

The medical histories of all employees will be maintained in a standard format annually. Thereafter, the employees will be subject to medical examination annually. The above tests keep upgrading the database of medical history of the employees.

10.10 Proposed Health and safety Measures

- Providing a clean working environment that is conductive to safety & health annually
- Employee involvement and commitment in the implementation of health and safety guidelines
- Implementing safety and health management system and assessing the effectiveness through periodic audits
- Setting of safety and health objectives based on comprehensive strategic plans and measure performance against these plans
- Provision of necessary standard personal protective equipment's (PPE)
- Ensuring that all employees at all levels receive appropriate training and are competent to carry out their duties and responsibilities.
- Provision of rest shelters for mine workers with amenities like drinking water, fans, toilets urinals, canteen etc.,
- Rotation of workers exposed to noisy areas.
- Daily dust suppression on haul roads by water sprinkling and proper housekeeping to prevent fugitive dust emission into the air.
- Provision of First-aid facility at the mine office.

10.11 Budget for Environmental Protection

It is necessary to include the environmental cost as a part of the budgetary cost component. Total capital cost of Rs. **64,05,000/-** and recurring cost Rs. **15,73,600/-** were allocated for environmental protection activities. Environmental Management cost is given in below table**.**

Table 10-7 Environmental Management Plan Cost

Parameters	Mitigation Measure	Provision for Implementation	Capital cost (INR)	Recurring Cost
Air Environment	Compaction, gradation and drainage on both sides for Haulage Road	Rental Dozer & drainage construction on haul road @ Rs. 10,000/- per hectare; and yearly maintenance @ Rs. 10,000/- per hectare	1,75,000	1,75,000
	Fixed Water Sprinkling Arrangements + Water sprinkling by own water tankers	Fixed Sprinkler Installation and New Water Tanker Cost for Capital; and Water Sprinkling (thrice a day) Cost for recurring	8,00,000	50,000
	Muffle blasting – To control fly rocks during blasting	Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts	0	5,000
	Wet drilling procedure / latest eco-friendly drill machine with separate dust extractor unit	Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500 per unit recurring cost for maintenance	1,50,000	15000
	No overloading of trucks/tippers/tractors	Monitoring through Weighing machines	-	5,000
	Stone carrying trucks will be covered by tarpaulin	Monitoring if trucks will be covered by tarpaulin	-	10,000
	Enforcing speed limits of 20 km/hr within ML area	Installation of Speed Governers @ Rs. 5000/- per Tipper/Dumper deployed	10,000	1,000
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes by Manual Labour	0	5,000

	Regular sweeping and maintenance of approach roads for at least about 200 m from ML Area	Provision for 2 labours @ Rs.10,000/labour (Contractual) per Hectare	0	0
	Installing wheel wash system near gate of quarry	Installation + Maintenance + Supervision	50,000	20,000
Noise Environment	Source of noise will be during operation of transportation vehicles, HEMM for this proper maintenance will be done at regular intervals.	Provision made in operating cost	0	0
	Oiling & greasing of Transport vehicles and HEMM at regular interval will be done	Provision made in operating cost	0	0
	Adequate silencers will be provided in all the diesel engines of vehicles.	Provision made in operating cost	0	0
	It will be ensured that all transportation vehicles carry a fitness certificate.	Provision made in operating cost	0	0
	Safety tools and implements that are required will be kept adequately near blasting site at the time of charging.	Provision made in operating cost	0	0

	Line Drilling all along the boundary to reduce the PPV from blasting activity and implementing controlled blasting.	Provision made in operating cost	0	0
	Proper warning system before blasting will be adopted and clearanceof the area before blasting wil be ensured	Blowing Whistle by Mining Mate / Blaster / Compentent Person	0	0
	Provision for Portable blaster shed	Installation of Portable blasting shelter	50,000	2,000
	NONEL Blasting will be practiced to control Ground vibration and fly rocks	Bulk density of rock = 2.6 for Rough stone /Granite ; = 2.5 for lime stones of 6tons of production requires 1 kg pf explosives. Cost of NONEL = Rs. 30 per kg	0	22,100
Waste Management	Waste management (Spent Oil, Grease etc.,)	Provision for domestic waste collection and disposal through authorized agency	25,000	20,000
		Installation of dust bins	5,000	2,000
	Bio toilets will be made available outside mine lease on the land of owner itself	Provision made in Operating Cost	0	0
Mine Closure	1. Progressive Closure Activity - Surface Runoff managent	Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance of Rs. 5,000/- per annum	1,75,000	5,000
	2. Progressive Closure Activity Barbed Wire Fencing to quarry area will be provisioned	Per Hectare fencing Cost @ Rs. 2,00,000/- with Maintenance of Rs 10,000/- per annum	35,00,000	10,000

	3. Progressive Closure Activity Green belt development -500 trees per one hectare - 200 trees inside lease area & 300 trees outside the lease area- TAMIN is proposing to plant 2,200 trees.	Site clearance, preparation of land, digging of pits / trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring)	4,40,000	52,500
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)		
	4. Implementation of Final Mine Closure Actity as per Approved Mining Plan on Last Year	Few activities already covered as progressive closure activities as greenbelt development, wire fencing, garland drain. *For Final Closure Activities 15% of the proposed closure cost will be spent during the final mine closure stage - Last Year	5,25,000	0
	5. Contribution towards Green Fund. As per TNMMCR 1959, Rule 35 A	The Contribution towards Green Funds @ 10% of Seigniorage fee are indicated as part of EMP Budget and not necessarily implemented in the Project Site	1,00,000	0
Implementation of EC, Mining Plan & DGMS Condition	Size 6’ X 5’ with blue background and white letters as mentioned in MoM Appendix II by the SEAC TN	Fixed Display Board at the Quarry Entrance as permanent structure mentioning Environmental Conditions	10,000	1,000

	Air, Water, Noise and Soil Quality Sampling every 6 Months for Compliance Report of EC Conditions	Submission of 2 Half Yearly Compliance - Lab Monitoring Report as per CPCB norms	0	50,000
	Workers will be provided with Personal Protective Equipment's	Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee)	1,20,000	30,000
	Health check up for workers will be provisioned	IME & PME Health check up @ Rs. 1000/- per employee	0	30,000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	10,000
	Slope stability action plan	Slope stability action plan in the end of fourth year plan period	2,00,000	0
	Mine will have safety precaution signages, boards.	Provision for signages and boards made	10,000	2,000
	No parking will be provided on the transport routes. Separate provision on the bottom of the hill will be made for vehicles /HEMMs. Flaggers will be deployed for traffic management	Parking area with shelter and flags @ Rs. 50,000/- per hectare project and Rs. 10,000/- as maintenance cost	50,000	50,000
	Installation of CCTV cameras in the mines and mine entrance	Camera 4 Nos, DVR, Monitor with internet facility	10,000	5,000
	Implementation as per Mining Plan and ensure safe quarry working	Mines Manager (1^{st} Class / 2^{nd} Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116 of MMR,1961 @ 40,000/- for Manager & @ 25,000/- for Foreman / Mate	0	7,80,000
Conservation Measures	Conservation Plan for Schedule 1 species- Indian Peafowl		0	2,02,500

Total		**64,05,000**	**15,73,600**

Table 10-8 Consolidated Environmental Management Plan Cost

S.No	Description	Capital Cost	Recurring Cost
1.	Air Environment	11,85,000	2,86,000
2.	Noise Environment	50,000	24,100
3.	Waste Management	30,000	22,000
4.	Mine Closure	47,40,000	81,500
5.	Implementation of EC, Mining Plan & DGMS Condition	4,00,000	9,58,000
6.	Conservation Measures	0	2,02,500
Total		**64,05,000**	**15,73,600**

11 SUMMARY & CONCLUSION

11.1 Overall justification for the implementation of project

An Environmental Impact Assessment Study has been carried out and assessed for the proposed project, based on the ToR and baseline quality data collected for the study area. Identification and anticipation of the potential environmental impacts due to the proposed project with a delineation of appropriate impact mitigation measures in an Environmental Management plan is provided in the EIA report.

The marginal impacts that might be caused by the proposed activity will be mitigated by the pollution control and environmental management measures. In a true and a larger sense, in view of the considerable benefits from the project with no major impacts, the proposed project is said to be more beneficial to the country.

The EMP implemented for the proposed project will include:

- Soil Pollution and Control Management
- Air Pollution control and management
- Noise Control and Management
- Solid and Hazardous Waste Management
- Water Pollution control and Management

In order to effectively implement the EMP, an environmental management system will be formulated.

11.2 Explanation on how adverse effects will be mitigated

The baseline study carried out for the study area indicates that all the physical, chemical and biological characteristics of the environmental attributes in the surrounding area are well within the permissible limits.

Based on this environmental assessment, the possible impacts are anticipated and the necessary adequate control measures are formulated to meet the statutory compliances.

Following mitigation measures are proposed for the project:

- Usage of Diamond Wire saw cutting method instead of blasting
- Usage of Rock breaking powder($Ca(OH)_2$) to avoid secondary splitting by blasting.
- Usage of NONEL Blasting (Non-Electric Detonator) for controlled primary blasting.
- Greenbelt around infrastructure within the mine lease area and along the periphery of the mine lease area by using native plants.
- Construction of garland drains of suitable size around mine area and dumps to prevent rain water descent into active mine areas.

- Proper fencing will be provided around the mine lease area to avoid rock rolling and trespassing.
- Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and reducing the exposure time of workers to the higher noise levels.
- 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.

Also as discussed in **Chapter 10** - proper Environment Management Cell will be formed for the proper monitoring and implementation of Environment Management Plan and to ensure compliance of Environmental Statutory Guidelines. The Proposed Team of Environment Management cell will be responsible for Management of Monitoring and compliance activities on all aspects of environment including land, water and air. With very minimal impacts, the project positively leads to commercial business opportunities, employment opportunities, increased revenue and infrastructural development. Thus, this project may kindly be granted Environmental Clearance.

12 DISCLOSURE OF CONSULTANTS

In order to assess the potential environmental impacts due to the proposed project at Survey No: 896 Ajjanahalli village, Pennagaram Taluk, Dharmapuri District, Tamil Nadu State to undertake EIA study. The nature of consultancy service rendered covers terrestrial environmental assessment.

12.1 Brief Profile of HubertEnviro Care Systems (P) Limited (HECS)

Hubert Enviro Care Systems (P) Limited is a leading Environmental Management Company and service provider serving as a catalyst for environmental protection in the industrial & service sectors.

Enviro care Systems was started in 1997 as a proprietor company. In the year 2004, Enviro Care Systems became a Private Limited Company and registered as Hubert Enviro Care Systems (P) Limited.

Across two decades of operation we have developed into a matured corporate house to meet client's requirements to provide products and services of Global standards at the most competitive price within committed schedule of time.

We have full-fledged office and laboratory at Chennai, Mangalore, Trivandrum & Hyderabad.

12.2 Strengths of HECS

Number of Employees as on till date

Consultancy	42
Laboratory	100
Projects	29
Operation & Maintenance	999
Total No of Employees	**1,170**

12.3 QCI-NABET - EIA Accreditation

Consultancy	Hubert Enviro Care Systems Pvt. Ltd., Chennai
NABET Certificate No	NABET/EIA/24-27/RA0335 Valid up to 31/03/2027
MoEF Reg. Lab	F.No. Q-15018/13/2016-CPW

12.4 Copy of QCI NABET Accreditation

भारतीय गुणवत्ता परिषद्
QUALITY COUNCIL OF INDIA
Creating an Ecosystem for Quality

NABET

National Accreditation Board for Education and Training

Certificate of Accreditation

Hubert Enviro Care Systems, Chennai

A-21, III Phase, Thiru Vi Ka Industrial Estate– 600032

*The organization is accredited as **Category-A** under the QCI-NABET **Scheme for Accreditation of EIA Consultant Organization, Version 3** for preparing EIA/EMP reports in the following Sectors-*

S.No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1.	Mining of minerals including opencast / underground mining	1	1 (a) (i)	A
2.	Offshore and onshore oil and gas exploration, development & production	2	1 (b)	A
3.	River Valley projects	3	1 (c)	A
4.	Thermal power plants	4	1 (d)	A
5.	Mineral beneficiation	7	2 (b)	A
6.	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	A
7.	Cement plants	9	3 (b)	A
8.	Petroleum refining industry	10	4 (a)	A
9.	Pesticides industry and pesticide specific intermediates (excluding formulations)	17	5 (b)	A
10.	Petro-chemical complexes	18	5 (c)	A
11.	Petrochemical based processing	20	5 (e)	A
12.	Synthetic organic chemicals industry	21	5 (f)	A
13.	Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes	31	7 (c)	A
14.	Bio-medical waste treatment facilities	32A	7(d a)	B
15.	Ports, harbours, break waters and dredging	33	7 (e)	A
16.	Highways,	34	7 (f)	B
17.	Common Effluent Treatment Plants (CETPs)	36	7 (h)	B
18.	Common Municipal Solid Waste Management Facility (CMSWMF)	37	7 (i)	B
19.	Building and construction projects	38	8 (a)	B
20.	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated May 31, 2024, posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/24/3292 dated June 25, 2024. The accreditation needs to be renewed before the expiry date by Hubert Enviro Care Systems, Chennai following due process of assessment.

Issue Date
June 25, 2024

Valid up to
March 31, 2027

Mr. Ajay Kumar Jha
(Sr. Director, NABET)

Certificate No.
NABET/EIA/24-27/RA 0335

Prof (Dr) Varinder S Kanwar
(CEO- NABET)

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.

Further details may be seen on the following URL: www.hecs.in.

ANNEXURE

For

Proposed Ajjanahalli Black Granite Quarry

over An Extent of 17.50.0 Ha
Proposed Production Capacity: 6,940m^3

At

Survey No: 896
Village: Ajjanahalli
Taluk: Pennagaram
District: Dharmapuri
State: Tamil Nadu

By

M/s. Tamil Nadu Minerals Limited

(Project termed under Schedule 1(a) Mining of Minerals 'B1' category as per EIA Notification 2006 and its Amendments)

ToR Identification No.TO24B0108TN5399141N Dated: 22.04.2024

Baseline Period: From March 2024 to May 2024

EIA Consultant & Laboratory

M/s. 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

January 2025

LIST OF ANNEXURES

Annexure No: A

Annexure -1

19 SEP 2023

Natural Resources (MME.1) Department,
Secretariat, Chennai-600 009.

507

Letter No.3740397/MME.1/2023-1, dated 13.09.2023

From
Thiru. K. Phanindra Reddy, I.A.S.,
Additional Chief Secretary to Government (FAC)

To
Tvl.Tamil Nadu Minerals Limited,
No.31, Kamarajar Salai,
TWAD House,
Chepauk, Chennai – 600 005.

Sir,

Sub: Natural Resources – Minor Mineral – Black Granite – Quarry lease application preferred by Tvl.TAMIN for quarrying of Black Granite over an extent of 17.50.0 hectares of Government Poramboke land in S.F.No.896 Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District - Precise area communicated – Approved Mining Plan and Environmental Clearance – Called for.

Ref: 1. Your Quarry Lease Application dated 13.02.2022.

2. From the District Collector, Dharmapuri, Note File.No.605/2002-(Mines), dated 12.09.2022.

3. From the Commissioner of Geology and Mining, Chennai, File Rc.No.6167/MM4/2002, dated 11.12.2022.

I am directed to invite attention to the references second and third cited, wherein the District Collector, Dharmapuri and the Commissioner of Geology and Mining, Chennai have recommended and forwarded your quarry lease application for grant of quarry lease for quarrying of Black Granite over an extent of 17.50.0 hectares of Government Poramboke land in S.F.No.896 Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District for a period of 20 years under rule 8-C of the Tamil Nadu Minor Mineral Concession Rules, 1959.

2. The Government carefully examined the recommendations of the District Collector, Dharmapuri and the Commissioner of Geology and Mining, to communicate precise area for the extent of 17.50.0 hectares of Government Poramboke land in S.F.No.896 Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District and accordingly, the Government hereby

(p.t.o.)

communicate Precise Area for the above said area under sub-rule (3) (b) of rule 8-C of the Tamil Nadu Minor Mineral Concession Rules, 1959 for grant of quarry lease.

3. I, therefore, request you to furnish the Approved Mining Plan for the above-mentioned Precise Area through the Director of Geology and Mining within a period of 3 months as per sub-rule (3) (b) of rule 8-C of the TNMMCR, 1959 and to produce Environmental Clearance obtained from the competent authority for the above said area for grant of quarry lease subject to the following conditions:-

1) The required safety distance to be provided to the "Masakal Forest" in S.F.No.420/A over an extent 250.26.5 hectares located abutting to the applied area on the North Eastern side as per rules.
2) 50 meters safety distance to be provided to the electric line, Check dam, Tar Road and the temple located on the Western boundary of the applied area and 10 m safety distance to the Tar road on the eastern side.
3) 7.5 meters safety distance should be provided all along the boundaries of the patta lands.
4) The applicant company should not cause hindrance to the pattadar and Government lands if any adjacent to the area, while quarrying and transporting the Granite.
5) The quarrying operation should be restricted only in the area to be granted on lease.
6) Barbed wire fencing or Compound wall should be erected all along the boundary of the lease granted area.
7) The waste materials generated during the course of quarrying should be dumped only within the lease hold area.
8) A green belt should be created by planting trees along the boundary of the area to control air and noise pollution.
9) Environment Clearance should be obtained from the competent authority in respect of the subject area as per rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 and as per the notification of the Ministry of Environment and Forest and any other clearances if any.
10) The applicant company should submit Mining Due Clearance Certificate for the year 2017-18 before execution of lease deed and for the period from 2018-19 to 2022-23 after March, 2023 as per the G.O (D) No.43 Industries (MME.1) Department dated 16.05.2022 in which the Government has given exception to Tvl.TAMIN Ltd., for remittance of arrear dues to the Government.

COMMISSIONERATE OF GEOLOGY AND MINING

From
Tmt.Pooja KulKarni, I.A.S.,
Commissioner,
Department of Geology and Mining,
Guindy, Chennai - 600 032.

To
The Managing Director,
Tvl. TAMIN Ltd.,
No.31, Kamarajar Salai,
Chepauk, Chennnai -05.

Rc. No.6167/MM4/2022, dated:23.11.2023

Sir,

Sub: Mines and Minerals – Minor Mineral – Black Granite – Dharmapuri district - Pennagaram taluk – Ajjanahalli village - over an extent of 17.5.0 ha of Government land – S.F.No.896 –Quarry lease application preferred by Tvl.TAMIN Ltd., Chennai – Precise area communicated by the Government – Mining Plan submitted by Tvl.TAMIN Ltd., Chennai - Recommended by the Assistant Director (G&M), Dharmapuri - Approval accorded.

Ref:
1. Commissioner of Geology and Mining original file no. Rc.No.6167/MM4/2022 dated 11.12.2023 forwarded to Government under single file system.
2. Government letter no. 3740397/MME.1/2023-1 dated 13.9.2023.
3. Tvl.TAMIN Ltd., Chennai letter Rc.No.2460/ML4/2002 dated 30.10.2023.
4. The Assistant Director of Geology and Mining, Dharmapuri letter Rc.No.605/2022 (Mines), dated 31.10.2023.

****

Kind attention is invited to the above references cited.

2) The quarry lease application preferred by Tvl.TAMIN Ltd., for quarrying black granite over an extent of 17.50.0 ha of Government poramboke lands in S.F.No.896 of Ajjanahalli village, - Pennagaram taluk, Dharmapuri district was forwarded to the Government by the Commissioner of Geology and Mining vide reference 1st cited for grant of quarry lease under rule 8-C of TNMMCR, 1959. Now, the Government vide letter dated 13.09.2023 have communicated the precise area to an over an extent of 17.50.0 ha and requested the applicant company to submit the approved mining plan through the

Commissioner of Geology and Mining and to produce environmental clearance obtained from the competent authority for the subject area for grant of quarry lease.

3) Accordingly, the mining plan submitted by Tvl.TAMIN Ltd., has been forwarded and recommended by the Assistant Director, (G&M), Dharmapuri vide reference 4th for the subject area for approval.

4) On Scrutinizing the mining plan submitted by Tvl.TAMIN Ltd., and the report of the Assistant Director (G&M), Dharmapuri, the following are submitted.

i. The Assistant Director (G&M), Dharmapuri has reported that the mining plan has been prepared by incorporating all the conditions imposed in the precise area communication vide letter No. 3740397/MME.1/2023-1 dated 13.9.2023 and the plan tallied with the present filed conditions.

ii. The proposed year wise production:

Year	ROM (cbm)	Production (m^3) @ 10% Recovery	Granite Waste @ 90% cbm
1st year	10002	1000	9002
2nd year	11999	1200	10799
3rd year	14398	1440	12958
4th year	16000	1600	14400
5th year	17004	1700	15304
Total	**69403**	**6940**	**62463**

iii. As per the Mining plan submitted by Tvl.TAMIN Ltd., it is mentioned that the total ROM in the mining plan period is about 69403 cbm for a total depth of 12 m. Production for first 5 years Mining plan period is 6940 cbm at 10% recovery for a depth of 12 m.

ii. With regard to the dumping of waste during the Mining Plan period, it has been proposed to dump on the southern side of the lease boundary area.

iii. Finally, the Assistant Director (G&M), Dharmapuri has recommended and forwarded the mining plan submitted by Tvl. Tamil Nadu Minerals Limited, Chennai for quarrying Black Granite over an extent of 17.50.0 ha in S.F.No 896 of Ajjanahalli village, Pennagaram taluk, Dharmapuri district to the Commissioner of Geology and Mining, Chennai for approval.

5) The mining plan submitted by Tvl.TAMIN Ltd, and report of the Assistant Director (G&M), Dharmapuri have been examined with reference to the provisions of Rule 12, 13 and 15 of Granite Conservation and Development Rules, 1999 read with G.O.(Ms). No. 87, Industries (MMC.1), Department dated: 22.02.2001. Based on the recommendation of the Assistant Director (G&M), Dharmapuri the mining plan submitted by Tvl.TAMIN Ltd, is hereby approved subject to the following conditions in addition to the conditions stipulated in the precise area communication issued by the Government vide reference 2nd cited.

i. This mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time whether such Laws are made by the Central Government, State Government or any other authority

ii. The approval of the mining plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development and Regulation) Act 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Indian Explosives Act, 1884 (Central Act IV of 1884) and the rules made there

under and the Tamil Nadu Minor Mineral Concession Rules, 1959.

iii. This mining plan including progressive mine closure plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.

iv. Provisions of the Mines Act, 1952 and the Rules and Regulations made there under including submission of notice of opening, appointment of manager and other statutory officials as required under Mines Act, 1952 shall be complied with.

v. Provisions made under Mines and Minerals (Development & Regulation) Act, 1957, MMDR Amendment Act, 2015 and Granite conservation and Development Rules, 1999 made there under shall be complied with.

vi. Relaxation to be obtained under Rule 106(2)(b) of Metalliferous Mines Regulations, 1961 from the Director of Mines Safety, if necessary.

vii. If anything is found to be concealed as required by the Granite Conservation and Development Rules, 1999 and Tamil Nadu Minor Mineral Concession Rules, 1959 and proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.

viii. 50 meters safety distance to be provided to the electric line,Check dam, Tar Road and the temple located on the Western boundary of the applied area and 10 m safety distance to the Tar road on the eastern side.

ix. 7.5 m safety distance should be provided all along the boundaries of the patta lands.

x. The required safety distance should be provided to the "Masakal" Forest in S.F.No.420/A over an extent 250.26.5 hectare located abutting to the application area on the NE side as per rules.

xi. No blasting and transportation of materials in vehicles should be carried out from 6.00 PM to 6.00AM.

xii. A green belt should be constructed to prevent sound and air pollution due to the proposed quarrying activity by planting at least 250 seedlings all along the boundary the area.

xiii. No hindrance shall be caused to the adjacent Patta lands and Government poramboke lands if any while quarrying and transportation of granite.

xiv. The applicant company shall strictly adhere to the statutory and safety requirements and the applicant company should ensure the periodical medical checkup to the quarry workers to safeguard them from quarry related diseases.

xv. The waste materials generated during the course of quarrying should be dumped only within the lease hold area that will be earmarked for the purpose in the mining plan as per rule 31 of GCDR, 1999.

xvi. The applicant company shall submit Scheme of Mining, mine closure plan and other statutory requirements within the time stipulated for submission of the above as per GCDR, 1999 rules.

xvii. The applicant company should fence the lease granted area with barbed wire before the execution of lease deed as follows.

- The pillar post shall be firmly grounded with concrete foundation of height not less than 2 m with a distance between two pillars shall not be more than 3mts.
- The applicant company shall incorporate the DGPS readings for the entire boundary pillars of the area and the same should be clearly shown in the mining plan.
- A soft copy of the digitized map with DGPS readings should be submitted in CD to the Assistant Director (G&M), Dharmapuri.

xviii. The boundary stone should be fixed for the subject quarry and the district administration / Geology and Mining Department should ensure that the quarrying operation should be restricted only within the area granted for lease.

xix. Environment Clearance should be obtained from the competent authority in respect of the subject area as per rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 and as per the notification of the Ministry of Environment and Forest and any other clearances if any.

xx. As per rule 12 (v) of Mineral (other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016, the applicant company shall at their own expense, erect, maintain and keep in repair all boundary pillars.

xxi. The conditions mentioned in G.O No. 79 Industries Department dated 06.04.2015 should be complied with.

xxii. The applicant company may use mild explosives during quarrying, and storing of explosives if required, by obtaining valid license under explosive Acts and Rules.

xxiii. If any violation is found during quarrying operation, the penal provisions of Tamil Nadu Minor Mineral Concession Rules 1959 and other rules and act in force will attract.

xxiv. Child labour should not be engaged in the quarry works and the quarry workers should be enrolled in the insurance scheme through the Labour Department.

xxv. The applicant company should remit the Stamp Duty as per the approved modified mining plan during the currency of the lease period.

xxvi. The earlier instances of irregular / illegal quarrying, if any, shall not be regularized through the approval of this document.

xxvii. The applicant company shall remit the penalty / cost of mineral / other dues if any as arrived by the District Collector / Assistant Director (G&M), Dharmapuri district.

xxviii. Non adherence to any condition set-out above, the approval shall be deemed to have been withdrawn with immediate effect.

xxix. The applicant company should comply with the additional conditions stipulated in the Government of India, Ministry of Mines, Order No.11/02/2020, dated.14.01.2020 issued as per the Order of the Hon'ble Supreme Court of India, dated.08.01.2020 states that, "The Mining lease holders shall after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc".

xxx. The applicant company should carry out DGPS survey and erection of RCC boundary pillars as per the norms stipulated in the EOI notification in Rc.No.2921/MM4/2019 dated.01.02.2018 and subsequent corrigendum dated 13.08.2019.

Sd/-Pooja Kulkarni
Commissioner of Geology and Mining

Forwarded / by Order

Additional Director

Copy to:

1. The Additional Chief Secretary
   to Government(FAC),
   Natural Resources Department,
   4th Floor, Secretariat, Chennai-9.
2. The Director of Mines Safety,
   3rd Floor, Left Wing,
   New Additional Building,
   CGO Complex, Shastri Bhawan,
   Nungambakkam, Chennai – 06
3. The District Collector,
   Dharmapuri District.

Tamil Nadu Minerals Limited
(A Government of Tamil Nadu Undertaking)

கலைஞர் 100 1924 - 2023

TAMIN

Tel : 044-28415003 / 28511972
Fax : 91-44-2852 4960
E-mail : tamin@tamingranites.com
GSTIN. : 33AABCT2250P1ZA
WEB : www.tamin.co.in
CIN No. : U14210TN1978SGC007488
Regd.Office : No.31, Kamarajar Salai, "TWAD House" Chepauk, Post Box No.2961, Chennai - 600 005.

Rc No: 2460/ML4/2002 **Dated: 06.01.2025**

To
The Deputy Director (Mines)
Department of Geology & Mining
Collectorate, Dharmapuri

Sir,

Sub: TAMIN - Mining Lease- submission of Modified Mining Plan (Revised) for Black Granite quarry - over an extent of 17.50.0Ha in SF.No.896 Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District – resubmitted – seeking approval- regarding.

Ref:
1. Govt.Lr.No.3740397/MME.1/2023-1, dt.13.09.2023
2. TAMIN Lr Rc. No. 2460/ML4/2002, dt. 30.10.2023
3. The Commissioner of Geology and Mining, Chennai Letter Rc. No. 6167/MM4/2022, dated.23.11.2023
4. Govt. letter No.6588, Natural Resources (MME.1) 2022-6, department, dated.13.12.2023
5. TAMIN Lr Rc. No. 2460/ML4/2002, dt. 28.06.2024
6. The Assistant Director, (Mines), Dharmapuri Letter Rc. No.605/2002(Mines), dated.02.08.2024
7. The Commissioner of Geology and Mining, Chennai Letter Rc. No. 6563/MM4/2024, dt.11.12.2024.
8. The Deputy Director, (Mines), Dharmapuri Letter Rc. No.883/2015(Mines), dated.27.12.2024

***

GoTN has issued precise area communication letter to TAMIN for quarrying Black Granite over an extent of 17.50.0Ha of Govt. poramboke land in SF.No.896 of Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District for a period of 20 years under Rule 8-C of the Tamil Nadu Minor Mineral Concession Rules (TNMMCR),1959 vide reference 1st cited.

2. Accordingly, TAMIN submitted the Mining Plan for the subject area with 10% recovery of saleable production of Black Granite vide reference 2nd cited and the same was approved by the Commissioner of Geology and Mining vide reference 3rd cited.

3. In order to get the Environmental Clearance (EC) for the subject area, TAMIN applied to State Level Environmental Impact Assessment Authority (SEIAA). The proposal was placed before 451st State Expert Appraisal Committee (SEAC) Meeting on 13.03.2024.

4. During the meeting, the committee advised TAMIN to submit the revise the Mining Plan by leaving a minimum distance of 60 meter from the Masakkal Reserve Forest situated abutting the project site.

5. The Government of Tamil Nadu has made amendment the Rule 8-C (11) of the TNMMCR, 1959. Hence, TAMIN had proposed to produce and sell the Granite waste in accordance with the Rule and Standard Operating Procedure (SoP) vide reference 4th cited.

6. Considering the above, the Mining Plan was Modified with 10% recovery of Saleable of Black Granite dimensional stone and 90% of Saleable of Granite waste after leaving the safety distance for Benvanur RF adjacent to the northern side of the lease applied area under Rule 16(3) of the Granite Conservation and Development Rules, 1999.

7. In accordance with above, the Modified Mining Plan (Five copies) for the subject area were sent to the Assistant Director (Mines), Dharmapuri to recommend the same to the Commissioner of Geology & Mining, so as to get the approval and proceed to EC from SEIAA vide reference 5th cited.

8. In turn, the Assistant Director (Mines), Dharmapuri has recommended and forwarded the same to the Commissioner of Geology and Mining, Chennai vide reference 6th cited.

9. In the reference 7th cited, the Commissioner of Geology and Mining has returned the Mining Plan to the Deputy Director (G&M), Dharmapuri with request to give suitable direction to TAMIN to resubmit the Modified Mining Plan deleting the word "to produce and sell the Granite waste" in accordance with Rule 8-C(11) of TNMMCR,1959. In turn, the DD(G&M) Dharmapuri has returned the Scheme of Mining-III vide reference 8th cited.

10. Accordingly, the Modified Mining Plan has been revised as directed above. Further, there is no proposal for selling granite waste in this quarry in accordance with the Rule 8-C(11) of TNMMCR.1959.

11. Hence, five copies of Modified Mining Plans (Revised) is appended herewith and we request the Deputy Director (Mines), Dharmapuri to recommend and forward the same to the Commissioner of Geology and Mining, Chennai so as to get approval at an early date.

Yours faithfully
for **Tamil Nadu Minerals Ltd,**

06.1.2025

Deputy Manager (ML)
RQP/Authorized Signatory

Encl: As stated above.

6/1/25

MODIFIED MINING PLAN FOR
AJJANAHALLI BLACK GRANITE QUARRY

District : Dharmapuri

Taluk : Pennagaram

Village : Ajjanahalli

SF. No. : 896

Extent : 17.50.0Ha.

(UNDER RULE 16(3) OF GCDR, 1999)

APPLICANT:

M/s. TAMIL NADU MINERALS LIMITED,
(An Undertaking of Government of Tamil Nadu)
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI – 600 005.

Name of the RQP : Dr. E.GANESAN, Ph.D, PGDELP.

Designation : DEPUTY MANAGER, TAMIN

Mobile No : 94888 55535

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DECLARATION BY NOMINATED OWNER

Certified that the Modified Mining Plan in respect of Ajjanahalli village SF.No.896 extent 17.50.0Ha. Black Granite Quarry of Ajjanahalli villlage, Pennagaram Taluk, Dharmapuri District, Tamil Nadu State has been prepared in full consultation with me and I understood its contents and agree to implement the same in accordance with the law. The Modified Mining plan has been prepared by Thiru E.Ganesan, a Recognized Qualified Person.

I hereby undertake that all the modifications as made in the Modified Mining Plan by the RQP are deemed to have been made with my knowledge and consent and shall be acceptable to me and binding on me in all respects.

I request you to make further correspondences regarding the modifications of the Mining Plan with the said Recognized Qualified Person in the following address:

Dr. E. Ganesan, Ph.D, PGDELP
Deputy Manager (Mining Lease),
Recognized Qualified Person
Tamil Nadu Minerals Limited,
No.31, Kamarajar Salai,
Chepauk, Chennai-600 005.

ANIL MESHRAM, I A S.,
MANAGING DIRECTOR

21/1/25
Dy.M(ML)

CERTIFICATE FROM THE RECOGNIZED QUALIFIED PERSON

This is to certify that the provisions of Granite Conservation and Development Rules, 1999 and as amended in Tamil Nadu Minor Mineral Concession Rules, 1959 have been observed in the preparation of Modified Mining Plan for Ajjanahalli Black Granite Quarry over an extent of 17.50.0Ha in Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District, Tamil Nadu State has been prepared for

M/s. Tamil Nadu Minerals Limited,
No.31, Kamarajar Salai,
Chepauk, Chennai- 600 005.

Wherever specific permissions/exemptions/ relaxations and approvals are required, the applicant will approach concerned authorities of Commissioner of Geology and Mining, Government of Tamil Nadu, Guindy, Chennai for such permissions/exemptions/relaxations and approvals.

It is also certified that information furnished in the above Modified Mining Plan are true and correct to the best of my knowledge.

Place: Chennai
Date:

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

TAMIN,
MODIFIED MINING PLAN FOR
AJJANAHALLI BLACK GRANITE (DOLERITE)

[Under Rule 8-C and 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 & Rule 16(3) of Granite Conservation and Development Rules,1999]

INTRODUCTION:

M/s Tamil Nadu Minerals Limited (An Undertaking of Government of Tamil Nadu hereinafter referred as TAMIN) was established in the year 1978 to carryout systematic mining and development of different minerals all over the State.

Government of Tamil Nadu granted precise area communication letter to TAMIN for submitting the mining plan for grant of lease for quarrying Black Granite over an extent of 17.50.0Ha of Government poramboke land in SF.No.896 of Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District for a period of 20 years under Rule 8-C of the Tamil Nadu Minor Mineral Concession Rules,1959 vide Natural Resources (MME.1) Department, Letter No.3740397/MME.1/2023-1, dated, 13.09.2023.

Accordingly, TAMIN submitted the mining plan for the subject area with 10% recovery of saleable production of black granite vide this office letter Rc No.2460/ML4/2002, dated.30.10.2023 and the same was approved by the Commissioner of Geology and Mining vide Letter Rc.No.6167/MM4/2022, dated 23.11.2023.

In order to get the Environmental Clearance (EC) for the subject area, TAMIN applied to State Level Environmental Impact Assessment Authority (SEIAA) and the proposal was placed before 451st State Expert Appraisal Committee (SEAC) on 13.03.2024.

During the meeting, the Committee advised TAMIN to submit the Modified the mining plan by leaving a minimum distance of 60 meter form the Masakkal Reserve Forest situated abutting the project site (Actually Bevanur RF is adjacent to lease applied area)

Accordingly, the Modified mining plan was prepared for leaving a minimum distance of 60m form the Masakkal Reserve Forest and producing, selling Black Granite dimensional stone and granite waste in accordance with Rule 8-C (11) of the Tamil Nadu Minor Mineral Concession Rules, 1959 over an extent of 17.50.0Ha of Government poramboke land in SF.No.896 of Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District for a period of 20 years vide this office letter Rc. No.2460/ML4/2002, dt.28.06.2024.

Subsequently, the Commissioner of Geology and Mining has returned the Mining Plan to the Deputy Director (G&M), Dharmapuri with request to give suitable direction to TAMIN to resubmit the Modified Mining Plan deleting the word "to produce and sell the Granite waste" in accordance with Rule 8-C(11) of TNMMCR,1959 and SoP vide Govt letter No.6588/MME.1 Natural Resources Department, dated 13.12.2023 vide the Commissionerate of Geology and Mining vide Rc. No.6563/MM4/2024, dated 11.12.2024 under copy marked to TAMIN. In turn, the DD(G&M) Dharmapuri has returned the Scheme of Mining-III vide Rc. No.605/2002(Mines), dated 27.12.2024

Accordingly, the Modified Mining Plan has been revised as directed above. Further, there is no proposal for selling granite waste in this quarry in accordance with the Rule 8-C(11) of TNMMCR.1959.

PART-I

1.0. MINING PLAN:

Name of Mine:

Ajjanahalli SF.No.896 Black Granite Quarry.

1.2 Particulars of Approval of Mining Plan under GCDR (indicate approval No. and date):

Commissioner of Geology and Mining, Chennai Vide Lr.Rc.No.6167/MM4/2022, dated:23.11.2023.

1.3 Date of commencement of Mining Operations:

Will be intimated after execution of the lease deed under rule 8-C (5)(c) of the Tamil Nadu Minor Mineral Concession Rules, 1959.

1.4 (a) Deficiencies, if any that existed in the approved Mining Plan to be taken note of and rectified by incorporating suitable proposal for implementation in the Scheme of Mining:

Not applicable at this stage as it is a fresh lease.

1.4(b) Review of Compliance of salient features of Mining Plan on chapter-wise basis bringing out marked deviations, if any and justifications/ reasons thereof. Items to be covered may include exploration, mine development, exploitation, afforestation programme, reclamation and rehabilitation, control of dust, noise and ground vibration and any other significant feature:

(1) Exploration:

The same mineral available in the mineralised area of adjacent mining lease (Ajjanahalli Village, SF.No.883 Black Granite quarry in Pennagaram Taluk, Dharmapuri District) having similar geological features and explored. Hence, no more exploration study is required.

(2) Mine Development:

Year pertaining to	Proposed generation of waste in the Mining Plan Period (M^3)	
	Over Burden	Side Burden
First year to Twentieth Year	Nil	75804
Total	**Nil**	**75804**

(3) Exploitation: (Production)

Block- I

Year	Run of Mines in		Saleable Black Granite Recovery @10%		Black Granite Waste @90%	
	M^3	Tonnes	M^3	Tonnes	M^3	Tonnes
First	10002	30006	1000	3000	9002	27006
Second	11999	35997	1200	3600	10799	32397
Third	14403	43209	1440	4320	12963	38889
Fourth	16000	48000	1600	4800	14400	43200
Fifth	17000	51000	1700	5100	15300	45900
Total	**69404**	**208212**	**6940**	**20820**	**62464**	**187392**

Note : Specific Gravity of Black Granite: 3.0

Source : IBM, Granite in India Bulletin No.21, March, 1990 and in accordance with Appendix –II of the TNMMCR,1959.(Attached in Annexture-I).

Block- II

Year	Run of Mines in		Saleable Black Granite Recovery @10%		Black Granite Waste @90%	
	M^3	Tonnes	M^3	Tonnes	M^3	Tonnes
Sixth	10001	30003	1000	3000	9001	27003
Seventh	12001	36003	1200	3600	10801	32403
Eighth	14400	43200	1440	4320	12960	38880
Ninth	16001	48003	1600	4800	14401	43203
Tenth	17001	51003	1700	5100	15301	45903
Total	**69404**	**208212**	**6940**	**20820**	**62464**	**187392**

Block- III

Year	Run of Mines in		Saleable Black Granite Recovery @10%		Black Granite Waste @90%	
	M^3	Tonnes	M^3	Tonnes	M^3	Tonnes
Eleventh	10001	30003	1000	3000	9001	27003
Twelth	12002	36006	1200	3600	10802	32406
Thirteenth	14401	43203	1440	4320	12961	38883
Fourteenth	16001	48003	1600	4800	14401	43203
Fifteenth	17004	51012	1700	5100	15304	45912
Total	**69409**	**208227**	**6940**	**20820**	**62469**	**187407**

Block- IV

Year	Run of Mines in		Saleable Black Granite Recovery @10%		Black Granite Waste @90%	
	M^3	Tonnes	M^3	Tonnes	M^3	Tonnes
Sixteenth	10001	30003	1000	3000	9001	27003
Seventeenth	12004	36012	1200	3600	10804	32412
Eighteenth	14400	43200	1440	4320	12960	38880
Nineteenth	16001	48003	1600	4800	14401	43203
Twentieth	17003	51009	1700	5100	15303	45909
Total	**69409**	**208227**	**6940**	**20820**	**62469**	**187407**

(4) Progressive quarry closure Plan:

As a Petrogenetic character, the depth persistence of the Black granite body in the mine area is beyond the workable limits. However, it is very difficult to operate granite dimensional stone mine economically below an average depth of 30m by observing the statutory provisions of Mine Safety Rules and Regulations. Hence in the proposed Mining Plan, only 30m average depth has been envisaged as 'Workable depth' for safe and economic mining.

However, it is proposed not to back fill the ultimate pit, in as much as good quantity of reserves is available below the workable depth of 30m 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 30m depth. The pit boundaries shall be safely fenced and used for agricultural purpose when the pit is filled with underground see page or rain waters.

(5) Control of Dust, Noise and Ground Vibrations:

The quarrying operation is being carried out by semi-mechanized method with deployment of HEMM for development and production activities. Dust will be suppressed by adopting wet drilling method and water sprinkling in the haul road. As expansion rock breaking powder is using for splitting rock the noise level will be reduced. As TAMIN is using Milli Second Delay Detonator (MSDD) for blasting, the vibration observed in this quarry is negligible.

Ground Water:

Ground water occurrence in this area is below 12.4m ground level due to semi-arid climatic conditions with moderate rainfall. The quarry operation confined to well above the water table for the entire lease period, hence the quarry operation will not be affected/ intersected by the ground water in any manner.

Significant Features:

TAMIN closely monitored the environmental factors systematically without degrading the land, water and air.

1.4(c) Review of the compliance position of conditions and stipulations imposed, if any, while approving the Mining Plan. In case of non-compliance / partial compliance, detailed justification reasons thereof may be furnished along with proposal for compliance in the ensuing period:

TAMIN always carries out its mining operations in conformity with the above Acts and Rules.

1.4(d) Review of compliance of violations pointed out after inspections made under GCDR, 1999 during last 5 years. The position emerging out of the yearly review of the Mining Plan while checking up implementation of the Mining Plans in the field shall also be taken note of at this stage:

At this stage not applicable

1.4(e) Any other points requiring attention in the interest of proper mine design, development and conservation and environment and ecology of the area:

The proposed mine working is so designed in such a way mainly keeping in view of conservation of mineral, afforestation, environment, and ecology of the mine area.

***

PART – II

2.0. PROPOSAL UNDER MINING PLAN FOR THE 5 YEARS.

2.1 Name and Address of the Lessee:

Name	:	M/s.Tamil Nadu Minerals Limited,
Address	:	No. 31, Kamarajar Salai, Chepauk, Chennai - 600 005. Tamil Nadu State.
Phone	:	044-2989 2018
e.Mail	:	tamin@tamingranites.com

2.2 Name and address, registration number of the recognized persons together with validity date / person employed under Rule 13 of GCDR1999 who has prepared the Mining Plan:

RQP Certificate Enclosed.

2.3 Mineral (s) to be mined:

To mine the Dolerite Dyke commercially known as 'Ajjanahalli Black Granite Dimensional Stone'.

2.4 Area and date of expiry of lease:

Details of Lease Area	Date of expiry of lease
Ajjanahalli Village. Black Granite Quarry over an extent of 17.50.0Ha in Ajjanahalli village, SF.No.896, Pennagaram Taluk, Dharmapuri District, Tamil Nadu State.	Will be informed after execution of lease deed

2.5 Date of expiry of 5 year period for which Mining Plan approved on the last occasion:

Not applicable at this stage

3.0. RESERVES:

3.1 Category-wise (Proved, Probable and Possible) Reserves Estimated in the earlier Mining Plan with grades:

Sl. No	Geological Reserves	Mineable Reserves	Mineable Saleable Granite Reserves @10% Recovery	Granite Waste @90% Recovery
1.	8,87,700M^3	5,62,152M^3	56,215M^3	5,05,937

The above estimations arrived at on the basis of geological & Mineable Cross sections.

3.2 Depletion of Reserves:

Nil

3.3 Additional reserves established category wise (with basis and parameters considered):

No additional reserves.

3.4 Category wise updated reserve with grade (indicate and use grade with analysis) as well as marginal grades:

Sl. No	Geological Reserves	Mineable Reserves	Mineable Saleable Granite Reserves @10% Recovery	Granite Waste @90% Recovery
1.	8,87,700M^3	5,62,152M^3	56,215M^3	5,05,937

The above estimations arrived at on the basis of Geological & Mineable cross sections updated as on 08.06.2024.

4.0. CONCEPTUAL MINING PLAN:

a) Anticipated Life of the Quarry:

Updated Mineable Reserves : 5,62,152M^3

Anticipated Life of the Quarry : 33 years.

b. Depicted on Mine Geological Plans and sections with necessary statement annexed supported by essential text, covering the basic & long term design features of mine covering exploration, mine development, optimum exploitation & utilization of the mineral, waste & sub-grade mineral management, and environmental aspects. The ensuing five year detailed programme should but be a part of the conceptual overall Mining Plan.

i) Mine Year wise Production:

The Mine year wise production up to the lease period has been discussed in the Chapter.1.4(b) (3).

Mine Year wise Development:

Year pertaining to	Proposed generation of waste in the Mining Plan Period (M^3)	
	Over Burden	Side Burden
First year to Twentieth Year	Nil	75804
Total	**Nil**	**75804**

ii) Optimum exploitation and utilization of the Mineral:

The optimum quantity of mineable reserves as ROM is 5,62,152M^3.

iii) Waste and sub-grade Mineral Management:

The dumps will be maintained not exceeding 5m Height and the angle of slope of dumps will be at 45°from horizontal. The waste dump has been earmarked in the plate No.4/1 & 4/4.

iv) Environmental Aspects:-
Afforestation Programme:

TAMIN will get Environmental Clearance (EC) from the SEIAA as directed by the Govt. After approval of this mining plan, necessary native species of sapling will be planted as per the EC letter.

The quarrying operation is being carried out by semi-mechanized method with deployment of HEMM for development and production activities.

Ultimate Pit dimensions of the Quarry at top and bottom are tabulated below:

Ultimate Pit Dimensions at Top (m)		Ultimate Pit Dimensions at Bottom (m)		
Length	Ave.Width	Length	Ave.Width	Depth
734.00	65.00	529.00	23.17	30.00

5.0 MINING:

5.1 Salient Description of the present mining methods:

The Quarrying work being carried out under the direct supervision of our Statutory Mining Personal of TAMIN as approved by the DGMS under MMR,1961.

5.2 Yearly pit-wise development plan proposed for the next five years, depicted on plans and sections (ore and overburden to be shown clearly along with geological formations encountered depicting also the design and layout of the mine benches in case of opencast mining).

It has been discussed in chapter 4.0 b i)

5.3 Yearly pit-wise development plan proposed for next five years along with grade. Blending proposal, if any, may be indicated:

Nil

Details of depth and benches proposed during the Mining Plan Period:
Block I

Year	Section	R.L Proposed (m)	Depth Details(m)				No. of Benches
			Present	Proposed	Remaining	Total	
First	PQ & AA'	450.000 to 444.000	0	6.00	24.00	30	1
Second	PQ & BB'	448.000 to 442.000	0	6.00	24.00	30	1
Third	PQ & AA'	444.000 to 438.000	6.00	6.00	18.00	30	1
Fourth	PQ & BB'	442.000 to 436.800	6.00	5.20	18.80	30	1
Fifth	PQ & AA'	438.000 to 432.000	12.00	6.00	12.00	30	1

During the Mining Plan Period, Block-II, Block III and Block – IV details of proposed depth and benches have been given in the Annexure-J.

5.4 Any change in proposed method of mining and deployment of machinery, together with reasons thereof:

The quarrying operation is being carried out by semi-mechanized method with deployment of HEMM for development and production activities under Regulation 106.

6.0. HANDLING OF WASTE /SUB- GRADE MATERIAL:

6.1 Rate of yearly generation of waste and proposals for disposal of waste for next five years. (indicate sequence of dumping with necessary plan and sections)

The waste generated during the mining operation i.e., side burden, Granite waste etc, will be dumped in the suitable area already selected. The area for disposal of waste rock has been identified on Southern side of the lease area. The unsold blocks are kept within the boundary on the country rock area.

6.1.1 Build-up of dumps from year to year to be shown in yearly plans and sections with description of the method & manner of disposal of waste rock, designed capacity & height of individual dumps and precautions envisaged for confinement of the dumps together with design details of the protective works:

The dumps will be maintained not exceeding 5m height and the angle of slope of dumps will be at 45^0 from horizontal. The waste dump has been earmarked in the Plate Nos. 4 & 5.

6.2 Rate of yearly generation of sub-grade mineral with reference to threshold values and proposals for stacking for next five years. (Submit necessary plan/sections.) (In case variations from the recommended threshold values of IBM, please give adequate justification and reasons).

There is no sub-grade mineral produced.

6.3 Quantity and grade of sub-grade material available at the mine as on date duly supported by plans & sections and descriptive statement inclusive of the precautions adopted for storage.

-Not Applicable-

7.0. USE OF MINERAL:

7.1 Changes proposed in the use of mineral, if any, with reasons:

TAMIN will sell dimensional blocks only in accordance with Rule 8-C of the Tamil Nadu Minor Mineral Concession Rules,1959.

7.2 Changes in the specification, if any, imposed by the user industries and or specifications required in the case of new user industries, if any, to be given:

As mentioned above there is no change in specification imposed by the user industries.

7.3 Efforts made for utilization of the sub-grade mineral including fines:

As there is no sub-grade mineral, the question of efforts made for utilization of the sub grade mineral including fines does not arise.

8.0. MINERAL BENEFICIATION:

8.1 Results of any beneficiation investigations conducted and changes made in existing mineral beneficiation plant and tailing disposals, if any, with benefits expected (necessary) flow - sheet and tailing dam designs etc., to be submitted as applicable:

- Not Applicable –

8.2 Beneficiation test done, if any, on sub-grade mineral including fines and proposals for installation of new or additional beneficiation facility, if any (furnish process details in brief along with expected tailings loss):

- Not Applicable –

9.0. ENVIRONMENTAL MANAGEMENT PLAN:

The following observations are made for Environmental Management Plan:

i. Existing land use pattern:

The lease area is a hilly terrain with height of about 75m surrounded by plain lands. The altitude of the area is 455m (Maximum) above MSL and the area receives average annual rainfall of about 985mm.

ii. Land Reclamation & Rehabilitation:-

The mine-pit will be utilized as a water reservoir for agriculture purpose Waste Dump management.

iii. Waste Dump management:-

The waste can be dumped on Southern side of the lease boundary.

10.0. ANY OTHER INFORMATION:

- NIL -

Date:

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

Annexure No: A

19 SEP 2023

Natural Resources (MME.1) Department,
Secretariat, Chennai 600 009.

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Letter No.3740397/MME.1/2023-1, dated 13.09.2023

From
Thiru. K. Phanindra Reddy, I.A.S.,
Additional Chief Secretary to Government (FAC)

To
Tvl.Tamil Nadu Minerals Limited,
No.31, Kamarajar Salai,
TWAD House,
Chepauk, Chennai – 600 005.

Sir,

Sub: Natural Resources – Minor Mineral – Black Granite – Quarry lease application preferred by Tvl.TAMIN for quarrying of Black Granite over an extent of 17.50.0 hectares of Government Poramboke land in S.F.No.896 Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District - Precise area communicated – Approved Mining Plan and Environmental Clearance – Called for.

Ref: 1. Your Quarry Lease Application dated 13.02.2022.

2. From the District Collector, Dharmapuri, Note File.No.605/2002-(Mines), dated 12.09.2022.

3. From the Commissioner of Geology and Mining, Chennai, File Rc.No.6167/MM4/2002, dated 11.12.2022.

I am directed to invite attention to the references second and third cited, wherein the District Collector, Dharmapuri and the Commissioner of Geology and Mining, Chennai have recommended and forwarded your quarry lease application for grant of quarry lease for quarrying of Black Granite over an extent of 17.50.0 hectares of Government Poramboke land in S.F.No.896 Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District for a period of 20 years under rule 8-C of the Tamil Nadu Minor Mineral Concession Rules, 1959.

2. The Government carefully examined the recommendations of the District Collector, Dharmapuri and the Commissioner of Geology and Mining, to communicate precise area for the extent of 17.50.0 hectares of Government Poramboke land in S.F.No.896 Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District and accordingly, the Government hereby

(p.t.o.)

communicate Precise Area for the above said area under sub-rule (3) (b) of rule 8-C of the Tamil Nadu Minor Mineral Concession Rules, 1959 for grant of quarry lease.

3. I, therefore, request you to furnish the Approved Mining Plan for the above-mentioned Precise Area through the Director of Geology and Mining within a period of 3 months as per sub-rule (3) (b) of rule 8-C of the TNMMCR, 1959 and to produce Environmental Clearance obtained from the competent authority for the above said area for grant of quarry lease subject to the following conditions:-

1) The required safety distance to be provided to the "Masakal Forest" in S.F.No.420/A over an extent 250.26.5 hectares located abutting to the applied area on the North Eastern side as per rules.

2) 50 meters safety distance to be provided to the electric line, Check dam, Tar Road and the temple located on the Western boundary of the applied area and 10 m safety distance to the Tar road on the eastern side.

3) 7.5 meters safety distance should be provided all along the boundaries of the patta lands.

4) The applicant company should not cause hindrance to the pattadar and Government lands if any adjacent to the area, while quarrying and transporting the Granite.

5) The quarrying operation should be restricted only in the area to be granted on lease.

6) Barbed wire fencing or Compound wall should be erected all along the boundary of the lease granted area.

7) The waste materials generated during the course of quarrying should be dumped only within the lease hold area.

8) A green belt should be created by planting trees along the boundary of the area to control air and noise pollution.

9) Environment Clearance should be obtained from the competent authority in respect of the subject area as per rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 and as per the notification of the Ministry of Environment and Forest and any other clearances if any.

10) The applicant company should submit Mining Due Clearance Certificate for the year 2017-18 before execution of lease deed and for the period from 2018-19 to 2022-23 after March, 2023 as per the G.O (D) No.43 Industries (MME.1) Department dated 16.05.2022 in which the Government has given exception to Tvl.TAMIN Ltd., for remittance of arrear dues to the Government.

11) The applicant company should fence the lease granted area with barbed wire before the execution of lease deed as follows:

a. The pillar post shall be firmly grounded with concrete foundation of height not less than 2 meters with a distance between two pillars shall not be more than 3 meters.

b. The applicant shall incorporate the DGPS readings for the entire boundary Pillars of the area and the same should be clearly shown in the mining plan.

c. A soft copy of the digitized map with DGPS readings should be submitted in the CD to the Assistant Director (G&M), Dharmapuri.

12) The conditions mentioned in G.O.(Ms).No.79, Industries (MMC.1) Department, dated 06.04.2015 should be complied with.

13) As per rule 12 (V) of Mineral (other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016, the company Their applicant company shall at their own expenses erect, maintain and keep in repair all the boundary pillars.

14) The applicant company should ensure that all the labourers are registered in the Labour Welfare Board and Insurance Scheme.

15) The applicant company should comply with the additional conditions stipulated in the Government of India, Ministry of Mines order No. 11/02/2020, dated 14.01.2020 issued as per the order of Hon'ble Supreme Court of India, dated 08.01.2020 which states that "The mining lease holders shall after ceasing mining operations, under take re- grassing the mining area and any other area which may have been disturbed due to this mining activities and restore the land to a condition which is fit for growth of fodder, flora and fauna etc.,"

16) The applicant company should carry out DGPS survey and erection of RCC boundary pillars as per the norms stipulated in the EOI notification in Rc.No.2921/MM4/2019 subsequent corrigendum dated 13.08.2019 before execution of quarry lease.

17) Tvl. TAMIN Limited, Chennai-5 shall produce current mining dues clearance certificate as per the affidavit filed along with this application, on grant of mining lease for this area but, before execution of lease deed.

18) The applicant company should submit latest Board of Directors details before execution of lease deed.

4. The District Collector, Dharmapuri shall obtain a sworn-in-affidavit from the appellant containing the above conditions before execution of lease deed and also ensure that the instructions issued in Government Letter No.12789/MMB.2/2002-7, Industries (MMB) Department, dated 09.01.2003 are complied with.

Yours faithfully,

S. Sanmuganathan 13/9/23

for Additional Chief Secretary to Government (FAC)

To
The Director of Geology and Mining,
Guindy, Chennai – 600 032.

The District Collector,
Dharmapuri District.

Annexure No - B

COMMISSIONERATE OF GEOLOGY AND MINING

From
Tmt.Pooja KulKarni, I.A.S.,
Commissioner,
Department of Geology and Mining,
Guindy, Chennai - 600 032.

To
The Managing Director,
Tvl. TAMIN Ltd.,
No.31, Kamarajar Salai,
Chepauk, Chennnai -05.

Rc. No.6167/MM4/2022, dated:23.11.2023

Sir,

Sub: Mines and Minerals – Minor Mineral – Black Granite – Dharmapuri district - Pennagaram taluk – Ajjanahalli village - over an extent of 17.5.0 ha of Government land – S.F.No.896 –Quarry lease application preferred by Tvl.TAMIN Ltd., Chennai – Precise area communicated by the Government – Mining Plan submitted by Tvl.TAMIN Ltd., Chennai - Recommended by the Assistant Director (G&M), Dharmapuri - Approval accorded.

Ref:
1. Commissioner of Geology and Mining original file no. Rc.No.6167/MM4/2022 dated 11.12.2023 forwarded to Government under single file system.
2. Government letter no. 3740397/MME.1/2023-1 dated 13.9.2023.
3. Tvl.TAMIN Ltd., Chennai letter Rc.No.2460/ML4/2002 dated 30.10.2023.
4. The Assistant Director of Geology and Mining, Dharmapuri letter Rc.No.605/2022 (Mines), dated 31.10.2023.

****

Kind attention is invited to the above references cited.

2) The quarry lease application preferred by Tvl.TAMIN Ltd., for quarrying black granite over an extent of 17.50.0 ha of Government poramboke lands in S.F.No.896 of Ajjanahalli village, - Pennagaram taluk, Dharmapuri district was forwarded to the Government by the Commissioner of Geology and Mining vide reference 1st cited for grant of quarry lease under rule 8-C of TNMMCR, 1959. Now, the Government vide letter dated 13.09.2023 have communicated the precise area to an over an extent of 17.50.0 ha and requested the applicant company to submit the approved mining plan through the

Commissioner of Geology and Mining and to produce environmental clearance obtained from the competent authority for the subject area for grant of quarry lease.

3) Accordingly, the mining plan submitted by Tvl.TAMIN Ltd., has been forwarded and recommended by the Assistant Director, (G&M), Dharmapuri vide reference 4th for the subject area for approval.

4) On Scrutinizing the mining plan submitted by Tvl.TAMIN Ltd., and the report of the Assistant Director (G&M), Dharmapuri, the following are submitted.

i. The Assistant Director (G&M), Dharmapuri has reported that the mining plan has been prepared by incorporating all the conditions imposed in the precise area communication vide letter No. 3740397/MME.1/2023-1 dated 13.9.2023 and the plan tallied with the present filed conditions.

ii. The proposed year wise production:

Year	ROM (cbm)	Production (m^3) @ 10% Recovery	Granite Waste @ 90% cbm
1st year	10002	1000	9002
2nd year	11999	1200	10799
3rd year	14398	1440	12958
4th year	16000	1600	14400
5th year	17004	1700	15304
Total	**69403**	**6940**	**62463**

iii. As per the Mining plan submitted by Tvl.TAMIN Ltd., it is mentioned that the total ROM in the mining plan period is about 69403 cbm for a total depth of 12 m. Production for first 5 years Mining plan period is 6940 cbm at 10% recovery for a depth of 12 m.

ii. With regard to the dumping of waste during the Mining Plan period, it has been proposed to dump on the southern side of the lease boundary area.

iii. Finally, the Assistant Director (G&M), Dharmapuri has recommended and forwarded the mining plan submitted by Tvl. Tamil Nadu Minerals Limited, Chennai for quarrying Black Granite over an extent of 17.50.0 ha in S.F.No 896 of Ajjanahalli village, Pennagaram taluk, Dharmapuri district to the Commissioner of Geology and Mining, Chennai for approval.

5) The mining plan submitted by Tvl.TAMIN Ltd, and report of the Assistant Director (G&M), Dharmapuri have been examined with reference to the provisions of Rule 12, 13 and 15 of Granite Conservation and Development Rules, 1999 read with G.O.(Ms). No. 87, Industries (MMC.1), Department dated: 22.02.2001. Based on the recommendation of the Assistant Director (G&M), Dharmapuri the mining plan submitted by Tvl.TAMIN Ltd, is hereby approved subject to the following conditions in addition to the conditions stipulated in the precise area communication issued by the Government vide reference 2nd cited.

i. This mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time whether such Laws are made by the Central Government, State Government or any other authority

ii. The approval of the mining plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development and Regulation) Act 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Indian Explosives Act, 1884 (Central Act IV of 1884) and the rules made there

under and the Tamil Nadu Minor Mineral Concession Rules, 1959.

iii. This mining plan including progressive mine closure plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.

iv. Provisions of the Mines Act, 1952 and the Rules and Regulations made there under including submission of notice of opening, appointment of manager and other statutory officials as required under Mines Act, 1952 shall be complied with.

v. Provisions made under Mines and Minerals (Development & Regulation) Act, 1957, MMDR Amendment Act, 2015 and Granite conservation and Development Rules, 1999 made there under shall be complied with.

vi. Relaxation to be obtained under Rule 106(2)(b) of Metalliferous Mines Regulations, 1961 from the Director of Mines Safety, if necessary.

vii. If anything is found to be concealed as required by the Granite Conservation and Development Rules, 1999 and Tamil Nadu Minor Mineral Concession Rules, 1959 and proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.

viii. 50 meters safety distance to be provided to the electric line,Check dam, Tar Road and the temple located on the Western boundary of the applied area and 10 m safety distance to the Tar road on the eastern side.

ix. 7.5 m safety distance should be provided all along the boundaries of the patta lands.

x. The required safety distance should be provided to the "Masakal" Forest in S.F.No.420/A over an extent 250.26.5 hectare located abutting to the application area on the NE side as per rules.

xi. No blasting and transportation of materials in vehicles should be carried out from 6.00 PM to 6.00AM.

xii. A green belt should be constructed to prevent sound and air pollution due to the proposed quarrying activity by planting at least 250 seedlings all along the boundary the area.

xiii. No hindrance shall be caused to the adjacent Patta lands and Government poramboke lands if any while quarrying and transportation of granite.

xiv. The applicant company shall strictly adhere to the statutory and safety requirements and the applicant company should ensure the periodical medical checkup to the quarry workers to safeguard them from quarry related diseases.

xv. The waste materials generated during the course of quarrying should be dumped only within the lease hold area that will be earmarked for the purpose in the mining plan as per rule 31 of GCDR, 1999.

xvi. The applicant company shall submit Scheme of Mining, mine closure plan and other statutory requirements within the time stipulated for submission of the above as per GCDR, 1999 rules.

xvii. The applicant company should fence the lease granted area with barbed wire before the execution of lease deed as follows.

- The pillar post shall be firmly grounded with concrete foundation of height not less than 2 m with a distance between two pillars shall not be more than 3mts.
- The applicant company shall incorporate the DGPS readings for the entire boundary pillars of the area and the same should be clearly shown in the mining plan.
- A soft copy of the digitized map with DGPS readings should be submitted in CD to the Assistant Director (G&M), Dharmapuri.

xviii. The boundary stone should be fixed for the subject quarry and the district administration / Geology and Mining Department should ensure that the quarrying operation should be restricted only within the area granted for lease.

xix. Environment Clearance should be obtained from the competent authority in respect of the subject area as per rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 and as per the notification of the Ministry of Environment and Forest and any other clearances if any.

xx. As per rule 12 (v) of Mineral (other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016, the applicant company shall at their own expense, erect, maintain and keep in repair all boundary pillars.

xxi. The conditions mentioned in G.O No. 79 Industries Department dated 06.04.2015 should be complied with.

xxii. The applicant company may use mild explosives during quarrying, and storing of explosives if required, by obtaining valid license under explosive Acts and Rules.

xxiii. If any violation is found during quarrying operation, the penal provisions of Tamil Nadu Minor Mineral Concession Rules 1959 and other rules and act in force will attract.

xxiv. Child labour should not be engaged in the quarry works and the quarry workers should be enrolled in the insurance scheme through the Labour Department.

xxv. The applicant company should remit the Stamp Duty as per the approved modified mining plan during the currency of the lease period.

xxvi. The earlier instances of irregular / illegal quarrying, if any, shall not be regularized through the approval of this document.

xxvii. The applicant company shall remit the penalty / cost of mineral / other dues if any as arrived by the District Collector / Assistant Director (G&M), Dharmapuri district.

xxviii. Non adherence to any condition set-out above, the approval shall be deemed to have been withdrawn with immediate effect.

xxix. The applicant company should comply with the additional conditions stipulated in the Government of India, Ministry of Mines, Order No.11/02/2020, dated.14.01.2020 issued as per the Order of the Hon'ble Supreme Court of India, dated.08.01.2020 states that, "The Mining lease holders shall after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc".

xxx. The applicant company should carry out DGPS survey and erection of RCC boundary pillars as per the norms stipulated in the EOI notification in Rc.No.2921/MM4/2019 dated.01.02.2018 and subsequent corrigendum dated 13.08.2019.

Sd/-Pooja Kulkarni
Commissioner of Geology and Mining

Forwarded / by Order

Additional Director

Copy to:

1. The Additional Chief Secretary to Government(FAC), Natural Resources Department, 4th Floor, Secretariat, Chennai-9.
2. The Director of Mines Safety, 3rd Floor, Left Wing, New Additional Building, CGO Complex, Shastri Bhawan, Nungambakkam, Chennai – 06
3. The District Collector, Dharmapuri District.

மாவட்டம் : தர்மபுரி எண் : 30

வட்டம் : பென்னாகரம் SHEET No: 6 இடம் பயர் : ஜிஜுஜு

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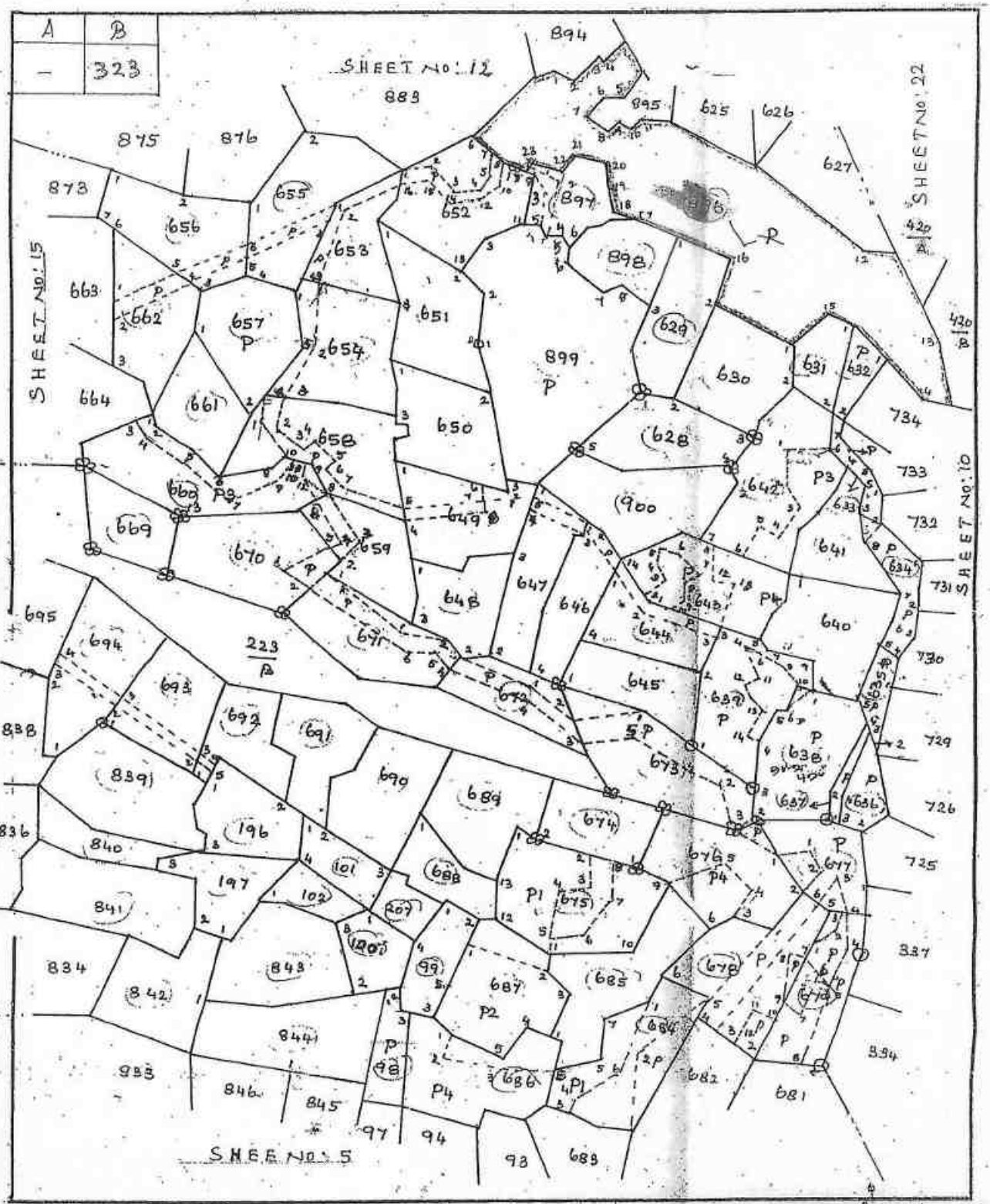

Applied for Mine
ASSISTANT GEOLOGIST
O/o. the Deputy Director,
Dept. of Geology and Mining,
DHARMAPURI.

DIVISIONAL MANAGER
TAMILNADU MINERALS LTD.,
KRISHNAGIRI.

ASSISTANT DIRECTOR
Dept. of Geology
DHARMAPURI

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3	-3	ஈ	பு	...	8-5	12	0 62	0 57·0	0 35	410 சி. சின்னையன்.
4	-4	ஈ	பு	...	8-5	12	0 62	0 29·5	0 19	1028 ரா. ராஜி.
5	-5	அ	பு	...	8-5	12	0 62	0 90·5	0 55	.....
6	-6	ஈ	பு	...	8-5	12	0 62	0 90·5	0 55	275 கொ. கொவ்வை.
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	-3	ஈ	பு	...	8-5	12	0 62	0 70·0	0 43	313 பொ. கோவிந்தன்.
	-4	ஈ	பு	...	8-5	12	0 62	0 42·0	0 21	313 பொ. கோவிந்தன்.
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Annexure No. H

Tamil Nadu Minerals Limited, Chennai-600 005

List of Board of Directors

1. **Thiru.K.Phanindra Reddy, I.A.S.,**
   Chairman,
   Tamil Nadu Minerals Limited and
   Additional Chief Secretary to Government
   Natural Resources Department, [Full Additional Charge]
   Secretariat, Chennai–600 009.
2. **Thiru.Anil Meshram,I.A.S.,**
   Managing Director,
   Tamil Nadu Minerals Limited
   Chepauk, Chennai–600 005.
3. **Thiru.L.Nirmal Raj, I.A.S.,**
   Industries Commissioner and Director of Industries Commerce,
   2nd Floor and 3rd Floor, SIDCO Corporate Office Building,
   Thiru-Vi-Ka Industrial Estate,
   Guindy, Chennai–600 032.
4. **Thiru.M.J.Devaraj,**
   Deputy Secretary to Government,
   Industries, Investment Promotion & Commerce Department,
   Secretariat, Chennai–600 009.
5. **Thiru. G.K. Arun Sundar Thayalan, I.A.S.,**
   Additional Secretary to Government,
   Finance Department, Secretariat, Chennai–600 009.
6. **Tmt.Pooja Kulkarani, I.A.S.,**
   Commissioner of Geology and Mining,
   Guindy, Chennai–600 032.
7. **Dr. T.Subramani, Ph.D.,**
   Professor and Head,
   Department of Mining Engg., Anna University,
   Guindy, Chennai - 600 025.
8. **Thiru. P. Sankara Kumar, B.Com., B.L.,A.C.S.,**
   Independent Director,
   Old.No.88, New No.227, North Madhavaram High Road,
   Perambur, Chennai–600 011.
9. **Thiru. R. Pitchai Muthu, M.Sc.,**
   Independent Director,
   No.82, LGB Nagar, East Street,
   Karur–639 002 Cell:9444025938
10. **Dr.Godwin Tennyson,**
    Professor in Operations, Management and Decision Sciences,
    Indian Institute of Management,Pudukkottai Main Road,
    Chinna Sooriyur Village, Trichirappalli - 620 024.
11. **Dr.Biswajit Paul,**
    Professor, Dept. of Environmental Science and Engineering,
    Centre of Mining, Indian Institute of Technology,
    (Indian School of Mines)
    Dhanbad - 826 004.Jarkhand.

Annexure No: I

भारत सरकार
GOVERNMENT OF INDIA
इस्पात और खान मंत्रालय
MINISTRY OF STEEL AND MINES
भारतीय खान ब्यूरो
INDIAN BUREAU OF MINES

प्रशिक्षण, खनन अनुसंधान और प्रकाशन प्रभाग
Training, Mining Research and Publication Division
प्रकाशन प्रकोष्ठ
PUBLICATION CELL

GRANITE IN INDIA

Bulletin No. 21

Issued by
Controller-General
Indian Bureau of Mines
NAGPUR

March 1990

Price : (Inland) Rs. 55.00; (Foreign) £ 6.41; or $ 19.80

TABLE 1.1 (E)

PHYSICAL PROPERTIES OF GREY GRANITE, DOLERITE AND GABBRO[4]

Property	Grey granite	dolerite	Gabbro
1. Hardness			
a. Moh's scale	5.8-6.6	6-6.7	4.8-6.2
b. Shore	85-110	85-105	-
2. Specific gravity	2.6-2.7	2.6-3.13	2.9-3.12
3. Compressive strength, kg/cm²	1000-3000	2000-3500	1800-3000
4. Tensile strength, kg/cm²	70-250	150-350	150-300
5. Shear strength, kg/cm²	140-500	250-600	-
6. Modulus of elasticity, kg/cm²x10⁵	2.5	8-11	7-11
7. Coefficient of linear expansion, x10⁶	4-6	2-4	-
8. Porosity, %	0.5-1.5	0.1-0.5	0.1-0.2

2.3 PHYSICAL PROPERTIES

The desirable physical properties of granite vary with the intended use. Generally strength, durability and appearance are considered the most important physical properties. Besides, a number of other properties influence the utility and value of granite. The salient physical properties are described in Table 1.1 (E).

Strength and deformation characteristics of granite and dolerites from Warangal District, Andhra Pradesh are given below :

Rock	Density	Compression strength (SC)	Tensile strength (St)	Shear strength (SS)	Young's Modulus (E)
	M/V	kg/cm²	kg/cm²	kg/cm²	x10⁵ kg/cm²
Pink granite	2.58 to 2.63	800 to 1500	70 to 130	280 to 425	2.15 to 3.60
Grey granite	2.60 to 2.68	1300 to 2200	100 to 150	300 to 540	2.80 to 5.04
Dolerite	3.00 to 3.10	1500 to 3200	130 to 220	400 to 680	4.40 to 7.42

Source : Deva Pratap, Granite Seminar, Institution of Engineers, 1988 Hyderabad.

[1][APPENDIX - II

A. RATE OF SEIGNIORAGE FEE

Sl. No.	Name of the Minor Mineral	Rate of Seigniorage Fee (in Rs.)	
(1)	(2)	(3)	
		Per Cubic Meter	Per Metric Tonne
1.	Building and road construction materials / stones other than Granite		
	(a) Rough stones including Khandas, boulders, size reduced (broken and crushed) materials including metal jelly, ballast, millstone and hand chakais	90/-	60/-
	(b) Pebbles and nodules of chalcedony, flint etc.	263/-	100/-
	(c) Laterites and Gravel	56/-	28/-
	(d) Ordinary Earth	56/-	28/-
2.	Granite—		
	(a) Black Granite	5210/-	1680/-
	(b) Red, Pink, Grey, Green, White or multi-coloured granites or any other rock suitable for use as oranamental and decorative stones	3133/-	1180/-
	(c) Granite waste:	265/-	100/-
	(i) Irregular pieces of granite which cannot be used as dimensional blocks and		
	(ii) the granite pieces having size less than 15cm X 10cm		
3.	Ordinary sand	160/-	80/-
4.	Ordinary clay / Tile clay that can be used for brick, tile manufacturing and potteries.	56/-	28/-
5.	Lime shell that can be used in kilns for manufacture of lime required for use as building materials	176/-	78/-

1. Appendix II substituted by G.O. Ms. No. 4, Natural Resources (MMC.1), dated 22nd August 2023 - SRO No. A-28(b)/2023.

INDEX

- MINING LEASE APPLIED BOUNDARY
- SAFETY ZONE 5Km RADIUS
- ROAD
- UNMETALLED ROAD
- RESERVOIR
- STREAM / RIVER
- CONTOUR
- R.F BOUNDARY
- STATE BOUNDARY

WIND DIRECTION

- WINTER
- SUMMER

DISTRICT	: DHARMAPURI
TALUK	: PENNAGARAM
VILLAGE NAME	: AJJANAHALLI
VILLAGE No.	: 30
FIELD NO.	: 896
LEASE HOLD AREA	: 17.50.0Ha.

PLATE No. 1

AJJANAHALLI BLACK GRANITE QUARRY

KEY PLAN

PART OF TOPO SHEET NO: 57H/16

EASTERN LONGITUDE FROM 77°49'07.5609"TO 77°49'37.3636"

NORTHERN LATITUDE FROM 12 °03'48.1953" TO 12° 04'13.7287"

500 0 2500 5000

SCALE= 1:50,000(1CM = 500 M)

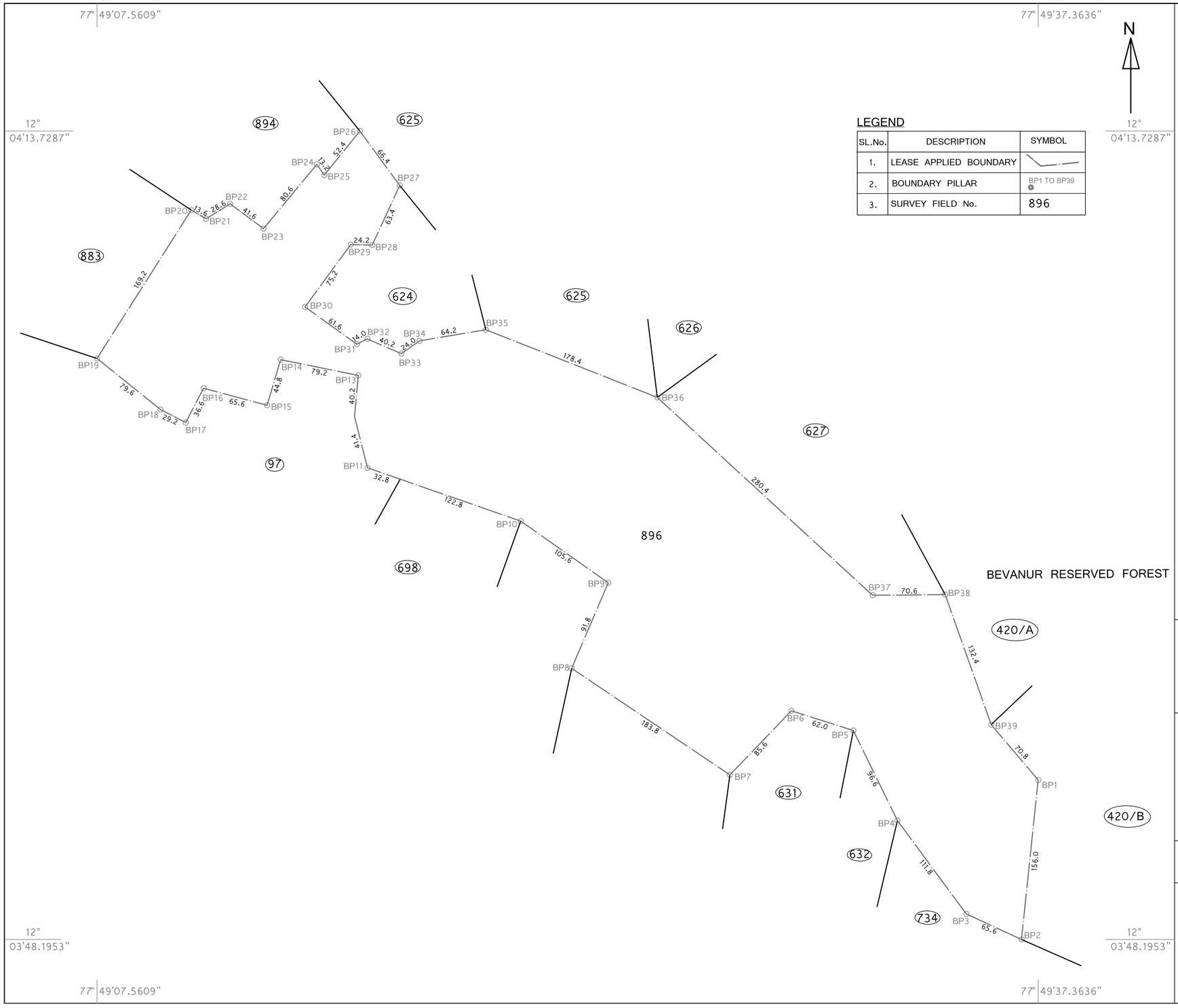
ALL DIMENSIONS ARE IN METRES

APPLICANT : M/S.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.



LEGEND

SL.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	BOUNDARY PILLAR	BP1 TO BP39
3.	SURVEY FIELD No.	896

DGPS-CO-ORDINATES OF BOUNDARY PILLARS

Sl.No	Boundary pillar Coordinates	Latitude	Longitude
1	BP1	12° 03' 53.1855" N	77° 49' 37.3636" E
2	BP2	12° 03' 48.1953" N	77° 49' 36.7796" E
3	BP3	12° 03' 49.0111" N	77° 49' 35.0346" E
4	BP4	12° 03' 52.0901" N	77° 49' 33..2404" E
5	BP5	12° 03' 54.7943" N	77° 49' 31.4992" E
6	BP6	12° 03' 55.4314" N	77° 49' 29.5347" E
7	BP7	12° 03' 53.4441" N	77° 49' 27.5591" E
8	BP8	12° 03' 56.8310" N	77° 49' 22.5606" E
9	BP9	12° 03' 59.4989" N	77° 49' 23.7516" E
10	BP10	12° 04' 01.4598" N	77° 49' 20.9860" E
11	BP11	12° 04' 03.1781" N	77° 49' 16.1304" E
12	BP12	12° 04' 04.7924" N	77° 49' 15.7330" E
13	BP13	12° 04' 06.0739" N	77° 49' 15.8712" E
14	BP14	12° 04' 06.5927" N	77° 49' 13.4014" E
15	BP15	12° 04' 05.1674" N	77° 49' 12.9564" E
16	BP16	12° 04' 05.7229" N	77° 49' 10.9426" E
17	BP17	12° 04' 04.6495" N	77° 49' 10.3610" E
18	BP18	12° 04' 05.0710" N	77° 49' 09.5614" E
19	BP19	12° 04' 06.6885" N	77° 49' 07.5609" E
20	BP20	12° 04' 11.3069" N	77° 49' 10.6096" E
21	BP21	12° 04' 11.0286" N	77° 49' 11.0789" E
22	BP22	12° 04' 11.4880" N	77° 49' 11.8487" E
23	BP23	12° 04' 10.6999" N	77° 49' 12.9007" E
24	BP24	12° 04' 12.6949" N	77° 49' 14.6155" E
25	BP25	12° 04' 12.3567" N	77° 49' 14.8566" E
26	BP26	12° 04' 13.7287" N	77° 49' 15.9985" E
27	BP27	12° 04' 12.0111" N	77° 49' 17.2485" E
28	BP28	12° 04' 10.1498" N	77° 49' 16.3536" E
29	BP29	12° 04' 10.1765" N	77° 49' 15.6730" E
30	BP30	12° 04' 08.2360" N	77° 49' 14.1943" E
31	BP31	12° 04' 07.0524" N	77° 49' 15.8340" E
32	BP32	12° 04' 07.2185" N	77° 49' 16.1714" E
33	BP33	12° 04' 06.7421" N	77° 49' 17.2448" E
34	BP34	12° 04' 07.1380" N	77° 49' 17.8323" E
35	BP35	12° 04' 07.4636" N	77° 49' 19.9404" E
36	BP36	12° 04' 05.2900" N	77° 49' 25.3701" E
37	BP37	12° 03' 59.0213" N	77° 49' 32.1578" E
38	BP38	12° 03' 59.0214" N	77° 49' 34.4664" E
39	BP39	12° 03' 54.9344" N	77° 49' 35.8858" E

DISTRICT : DHARMAPURI
TALUK : PENNAGARAM
VILLAGE No. : 30
VILLAGE NAME : AJJANAHALLI
SURVEY FIELD No. : 896
EXTENT OF LEASE : 17.50.0 Ha.

PLATE No. 1a

AJJANAHALLI BLACK GRANITE QUARRY
LEASE PLAN

20 0 100 200

SCALE= 1:2,000 (1CM = 20 M)
ALL DIMENSIONS ARE IN METRES

APPLICANT : M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

77° 49'07.5609" 806800 E 806900 E 807000 E 807100 E 807200 E 807300 E 807400 E 807500 E 807600 E 807700 E 807800 E 807900 E 77° 49'37.3636"

1336000 N 1335900 N 1335800 N 1335700 N 1335600 N 1335500 N 1335400 N 1335300 N 1335200 N 1335100 N

12° 04'13.7287" 12° 03'48.1953"

N

Kotta thandu kadu

Jaihanuman Kovil

Check Dam

Culvert

OFFICE
FIRST AID
STORE

BEVANUR RESERVED FOREST

B.M-434.013

894 625 624 625 626 627 883 96 97 698 629 630 631 632 734 420/A 420/B

BP1 BP2 BP3 BP4 BP5 BP6 BP7 BP8 BP9 BP10 BP11 BP12 BP13 BP14 BP15 BP16 BP17 BP18 BP19 BP20 BP21 BP22 BP23 BP24 BP25 BP26 BP27 BP28 BP29 BP30 BP31 BP32 BP33 BP34 BP35 BP36 BP37 BP38 BP39

GCP-CO-ORDINATES OF BOUNDARY PILLARS

Sl.No	Boundary pillar Coordinates	Latitude	Longitude
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39	BP39	12° 03' 54.9344" N	77° 49' 35.8858" E

INDEX

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	MINING LEASE APPLIED BOUNDARY CORNER PILLAR WITH No.	BP1 TO BP39
3.	TAR ROAD	
4.	TEMPORARY SHED	
5.	CONTOUR INTERVAL AT 5m	400 405
6.	BENCH MARK	B.M-434.013
7.	ELECTRICAL POWER LINE	
8.	CHECK DAM	
9.	ODAI	
10.	BLACK GRANITE DYKE	
11.	SAFETY DISTANCE 7.5M FROM BOUNDARY FOR PATTA LANDS 10M FROM TAR ROAD (Eastern Side) 60M FROM BEVANUR RESERVED FOREST 50M FROM ELECTRIC LINE 50M FROM CHECK DAM AND ODAI 50M FROM JAI HANUMAN TEMPLE 50M FROM TAR ROAD (Western Side)	

DISTRICT : DHARMAPURI
TALUK : PENNAGARAM
VILLAGE No. : 30
VILLAGE NAME : AJJANAHALLI
SURVEY FIELD No. : 896
EXTENT OF LEASE : 17.50.0 Ha.

PLATE No. 2

AJJANAHALLI BLACK GRANITE QUARRY
SURFACE PLAN
MODIFIED MINING PLAN

20 0 100 200

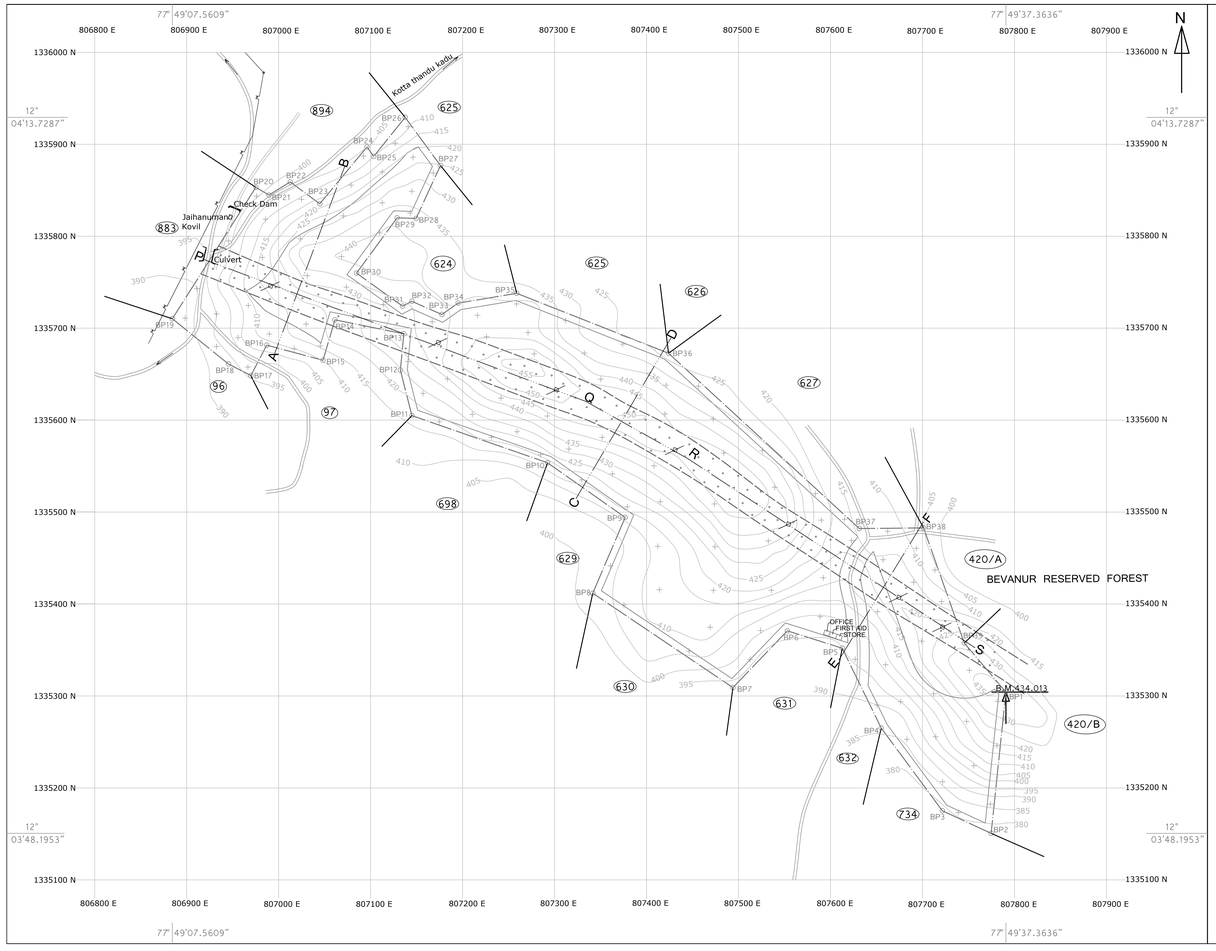
SCALE= 1:2,000 (1CM = 20 M)
ALL DIMENSIONS ARE IN METRES

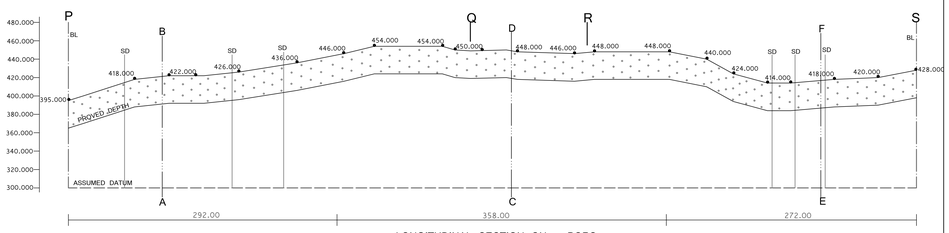
APPLICANT:- M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

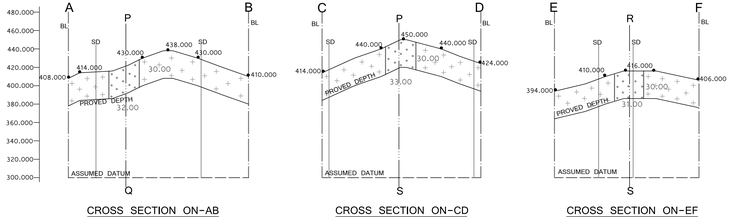
Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.







INDEX

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	MINING LEASE APPLIED BOUNDARY CORNER PILLAR WITH No.	BP1 TO BP39
3.	TAR ROAD	
4.	TEMPORARY SHED	
5.	CONTOUR INTERVAL AT 5m	
6.	BENCH MARK	B.M-434.013
7.	ELECTRICAL POWER LINE	
8.	CHECK DAM	
9.	ODAI	
10.	BLACK GRANITE DYKE	
11.	SAFETY DISTANCE 7.5M FROM BOUNDARY FOR PATTA LANDS 10M FROM TAR ROAD (Eastern Side) 60M FROM BEVANUR RESERVED FOREST 50M FROM ELECTRIC LINE 50M FROM CHECK DAM AND ODAI 50M FROM JAI HANUMAN TEMPLE 50M FROM TAR ROAD (Western Side)	
12.	CHARNOCKITE GNEISS	
13.	DIP AND STRIKE	

DISTRICT : DHARMAPURI
TALUK : PENNAGARAM
VILLAGE No. : 30
VILLAGE NAME : AJJANAHALLI
SURVEY FIELD No. : 896
EXTENT OF LEASE : 17.50.0 Ha.

PLATE No. 3

AJJANAHALLI BLACK GRANITE QUARRY
GEOLOGICAL PLAN AND SECTIONS
MODIFIED MINING PLAN

20 0 100 200

SCALE= 1:2,000 (1CM = 20 M)
ALL DIMENSIONS ARE IN METRES

APPLICANT : M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDLP
Qualified Person.
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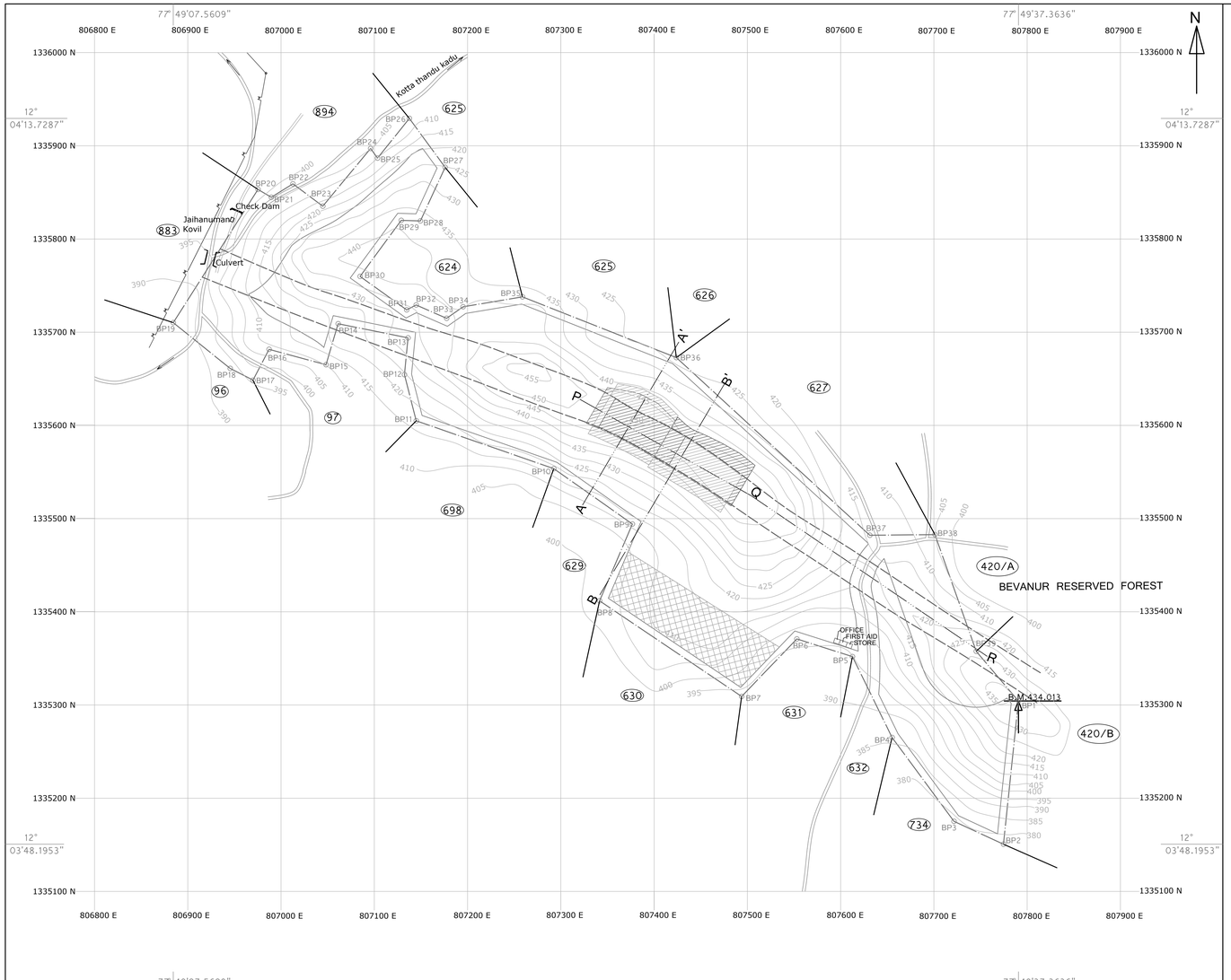
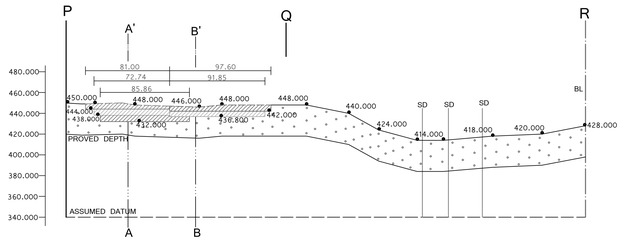
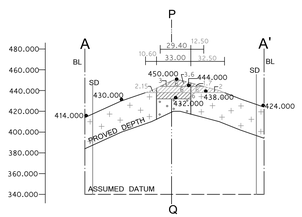
Chennai - 600 005.

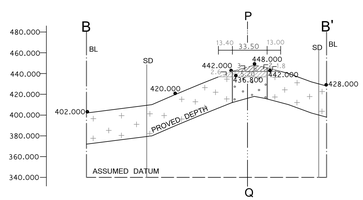




LONGITUDINAL SECTION ON - PQR



CROSS SECTION ON : A-A'



CROSS SECTION ON : B-B'

INDEX

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	MINING LEASE APPLIED BOUNDARY CORNER PILLAR WITH No.	BP1 TO BP39
3.	TAR ROAD	
4.	TEMPORARY SHED	
5.	CONTOUR INTERVAL AT 5m	
6.	BENCH MARK	B.M-434.013
7.	ELECTRICAL POWER LINE	
8.	CHECK DAM	
9.	ODAI	
10.	BLACK GRANITE DYKE	
11.	SAFETY DISTANCE 7.5M FROM BOUNDARY FOR PATTA LANDS 10M FROM TAR ROAD(Eastern Side) 60M FROM BEVANUR RESERVED FOREST 50M FROM ELECTRIC LINE 50M FROM CHECK DAM AND ODAI 50M FROM JAI HANUMAN TEMPLE 50M FROM TAR ROAD(Western Side)	
12.	PROPOSED WASTE DUMP	

FIRST YEAR TO FIFTH YEAR PRODUCTION DETAILS

Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Rom in m³	Proposed Salable BG @ 10% in m³	Proposed BG Rejects @ 90% in m³	Top Soil in m³	Side Burden in m³
First Year	PQ-AA'	I	81.00	29.40	3+6+3.6/3 4.20	10002	1000	9002		
	A' Side		81.00	12.50	1.70				Nil	1721
Second Year	PQ-BB'	I	97.60	33.50	3+6+2/3 3.67	11999	1200	10799		
	B' Side		97.60	13.00	1.80				Nil	2284
Third Year	PQ-AA'	I	72.74	33.00	6.00	14403	1440	12963		
	A Side		72.74	10.60	2.15				Nil	1658
	A' Side		72.74	32.50	6+2/2 4.00					9456
										11114
Fourth Year	PQ-BB'	I	91.85	33.50	5.20	16000	1600	14400		
	B Side		91.85	13.40	2.60				Nil	3200
Fifth Year	PQ-AA'	I	85.86	33.00	6.00	17000	1700	15300	Nil	Nil
GRAND TOTAL						69404	6940	62464	Nil	18319

DETAILS OF DEPTH AND BENCH

Year	Section	RL	Bench	Present Depth in (m)	Proposed Depth in (m)	Remaining Depth in (m)	Total Depth in (m)
First Year	PQ-AA'	450.000 TO 444.000	I	0	6.00	24.00	30.00
Second Year	PQ-BB'	448.000 TO 442.000	I	0	6.00	24.00	30.00
Third Year	PQ-AA'	444.000 TO 438.000	I	6.00	6.00	18.00	30.00
Fourth Year	PQ-BB'	442.000 TO 436.800	I	6.00	5.20	18.80	30.00
Fifth Year	PQ-AA'	438.000 TO 432.000	I	12.00	6.00	12.00	30.00

PRODUCTION

- FOR THE FIRST YEAR
- FOR THE SECOND YEAR
- FOR THE THIRD YEAR
- FOR THE FOURTH YEAR
- FOR THE FIFTH YEAR

DISTRICT : DHARMAPURI
TALUK : PENNAGARAM
VILLAGE No. : 30
VILLAGE NAME : AJJANAHALLI
SURVEY FIELD No. : 896
EXTENT OF LEASE : 17.50.0 Ha.

PLATE No.4/1

AJJANAHALLI BLACK GRANITE QUARRY

YEARWISE PRODUCTION/DEVELOPMENT PLAN AND SECTIONS FOR FIVE YEARS(BLOCK-I) (FIRST YEAR TO FIFTH YEAR)

MODIFIED MINING PLAN

20 0 100 200

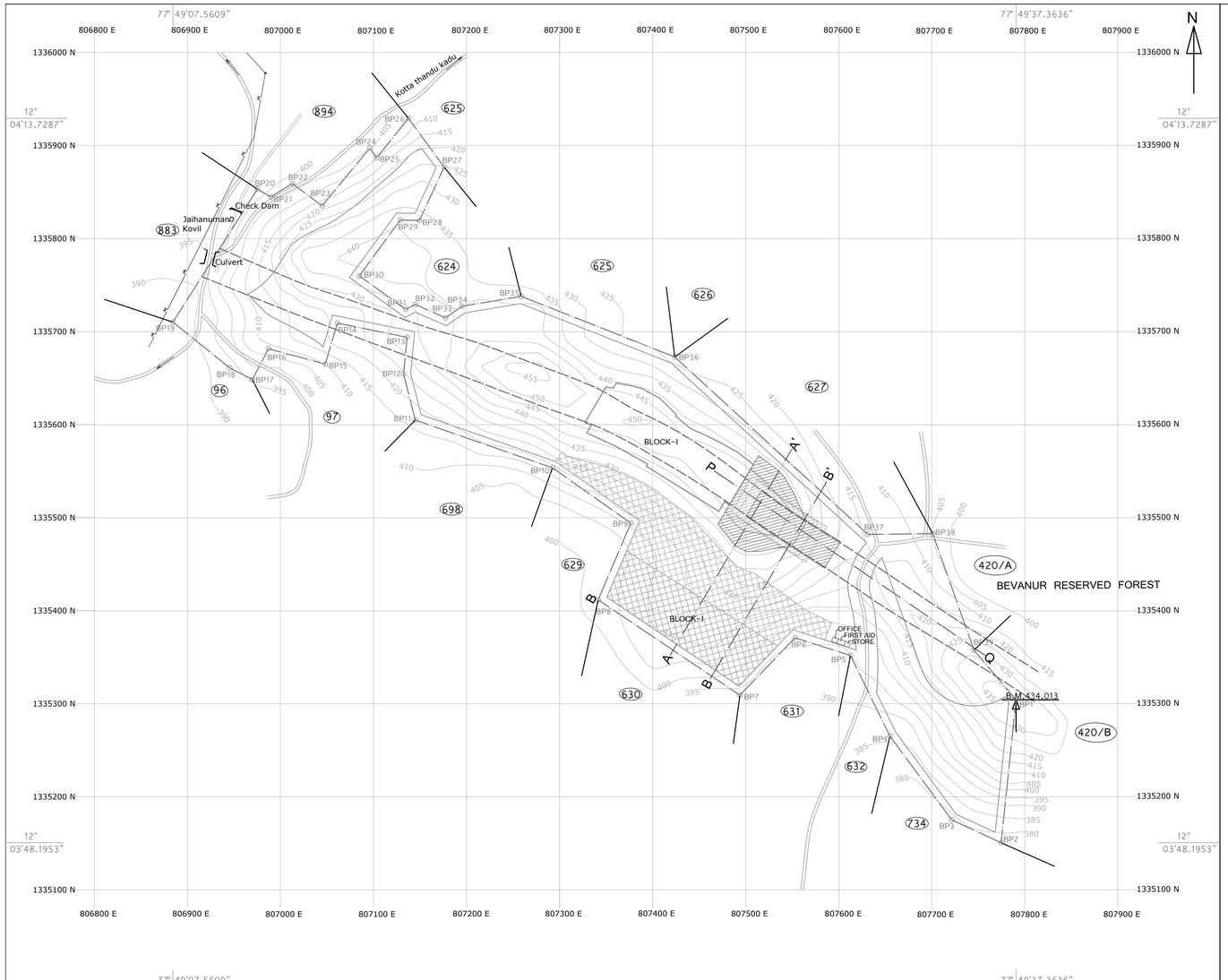
SCALE= 1:2,000(1CM = 20 M)
ALL DIMENSIONS ARE IN METRES

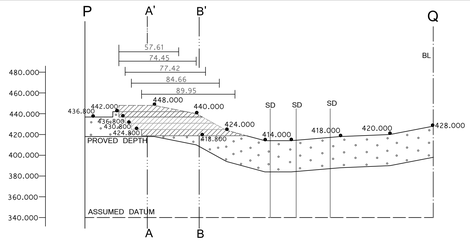
APPLICANT:- M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

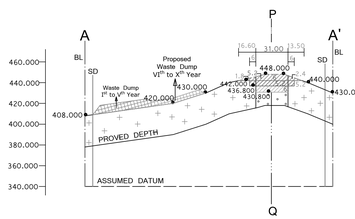
M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/739.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person.
Tamil Nadu Minerals Limited
Chennai - 600 005.

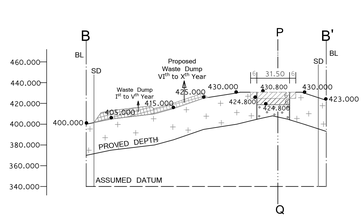




LONGITUDINAL SECTION ON - PQ



CROSS SECTION ON : A-A'



CROSS SECTION ON : B-B'

INDEX

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	MINING LEASE APPLIED BOUNDARY CORNER PILLAR WITH No.	BP1 TO BP39
3.	TAR ROAD	
4.	TEMPORARY SHED	
5.	CONTOUR INTERVAL AT 5m	
6.	BENCH MARK	B.M-434.013
7.	ELECTRICAL POWER LINE	
8.	CHECK DAM	
9.	ODAI	
10.	BLACK GRANITE DYKE	
11.	SAFETY DISTANCE 7.5M FROM BOUNDARY FOR PATTA LANDS 10M FROM TAR ROAD(Eastern Side) 60M FROM BEVANUR RESERVED FOREST 50M FROM ELECTRIC LINE 50M FROM CHECK DAM AND ODAI 50M FROM JAI HANUMAN TEMPLE 50M FROM TAR ROAD(Western Side)	
12.	WASTE DUMP (FIRST YEAR TO FIFTH YEAR)	
13.	PROPOSED WASTE DUMP (SIXTH YEAR TO TENTH YEAR)	

SIXTH YEAR TO TENTH YEAR PRODUCTION DETAILS

Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Rom in m³	Proposed Salable BG @ 10% in m³	Proposed BG Rejects @ 90% in m³	Top Soil in m³	Side Burden in m³
Sixth Year	PQ-AA'	I	57.61	31.00	5.20+6.00/2 5.60	10001	1000	9001	Nil	
	A Side		57.61	16.60	1.80					1721
	A' Side		57.61	13.50	2.40					1867
										3588
Seventh Year	PQ-AA'	I	74.45	31.00	5.20	12001	1200	10801	Nil	
	A Side		74.45	6.00	5.20					2323
	A' Side		74.45	6.00	5.20					2323
										4646
Eighth Year	PQ-AA'	I	77.42	31.00	6.00	14400	1440	12960	Nil	NIL
Ninth Year	PQ-BB'	I	84.66	31.50	6.00	16001	1600	14401	Nil	
	B Side		84.66	6.00	6.00					3048
	B' Side		84.66	6.00	6.00					3048
										6096
Tenth Year	PQ-BB'	I	89.95	31.50	6.00	17001	1700	15301	Nil	Nil
GRAND TOTAL						69404	6940	62464	Nil	14330

DETAILS OF DEPTH AND BENCH

YEAR	Section	RL	Bench	Present Depth in (m)	Proposed Depth in (m)	Remaining Depth in (m)	Total Depth in (m)
Sixth Year	PQ-AA'	448.000 TO 442.000	I	0	6.00	24.00	30.00
Seventh Year	PQ-AA'	442.000 TO 436.800	I	6.00	5.20	18.80	30.00
Eighth Year	PQ-AA'	436.800 TO 430.800	I	11.20	6.00	12.80	30.00
Ninth Year	PQ-BB'	430.800 TO 424.800	I	6.00	6.00	18.00	30.00
Tenth Year	PQ-BB'	424.800 TO 418.800	I	12.00	6.00	12.00	30.00

BLOCK - I

PRODUCTION
- FOR THE SIXTH YEAR
- FOR THE SEVENTH YEAR
- FOR THE EIGHTH YEAR
- FOR THE NINTH YEAR
- FOR THE TENTH YEAR

DISTRICT : DHARMAPURI
TALUK : PENNAGARAM
VILLAGE No. : 30
VILLAGE NAME : AJJANAHALLI
SURVEY FIELD No. : 896
EXTENT OF LEASE : 17.50.0 Ha.

PLATE No.4/2

AJJANAHALLI BLACK GRANITE QUARRY
YEARWISE PRODUCTION/DEVELOPMENT PLAN AND SECTIONS FOR FIVE YEARS(BLOCK-II) (SIXTH YEAR TO TENTH YEAR)
MODIFIED MINING PLAN

20 0 100 200

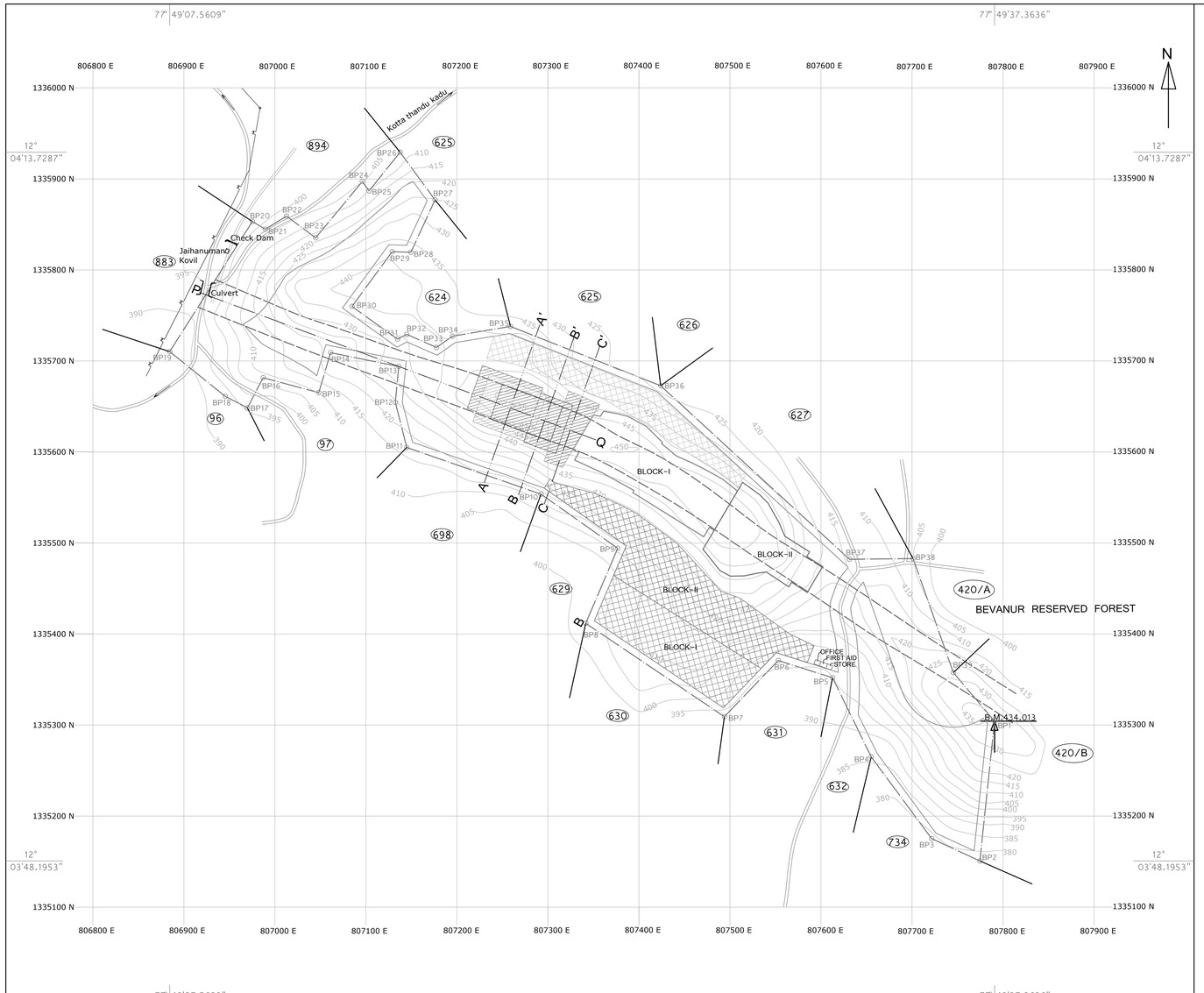
SCALE= 1:2,000(1CM = 20 M)
ALL DIMENSIONS ARE IN METRES

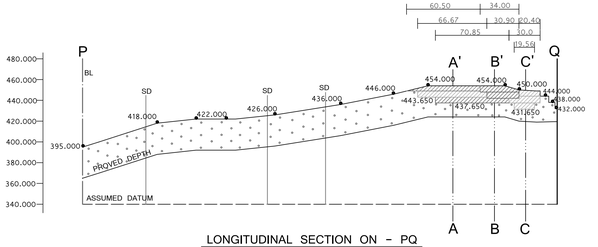
APPLICANT:- M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

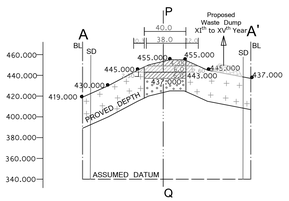
Certified that the PLAN is Correct.

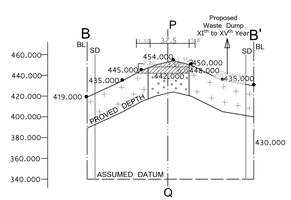
M. RAM SANKAR
Mines Surveyor
Certificate No: SV/5789.
Tamil Nadu Minerals Limited.

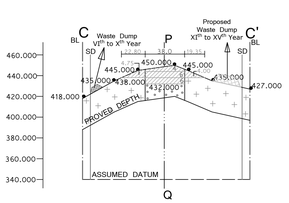
Dr. E.GANESAN, M.Sc., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.











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2.	MINING LEASE APPLIED BOUNDARY CORNER PILLAR WITH No.	BP1 TO BP39
3.	TAR ROAD	
4.	TEMPORARY SHED	
5.	CONTOUR INTERVAL AT 5m	
6.	BENCH MARK	B.M-434.013
7.	ELECTRICAL POWER LINE	
8.	CHECK DAM	
9.	ODAI	
10.	BLACK GRANITE DYKE	
11.	SAFETY DISTANCE 7.5M FROM BOUNDARY FOR PATTA LANDS 10M FROM TAR ROAD(Eastern Side) 60M FROM BEVANUR RESERVED FOREST 50M FROM ELECTRIC LINE 50M FROM CHECK DAM AND ODAI 50M FROM JAI HANUMAN TEMPLE 50M FROM TAR ROAD(Western Side)	
12.	WASTE DUMP (FIRST YEAR TO FIFTH YEAR)	
13.	WASTE DUMP (SIXTH YEAR TO TENTH YEAR)	
14.	PROPOSED WASTE DUMP (ELEVENTH YEAR TO FIFTEENTH YEAR)	

DETAILS OF DEPTH AND BENCH

Year	Section	RL	Bench	Present Depth in (m)	Proposed Depth in (m)	Remaining Depth in (m)	Total Depth in (m)
Eleventh Year	PQ-AA'	455.000 TO 449.000	1	0	6.00	24.00	30.00
Twelveth Year	PQ-BB'	451.670 TO 442.000	2	0	9.67	20.33	30.00
Thirteenth Year	PQ-CC'	448.000 TO 432.000	3	0	16.00	14.00	30.00
Fourteenth Year	PQ-AA'	449.000 TO 443.000	1	6.00	6.00	18.00	30.00
Fifteenth Year	PQ-AA'	443.000 TO 437.000	1	12.00	6.00	12.00	30.00

BLOCK - I

BLOCK - II

PRODUCTION

FOR THE ELEVENTH YEAR

FOR THE TWELVETH YEAR

FOR THE THIRTEENTH YEAR

FOR THE FOURTEENTH YEAR

FOR THE FIFTEENTH YEAR

ELEVENTH YEAR TO FIFTEENTH YEAR PRODUCTION DETAILS

Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Rom in m^3	Proposed Salable BG @ 10% in m^3	Proposed BG Rejects @ 90% in m^3	Top Soil in m^3	Side Burden in m^3
Eleventh Year	PQ-AA'	1	60.50	38.00	2.7+6/2 4.35	10001	1000	9001		
	A' Side		60.50	12.00	2.60				Nil	1888
										1888
Twelveth Year	PQ-BB'	1	34.00	37.50	2.5+6.5/3 3.67	4679	468	4211		
	PQ-BB'	2	30.90	39.50	6.00	7323	732	6591		
	B Side		30.90	11.30	2.80				Nil	978
	B' Side		30.90	5.80	1.35					242
						12002	1200	10802		1220
Thirteenth Year	PQ-CC'	1	20.40	38.00	2+8/2 4.00	3101	310	2791		
	PQ-CC'	2	30.00	38.00	6.00	6840	684	6156		
	PQ-CC'	3	19.56	38.00	6.00	4460	446	4014		
	C Side		30.00	22.80	4.75				Nil	3249
	C' Side		30.00	19.35	4.00					2322
						14401	1440	12961		5571
Fourteenth Year	PQ-AA'	1	66.67	40.00	6.00	16001	1600	14401		
	A Side		66.67	10.30	2.50				Nil	1717
										1717
Fifteenth Year	PQ-AA'	1	70.85	40.0	6.00	17004	1700	15304	Nil	Nil
	GRAND TOTAL					69409	6940	62469	Nil	10396

DISTRICT : DHARMAPURI
TALUK : PENNAGARAM
VILLAGE No. : 30
VILLAGE NAME : AJJANAHALLI
SURVEY FIELD No. : 896
EXTENT OF LEASE : 17.50.0 Ha.

PLATE No.4/3

AJJANAHALLI BLACK GRANITE QUARRY

YEARWISE PRODUCTION/DEVELOPMENT PLAN AND SECTIONS FOR FIVE YEARS (BLOCK-III)

(ELEVENTH YEAR TO FIFTEENTH YEAR)

MODIFIED MINING PLAN

20 0 100 200

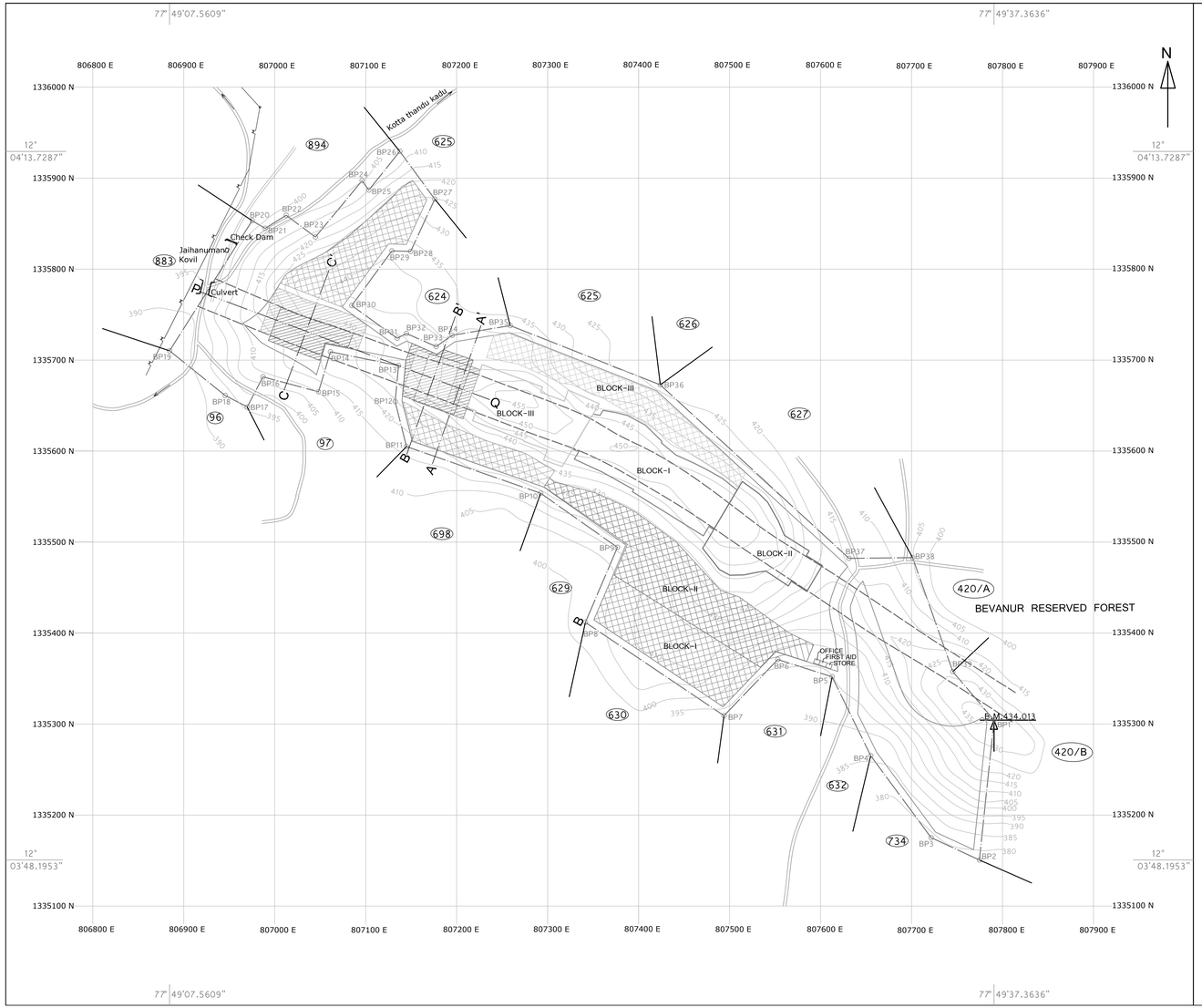
SCALE= 1:2,000 (1CM = 20 M)
ALL DIMENSIONS ARE IN METRES

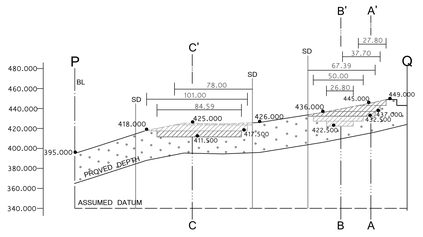
APPLICANT:- M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

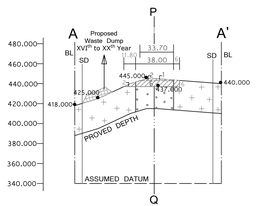
M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

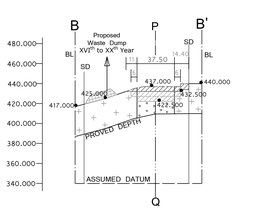




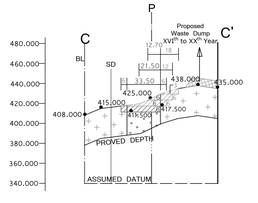
LONGITUDINAL SECTION ON - PQ



CROSS SECTION ON : A-A'



CROSS SECTION ON : B-B'



CROSS SECTION ON : C-C'

INDEX

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	MINING LEASE APPLIED BOUNDARY CORNER PILLAR WITH No.	BP1 TO BP39
3.	TAR ROAD	
4.	TEMPORARY SHED	
5.	CONTOUR INTERVAL AT 5m	
6.	BENCH MARK	B.M-434.013
7.	ELECTRICAL POWER LINE	
8.	CHECK DAM	
9.	ODAI	
10.	BLACK GRANITE DYKE	
11.	SAFETY DISTANCE 7.5M FROM BOUNDARY FOR PATTA LANDS 10M FROM TAR ROAD (Eastern Side) 60M FROM BEVANUR RESERVED FOREST 50M FROM ELECTRIC LINE 50M FROM CHECK DAM AND ODAI 50M FROM JAI HANUMAN TEMPLE 50M FROM TAR ROAD (Western Side)	
12.	WASTE DUMP (FIRST YEAR TO FIFTH YEAR)	
13.	WASTE DUMP (SIXTH YEAR TO TENTH YEAR)	
14.	WASTE DUMP (ELEVENTH YEAR TO FIFTEENTH YEAR)	
15.	PROPOSED WASTE DUMP (SIXTEENH YEAR TO TWENTIETH YEAR)	

DETAILS OF DEPTH AND BENCH

Year	Section	RL	Bench	Present Depth in (m)	Proposed Depth in (m)	Remaining Depth in (m)	Total Depth in (m)
Sixteenth Year	PQ-AA'	445.000 TO 437.000	2	0	8.00	20.00	30.00
Seventeenth Year	PQ-BB'	437.000 TO 432.250	1	2.60	4.75	22.65	30.00
Eighteenth Year	PQ-BB'	432.250 TO 422.250	2	7.35	10.00	12.65	30.00
Nineteenth Year	PQ-CC'	426.500 TO 417.500	2	0	9.00	21.00	30.00
Twentieth Year	PQ-CC'	417.500 TO 411.500	1	9.00	6.00	15.00	30.00

BLOCK - I

BLOCK - II

BLOCK - III

PRODUCTION

FOR THE SIXTEENTH YEAR

FOR THE SEVENTEENTH YEAR

FOR THE EIGHTEENTH YEAR

FOR THE NINETEENTH YEAR

FOR THE TWENTIETH YEAR

SIXTEENTH YEAR TO TWENTIETH YEAR PRODUCTION DETAILS

Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Rom in m³	Proposed Salable BG @ 10% in m³	Proposed BG Rejects @ 90% in m³	Top Soil in m³	Side Burden in m³
Sixteenth Year	PQ-AA'	1	27.80	33.70	2.00+1.00/2 1.50	1405				
		2	37.70	38.00	6.00	8596			Nil	
	A Side		37.70	11.80	2.45					1090
	A' Side		37.70	6.00	6.00					1357
						10001	1000	9001		2447
Seventeenth Year	PQ-BB'	1	67.39	37.50	4.75	12004	1200	10804		
	B Side		67.39	11.00	2.00				Nil	1483
	B' Side		67.39	14.40	6.00					5822
										7305
Eighteenth Year	PQ-BB'	1	50.00	37.50	5.00	9375				
		2	26.80	37.50	5.00	5025				
	B Side		50.00	6.00	6.00					1800
	B' Side		50.00	6.00	6.00				Nil	1800
						14400	1440	12960		3600
Nineteenth Year	PQ-CC'	1	78.00	12.70	0+6.00/2 3.00	2972				
		2	101.00	21.50	6.00	13029				
	C' Side		101.00	18.00	3.00					5454
			101.00	12.00	6.00				Nil	7272
			101.00	6.00	6.00					3636
						16001	1600	14401		16362
Twentieth Year	PQ-CC'	1	84.59	33.50	6.00	17003	1700	15303	Nil	
	C Side		84.59	6.00	6.00					3045
GRAND TOTAL						69409	6940	62468	Nil	32759

DISTRICT : DHARMAPURI
TALUK : PENNAGARAM
VILLAGE No. : 30
VILLAGE NAME : AJJANAHALLI
SURVEY FIELD No. : 896
EXTENT OF LEASE : 17.50.0 Ha.

PLATE No.4/4

AJJANAHALLI BLACK GRANITE QUARRY

YEARWISE PRODUCTION/DEVELOPMENT PLAN AND SECTIONS FOR FIVE YEARS (BLOCK-IV) (SIXTEENTH YEAR TO TWENTIETH YEAR)

MODIFIED MINING PLAN

20 0 100 200

SCALE= 1:2,000 (1CM = 20 M)

ALL DIMENSIONS ARE IN METRES

APPLICANT:- M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person.
Tamil Nadu Minerals Limited
Chennai - 600 005.

77° 49'07.5609" 806800 E 806900 E 807000 E 807100 E 807200 E 807300 E 807400 E 807500 E 807600 E 807700 E 807800 E 807900 E 77° 49'37.3636"

12° 04'13.7287" 1336000 N 1335900 N 1335800 N 1335700 N 1335600 N 1335500 N 1335400 N 1335300 N 1335200 N 12° 03'48.1953" 1335100 N

N

Kotta thandu kadu

894 625 624 625 626 627 96 97 698 629 630 631 632 734 883 420/A 420/B

BP19 BP18 BP17 BP16 BP15 BP14 BP13 BP12 BP11 BP10 BP9 BP8 BP7 BP6 BP5 BP4 BP3 BP2 BP1 BP20 BP21 BP22 BP23 BP24 BP25 BP26 BP27 BP28 BP29 BP30 BP31 BP32 BP33 BP34 BP35 BP36 BP37 BP38 BP39

Jaihanuman Kovil

Check Dam

Culvert

BLOCK-I BLOCK-II BLOCK-III BLOCK-IV

OFFICE FIRST AID STORE

BEVANUR RESERVED FOREST

B.M-434.013

AFFORESTATION DETAILS

BLOCK-I	: 100 PLANTS IN 0.06.5Ha. 50% SURVIVAL
BLOCK-II	: 100 PLANTS IN 0.06.5Ha. 50% SURVIVAL
BLOCK-III	: 100 PLANTS IN 0.06.5Ha. 50% SURVIVAL
BLOCK-IV	: 100 PLANTS IN 0.06.5Ha. 50% SURVIVAL

INDEX

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5.	CONTOUR INTERVAL AT 5m	
6.	BENCH MARK	B.M-434.013
7.	ELECTRICAL POWER LINE	
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9.	ODAI	
10.	BLACK GRANITE DYKE	
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PROPOSED DEVELOPMENT UP TO LEASE PERIOD

BLOCK - I	
BLOCK - II	
BLOCK - III	
BLOCK - IV	

PROPOSED WASTE DUMP UP TO LEASE PERIOD

BLOCK - I	
BLOCK - II	
BLOCK - III	
BLOCK - IV	

DISTRICT : DHARMAPURI
TALUK : PENNAGARAM
VILLAGE No. : 30
VILLAGE NAME : AJJANAHALLI
SURVEY FIELD No. : 896
EXTENT OF LEASE : 17.50.0 Ha.

PLATE No. 5

AJJANAHALLI BLACK GRANITE QUARRY

LANDUSE AND AFFORESTATION PLAN

MODIFIED MINING PLAN

20 0 100 200

SCALE= 1:2,000 (1CM = 20 M)
ALL DIMENSIONS ARE IN METRES

APPLICANT:- M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
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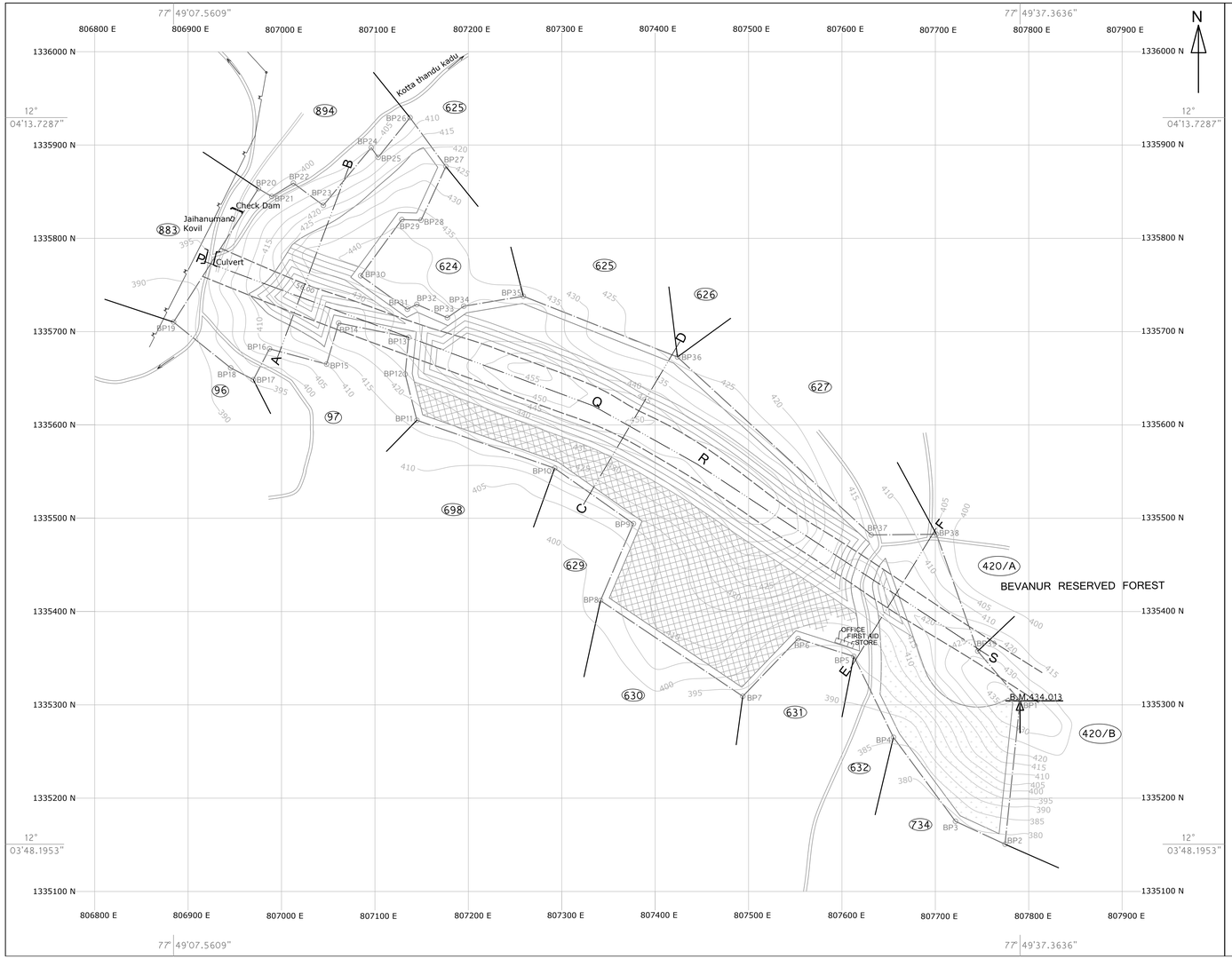
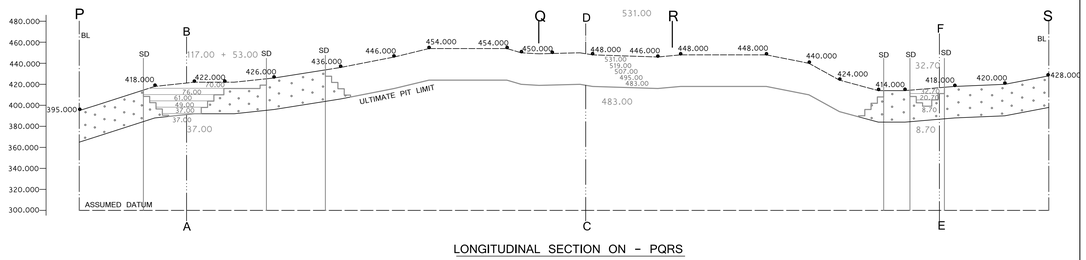
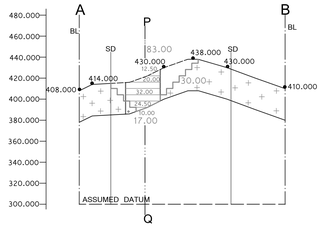
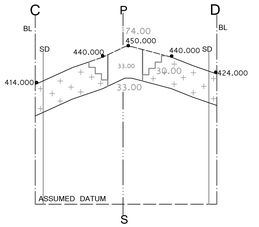
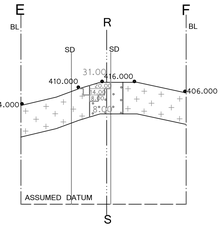










LANDUSE PATERN

SL.No	DESCRIPTION	AT END OF LIFE OF MINE (In Ha.)
1.	MINING	5.08.0
2.	WASTE DUMP	4.59.0
3.	OFFICE INFRASTRUCTURE	0.01.0
4.	TAR ROAD	0.20.5
5.	AFFORESTATION	1.52.5
6.	UNUTILIZED AREA	6.09.0
	TOTAL	17.50.0

ULTIMATE PIT DIMENSION

Sl.No.	Section on	Detail	Ave.Length in M	Ave.Width in M	Depth in M
1.	PQRS AND AB, CD, EF	Top bench	734.00	65.00	30.00
		Bottom bench	529.00	23.17	

INDEX

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	MINING LEASE APPLIED BOUNDARY CORNER PILLAR WITH No.	BP1 TO BP39
3.	TAR ROAD	
4.	TEMPORARY SHED	
5.	CONTOUR INTERVAL AT 5m	
6.	BENCH MARK	B.M-434.013
7.	ELECTRICAL POWER LINE	
8.	CHECK DAM	
9.	ODAI	
10.	BLACK GRANITE DYKE	
11.	SAFETY DISTANCE 7.5M FROM BOUNDARY FOR PATTA LANDS 10M FROM TAR ROAD (Eastern Side) 60M FROM BEVANUR RESERVED FOREST 50M FROM ELECTRIC LINE 50M FROM CHECK DAM AND ODAI 50M FROM JAI HANUMAN TEMPLE 50M FROM TAR ROAD (Western Side)	
12.	CHARNOCKITE GNEISS	
13.	ULTIMATE PIT LIMIT	
14.	ULTIMATE AFFORESTATION	
15.	ULTIMATE WASTE DUMP	

DISTRICT : DHARMAPURI
TALUK : PENNAGARAM
VILLAGE No. : 30
VILLAGE NAME : AJJANAHALLI
SURVEY FIELD No. : 896
EXTENT OF LEASE : 17.50.0 Ha.

PLATE No. 6

AJJANAHALLI BLACK GRANITE QUARRY
CONCEPTUAL PLAN AND SECTIONS
MODIFIED MINING PLAN

20 0 100 200

SCALE= 1:2,000 (1CM = 20 M)
ALL DIMENSIONS ARE IN METRES

APPLICANT : M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

77° 49'07.5609"
77° 49'37.3636"
12° 04'13.7287"
12° 03'48.1953"

NO.85,KODIHALLI

420/A
BEVANUR RESERVED FOREST

420/B

420/C

338/A
MASAKKAL RESERVED FOREST

VATHAIAPURAM

223/B

223/B

N

LEGEND

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	VILLAGE ROAD	
3.	CART TRACK	
4.	KULAM / ERI	
5.	KALVAI	
6.	STREAM	
7.	WELL	
8.	SURVEY FIELD No.	896
9.	VILLAGE BOUNDARY	
10.	BUFFER ZONE 500m RADIUS	
11.	RESIDENTIAL AREA	

DISTRICT : DHARMAPURI
TALUK : PENNAGARAM
VILLAGE No. : 30
VILLAGE NAME : AJJANAHALLI
SURVEY FIELD No. : 896
EXTENT OF LEASE : 17.50.0 Ha.

PLATE No. 7

AJJANAHALLI BLACK GRANITE QUARRY
ENVIRONMENTAL PLAN

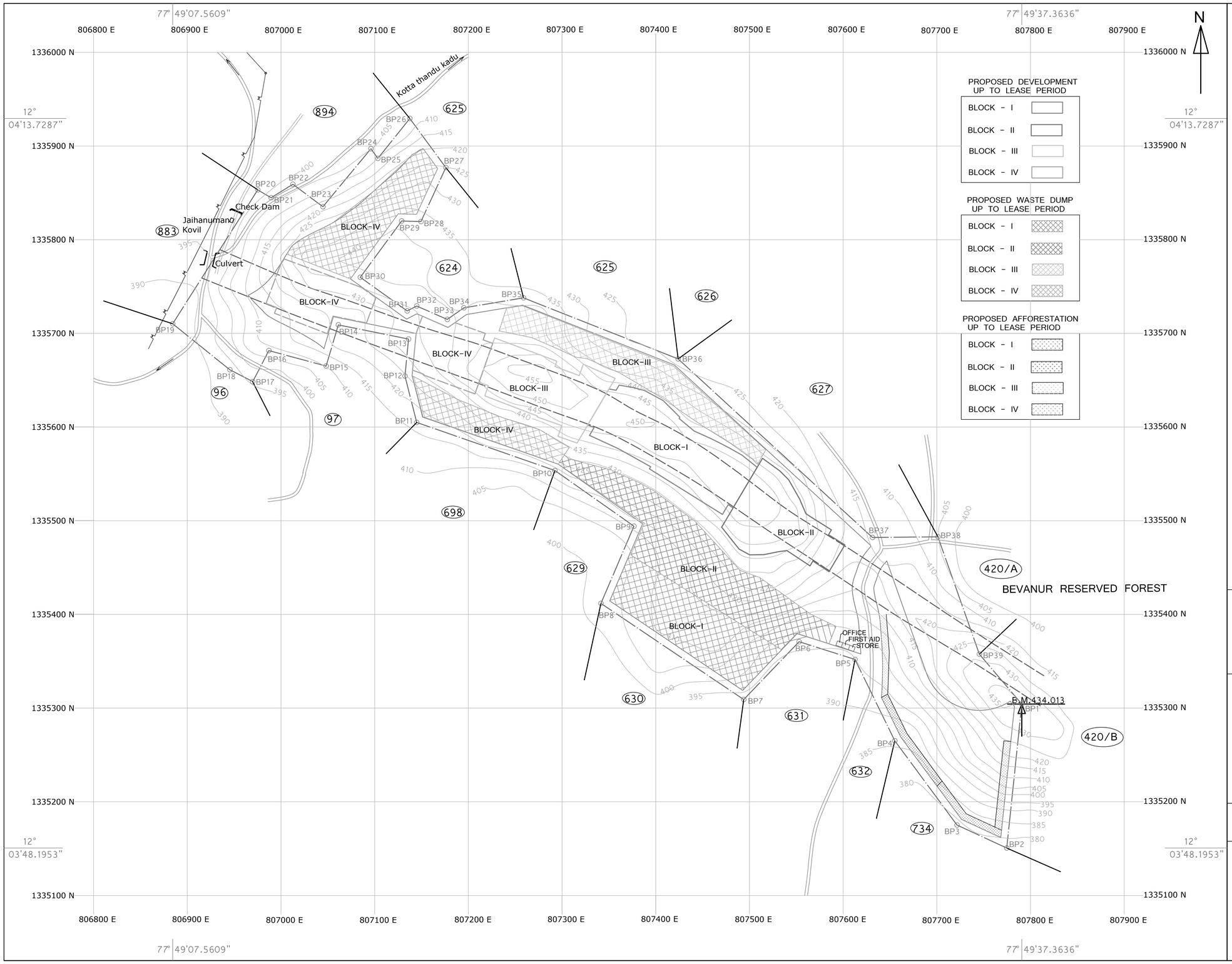
50 0 250 500
SCALE= 1:5,000 (1CM = 50 M)
ALL DIMENSIONS ARE IN METRES

APPLICANT : M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.



PROPOSED DEVELOPMENT UP TO LEASE PERIOD

- BLOCK - I
- BLOCK - II
- BLOCK - III
- BLOCK - IV

PROPOSED WASTE DUMP UP TO LEASE PERIOD

- BLOCK - I
- BLOCK - II
- BLOCK - III
- BLOCK - IV

PROPOSED AFFORESTATION UP TO LEASE PERIOD

- BLOCK - I
- BLOCK - II
- BLOCK - III
- BLOCK - IV

INDEX

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	MINING LEASE APPLIED BOUNDARY CORNER PILLAR WITH No.	BP1 TO BP39
3.	TAR ROAD	
4.	TEMPORARY SHED	
5.	CONTOUR INTERVAL AT 5m	
6.	BENCH MARK	B.M-434.013
7.	ELECTRICAL POWER LINE	
8.	CHECK DAM	
9.	ODAI	
10.	BLACK GRANITE DYKE	
11.	SAFETY DISTANCE 7.5M FROM BOUNDARY FOR PATTA LANDS 10M FROM TAR ROAD (Eastern Side) 60M FROM BEVANUR RESERVED FOREST 50M FROM ELECTRIC LINE 50M FROM CHECK DAM AND ODAI 50M FROM JAI HANUMAN TEMPLE 50M FROM TAR ROAD (Western Side)	

LANDUSE PATTERN

SL.No.	DESCRIPTION	PRESENT AREA (In Ha.)	UP TO LEASE PERIOD (In Ha.)
1.	MINING	--	3.72.5
2.	WASTE DUMP	--	4.63.5
3.	OFFICE INFRASTRUCTURE	0.01.0	--
4.	TAR ROAD	0.20.5	--
5.	AFFORESTATION	--	0.26.0
6.	UNUTILIZED AREA	17.28.5	8.66.5
	TOTAL	17.50.0	17.28.5

DISTRICT : DHARMAPURI
TALUK : PENNAGARAM
VILLAGE No. : 30
VILLAGE NAME : AJJANAHALLI
SURVEY FIELD No. : 896
EXTENT OF LEASE : 17.50.0 Ha.

PLATE No. 8

AJJANAHALLI BLACK GRANITE QUARRY

PROGRESSIVE QUARRY CLOSURE PLAN

MODIFIED MINING PLAN

20 0 100 200

SCALE= 1:2,000 (1CM = 20 M)
ALL DIMENSIONS ARE IN METRES

APPLICANT:- M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

File No: 10684
Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment Authority(SEIAA), TAMIL NADU)
***

Dated **22/04/2024**

To,

Sudeep Jain IAS
M/S. TAMIL NADU MINERALS LIMITED
M/s. Tamil Nadu Minerals Limited (Government of Tamil Nadu undertaking) 31 Kamarajar Salai, Chepauk, Chennai, Tamil Nadu., CHENNAI, TAMIL NADU, , 600005
tamin@tamingranites.com

Subject: Grant of Terms of Reference under the provision of the EIA Notification 2006-regarding.

Sir/Madam,

This is in reference to your application for Grant of Terms of Reference under the provision of the EIA Notification 2006-regarding in respect of project Ajjanahalli Black Granite Quarry submitted to SEIAA-TN vide proposal number SIA/TN/MIN/460253/2024 dated 12/03/2024.

Ref:

1. Online proposal No. SIA/TN/MIN/460253/2024 dated: 07.02.2024.
2. Your application for Terms of Reference submitted at SEIAA-TN on 08.02.2024.

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO24B0108TN5399141N
(ii) File No.	10684
(iii) Clearance Type	TOR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals
(vii) Name of Project	Ajjanahalli Black Granite Quarry
(viii) Name of Company/Organization	M/S. TAMIL NADU MINERALS LIMITED
(ix) Location of Project (District, State)	DHARMAPURI, TAMIL NADU
(x) Issuing Authority	SEIAA
(xii) Applicability of General Conditions	no
(xiii) Applicability of Specific Conditions	no

3. In view of the particulars given in the Para 1 above, the project proposal interalia including Form-1(Part A and B) were submitted to SEIAA for an appraisal under the provision of EIA notification 2006 and its subsequent amendments.

4. The above-mentioned proposal has been considered by State Environment Impact Assessment Authority (SEIAA) in the meeting held on 05/04/2024. The minutes of the meeting and all the Application and documents submitted (Part A, part B) are available on PARIVESH portal which can be accessed by scanning the QR Code above

5. The State Expert Appraisal Committee (SEAC), based on the information & clarifications provided by the project proponent and after detailed deliberations recommended the proposal for grant of Terms of Reference under the provision of EIA Notification, 2006 and as amended thereof subject to the stipulation of specific and general conditions as detailed in Annexure (2).

6. The SEIAA has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the SEAC hereby decided to grant Terms of Reference for instant proposal of Mr. Sudeep Jain IAS under the provisions of EIA Notification, 2006 and as amended thereof.

7. The Ministry/SEIAA-TN reserves the right to stipulate additional conditions, if found necessary.

8. The Terms of Reference to the aforementioned project is under provisions of EIA Notification, 2006. It does not tantamount to approvals/consent/permissions etc. required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.

9. This issues with the approval of the Competent Authority.

10. The TORs prescribed shall be valid for a period of three years from the date of issue, for submission of the EIA/EMP report as per OM No.J-11013/41/2006-IA-II(I)(part) dated 29th August 2017.

Copy To

1. The Additional Chief Secretary to Government, Environment & Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD Cum-Office Complex, East Arjun Nagar, New Delhi 110032.
3. The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-600 032.
4. Monitoring Cell, IA Division, Ministry of Environment, Forests &CC, Paryavaran Bhavan, CGO Complex, New Delhi 110003
5. The District Collector, Dharmapuri District.
6. Integrated Regional office of MoEF&CC, Sasthri Bhawan, Nungambakkam, Chennai.
7. Stock File.

Annexure 1

Specific Terms of Reference for (Mining Of Minerals)

1. Seiaa Specific Conditions:

S. No	Terms of Reference
1.1	The authority noted that the subject was appraised in the 451st SEAC meeting held on 13.03.2024. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant **Terms of Reference (ToR) along with Public Hearing** under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions.

2. Seac Standard Conditions

S. No	Terms of Reference
2.1	1. In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following: (i) Original pit dimension (ii) Quantity achieved Vs EC Approved Quantity (iii) Balance Quantity as per Mineable Reserve calculated. (iv) Mined out Depth as on date Vs EC Permitted depth (v) Details of illegal/illicit mining (vi) Violation in the quarry during the past working. (vii) Quantity of material mined out outside the mine lease area (viii) Condition of Safety zone/benches (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m. 2. Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site. 3. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry. 4. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report. 5. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site. 6. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC. 7. However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level. 8. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent. 9. The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site. 10. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences. 11. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines, 12. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines? 13. Quantity of minerals mined out. ● Highest production achieved in any one year ● Detail of approved depth of mining.

S. No	Terms of Reference
	● Actual depth of the mining achieved earlier. ● Name of the person already mined in that leases area. ● If EC and CTO already obtained, the copy of the same shall be submitted. ● Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches. 14. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone). 15. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc., 16. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan. 17. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same. 18. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment. 19. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. 20. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study. 21. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind. 22. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted. 23. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given. 24. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided. 25. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.

S. No	Terms of Reference
	26. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided. 27. Impact on local transport infrastructure due to the Project should be indicated. 28. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity. 29. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific. 30. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible. 31. The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner. 32. Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner 33. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period. 34. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period. 35. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed. 36. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations. 37. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation. 38. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given. 39. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc. 40. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB. 41. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine. 42. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986. 43.The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) l0O m, (iii) 200 m and (iv)300 m (v) 50Om shall be enumerated with

S. No	Terms of Reference
	details such as dwelling houses with number of occupant, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc

3. Seiaa Standard Conditions:

S. No	Terms of Reference
3.1	**Cluster Management Committee** 1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry. 2. The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc., 3. The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines. 4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network. 5. The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan. 6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail. 7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner. 8. The committee shall furnish the Emergency Management plan within the cluster. 9. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public. 10. The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety. 11. The committee shall furnish the fire safety and evacuation plan in the case of fire accidents. **Impact study of mining** 12. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following a) Soil health & soil biological, physical land chemical features . b) Climate change leading to Droughts, Floods etc. c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people. d) Possibilities of water contamination and impact on aquatic ecosystem health. e) Agriculture, Forestry & Traditional practices. f) Hydrothermal/Geothermal effect due to destruction in the Environment. g) Bio-geochemical processes and its foot prints including environmental stress. h) Sediment geochemistry in the surface streams. **Agriculture & Agro-Biodiversity** 13. Impact on surrounding agricultural fields around the proposed mining Area. 14. Impact on soil flora & vegetation around the project site. 15. Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.

S. No	Terms of Reference
	16. The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem. 17. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services. 18. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock. **Forests** 19. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife. 20. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna. 21. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection. 22. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site. **Water Environment** 23. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period. 24. Erosion Control measures. 25. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas. 26. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir. 27. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities. 28. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts. 29. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components. 30. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites. **Energy** 31. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished. **Climate Change** 32. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities. 33. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock. **Mine Closure Plan** 34. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued. **EMP** 35. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued. 36. The Environmental Impact Assessment should hold detailed study on EMP with budget for

S. No	Terms of Reference
	Green belt development and mine closure plan including disaster management plan. **Risk Assessment** 37. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining. **Disaster Management Plan** 38. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued. **Others** 39. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc. 40. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan. 41. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.

Standard Terms of Reference for (Mining of minerals)

1.

S. No	Terms of Reference
1.1	An EIA-EMP Report shall be prepared for peak capacity (…..MTPA)operation in an ML/project area of.....ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.
1.2	An EIA-EMP Report would be prepared for peak capacity operation to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modeling for..... MTPA of mineral production based on approved project/Mining Plan for.....MTPA. Baseline data collection can be for any season (three months) except monsoon.
1.3	Propoer KML file with pin drop and coordinate of mine at 500-1000 m interval be provided
1.4	A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries, mines and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given. The above details to be furnished in tabular form also
1.5	Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical

S. No	Terms of Reference
	features such as water bodies, etc should be furnished.
1.6	A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.
1.7	Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with names, details of rivers/ riverlet system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river need eloboration in form of lengthe, quantity and quality of water to be diverted
1.8	(Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects.
1.9	Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.
1.10	Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing though the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.
1.11	A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.
1.12	Original land use (agricultural land/forestland/grazing land/wasteland/water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations should be analyzed. Extent of area under surface rights and under mining rights should be specified. Area under Surface Rights S.N ML/Project Land use Area under Surface Rights(ha) Area Under Mining Rights(ha) Area under Both (ha) 1 Agricultural land 2 Forest Land 3 Grazing Land 4 Settlements 5 Others (specify)

S. No	Terms of Reference
	S.N. Details Area (ha) 1 Buildings 2 Infrastructure 3 Roads 4 Others (specify) Total
1.13	Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.
1.14	One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/ MoEF&CC certification of the respective laborartory and NABET accreditation of the consultant to be provided.
1.15	Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards.
1.16	For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed and accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided
1.17	A detailed traffic study along with presence of habitation in 100 mts distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.
1.18	The socio-economic study to conducted with actual survey report and a comparative assessment to be provided from the census data should be provided in EIA/ EMP report also occupational status & economic status of the study area and what economically project will contribute should be clearly

S. No	Terms of Reference
	mention. The study should also include the status of infrastructural facilities and amenities present in the study area and a comparative assessment with census data to be provided and to link it with the initialization and quantification of need based survey for CSR activities to be followed.
1.19	The Ecology and biodiversity study should also indicate the likely impact of change in forest area for surface infrastructural development or mining activity in relation to the climate change of that area and what will be the compensatory measure to be adopted by PP to minimize the impact of forest diversion.
1.20	Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be submitted.
1.21	Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted
1.22	Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls within dark/grey zone.
1.23	Study on land subsidence including modeling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.
1.24	Detailed water balance should be provided. The break up of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the competing users should be provided.
1.25	PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs
1.26	PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of mineral. The measures adopted to conserve energy or use of renewable sources shall be explored
1.27	PP to evaluate the green house emission gases from the mine operation plant and corresponding carbon absorption plan.
1.28	Site specific Impact assessment with its mitigation measures, Risk Assessment and Disaster Preparedness and Management Plan should be provided.
1.29	Impact of choice of mining method, technology, selected use of machinery and impact on air quality, mineral transportation, handling & storage/stockyard, etc, Impact of blasting, noise and vibrations should be provided.
1.30	Impacts of mineral transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of effluents from

S. No	Terms of Reference
	workshop etc, management plan for maintenance of HEMM and other machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided.
1.31	Details of various facilities to be provided to the workers in terms of parking, rest areas and canteen, and effluents/pollution load resulting from these activities should also be given.
1.32	The number and efficiency of mobile/static water jet, Fog cannon sprinkling system along the main mineral transportation road inside the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality should be provided.
1.33	Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre- mining status should be provided. A Plan for the ecological restoration of the mined out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and issues of re-handling (wherever applicable) and backfilling and progressive mine closure and reclamation should be furnished.
1.34	Adequate greenbelt nearby areas, mineral stock yard and transportation area of mineral shall be provided with details of species selected and survival rate Greenbelt development should be undertaken particularly around the transport route.
1.35	Cost of EMP (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.
1.36	Details of R&R. Detailed project specific R&R Plan with data on the existing socio- economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and costs along with the schedule of the implementation of the R&R Plan should be given.
1.37	CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project should be given.
1.38	Corporate Environment Responsibility:
1.39	a) The Company must have a well laid down Environment Policy approved by the Board of Directors.
1.40	b) The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.
1.41	c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.
1.42	d) To have proper checks and balances, the company should have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.
1.43	e) Environment Managament Cell and its responsibilities to be clearly spleel out in EIA/ EMP

S. No	Terms of Reference
	report
1.44	f) In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.
1.45	Status of any litigations/ court cases filed/pending on the project should be provided.
1.46	PP shall submit clarification from DFO that mine does not falls under corridors of any National Park and Wildlife Sanctuary with certified map showing distance of nearest sanctuary.
1.47	Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan approval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable.
1.48	Details on the Forest Clearance should be given as per the format given: Total Project Area (ha) | ML Total Forest land (ha) If more than one provide details of each FC | Date of FC | Extent of Forest Land | Balance area for which FC is yet to be obtained | Status of appl For diversion of forest land
1.49	In case of expansion of the proposal, the status of the work done as per mining plan and approved mine closure plan shall be detailed in EIA/ EMP report
1.50	Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general public and commitments made by the proponent and the time bound action proposed with budgets in suitable time frame. These details should be presented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.
1.51	PP shall carry out survey through drone highlighting the ground reality for atleast 10 minutes
1.52	Detailed Chronology of the project starting from the first lease deed alloted/Block allotment/ Land acquired to its No. of renewals, CTO /CTE with details of no. renewals, previous EC(s) granted details and its compliance details, NOC details from various Govt bodies like Forest NOC(s), CGWA permissions, Power permissions, etc as per the requisites respectively to be furnished in tabular form.
1.53	The first page of the EIA/ EMP report must mention the peak capacity production, area, detail of PP, Consultant (NABET acrreditation) and Laboratory (NABL / MoEF & CC certification)
1.54	The compliances of ToR must be properly cited with respective chapter section and page no in tabular form and also mention sequence of the respective ToR complied within the EIA-EMP report in all the chapter,s section.

EAC Conditions - Site Specific

1. The Project Proponent shall obtain NBWL Clearance from the competent authority since Cauvery South wildlife Sanctuary is located within 10km radius from the proposed project site and the Eco Sensitive Zone for the Sanctuary is not yet declared.
2. The proponent shall furnish a revised mining plan by leaving a minimum safety distance of 60m from the Masakkal Reserve Forest situated abutting the project site.
3. The proponent shall carry out tree plantations in the Masakkal Reserve Forest in consultation with the DFO and furnish photographic/ videographic evidences for the same. The proponent shall also provide percolation pits in consultation with the DFO.
4. Since Cauvery North & South Wildlife Sanctuaries are located within 10km radius from the project site, the proponent shall provide details on the impact of the project activity on the Sanctuaries and the conservation measures to mitigate the same in consultation with the DFO.
5. The Project Proponent shall furnish the revised EMP based on the study carried out on impact of the dust & other environmental impacts due to proposed quarrying operations on the nearby agricultural lands for the life of the mine in the format prescribed by the SEAC considering the cluster situation.
6. The PP shall submit the slope stability action plan by carrying out the scientific studies to assess the slope stability of the working benches to be constructed (above ground level) along with a conceptual working plan for maintaining the safety aspects within the lease.
7. The PP shall undertake Hydrogeology study considering nearby existing wells, Aquifers, Ground water & surface water levels etc., within the radius of 1km.
8. The study on impact of the proposed quarrying operations on the surrounding environment which includes water bodies, Odai etc., shall be furnished.

சான்று

தேவனூர் மாவட்டம், வண்ணாரப்பேட்டை வருவாய், அண்ணா நகர் கிராமம் புல எண் 696-ல் 17.50.0 ஏக்கர் அரசு புறம்போக்கு நிலமாகும். இந்த புல எண்ணை 300m சுற்றளவில் வேறுபிரிவுகள் எவையும் இல்லை எனவும் 300m சுற்றளவில் பள்ளிகூடமோ, அரசுதேவையோ, சுற்றுலை புறம்போக்குகளோ, வழிபாட்டு தளங்களோ இல்லை என புல தணிக்கையிலும் தெரிய வருகிறது என சான்றளிக்கப்படுகிறது.

28/03/2024

கிராம நிர்வாக அலுவலர்
30, அஞ்சுனா அள்ளி
பென்னாகரம் (Tk.), தருமபுரி (Dt.),

Annexure 7

From

Dr.G.Panneerselvam,
M.Sc., M.Phill., Ph.D.,
Assistant Director,
Geology and Mining,
Dharmapuri

To

Tvl. Tamil Nadu Minerals Limited,
No.31 Kamarajar Salai,
Cheapuk, Chennai -5

Roc.No.605/2002 (Mines) dated: 16.11.2023

Sir,

Sub: Mines and Minerals – Minor Mineral – Black Granite – Dharmapuri District – Pennagaram Taluk – Ajjanahalli Village – S.F.No.896 – over an extent of 17.50.0 Ha of Govt. Poramboke lands – quarry lease application of TVL.Tamil Nadu Minerals Limited., Chennai – Precise Area communicated – certain particulars requested – furnished –Reg.

Ref:
1. Quarry lease application preferred by Tvl. Tamil Nadu Minerals Ltd., Chennai dated:13.02.2002.
2. The Government Letter No.3740397/MME.1/2023-1 dated:13.09.2023.
3. Tvl. Tamil Nadu Minerals Limited., Krishnagiri letter Rc.No.347/A2/2002 dated:16.11.2023.

****

In the reference 2nd cited, the Government have communicated an extent of 17.50.0Hects of Government poramboke lands in SF.No.896 in Ajjanahalli village, Pennagaram Taluk, Dharmapuri District as precise area for quarrying Black Granite under sub rule 3(b) of Rule 8-C of Tamil Nadu Minor Mineral Concession Rule, 1959 to TVL.Tamil Nadu Minerals Ltd., Chennai with a direction to produce the approved mining plan and also to produce Environmental Clearance obtained from the competent authority for the above said area for grant of quarry lease along with various conditions.

2) In the reference 3rd cited, Tvl. Tamil Nadu Minerals Limited., Krishnagiri have requested to furnish the details of mines / quarries located within 500 meters radius from the precise area for obtaining Environmental Clearance from SEIAA for carrying quarry operation in the proposed area.

3) As requested, the following are furnished.

ABANDONED QUARRY

Sl. No	Name and Address of the Lessee	Village & Taluk	S.F. No.	Extent (In Hects)	Classification of Land	Lease Period
---NIL----						

EXISTING QUARRY

Sl. No	Name and Address of the Lessee	Village & Taluk	S.F. No.	Extent (In Hects)	Classification Of Land	Lease Period
01	Tvl. Tamil Nadu Minerals Limited, Chennai	Ajjanahalli Pennagaram	883(P)	8.98.5	Poramboke lands	13.01.2011 to 12.01.2041

ANY OTHER PROPOSED QUARRY

Sl. No	Name and Address of the Lessee	Village & Taluk	S.F. No.	Extent (In Hects)	Classification Of Land	Lease Period
---- Nil---						

16.11.2023

Assistant Director,
Geology and Mining,
Dharmapuri.

16.11.2023 16/11/23

Annexure-8 325

District : Dharmapuri

Taluk : Pennagaram

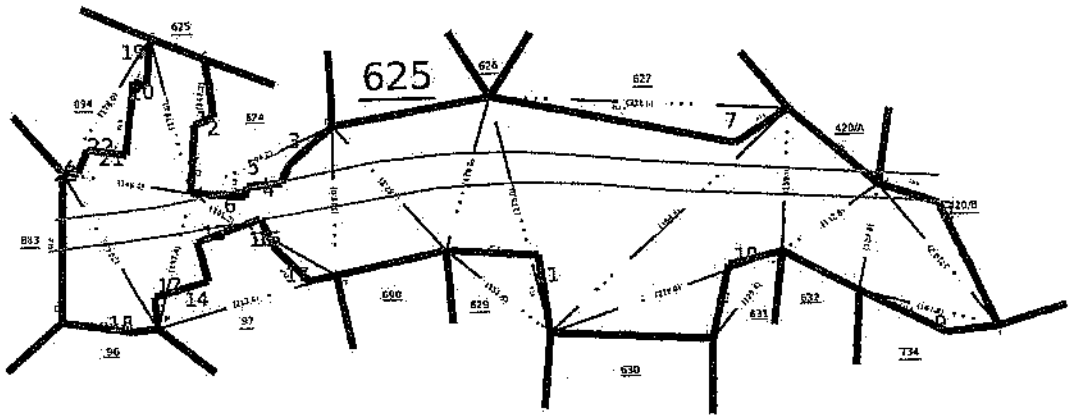
Village : Ajjanahalli [30]

Survey No : 896

Area : Hect 17 Ares 50.00

Scale : 1 : 7883

453



INDEX:

LEASE APPLIED AREA 17.50.00Ha.

BLACK GRANITE DEPOSIT

DISTRICT : DHARAMPURI,
TALUK : PENNAGARAM,
VILLAGE : AJJANAHALLI,
SURVEY FIELD No. : 896,
LEASE APPLIED AREA : 17.50.00 Ha.

Top MSL of Hill : 459.00M.
Bottom MSL of Hill : 375.00M.
Elevation : 84.00M.

DYKE DIMENSION =(L.935.00M. X W 30.00M.)

12/9/22

Divisional Manager
TAMILNADU MINERALS LTD.,
KRISHNAGIRI.

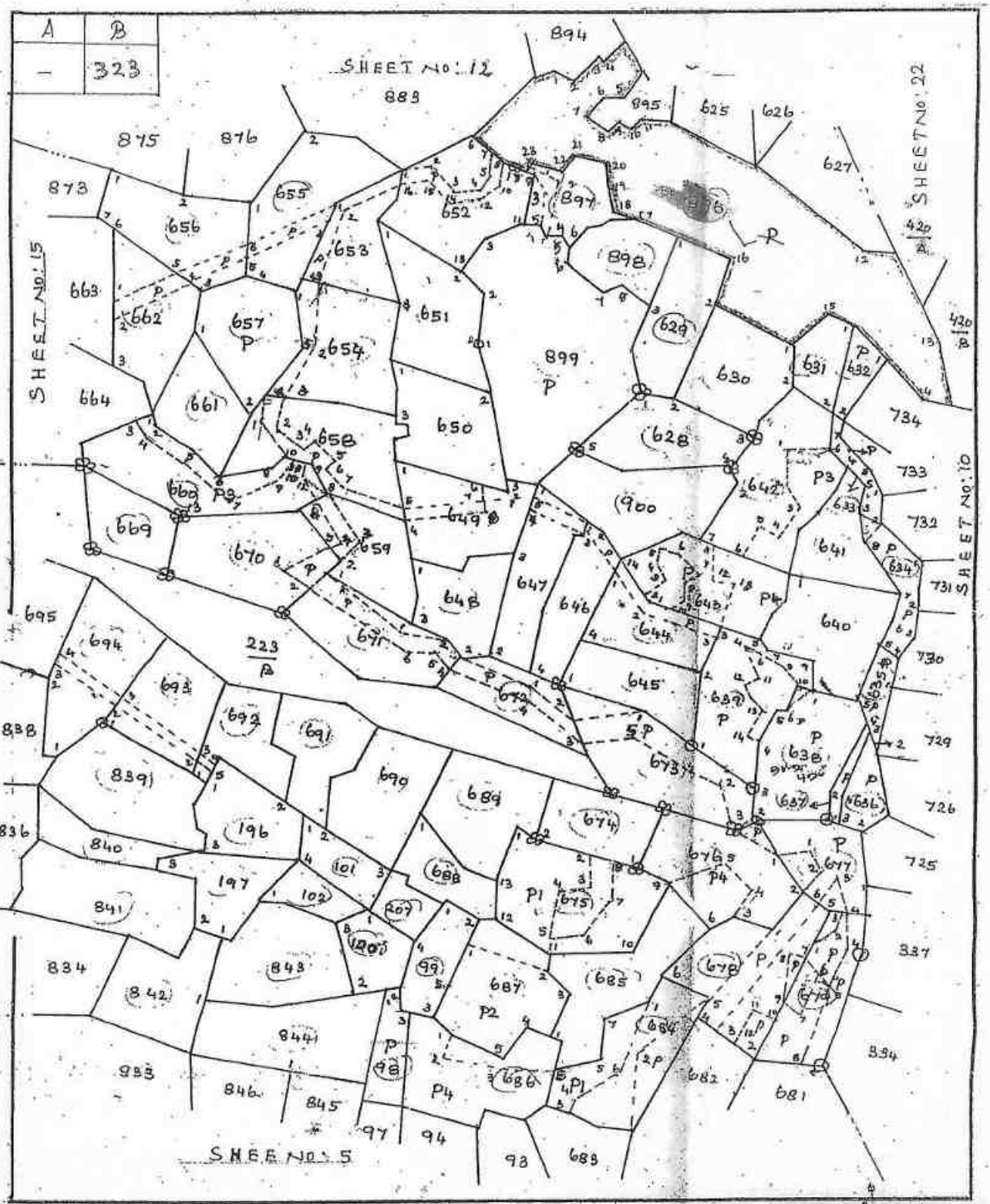
ASSISTANT GEOLOGIST
Dept. of Geology and Mining,
DHARMAPURI.

12.09.2022

ASSISTANT DIRECTOR
Dept. of Geology and Mining,
DHARMAPURI-5.

mv.240

Date of Issue: 12-05-2022 10:11:44



Applied for Mine
ASSISTANT GEOLOGIST
O/o. the Deputy Director,
Dept. of Geology and Mining,
DHARMAPURI.

DIVISIONAL MANAGER
TAMILNADU MINERALS LTD.,
KRISHNAGIRI.

ASSISTANT DIRECTOR
Dept. of Geology
DHARMAPURI

அ — படிவம்

நிலவரம்: தரிசு

எண். 30

உரிமம்: வங்காளம்

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
796	796	அ	தரிசு	...	...	...	...	17	50	0	...

(கையெழுத்து)

கிராம நிர்வாக அலுவலர்

50. அண்ணா நகர்

பென்னாகரம்-Tk. தருமபுரி-Dt.

Annexure No. 5

Annexure 10

77

1	2	3	4	5	6	7	8	9	10	11
							ரூ.பை.	ஹெ.ஏர்ஸ்	ரூ.பை.	
...	896	அ	தி.ஏ.த	...	...	...	...	17 50·0	...	.....
1	897-1	அ	பு	...	8-5	12	0 62	0 24·0	0 15	.....
	-2	அ	பு	...	...	...	...	0 27·0	...	.....
	-3	அ	பு	...	8-5	12	0 62	0 31·0	0 19	.....
	-4	அ	பு	...	8-5	12	0 62	1 46·0	0 91	.....
								2 28·0	1 25	
...	898	அ	பு	...	8-5	12	0 62	2 58·0	1 51	.....
...	899	அ	தி.ஏ.த	...	...	...	...	11 19·0	...	.....
...	900	அ	பு	...	8-5	12	0 62	5 18·0	3 20	.....
...	901	அ	தி.ஏ.த	...	...	...	...	1 30·5	...	.....
1	902-1	அ	புற	...	...	...	...	0 18·0	...	.....
2	-2	ஈ	பு	...	8-5	12	0 62	0 54·0	0 34	162 கு. குருவன்னன்.
3	-3	ஈ	பு	...	8-5	12	0 62	0 57·0	0 35	410 சி. சின்னையன்.
4	-4	ஈ	பு	...	8-5	12	0 62	0 29·5	0 19	1028 ரா. ராஜி.
5	-5	அ	பு	...	8-5	12	0 62	0 90·5	0 55	.....
6	-6	ஈ	பு	...	8-5	12	0 62	0 90·5	0 55	275 கொ. கொவந்தை.
								3 39·5	1 98	
	903-1	அ	பு	...	8-5	12	0 62	0 77·0	0 50	.....
	-2	ஈ	பு	...	8-5	12	0 62	0 98·5	0 61	878 பொ. மாது.
	-3	ஈ	பு	...	8-5	12	0 62	0 70·0	0 43	313 பொ. கோவிந்தன்.
	-4	ஈ	பு	...	8-5	12	0 62	0 42·0	0 21	313 பொ. கோவிந்தன்.
	-5	ஈ	பு	...	8-5	12	0 62	1 21·5	0 75	411 பொ. சின்னச்சாமி.
	-6	ஈ	பு	...	8-5	12	0 62	1 21·5	0 75	746 த. பொன்னுப்பன்.
								5 30·5	3 05	
		அ	பு	...	8-5	12	0 62	1 29·5	0 80	

Annexure No : G

Tamil Nadu Minerals Limited
(A Government of Tamil Nadu Undertaking)

TAMIN

1924 - 2023

Tel : 044-28415003 / 28511972
Fax : 91-44-2852 4960
E-mail : tamin@tamingranites.com
GSTIN. : 33AABCT2250P1ZA
WEB : www.tamin.co.in

Regd.Office : No.31, Kamarajar Salai, "TWAD House" Chepauk, Post Box No.2961, Chennai - 600 005.

Rc No. 9456/ML1/2017 **Dated: 20.02.2024**

TO WHOM SO EVER IT MAY CONCERN

This is to certify that Dr.E.Ganesan is working as Deputy Manager (Mining Lease) in Tamil Nadu Minerals Limited, Chennai. His qualification and experience is given below.

Qualification:-

1. M.Sc., (Geology)
2. MBA
3. Ph.D (Environmental Geology)
4. PGDELP (Post Graduate Diploma in Environmental Law & Policy)
5. Second Class Mines Manager Certificate of Competency (Restricted) Certificate No. SMR/5390, dated.06.05.2014.

Experience:-

Sl No	Name of Projects	Designation	Nature of work	Period	Total period
1.	Sivagangai Graphite Mine	Project Officer (Trainee)	Mining Geologist & over all mining supervision	23.06.1993 to 23.06.1994	Years : 01 Months : 00 Days : 00
2.	-do-	Project Officer	-do-	24.06.1994 to 09.07.1997	Years : 03 Months : 00 Days : 15
3.	Lakmanaickenpatti Quartz & Feldspar Mine	Project Officer	Mining Geologist & over all mining supervision in statutory capacity	03.05.2002 to 23.08.2002	Years : 00 Months : 03 Days : 20
4.	Periyanagalur Limestone Mine	Divisional Manager i/c	-do-	17.10.2012 to 14.07.2013	Years : 00 Months : 08 Days : 27
	Total period of experience				**Years : 05 Months : 01 Days : 02**

The Regional Controller of Mines, Indian Bureau of Mines (IBM), Chennai Region has already issued the Recognized Qualified Person (RQP) Certificate to him vide RQP/MAS/036/88/B, dated.21.10.2014. This certificate is issued only for preparation of Mining Plan / Scheme etc., as per Rules in force.

for **Tamil Nadu Minerals Ltd,**

Nominated Owner /Managing Director

भारतीय गैर न्यायिक

एक सौ रुपये Rs. 100

रु. 100 ONE HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

தமிழ்நாடு तमिलनाडु TAMILNADU

TAMIN

28 JAN 2025

DF 184263

M.S. CHANDRAMOULI
STAMP VENDOR
LIC No. 9034/86/B1
New No. 133/3, T.H. Road
Triplicane, Chennai-600 005.
Phone : 044-48592446

AFFIDAVIT

I, Dr.E.Ganesan, represents M/s.Tamil Nadu Minerals Limited, as Deputy Manager (ML) and authorized signatory of the project solemnly declare and sincerely affirm that the blasting operation in respect of proposed Ajjanahalii Black Granite Quarry over an extent of 17.50.0Ha in SF No.896 of Ajjanahalli Village, Pennagram Taluk, Dharmapuri District will be carried out by the statutory competent person as per the Metalliferous Mines Regulations, 1961 such as Blaster, Mining Mate, Mine Foreman, Second Class Manager Certificate of Competency appointed by TAMIN.

for Tamil Nadu Minerals Ltd.,

Deputy Manager (ML)
Authorized Signatory

NOTARY
B. DHEENADHAYALAN
G.O.M.No 162/2020
CITY OF MADRAS
GOVT. OF TAMILNADU. INDIA

D DHEENADHAYALAN, M.A., B.L.,
ADVOCATE & NOTARY PUBLIC
400, LAW CHAMBER,
MADRAS HIGH COURT, CHENNAI-104
EXPIRE ON 22/10/25
CELL No 9381016780

28 JAN 2025

COMMISSIONERATE OF GEOLOGY AND MINING

From
Tmt.Pooja KulKarni, I.A.S.,
Commissioner,
Department of Geology and Mining,
Guindy, Chennai - 600 032.

To
The Managing Director,
Tvl. TAMIN Ltd.,
No.31, Kamarajar Salai,
Chepauk, Chennnai -05.

Rc. No.6167/MM4/2022, dated:23.11.2023

Sir,

Sub: Mines and Minerals – Minor Mineral – Black Granite – Dharmapuri district - Pennagaram taluk – Ajjanahalli village - over an extent of 17.5.0 ha of Government land – S.F.No.896 –Quarry lease application preferred by Tvl.TAMIN Ltd., Chennai – Precise area communicated by the Government – Mining Plan submitted by Tvl.TAMIN Ltd., Chennai - Recommended by the Assistant Director (G&M), Dharmapuri - Approval accorded.

Ref:
1. Commissioner of Geology and Mining original file no. Rc.No.6167/MM4/2022 dated 11.12.2023 forwarded to Government under single file system.
2. Government letter no. 3740397/MME.1/2023-1 dated 13.9.2023.
3. Tvl.TAMIN Ltd., Chennai letter Rc.No.2460/ML4/2002 dated 30.10.2023.
4. The Assistant Director of Geology and Mining, Dharmapuri letter Rc.No.605/2022 (Mines), dated 31.10.2023.

****

Kind attention is invited to the above references cited.

2) The quarry lease application preferred by Tvl.TAMIN Ltd., for quarrying black granite over an extent of 17.50.0 ha of Government poramboke lands in S.F.No.896 of Ajjanahalli village, - Pennagaram taluk, Dharmapuri district was forwarded to the Government by the Commissioner of Geology and Mining vide reference 1st cited for grant of quarry lease under rule 8-C of TNMMCR, 1959. Now, the Government vide letter dated 13.09.2023 have communicated the precise area to an over an extent of 17.50.0 ha and requested the applicant company to submit the approved mining plan through the

Commissioner of Geology and Mining and to produce environmental clearance obtained from the competent authority for the subject area for grant of quarry lease.

3) Accordingly, the mining plan submitted by Tvl.TAMIN Ltd., has been forwarded and recommended by the Assistant Director, (G&M), Dharmapuri vide reference 4th for the subject area for approval.

4) On Scrutinizing the mining plan submitted by Tvl.TAMIN Ltd., and the report of the Assistant Director (G&M), Dharmapuri, the following are submitted.

i. The Assistant Director (G&M), Dharmapuri has reported that the mining plan has been prepared by incorporating all the conditions imposed in the precise area communication vide letter No. 3740397/MME.1/2023-1 dated 13.9.2023 and the plan tallied with the present filed conditions.

ii. The proposed year wise production:

Year	ROM (cbm)	Production (m^3) @ 10% Recovery	Granite Waste @ 90% cbm
1st year	10002	1000	9002
2nd year	11999	1200	10799
3rd year	14398	1440	12958
4th year	16000	1600	14400
5th year	17004	1700	15304
Total	**69403**	**6940**	**62463**

iii. As per the Mining plan submitted by Tvl.TAMIN Ltd., it is mentioned that the total ROM in the mining plan period is about 69403 cbm for a total depth of 12 m. Production for first 5 years Mining plan period is 6940 cbm at 10% recovery for a depth of 12 m.

ii. With regard to the dumping of waste during the Mining Plan period, it has been proposed to dump on the southern side of the lease boundary area.

iii. Finally, the Assistant Director (G&M), Dharmapuri has recommended and forwarded the mining plan submitted by Tvl. Tamil Nadu Minerals Limited, Chennai for quarrying Black Granite over an extent of 17.50.0 ha in S.F.No 896 of Ajjanahalli village, Pennagaram taluk, Dharmapuri district to the Commissioner of Geology and Mining, Chennai for approval.

5) The mining plan submitted by Tvl.TAMIN Ltd, and report of the Assistant Director (G&M), Dharmapuri have been examined with reference to the provisions of Rule 12, 13 and 15 of Granite Conservation and Development Rules, 1999 read with G.O.(Ms). No. 87, Industries (MMC.1), Department dated: 22.02.2001. Based on the recommendation of the Assistant Director (G&M), Dharmapuri the mining plan submitted by Tvl.TAMIN Ltd, is hereby approved subject to the following conditions in addition to the conditions stipulated in the precise area communication issued by the Government vide reference 2nd cited.

i. This mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time whether such Laws are made by the Central Government, State Government or any other authority

ii. The approval of the mining plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development and Regulation) Act 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Indian Explosives Act, 1884 (Central Act IV of 1884) and the rules made there

under and the Tamil Nadu Minor Mineral Concession Rules, 1959.

iii. This mining plan including progressive mine closure plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.

iv. Provisions of the Mines Act, 1952 and the Rules and Regulations made there under including submission of notice of opening, appointment of manager and other statutory officials as required under Mines Act, 1952 shall be complied with.

v. Provisions made under Mines and Minerals (Development & Regulation) Act, 1957, MMDR Amendment Act, 2015 and Granite conservation and Development Rules, 1999 made there under shall be complied with.

vi. Relaxation to be obtained under Rule 106(2)(b) of Metalliferous Mines Regulations, 1961 from the Director of Mines Safety, if necessary.

vii. If anything is found to be concealed as required by the Granite Conservation and Development Rules, 1999 and Tamil Nadu Minor Mineral Concession Rules, 1959 and proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.

viii. 50 meters safety distance to be provided to the electric line,Check dam, Tar Road and the temple located on the Western boundary of the applied area and 10 m safety distance to the Tar road on the eastern side.

ix. 7.5 m safety distance should be provided all along the boundaries of the patta lands.

x. The required safety distance should be provided to the "Masakal" Forest in S.F.No.420/A over an extent 250.26.5 hectare located abutting to the application area on the NE side as per rules.

xi. No blasting and transportation of materials in vehicles should be carried out from 6.00 PM to 6.00AM.

xii. A green belt should be constructed to prevent sound and air pollution due to the proposed quarrying activity by planting at least 250 seedlings all along the boundary the area.

xiii. No hindrance shall be caused to the adjacent Patta lands and Government poramboke lands if any while quarrying and transportation of granite.

xiv. The applicant company shall strictly adhere to the statutory and safety requirements and the applicant company should ensure the periodical medical checkup to the quarry workers to safeguard them from quarry related diseases.

xv. The waste materials generated during the course of quarrying should be dumped only within the lease hold area that will be earmarked for the purpose in the mining plan as per rule 31 of GCDR, 1999.

xvi. The applicant company shall submit Scheme of Mining, mine closure plan and other statutory requirements within the time stipulated for submission of the above as per GCDR, 1999 rules.

xvii. The applicant company should fence the lease granted area with barbed wire before the execution of lease deed as follows.

- The pillar post shall be firmly grounded with concrete foundation of height not less than 2 m with a distance between two pillars shall not be more than 3mts.
- The applicant company shall incorporate the DGPS readings for the entire boundary pillars of the area and the same should be clearly shown in the mining plan.
- A soft copy of the digitized map with DGPS readings should be submitted in CD to the Assistant Director (G&M), Dharmapuri.

xviii. The boundary stone should be fixed for the subject quarry and the district administration / Geology and Mining Department should ensure that the quarrying operation should be restricted only within the area granted for lease.

xix. Environment Clearance should be obtained from the competent authority in respect of the subject area as per rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 and as per the notification of the Ministry of Environment and Forest and any other clearances if any.

xx. As per rule 12 (v) of Mineral (other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016, the applicant company shall at their own expense, erect, maintain and keep in repair all boundary pillars.

xxi. The conditions mentioned in G.O No. 79 Industries Department dated 06.04.2015 should be complied with.

xxii. The applicant company may use mild explosives during quarrying, and storing of explosives if required, by obtaining valid license under explosive Acts and Rules.

xxiii. If any violation is found during quarrying operation, the penal provisions of Tamil Nadu Minor Mineral Concession Rules 1959 and other rules and act in force will attract.

xxiv. Child labour should not be engaged in the quarry works and the quarry workers should be enrolled in the insurance scheme through the Labour Department.

xxv. The applicant company should remit the Stamp Duty as per the approved modified mining plan during the currency of the lease period.

xxvi. The earlier instances of irregular / illegal quarrying, if any, shall not be regularized through the approval of this document.

xxvii. The applicant company shall remit the penalty / cost of mineral / other dues if any as arrived by the District Collector / Assistant Director (G&M), Dharmapuri district.

xxviii. Non adherence to any condition set-out above, the approval shall be deemed to have been withdrawn with immediate effect.

xxix. The applicant company should comply with the additional conditions stipulated in the Government of India, Ministry of Mines, Order No.11/02/2020, dated.14.01.2020 issued as per the Order of the Hon'ble Supreme Court of India, dated.08.01.2020 states that, "The Mining lease holders shall after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc".

xxx. The applicant company should carry out DGPS survey and erection of RCC boundary pillars as per the norms stipulated in the EOI notification in Rc.No.2921/MM4/2019 dated.01.02.2018 and subsequent corrigendum dated 13.08.2019.

Sd/-Pooja Kulkarni
Commissioner of Geology and Mining

Forwarded / by Order

Additional Director

Copy to:

1. The Additional Chief Secretary
   to Government(FAC),
   Natural Resources Department,
   4th Floor, Secretariat, Chennai-9.
2. The Director of Mines Safety,
   3rd Floor, Left Wing,
   New Additional Building,
   CGO Complex, Shastri Bhawan,
   Nungambakkam, Chennai – 06
3. The District Collector,
   Dharmapuri District.

MINING PLAN FOR
AJJANAHALLI BLACK GRANITE QUARRY

District : Dharmapuri

Taluk : Pennagaram

Village : Ajjanahalli

SF. No. : 896

Extent : 17.50.0Ha.

(UNDER RULE 12 & 13 OF GCDR, 1999)

APPLICANT:

M/s. TAMIL NADU MINERALS LIMITED,
(An Undertaking of Government of Tamil Nadu)
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI – 600 005.

Name of the RQP : Dr. E.GANESAN, Ph.D, PGDELP.

Designation : DEPUTY MANAGER, TAMIN

Mobile No : 94888 55535

LIST OF CONTENTS

LIST OF PLATES

LIST OF ANNEXURES

DECLARATION BY NOMINATED OWNER

Certified that the Mining Plan in respect of Ajjanahalli village SF.No.896 extent 17.50.0Ha. Black Granite Quarry of Ajjanahalli villlage, Pennagaram Taluk, Dharmapuri District, Tamil Nadu State has been prepared in full consultation with me and I understood its contents and agree to implement the same in accordance with the law. The Mining plan has been prepared by Thiru E.Ganesan, a Recognized Qualified Person.

I hereby undertake that all the modifications as made in the Mining Plan by the RQP are deemed to have been made with my knowledge and consent and shall be acceptable to me and binding on me in all respects.

I request you to make further correspondences regarding the modifications of the Mining Plan with the said Recognized Qualified Person in the following address:

Dr. E. Ganesan, Ph.D, PGDELP
Deputy Manager (Mining Lease),
Recognized Qualified Person
Tamil Nadu Minerals Limited,
No.31, Kamarajar Salai,
Chepauk, Chennai-600 005.

SUDEEP JAIN, I A S.,
MANAGING DIRECTOR

5/6

10/10/12

CERTIFICATE FROM THE RECOGNIZED QUALIFIED PERSON

This is to certify that the provisions of Granite Conservation and Development Rules, 1999 and as amended in Tamil Nadu Minor Mineral Concession Rules, 1959 have been observed in the preparation of Mining Plan for Ajjanahalli Black Granite Quarry over an extent of 17.50.0Ha in Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District, Tamil Nadu State has been prepared for

M/s. Tamil Nadu Minerals Limited,
No.31, Kamarajar Salai,
Chepauk, Chennai- 600 005.

Wherever specific permissions/exemptions/ relaxations and approvals are required, the applicant will approach concerned authorities of Commissioner of Geology and Mining, Government of Tamil Nadu, Guindy, Chennai for such permissions/exemptions/relaxations and approvals.

It is also certified that information furnished in the above Mining Plan are true and correct to the best of my knowledge.

Place: Chennai
Date:

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

TAMIN,
MINING PLAN FOR
AJJANAHALLI BLACK GRANITE (DOLERITE)

[Under Rule 8-C and 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 & Rule 12, 13 and 16 of Granite Conservation and Development Rules,1999]

INTRODUCTION:

M/s Tamil Nadu Minerals Limited (An Undertaking of Government of Tamil Nadu hereinafter referred as TAMIN) was established in the year 1978 to carryout systematic mining and development of different minerals all over the State.

The present Mining Plan has been prepared for quarrying Black Granite (Dolerite) over an extent of 17.50.0Ha in SF.No.896 of Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District, Tamil Nadu State for 20 years for which precise area communication has been granted vide Government Industries, Natural Resources (MME.1) Department, Letter No.3740397/MME.1/2023-1, dated:13.09.2023.

PART-I

1.0. MINING PLAN:

Name of Mine:

Ajjanahalli SF.No.896 Black Granite Quarry.

1.2 Particulars of Approval of Mining Plan under GCDR (indicate approval No. and date):

As the subject area is fresh lease, the question of approval of mining does not arise at this stage.

1.3 Date of commencement of Mining Operations:

Will be intimated after execution of the lease deed under rule 8-C (5)(c) of the Tamil Nadu Minor Mineral Concession Rules, 1959.

1.4 (a) Deficiencies, if any that existed in the approved Mining Plan to be taken note of and rectified by incorporating suitable proposal for implementation in the Scheme of Mining:

Not applicable at this stage as it is a fresh lease.

1.4(b) Review of Compliance of salient features of Mining Plan on chapter-wise basis bringing out marked deviations, if any and justifications/ reasons thereof. Items to be covered may include exploration, mine development, exploitation, afforestation programme, reclamation and rehabilitation, control of dust, noise and ground vibration and any other significant feature:

(1) Exploration:

The same mineral available in the mineralised area of adjacent mining lease (Ajjanahalli Village, SF.No.883 Black Granite quarry in Pennagaram Taluk, Dharmapuri District) having similar geological features and explored. Hence, no more exploration study is required.

(2) Mine Development:

Sl. No.	Year Pertaining to	Proposed generation of waste in the Mining Plan (M^3)		
		Over Burden	Side Burden	Granite Rejects(90%)
1.	First	--	1721	9002
2.	Second	--	2284	10799
3.	Third	--	3070	12958
4.	Fourth	--	3701	14400
5.	Fifth	--	1821	15304
Total		Nil	**12597**	**62463**

(3) Exploitation: (Production)

Sl. No	Year pertaining to	ROM Proposed in the Mining Plan (M^3)	Saleable proposed @ 10% (M^3)
1.	First	10002	1000
2.	Second	11999	1200
3.	Third	14398	1440
4.	Fourth	16000	1600
5.	Fifth	17004	1700
	Total	**69403**	**6940**

(4) Progressive quarry closure Plan:

As a Petrogenetic character, the depth persistence of the Black granite body in the mine area is beyond the workable limits. However, it is very difficult to operate granite dimensional stone mine economically below an average depth of 30m by observing the statutory provisions of Mine Safety Rules and Regulations. Hence in the proposed Mining Plan, only 30m average depth has been envisaged as 'Workable depth' for safe and economic mining.

However, it is proposed not to back fill the ultimate pit, in as much as good quantity of reserves is available below the workable depth of 30m 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 30m depth. The pit boundaries shall be safely fenced and used for agricultural purpose when the pit is filled with underground see page or rain waters.

(5) Control of Dust, Noise and Ground Vibrations:

The quarrying operation is being carried out by semi-mechanized method with deployment of HEMM for development and production activities. Dust will be suppressed by adopting wet drilling method and water sprinkling in the haul road. As expansion rock breaking powder is using for splitting rock the noise level will be reduced. As TAMIN is using Milli Second Delay Detonator (MSDD) for blasting, the vibration observed in this quarry is negligible.

Ground Water:

Ground water occurrence in this area is below 12.4m ground level due to semi-arid climatic conditions with moderate rainfall. The quarry operation confined to well above the water table for the entire lease period, hence the quarry operation will not be affected/ intersected by the ground water in any manner.

Significant Features:

TAMIN closely monitored the environmental factors systematically without degrading the land, water and air.

1.4(c) Review of the compliance position of conditions and stipulations imposed, if any, while approving the Mining Plan. In case of non-compliance / partial compliance, detailed justification reasons thereof may be furnished along with proposal for compliance in the ensuing period:

TAMIN always carries out its mining operations in conformity with the above Acts and Rules.

1.4(d) Review of compliance of violations pointed out after inspections made under GCDR, 1999 during last 5 years. The position emerging out of the yearly review of the Mining Plan while checking up implementation of the Mining Plans in the field shall also be taken note of at this stage:

At this stage not applicable

1.4(e) Any other points requiring attention in the interest of proper mine design, development and conservation and environment and ecology of the area:

The proposed mine working is so designed in such a way mainly keeping in view of conservation of mineral, afforestation, environment, and ecology of the mine area.

***

PART – II

2.0. PROPOSAL UNDER MINING PLAN FOR THE 5 YEARS.

2.1 Name and Address of the Lessee:

Name	:	M/s.Tamil Nadu Minerals Limited,
Address	:	No. 31, Kamarajar Salai, Chepauk, Chennai - 600 005. Tamil Nadu State.
Phone	:	044-2989 2018
e.Mail	:	tamin@tamingranites.com

2.2 Name and address, registration number of the recognized persons together with validity date / person employed under Rule 13 of GCDR1999 who has prepared the Mining Plan:

RQP Certificate Enclosed.

2.3 Mineral (s) to be mined:

To mine the Dolerite Dyke commercially known as 'Ajjanahalli Black Granite Dimensional Stone'.

2.4 Area and date of expiry of lease:

Details of Lease Area	Date of expiry of lease
Ajjanahalli Village. Black Granite Quarry over an extent of 17.50.0Ha in Ajjanahalli village, SF.No.896, Pennagaram Taluk, Dharmapuri District, Tamil Nadu State.	Will be informed after execution of lease deed

2.5 Date of expiry of 5 year period for which Mining Plan approved on the last occasion:

Not applicable at this stage

3.0 RESERVES:

3.1 Category-wise (Proved, Probable and Possible) Reserves Estimated in the earlier Mining Plan with grades:

Sl. No	Geological Reserves	Mineable Reserves	Mineable Saleble Reserves @10% Recovery
1.	8,87,700M^3	5,71,881 M^3	57,188 M^3

The above estimations arrived at on the basis of geological & Mineable Cross sections.

3.2 Depletion of Reserves:

Nil

3.3 Additional reserves established category wise (with basis and parameters considered):

No additional reserves.

3.4 Category wise updated reserve with grade (indicate and use grade with analysis) as well as marginal grades:

Sl. No	Geological Reserves	Mineable Reserves	Mineable Saleble Reserves @10% Recovery
1.	8,87,700M^3	5,71,881 M^3	57,188 M^3

The above estimations arrived at on the basis of Geological & Mineable cross sections updated as on 23.08.2023.

4.0. CONCEPTUAL MINING PLAN:

a) Anticipated Life of the Quarry:

Updated Mineable Reserves : 5,71,881 M^3

Anticipated Life of the Quarry : 33.6@34 years.

b. Depicted on Mine Geological Plans and sections with necessary statement annexed supported by essential text, covering the basic & long term design features of mine covering exploration, mine development, optimum exploitation & utilization of the mineral, waste & sub-grade mineral management, and environmental aspects. The ensuing five year detailed programme should but be a part of the conceptual overall Mining Plan.

i) Mine Year wise Production:

Year	ROM(M^3)	Recovery @10%(M^3)	Granite Waste @90% (M^3)
First	10,002	1,000	9,002
Second	11,999	1,200	10,799
Third	14,398	1,440	12,958
Fourth	16,000	1,600	14,400
Fifth	17,004	1,700	15,304
Total	**69,403**	**6,940**	**62,463**

ii) Optimum exploitation and utilization of the Mineral:

The optimum quantity of mineable reserves as ROM is 5,71,881M^3.

iii) Waste and sub-grade Mineral Management:

The dumps will be maintained not exceeding 5m height and the angle of slope of dumps will be at 45^0 from horizontal. The waste dump has been earmarked in the Plate No.4.

Generation of waste will be utilized for producing of Cubes, curbs, stone, Jally and M-Sand purpose etc..

iv) Environmental Aspects:-
Afforestation Programme:

TAMIN will get Environmental Clearance (EC) from the SEIAA as directed by the Govt. After approval of this mining plan and necessary native species of sapling will be planted as per the EC letter.

The quarrying operation is being carried out by semi-mechanized method with deployment of HEMM for development and production activities.

Ultimate Pit dimensions of the Quarry at top and bottom are tabulated below:

Pit	Ultimate Pit Dimensions at Top (m)		Ultimate Pit Dimensions at Bottom (m)		
	Length	Ave.Width	Length	Ave.Width	Depth
	750.00	69.00	526.00	23.33	30.00

5.0 MINING:

5.1 Salient Description of the present mining methods:

The Quarrying work being carried out under the direct supervision of our Statutory Mining Personal of TAMIN as approved by the DGMS under MMR,1961.

5.2 Yearly pit-wise development plan proposed for the next five years, depicted on plans and sections (ore and overburden to be shown clearly along with geological formations encountered depicting also the design and layout of the mine benches in case of opencast mining).

It has been discussed in chapter 4.0 b i)

5.3 Yearly pit-wise development plan proposed for next five years along with grade. Blending proposal, if any, may be indicated:

Nil

Details of depth and benches proposed during the Mining Plan Period:

Year	Section	R.L Proposed (m)	Depth Details(m)				No. of Benches
			Present	Proposed	Remaining	Total	
First	QR & AB	450.000 to 444.000	0	6.00	24.00	30	1
Second	QRS & CD	448.000 to 442.000	0	6.00	24.00	30	1
Third	RS & EF	448.000 to 436.000	0	12.00	18.00	30	2
Fourth	QRS & CD	442.000 to 436.000	6.00	6.00	18.00	30	1
Fifth	QR & AB	444.000 to 438.000	6.00	6.00	18.00	30	1

5.4 Any change in proposed method of mining and deployment of machinery, together with reasons thereof:

The quarrying operation is being carried out by semi-mechanized method with deployment of HEMM for development and production activities under Regulation 106.

6.0. HANDLING OF WASTE /SUB- GRADE MATERIAL:

Rate of yearly generation of waste and proposals for disposal of waste for next five years. (indicate sequence of dumping with necessary plan and sections)

The waste generated during the mining operation i.e., 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 for disposal of waste rock has been identified on South side of the lease area. The unsold blocks ~~are~~ will be kept within the boundary on the country rock area.

6.1.1 Build-up of dumps from year to year to be shown in yearly plans and sections with description of the method & manner of disposal of waste rock, designed capacity & height of individual dumps and precautions envisaged for confinement of the dumps together with design details of the protective works:

The dumps will be maintained not exceeding 5m height and the angle of slope of dumps will be at 45^0 from horizontal. The waste dump has been earmarked in the Plate Nos. 4 & 5.

6.2 Rate of yearly generation of sub-grade mineral with reference to threshold values and proposals for stacking for next five years. (Submit necessary plan/sections.) (In case variations from the recommended threshold values of IBM, please give adequate justification and reasons).

There is no sub-grade mineral produced. Commercial and small blocks are also proposed to be sold while handling granite waste.

6.3 Quantity and grade of sub-grade material available at the mine as on date duly supported by plans & sections and descriptive statement inclusive of the precautions adopted for storage.

-Not Applicable-

7.0. USE OF MINERAL:

7.1 Changes proposed in the use of mineral, if any, with reasons:

TAMIN will sell dimensional blocks and waste as per Government approvals in place.

7.2 Changes in the specification, if any, imposed by the user industries and or specifications required in the case of new user industries, if any, to be given:

As mentioned above there is no change in specification imposed by the user industries.

7.3 Efforts made for utilization of the sub-grade mineral including fines:

Commercial blocks and small blocks will also be sold in addition to defect free blocks.

8.0. MINERAL BENEFICIATION:

8.1 Results of any beneficiation investigations conducted and changes made in existing mineral beneficiation plant and tailing disposals, if any, with benefits expected (necessary) flow - sheet and tailing dam designs etc., to be submitted as applicable:

- Not Applicable –

8.2 Beneficiation test done, if any, on sub-grade mineral including fines and proposals for installation of new or additional beneficiation facility, if any (furnish process details in brief along with expected tailings loss):

- Not Applicable –

9.0. ENVIRONMENTAL MANAGEMENT PLAN:

The following observations are made for Environmental Management Plan:

i) **Existing land use pattern:**
The lease area is a hillock with height of about 78m surrounded by plain lands. The altitude of the area is 456m (Maximum) above MSL and the area receives average annual rainfall of about 985mm.

ii) **Land Reclamation & Rehabilitation:-**
The mine-pit will be utilized as a water reservoir for agriculture purpose Waste Dump management.

iii) **Waste Dump management:-**
The waste can be dumped on Southern side of the lease boundary.

10.0. ANY OTHER INFORMATION:

- NIL -

Date:

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

COMMISSIONER
GEOLOGY AND MINING,
GUINDY, CHENNAI-600 032.

22/11/2023

This Mining Plan is Approved
Subject to the Conditions/ Stipulation
Indicated in the Mining Plan Approval
Letter No./ 6167/mm4/2022 Dated 23-11-2023

Annexure No: A

19 SEP 2023

Natural Resources (MME.1) Department, Secretariat, Chennai-600 009.

507

Letter No.3740397/MME.1/2023-1, dated 13.09.2023

From
Thiru. K. Phanindra Reddy, I.A.S.,
Additional Chief Secretary to Government (FAC)

To
Tvl.Tamil Nadu Minerals Limited,
No.31, Kamarajar Salai,
TWAD House,
Chepauk, Chennai – 600 005.

Sir,

Sub: Natural Resources – Minor Mineral – Black Granite – Quarry lease application preferred by Tvl.TAMIN for quarrying of Black Granite over an extent of 17.50.0 hectares of Government Poramboke land in S.F.No.896 Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District - Precise area communicated – Approved Mining Plan and Environmental Clearance – Called for.

Ref: 1. Your Quarry Lease Application dated 13.02.2022.

2. From the District Collector, Dharmapuri, Note File.No.605/2002-(Mines), dated 12.09.2022.

3. From the Commissioner of Geology and Mining, Chennai, File Rc.No.6167/MM4/2002, dated 11.12.2022.

I am directed to invite attention to the references second and third cited, wherein the District Collector, Dharmapuri and the Commissioner of Geology and Mining, Chennai have recommended and forwarded your quarry lease application for grant of quarry lease for quarrying of Black Granite over an extent of 17.50.0 hectares of Government Poramboke land in S.F.No.896 Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District for a period of 20 years under rule 8-C of the Tamil Nadu Minor Mineral Concession Rules, 1959.

2. The Government carefully examined the recommendations of the District Collector, Dharmapuri and the Commissioner of Geology and Mining, to communicate precise area for the extent of 17.50.0 hectares of Government Poramboke land in S.F.No.896 Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District and accordingly, the Government hereby

(p.t.o.)

communicate Precise Area for the above said area under sub-rule (3) (b) of rule 8-C of the Tamil Nadu Minor Mineral Concession Rules, 1959 for grant of quarry lease.

3. I, therefore, request you to furnish the Approved Mining Plan for the above-mentioned Precise Area through the Director of Geology and Mining within a period of 3 months as per sub-rule (3) (b) of rule 8-C of the TNMMCR, 1959 and to produce Environmental Clearance obtained from the competent authority for the above said area for grant of quarry lease subject to the following conditions:-

1) The required safety distance to be provided to the "Masakal Forest" in S.F.No.420/A over an extent 250.26.5 hectares located abutting to the applied area on the North Eastern side as per rules.
2) 50 meters safety distance to be provided to the electric line, Check dam, Tar Road and the temple located on the Western boundary of the applied area and 10 m safety distance to the Tar road on the eastern side.
3) 7.5 meters safety distance should be provided all along the boundaries of the patta lands.
4) The applicant company should not cause hindrance to the pattadar and Government lands if any adjacent to the area, while quarrying and transporting the Granite.
5) The quarrying operation should be restricted only in the area to be granted on lease.
6) Barbed wire fencing or Compound wall should be erected all along the boundary of the lease granted area.
7) The waste materials generated during the course of quarrying should be dumped only within the lease hold area.
8) A green belt should be created by planting trees along the boundary of the area to control air and noise pollution.
9) Environment Clearance should be obtained from the competent authority in respect of the subject area as per rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 and as per the notification of the Ministry of Environment and Forest and any other clearances if any.
10) The applicant company should submit Mining Due Clearance Certificate for the year 2017-18 before execution of lease deed and for the period from 2018-19 to 2022-23 after March, 2023 as per the G.O (D) No.43 Industries (MME.1) Department dated 16.05.2022 in which the Government has given exception to Tvl.TAMIN Ltd., for remittance of arrear dues to the Government.

11) The applicant company should fence the lease granted area with barbed wire before the execution of lease deed as follows:

   a. The pillar post shall be firmly grounded with concrete foundation of height not less than 2 meters with a distance between two pillars shall not be more than 3 meters.

   b. The applicant shall incorporate the DGPS readings for the entire boundary Pillars of the area and the same should be clearly shown in the mining plan.

   c. A soft copy of the digitized map with DGPS readings should be submitted in the CD to the Assistant Director (G&M), Dharmapuri.

12) The conditions mentioned in G.O.(Ms).No.79, Industries (MMC.1) Department, dated 06.04.2015 should be complied with.

13) As per rule 12 (V) of Mineral (other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016, the company Their applicant company shall at their own expenses erect, maintain and keep in repair all the boundary pillars.

14) The applicant company should ensure that all the labourers are registered in the Labour Welfare Board and Insurance Scheme.

15) The applicant company should comply with the additional conditions stipulated in the Government of India, Ministry of Mines order No. 11/02/2020, dated 14.01.2020 issued as per the order of Hon'ble Supreme Court of India, dated 08.01.2020 which states that "The mining lease holders shall after ceasing mining operations, under take re- grassing the mining area and any other area which may have been disturbed due to this mining activities and restore the land to a condition which is fit for growth of fodder, flora and fauna etc.,"

16) The applicant company should carry out DGPS survey and erection of RCC boundary pillars as per the norms stipulated in the EOI notification in Rc.No.2921/MM4/2019 subsequent corrigendum dated 13.08.2019 before execution of quarry lease.

17) Tvl. TAMIN Limited, Chennai-5 shall produce current mining dues clearance certificate as per the affidavit filed along with this application, on grant of mining lease for this area but, before execution of lease deed.

18) The applicant company should submit latest Board of Directors details before execution of lease deed.

4. The District Collector, Dharmapuri shall obtain a sworn-in-affidavit from the appellant containing the above conditions before execution of lease deed and also ensure that the instructions issued in Government Letter No.12789/MMB.2/2002-7, Industries (MMB) Department, dated 09.01.2003 are complied with.

Yours faithfully,

S. Sanmuganathan 13/9/23

for Additional Chief Secretary to Government (FAC)

To
The Director of Geology and Mining,
Guindy, Chennai – 600 032.

The District Collector,
Dharmapuri District.

Annexure No : B

-337-

District : Dharmapuri

Survey No : 896

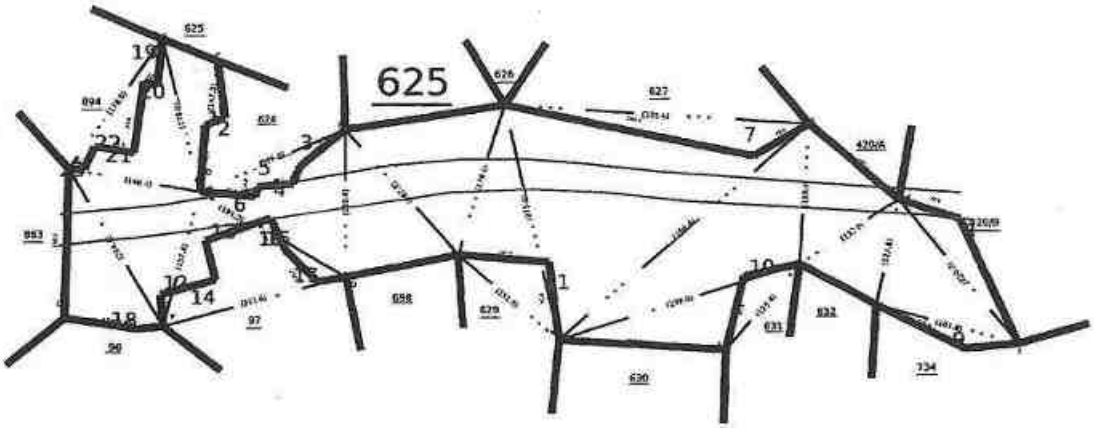
Taluk : Pennagaram

Area : Hect 17 Ares 50.00

Village : Ajjanahalli [30]

Scale : 1 : 7883

COMMISSIONER OF GEOLOGY AND MINING CHENNAI-032



INDEX:

LEASE APPLIED AREA 17.50.00Ha.

BLACK GRANITE DEPOSIT

DISTRICT : DHARAMPURI,
TALUK : PENNAGARAM,
VILLAGE : AJJANAHALLI,
SURVEY FIELD No. : 896,
LEASE APPLIED AREA : 17.50.00 Ha,

Top MSL of Hill : 459.00M.
Bottom MSL of Hill : 375.00M.
Elevation : 84.00M.

DYKE DIMENSION =(L 935.00M. X W 30.00M.)

12/9/22
Divisional Manager
TAMILNADU MINERALS LTD.,
KRISHNAGIRI.

ASSISTANT GEOLOGIST
Dept. of Geology and Mining,
DHARMAPURI.

12.09.2022
ASSISTANT DIRECTOR
Dept. of Geology and Mining,
DHARMAPURI-5

Date of Issue: 12-05-2022

ITV.240

Annexure No : C

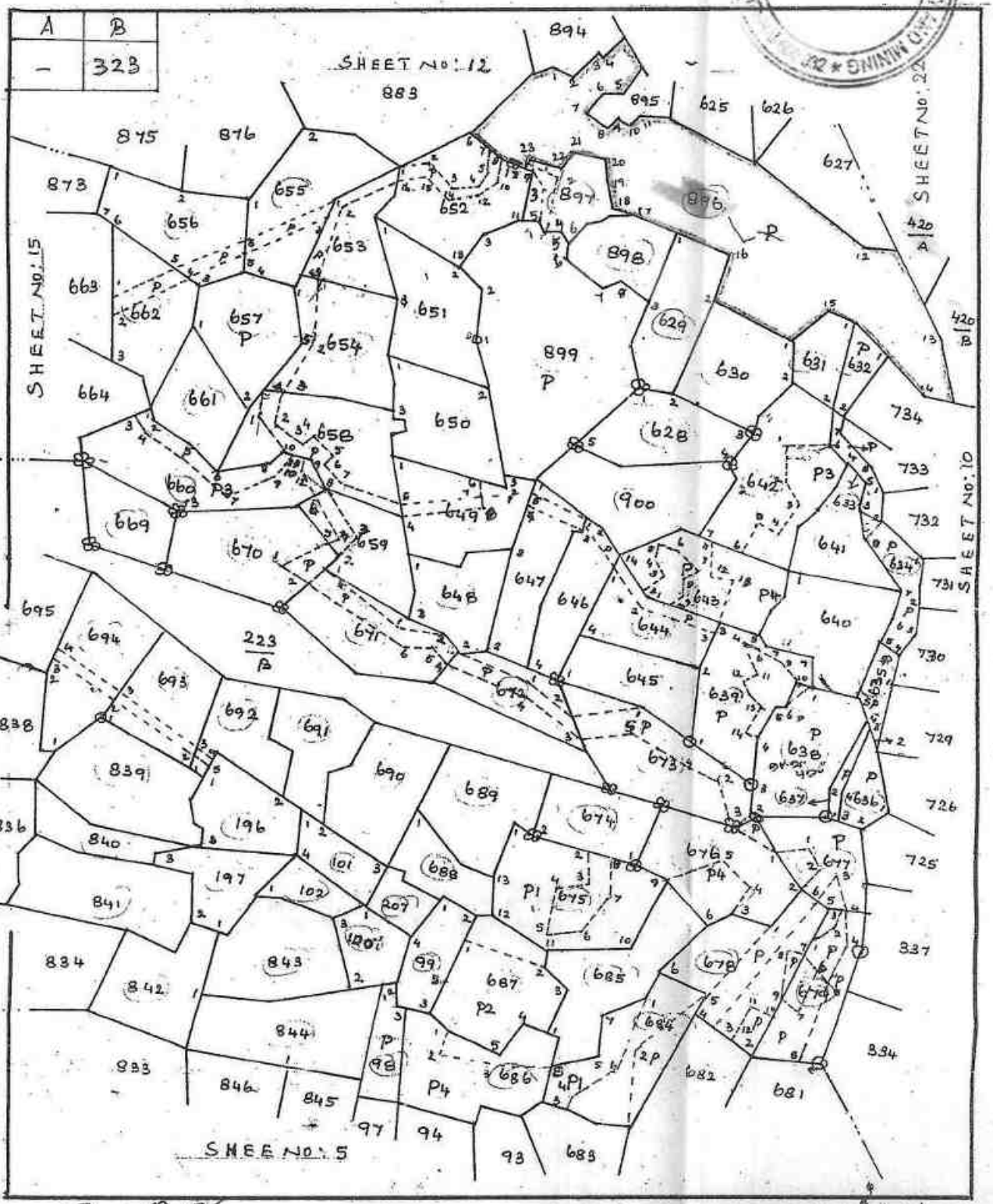
மாவட்டம் : கிருஷ்ணகிரி

வட்டம் : பென்னாகரம் SHEET NO: 6

எண் : 30

இராம் அயர் : அனுமன் உரிமம்

A	B
-	323



Applied for Mine Lease Area.

ASSISTANT GEOLOGIST
O/o. the Deputy Director,
Dept. of Geology and Mining,
DHARMAPURI.

DIVISIONAL MANAGER
TAMILNADU MINERALS LTD.,
KRISHNAGIRI.

ASSISTANT DIRECTOR
Dept. of Geology and Mining
DHARMAPURI.

1	2	3	4	5	6	7	8	9	10	11	12
							ரூ.பை.	ஹெ.ஏர்ஸ்	ரூ.பை.		
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1	897-1	அ	4	...	8-5	12	0 62	0 24·0	0 15	.....	அனாதீ
	-2	அ	4ற	...	...	...	...	0 27·0	...		பாட்ஷா
	-3	அ	4	...	8-5	12	0 62	0 31·0	0 19	.....	அனாதீ
	-4	அ	4	...	8-5	12	0 62	1 46·0	0 91	.....	அனாதீ
								2 28·0	1 25		
...	898	அ	4	...	8-5	12	0 62	2 58·0	1 51	.....	அனா
...	899	அ	தி.ஏ.த	....	..	..	...	11 19·0	...	.....	
...	900	அ	4	...	8-5	12	0 62	5 18·0	3 20	.....	
...	901	அ	தி.ஏ.த	...	..	...	...	1 30·5	...	.....	
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2	-2	ர	4	...	8-5	12	0 62	0 54·0	0 34	162 க. கருப்பன்னன்.	
3	-3	ர	4	...	8-5	12	0 62	0 57·0	0 35	410 சி. சின்னையன்.	
4	-4	ர	4	...	8-5	12	0 62	0 29·5	0 19	1028 ரா. ராஜி.	
5	-5	அ	4	...	8-5	12	0 62	0 90.5	0 55	.....	
6	-6	ர	4	...	8-5	12	0 62	0 90·5	0 55	275 செல்லம்மாள். கொளுந்தை.	
								3 39·5	1 98		
	903-1	அ	4	...	8-5	12	0 62	0 77·0	0 50	.....	
	-2	ர	4	...	8-5	12	0 62	0 98.5	0 61	878 பொ. மாது.	
	-3	ர	4	...	8-5	12	0 62	0 70·0	0 43	313 பொ. கோவிந்தன்.	
	-4	ர	4	...	8-5	12	0 62	0 42·0	0 21	313 பெரி. கோவிந்தன்.	
	-5	ர	4	...	8-5	12	0 62	1 21·5	0 75	411 பொ. சின்னசாமி.	
	-6	ர	4	...	8-5	12	0 62	1 21·5	0 75	746 த. பொன்னப்பன்.	
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"அ" — படிவம் (8)

இடம்: திருவாரூர் மாவட்டம்

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
வ											
896.	896	அ	தீர்த	...	...	...	...	17.50.0	...	.....	கரு.

எண்: 30

வயல்: தென்னைமரங்கள்

/ உண்மைநகல் /

கிராம நிர்வாக அலுவலர்
30. அஞ்ஜனஅள்ளி
பென்னாகரம்-Tk. தருமபுரி-Dt.

Annexure No : 17

Annexure No : F

Tamil Nadu Minerals Limited
(A Government of Tamil Nadu Undertaking)

TAMIN

Tel : 044-29862018 / 29511972
Fax : 91-44-2852 4960
E-mail : tamin@taminginlies.com
GSTIN. : 33AABCT2250P1ZA

Regd. Office : No. 31, Kamaraj Salai, "TWAD House" Chepauk, Post Box No. 2961, Chennai - 600 005.

Rc.No.9456/ML1/2017 Dated:03.11.2022

TO WHOM SO EVER IT MAY CONCERN

This is to certify that Shri.E.Ganesan is working as Deputy Manager (Mining Lease) in Tamil Nadu Minerals Limited, Chennai. His qualification and experience in given below.

1. Name : E.Ganesan
2. Qualification : i.M.Sc.(Geology)
   ii.M.B.A
   iii.Second Class Manager
   Certificate of Competency (Restricted)
   Certificate No.SMR/5390, date: 06.05.2014
3. Experience :

Sl. No	Name of the project	Designation	Nature of work	Period	Total period
1.	Sivaganga Graphite Mine	Project Officer (Trainee)	Mining Geologist & over all mining supervision	23.06.1993 to 23.06.1994	Years : 01 Month: 00 Days : 00
2.	- Do -	Project Officer	- Do -	24.06.1994 to 09.07.1997	Years : 03 Month: 00 Days : 15
3.	Lakmana Naicken Patti Quartz& Feldspar Mine	Project Officer	Mining Geologist & over all mining supervision in statutory capacity	03.05.2002 to 23.08.2002	Years : 00 Month: 03 Days : 20
4.	Periyanagalur Limestone Mine	Divisional Manager I/c	- Do -	17.10.2012 to 14.07.2013	Years : 00 Month: 08 Days : 27
	Total Period of experience				**Years : 05 Month: 01 Days : 02**

The Regional Controller of Mines, Indian Bureau of Mines, Chennai Region has already issued the Recognized Qualification Certificate to him vide RQP/MAS/036/88/B dated 21.10.2014.

This certificate is issued only for preparation and Modification of Mining Plan etc., under Rule, 15 of the Minerals (other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016 and under Rule 13 of the Granite Conservation and Development Rules, 1999.

for **Tamil Nadu Minerals Ltd,**

Nominated Owner/Managing Director

RQP CERTIFICATE

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES

CERTIFICATE OF RECOGNITION AS QUALIFIED PERSON

Controller of Mines
Indian Bureau of Mines

ANNEXURE I

1. S.Shanmugam, Selection Grade Divisional Manager
2. K.Shanmugam, Selection Grade Senior Project Officer
3. P.Chellapan, Selection Grade Divisional Manager
4. E.Ganesan, Selection Grade Project Officer
5. S.Venkatachalapathi, Project Officer
6. A.Ramchandran, Selection Grade Project Officer

Annexure No : G

List of Board of Directors

1.Thiru.K.Phanindra Reddy, I.A.S.,
Chairman,
Tamil Nadu Minerals Limited and
Additional Chief Secretary to Government
Natural Resources Department, [Full Additional Charge]
Secretariat, Chennai–600 009.

2.Thiru.Sudeep Jain, I.A.S.,
Managing Director,
Tamil Nadu Minerals Limited
Chepauk, Chennai–600 005.

3.Thiru.L.Nirmal Raj, I.A.S.,
Industries Commissioner and Director,
Industries and Commerce,
2nd Floor and 3rd Floor,
SIDCO Corporate Office Building,
Thiru-Vi-Ka Industrial Estate,
Guindy, Chennai–600 032.

4.Thiru.R.Veerusamy,
Deputy Secretary to Government,
Industries, Investment Promotion &
Commerce Department,
Secretariat, Chennai–600 009.

5.Thiru. G.K. Arun Sundar Thayalan, I.A.S.,
Additional Secretary to Government,
Finance Department,
Secretariat, Chennai–600 009.

6.Tmt.Pooja Kulkarani, I.A.S.,
Commissioner of Geology and Mining,
Guindy, Chennai–600 032.

7.Dr. T.Subramani, Ph.D.,
Professor and Head,
Department of Mining Engg.,
Anna University, Guindy,
Chennai - 600 025.

8.Thiru. P. Sankara Kumar, B.Com., B.L.,A.C.S.,
Independent Director,
Old.No.88, New No.227,
North Madhavaram High Road,
Perambur, Chennai–600 011.

9.Thiru. R. Pitchai Muthu, M.Sc.,
Independent Director,
No.82, LGB Nagar,
East Street, Karur–639 002.

77° 45' 00"

77° 49'24.10"

77° 50' 00"

N

12° 05' 00"

12° 04'00.81"

12° 00' 00"

77° 45' 00"

77° 49'24.10"

77° 50'00"

INDEX

- MINING LEASE APPLIED BOUNDARY
- SAFETY ZONE 5Km RADIUS
- ROAD
- UNMETALLED ROAD
- RESERVOIR
- STREAM / RIVER
- 100 CONTOUR
- R.F BOUNDARY
- DISTRICT BOUNDARY

WIND DIRECTION

WINTER

SUMMER

COMMISSIONER OF GEOLOGY AND MINING

DISTRICT	: DHARMAPURI
TALUK	: PENNAGARAM
VILLAGE NAME	: AJJANAHALLI
VILLAGE No.	: 30
FIELD NO.	: 896
LEASE HOLD AREA	: 17.50.0Ha.

PLATE No. 1

AJJANAHALLI BLACK GRANITE QUARRY

KEY PLAN

PART OF TOPO SHEET NO: 57H/16

EASTERN LONGITUDE FROM 77°49'07.5609" TO 77° 49'37.3636"

NORTHERN LATITUDE FROM 12° 03'48.1953" TO 12° 04'13.7287"

500 0 2500 5000

SCALE= 1:50,000 (1CM = 500 M)

ALL DIMENSIONS ARE IN METRES

APPLICANT:-

M/S.TAMILNADU MINERALS LIMITED

No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

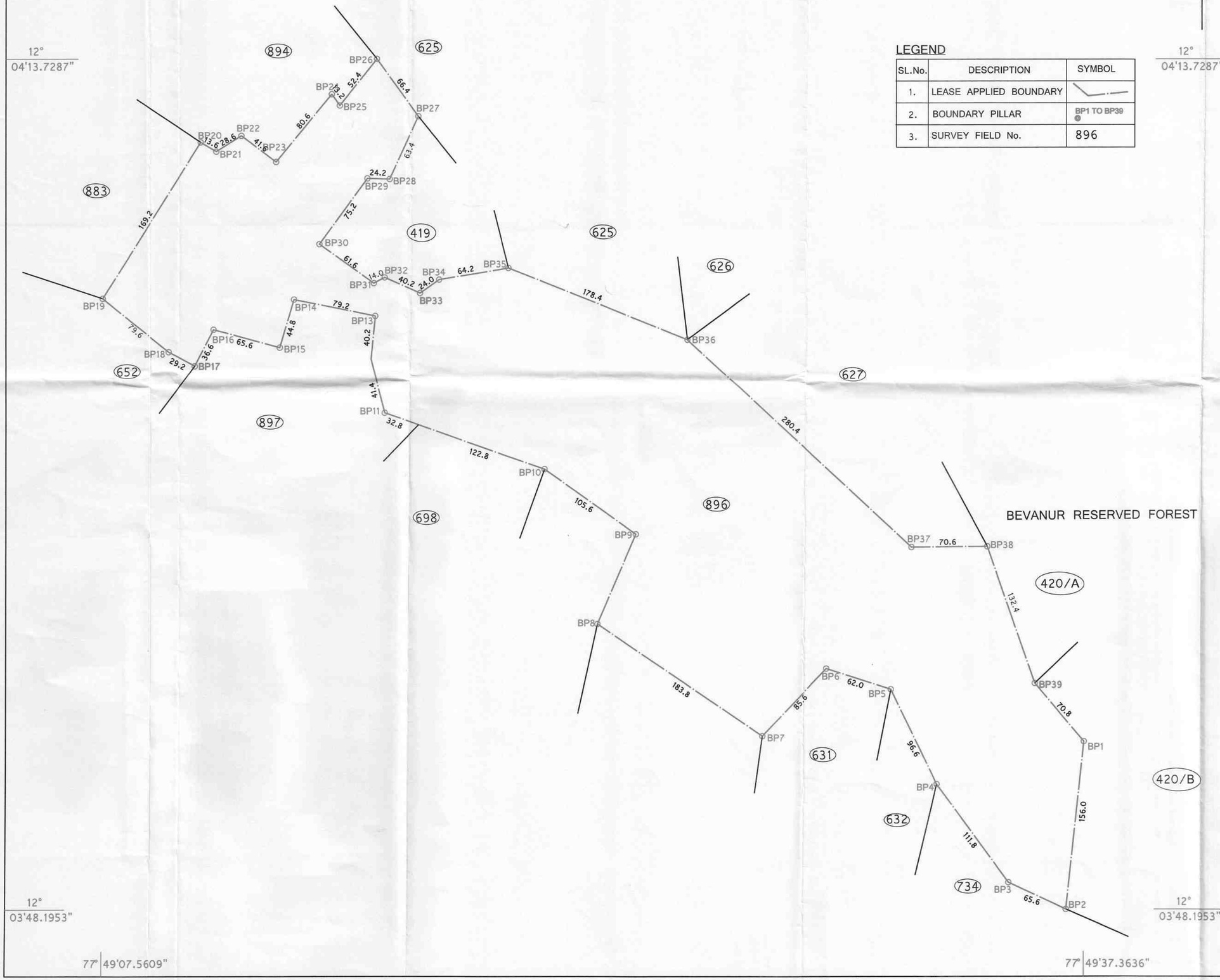
77° 49'07.5609"

77° 49'37.3636"

N

12° 04'13.7287"

12° 04'13.7287"



12° 03'48.1953"

12° 03'48.1953"

77° 49'07.5609"

77° 49'37.3636"

LEGEND

SL.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	BOUNDARY PILLAR	BP1 TO BP39
3.	SURVEY FIELD No.	896

DGPS-CO-ORDINATES OF BOUNDARY PILLARS

Sl.No	Boundary pillar Coordinates	Latitude	Longitude
1	BP1	12° 03' 53.1855" N	77° 49' 37.3636" E
2	BP2	12° 03' 48.1953" N	77° 49' 36.7796" E
3	BP3	12° 03' 49.0111" N	77° 49' 35.0346" E
4	BP4	12° 03' 52.0901" N	77° 49' 33..2404" E
5	BP5	12° 03' 54.7943" N	77° 49' 31.4992" E
6	BP6	12° 03' 55.4314" N	77° 49' 29.5347" E
7	BP7	12° 03' 53.4441" N	77° 49' 27.5591" E
8	BP8	12° 03' 56.8310" N	77° 49' 22.5606" E
9	BP9	12° 03' 59.4989" N	77° 49' 23.7516" E
10	BP10	12° 04' 01.4598" N	77° 49' 20.9860" E
11	BP11	12° 04' 03.1781" N	77° 49' 16.1304" E
12	BP12	12° 04' 04.7924" N	77° 49' 15.7330" E
13	BP13	12° 04' 06.0739" N	77° 49' 15.8712" E
14	BP14	12° 04' 06.5927" N	77° 49' 13.4014" E
15	BP15	12° 04' 05.1674" N	77° 49' 12.9564" E
16	BP16	12° 04' 05.7229" N	77° 49' 10.9426" E
17	BP17	12° 04' 04.6495" N	77° 49' 10.3610" E
18	BP18	12° 04' 05.0710" N	77° 49' 09.5614" E
19	BP19	12° 04' 06.6885" N	77° 49' 07.5609" E
20	BP20	12° 04' 11.3069" N	77° 49' 10.6096" E
21	BP21	12° 04' 11.0286" N	77° 49' 11.0789" E
22	BP22	12° 04' 11.4880" N	77° 49' 11.8487" E
23	BP23	12° 04' 10.6999" N	77° 49' 12.9007" E
24	BP24	12° 04' 12.6949" N	77° 49' 14.6155" E
25	BP25	12° 04' 12.3567" N	77° 49' 14.8566" E
26	BP26	12° 04' 13.7287" N	77° 49' 15.9985" E
27	BP27	12° 04' 12.0111" N	77° 49' 17.2485" E
28	BP28	12° 04' 10.1498" N	77° 49' 16.3536" E
29	BP29	12° 04' 10.1765" N	77° 49' 15.6730" E
30	BP30	12° 04' 08.2360" N	77° 49' 14.1943" E
31	BP31	12° 04' 07.0524" N	77° 49' 15.8340" E
32	BP32	12° 04' 07.2185" N	77° 49' 16.1714" E
33	BP33	12° 04' 06.7421" N	77° 49' 17.2448" E
34	BP34	12° 04' 07.1380" N	77° 49' 17.8323" E
35	BP35	12° 04' 07.4636" N	77° 49' 19.9404" E
36	BP36	12° 04' 05.2900" N	77° 49' 25.3701" E
37	BP37	12° 03' 59.0213" N	77° 49' 32.1578" E
38	BP38	12° 03' 59.0214" N	77° 49' 34.4664" E
39	BP39	12° 03' 54.9344" N	77° 49' 35.8858" E

COMMISSIONER OF GEOLOGY AND MINING

DISTRICT : DHARMAPURI
TALUK : PENNAGARAM
VILLAGE No. : 30
VILLAGE NAME : AJJANAHALLI
SURVEY FIELD No. : 896
EXTENT OF LEASE : 17.50.0 Ha.

PLATE No. 1a

AJJANAHALLI BLACK GRANITE QUARRY

LEASE PLAN

20 0 100 200

SCALE= 1:2,000 (1CM = 20 M)

ALL DIMENSIONS ARE IN METRES

APPLICANT: M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

77° 49'07.5609" 806800 806900 807000 807100 807200 807300 807400 807500 807600 807700 807800 807900 77° 49'37.3636"

N

12° 04'13.7287"

1336000 1335900 1335800 1335700 1335600 1335500 1335400 1335300 1335200 1335100

12° 03'48.1953"

Kotta thandu kadu

Check Dam

Jaihanuman Kovil

Culvert

BEVANUR RESERVED FOREST

OFFICE FIRST AID STORE

B.M.434.000

894 625 883 419 626 627 652 897 698 629 630 631 632 734 420/A 420/B

BP1 BP2 BP3 BP4 BP5 BP6 BP7 BP8 BP9 BP10 BP11 BP12 BP13 BP14 BP15 BP16 BP17 BP18 BP19 BP20 BP21 BP22 BP23 BP24 BP25 BP26 BP27 BP28 BP29 BP30 BP31 BP32 BP33 BP34 BP35 BP36 BP37 BP38 BP39

DGPS-CO-ORDINATES OF BOUNDARY PILLARS

Sl.No	Boundary pillar Coordinates	Latitude	Longitude
1	BP1	12° 03' 53.1855" N	77° 49' 37.3636" E
2	BP2	12° 03' 48.1953" N	77° 49' 36.7796" E
3	BP3	12° 03' 49.0111" N	77° 49' 35.0346" E
4	BP4	12° 03' 52.0901" N	77° 49' 33..2404" E
5	BP5	12° 03' 54.7943" N	77° 49' 31.4992" E
6	BP6	12° 03' 55.4314" N	77° 49' 29.5347" E
7	BP7	12° 03' 53.4441" N	77° 49' 27.5591" E
8	BP8	12° 03' 56.8310" N	77° 49' 22.5606" E
9	BP9	12° 03' 59.4989" N	77° 49' 23.7516" E
10	BP10	12° 04' 01.4598" N	77° 49' 20.9860" E
11	BP11	12° 04' 03.1781" N	77° 49' 16.1304" E
12	BP12	12° 04' 04.7924" N	77° 49' 15.7330" E
13	BP13	12° 04' 06.0739" N	77° 49' 15.8712" E
14	BP14	12° 04' 06.5927" N	77° 49' 13.4014" E
15	BP15	12° 04' 05.1674" N	77° 49' 12.9564" E
16	BP16	12° 04' 05.7229" N	77° 49' 10.9426" E
17	BP17	12° 04' 04.6495" N	77° 49' 10.3610" E
18	BP18	12° 04' 05.0710" N	77° 49' 09.5614" E
19	BP19	12° 04' 06.6885" N	77° 49' 07.5609" E
20	BP20	12° 04' 11.3069" N	77° 49' 10.6096" E
21	BP21	12° 04' 11.0286" N	77° 49' 11.0789" E
22	BP22	12° 04' 11.4880" N	77° 49' 11.8487" E
23	BP23	12° 04' 10.6999" N	77° 49' 12.9007" E
24	BP24	12° 04' 12.6949" N	77° 49' 14.6155" E
25	BP25	12° 04' 12.3567" N	77° 49' 14.8566" E
26	BP26	12° 04' 13.7287" N	77° 49' 15.9985" E
27	BP27	12° 04' 12.0111" N	77° 49' 17.2485" E
28	BP28	12° 04' 10.1498" N	77° 49' 16.3536" E
29	BP29	12° 04' 10.1765" N	77° 49' 15.6730" E
30	BP30	12° 04' 08.2360" N	77° 49' 14.1943" E
31	BP31	12° 04' 07.0524" N	77° 49' 15.8340" E
32	BP32	12° 04' 07.2185" N	77° 49' 16.1714" E
33	BP33	12° 04' 06.7421" N	77° 49' 17.2448" E
34	BP34	12° 04' 07.1380" N	77° 49' 17.8323" E
35	BP35	12° 04' 07.4636" N	77° 49' 19.9404" E
36	BP36	12° 04' 05.2900" N	77° 49' 25.3701" E
37	BP37	12° 03' 59.0213" N	77° 49' 32.1578" E
38	BP38	12° 03' 59.0214" N	77° 49' 34.4664" E
39	BP39	12° 03' 54.9344" N	77° 49' 35.8858" E

INDEX

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	MINING LEASE APPLIED BOUNDARY CORNER PILLAR WITH No.	BP1 TO BP39
3.	TAR ROAD	
4.	TEMPORARY SHED	
5.	CONTOUR INTERVAL AT 2m	
6.	BENCH MARK	B.M-434.000
7.	ELECTRICAL POWER LINE	
8.	CHECK DAM	
9.	ODAI	
10.	BLACK GRANITE DYKE	
11.	SAFETY DISTANCE 7.5M FROM BOUNDARY FOR PATTA LANDS 10M FROM TAR ROAD(Easten Side) 50M FROM BEVANUR RESERVED FOREST 50M FROM ELECTRIC LINE 50M FROM CHECK DAM AND ODAI 50M FROM JAI HANUMAN TEMPLE 50M FROM TAR ROAD(Western Side)	

DISTRICT : DHARMAPURI
TALUK : PENNAGARAM
VILLAGE No. : 30
VILLAGE NAME : AJJANAHALLI
SURVEY FIELD No. : 896
EXTENT OF LEASE : 17.50.0 Ha.

PLATE No. 2

AJJANAHALLI BLACK GRANITE QUARRY

SURFACE PLAN

MINING PLAN

20 0 100 200

SCALE= 1:2,000(1CM = 20 M)

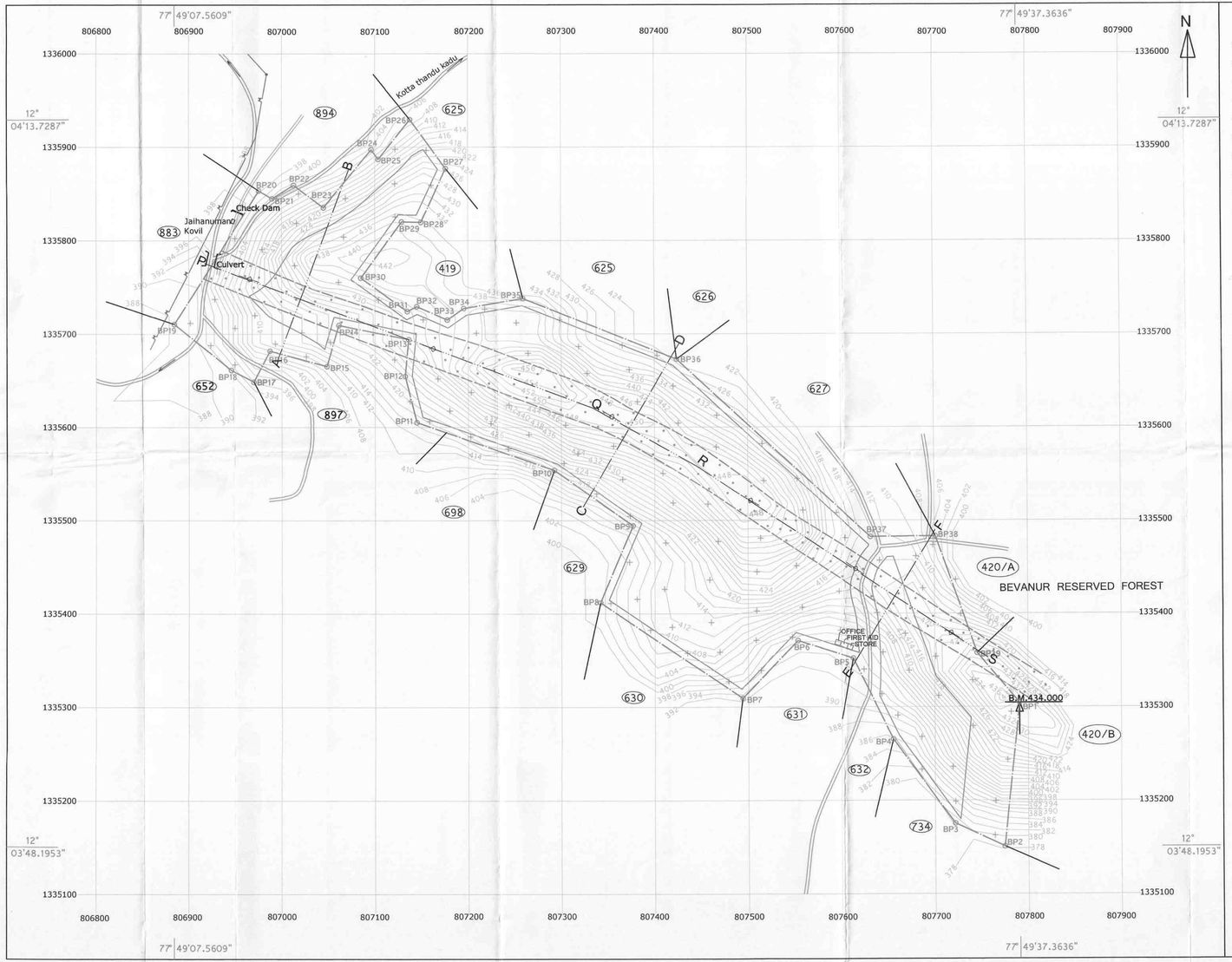
ALL DIMENSIONS ARE IN METRES

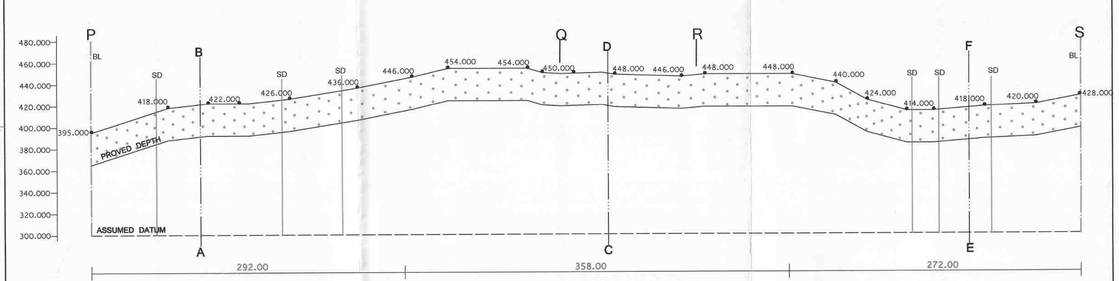
APPLICANT:- M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., FGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.





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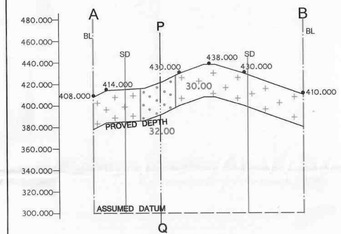

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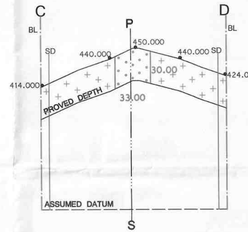

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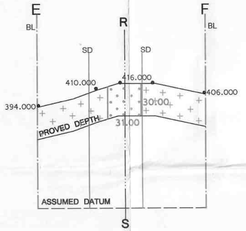


CROSS SECTION ON-EF

INDEX

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	MINING LEASE APPLIED BOUNDARY CORNER PILLAR WITH No.	BP1 TO BP39
3.	TAR ROAD	
4.	TEMPORARY SHED	
5.	CONTOUR INTERVAL AT 2m	
6.	BENCH MARK	B.M-434.000
7.	ELECTRICAL POWER LINE	
8.	CHECK DAM	
9.	ODAI	
10.	BLACK GRANITE DYKE	
11.	SAFETY DISTANCE 7.5M FROM BOUNDARY FOR PATTA LANDS 10M FROM TAR ROAD(Eastern Side) 50M FROM BEVANUR RESERVED FOREST 50M FROM ELECTRIC LINE 50M FROM CHECK DAM AND ODAI 50M FROM JAI HANUMAN TEMPLE 50M FROM TAR ROAD(Western Side)	
12.	CHARNOCKITE GNEISS	
13.	DIP AND STRIKE	

DISTRICT : DHARMAPURI
TALUK : PENNAGARAM
VILLAGE No. : 30
VILLAGE NAME : AJJANAHALLI
SURVEY FIELD No. : 896
EXTENT OF LEASE : 17.50.0 Ha.

PLATE No. 3

AJJANAHALLI BLACK GRANITE QUARRY

GEOLOGICAL PLAN AND SECTIONS

MINING PLAN

20 0 100 200

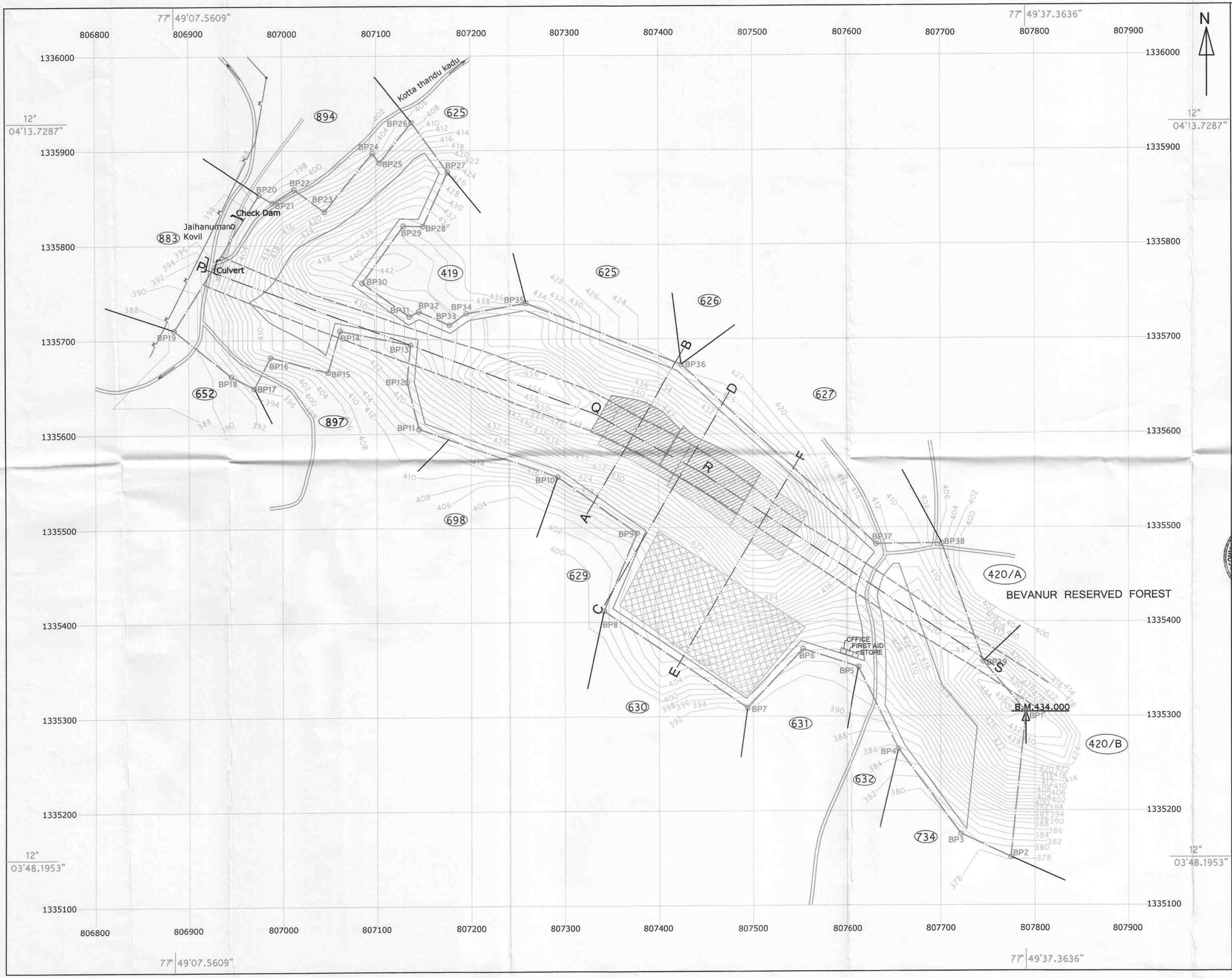
SCALE= 1:2,000(1CM = 20 M)
ALL DIMENSIONS ARE IN METRES

APPLICANT: M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.



INDEX

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	MINING LEASE APPLIED BOUNDARY CORNER PILLAR WITH No.	BP1 TO BP39
3.	TAR ROAD	
4.	TEMPORARY SHED	
5.	CONTOUR INTERVAL AT 2m	
6.	BENCH MARK	B.M-434.000
7.	ELECTRICAL POWER LINE	
8.	CHECK DAM	
9.	ODAI	
10.	BLACK GRANITE DYKE	
11.	SAFETY DISTANCE 7.5M FROM BOUNDARY FOR PATTA LANDS 10M FROM TAR ROAD (Easten Side) 50M FROM BEVANUR RESERVED FOREST 50M FROM ELECTRIC LINE 50M FROM CHECK DAM AND ODAI 50M FROM JAI HANUMAN TEMPLE 50M FROM TAR ROAD (Western Side)	
12.	PROPOSED WASTE DUMP	

PRODUCTION/DEVELOPMENT

- FOR THE FIRST YEAR
- FOR THE SECOND YEAR
- FOR THE THIRD YEAR
- FOR THE FOURTH YEAR
- FOR THE FIFTH YEAR

DISTRICT : DHARMAPURI
TALUK : PENNAGARAM
VILLAGE No. : 30
VILLAGE NAME : AJJANAHALLI
SURVEY FIELD No. : 896
EXTENT OF LEASE : 17.50.0 Ha.

PLATE No. 4

AJJANAHALLI BLACK GRANITE QUARRY
YEARWISE PRODUCTION/DEVELOPMENT PLAN FOR THE FIRST FIVE YEARS
MINING PLAN

20 0 100 200

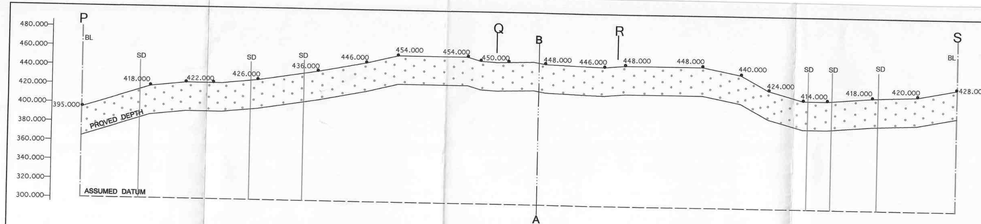
SCALE= 1:2,000 (1CM = 20 M)
ALL DIMENSIONS ARE IN METRES

APPLICANT: M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.



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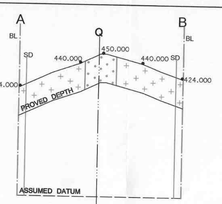
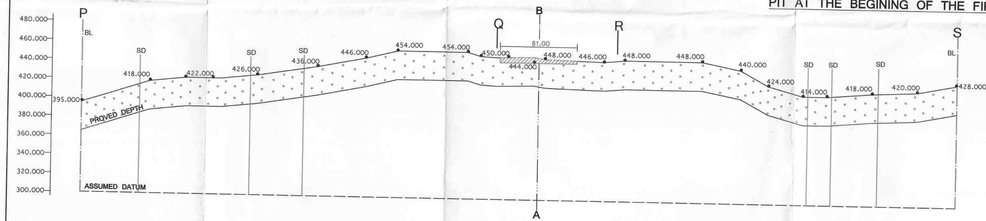


CROSS SECTION ON-AB

PIT AT THE BEGINING OF THE FIRST YEAR



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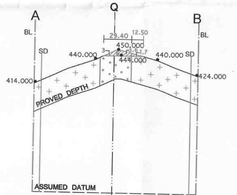

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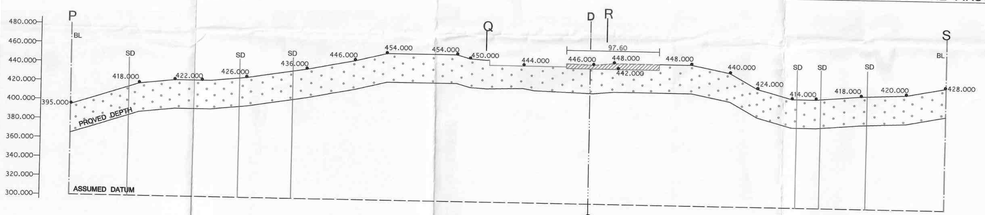
PIT AT THE END OF THE FIRST YEAR



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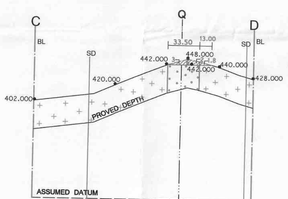
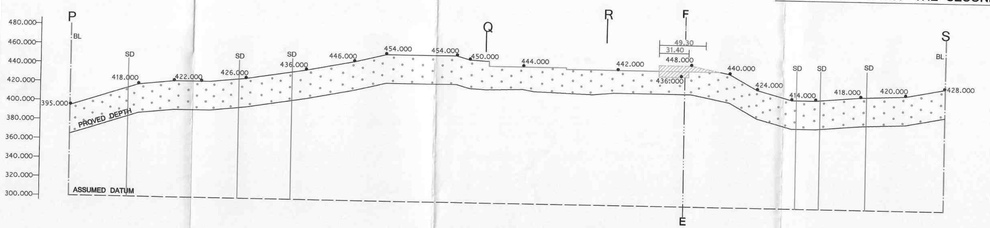


CROSS SECTION ON-CD

PIT AT THE END OF THE SECOND YEAR



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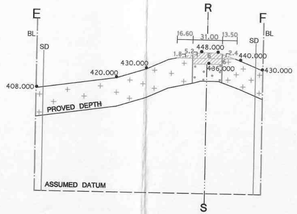
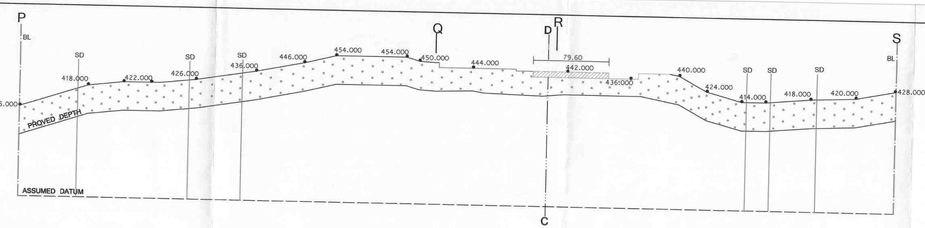


CROSS SECTION ON-EF

PIT AT THE END OF THE THIRD YEAR



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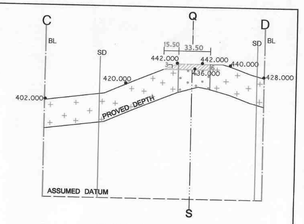
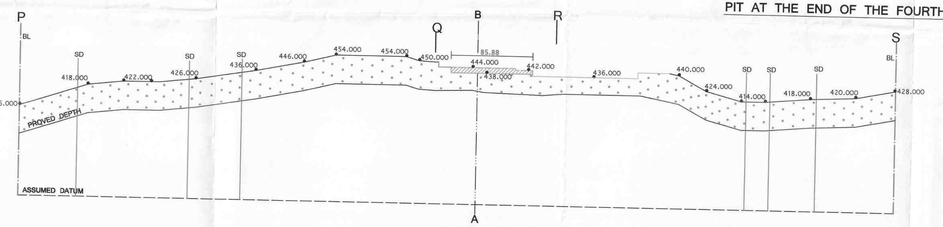


CROSS SECTION ON-CD

PIT AT THE END OF THE FOURTH YEAR



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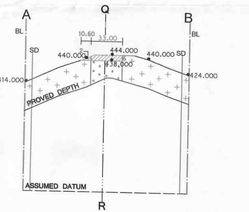


CROSS SECTION ON-AB

PIT AT THE END OF THE FIFTH YEAR

INDEX

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	BLACK GRANITE DYKE	
3.	CHARNOCKITE GNEISS	
4.	SAFETY DISTANCE 7.5M FROM BOUNDARY FOR PATTA LANDS 10M FROM TAR ROAD (Eastern Side) 50M FROM BEVANUR RESERVED FOREST 50M FROM ELECTRIC LINE 50M FROM CHECK DAM AND ODAI 50M FROM JAI HANUMAN TEMPLE 50M FROM TAR ROAD (Western Side)	

PRODUCTION/DEVELOPMENT

- FOR THE FIRST YEAR
- FOR THE SECOND YEAR
- FOR THE THIRD YEAR
- FOR THE FOURTH YEAR
- FOR THE FIFTH YEAR

DETAILS OF DEPTH, BENCH AND PRODUCTION FOR MINING PLAN PERIOD

YEAR	Section	RL	Details of Depth (Average Measurements in M)				No.Of Benches Proposed	Proposed ROM in Cu.M.	Proposed Production 10% in Cu.M.
			Present	Proposed	Remaining	Total (Ultimate depth)			
Ist YEAR	QR & AB	450.000 TO 444.000	0	**6.00**	24.00	**30.00**	1	10,002	1,000
IInd YEAR	QS & CD	448.000 TO 442.000	**0**	**6.00**	24.00	**30.00**	1	**11,999**	1,200
IIIrd YEAR	RS & EF	448.000 TO 436.000	**0**	12.00	18.00	**30.00**	**2**	14,398	1,440
IVth YEAR	QS & CD	442.000 TO 436.000	**6.00**	**6.00**	18.00	**30.00**	1	16,000	1,600
Vth YEAR	QR & AB	444.000 TO 438.000	**6.00**	**6.00**	18.00	**30.00**	1	17,004	1,700

DISTRICT : DHARMAPURI
TALUK : PENNAGARAM
VILLAGE No. : 30
VILLAGE NAME : AJJANAHALLI
SURVEY FIELD No. : 896
EXTENT OF LEASE : 17.50.0 Ha.

PLATE No. 4a

AJJANAHALLI BLACK GRANITE QUARRY

YEARWISE PRODUCTION/DEVELOPMENT SECTIONS FOR THE FIRST FIVE YEARS

MINING PLAN

20 0 100 200

SCALE= 1:2,000 (1CM = 20 M)
ALL DIMENSIONS ARE IN METRES

APPLICANT: M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

77° 49'07.5609" 806800 806900 807000 807100 807200 807300 807400 807500 807600 807700 807800 807900 77° 49'37.3636"

12° 04'13.7287" 1336000 1335900 1335800 1335700 1335600 1335500 1335400 1335300 1335200 1335100 12° 03'48.1953"

N

Kotta thandu kadu

Jaihanuman Kovil

Check Dam

Culvert

BP1 BP2 BP3 BP4 BP5 BP6 BP7 BP8 BP9 BP10 BP11 BP12 BP13 BP14 BP15 BP16 BP17 BP18 BP19 BP20 BP21 BP22 BP23 BP24 BP25 BP26 BP27 BP28 BP29 BP30 BP31 BP32 BP33 BP34 BP35 BP36 BP37 BP38 BP39

B.M-434.000

OFFICE FIRST AID STORE

BEVANUR RESERVED FOREST

894 625 883 419 625 626 652 627 897 698 629 630 631 632 734 420/A 420/B

AFFORESTATION DETAILS

FOR THE FIRST YEAR :	20PLANTS IN 0.01.3Ha. 50% SURVIVAL
FOR THE SECOND YEAR :	20PLANTS IN 0.01.3Ha. 50% SURVIVAL
FOR THE THIRD YEAR :	20PLANTS IN 0.01.3Ha. 50% SURVIVAL
FOR THE FOURTH YEAR :	20PLANTS IN 0.01.3Ha. 50% SURVIVAL
FOR THE FIFTH YEAR :	20PLANTS IN 0.01.3Ha. 50% SURVIVAL

INDEX

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	MINING LEASE APPLIED BOUNDARY CORNER PILLAR WITH No.	BP1 TO BP39
3.	TAR ROAD	
4.	TEMPORARY SHED	
5.	CONTOUR INTERVAL AT 2m	
6.	BENCH MARK	B.M-434.000
7.	ELECTRICAL POWER LINE	
8.	CHECK DAM	
9.	ODAI	
10.	BLACK GRANITE DYKE	
11.	SAFETY DISTANCE 7.5M FROM BOUNDARY FOR PATTA LANDS 10M FROM TAR ROAD(Easten Side) 50M FROM BEVANUR RESERVED FOREST 50M FROM ELECTRIC LINE 50M FROM CHECK DAM AND ODAI 50M FROM JAI HANUMAN TEMPLE 50M FROM TAR ROAD(Western Side)	
12.	PROPOSED WASTE DUMP	
13.	PROPOSED PIT DEVELOPMENT	

COMMISSIONER OF GEOLOGY AND MINES CHENNAI-600 032

DISTRICT : DHARMAPURI
TALUK : PENNAGARAM
VILLAGE No. : 30
VILLAGE NAME : AJJANAHALLI
SURVEY FIELD No. : 896
EXTENT OF LEASE : 17.50.0 Ha.

PLATE No. 5

AJJANAHALLI BLACK GRANITE QUARRY
LANDUSE AND AFFORESTATION PLAN
MINING PLAN

20 0 100 200

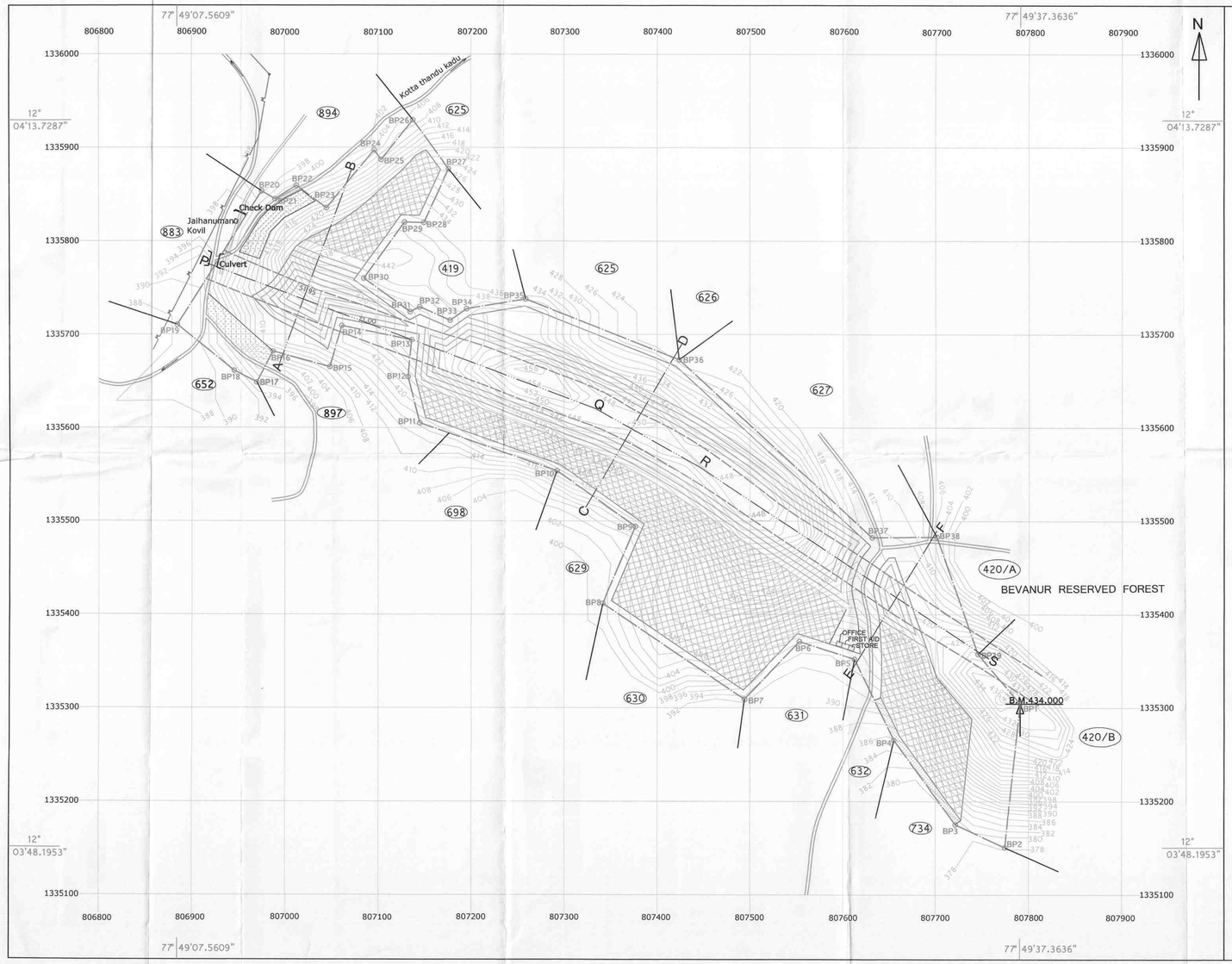
SCALE= 1:2,000(1CM = 20 M)
ALL DIMENSIONS ARE IN METRES

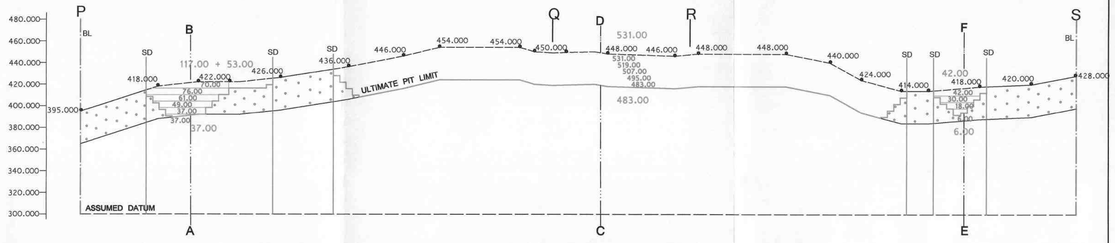
APPLICANT: M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.





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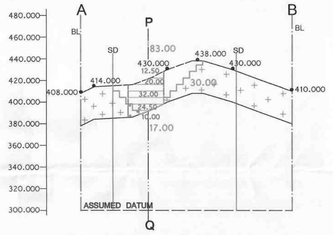

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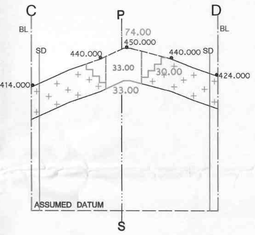

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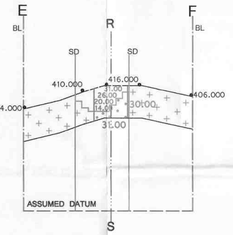

CROSS SECTION ON-EF

LANDUSE PATERN

Sl.No.	DESCRIPTION	AT END OF LIFE OF MINE (In Ha.)
1.	MINING	5.17.5
2.	WASTE DUMP	5.25.0
3.	OFFICE INFRASTRUCTURE	0.01.0
4.	TAR ROAD	0.20.5
5.	AFFORESTATION	0.45.5
6.	UNUTILIZED AREA	6.40.5
TOTAL		17.50.0

ULTIMATE PIT DIMENSION

Sl.No.	Section on	Detail	Ave.Length in M	Ave.Width in M	Ave.Depth in M
1.	PQRS,PLAN AND AB,CD,EF	Top bench	750.00	69.00	33.00
		Bottom bench	526.00	23.33	

INDEX

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	MINING LEASE APPLIED BOUNDARY CORNER PILLAR WITH No.	BP1 TO BP39
3.	TAR ROAD	
4.	TEMPORARY SHED	
5.	CONTOUR INTERVAL AT 2m	
6.	BENCH MARK	B.M-434.000
7.	ELECTRICAL POWER LINE	
8.	CHECK DAM	
9.	ODAI	
10.	BLACK GRANITE DYKE	
11.	SAFETY DISTANCE 7.5M FROM BOUNDARY FOR PATTA LANDS 10M FROM TAR ROAD (Easter Side) 50M FROM BEVANUR RESERVED FOREST 50M FROM ELECTRIC LINE 50M FROM CHECK DAM AND ODAI 50M FROM JAI HANUMAN TEMPLE 50M FROM TAR ROAD (Western Side)	
12.	CHARNOCKITE GNEISS	
13.	ULTIMATE PIT LIMIT	
14.	ULTIMATE AFFORESTATION	
15.	ULTIMATE WASTE DUMP	

DISTRICT : DHARMAPURI
TALUK : PENNAGARAM
VILLAGE No. : 30
VILLAGE NAME : AJJANAHALLI
SURVEY FIELD No. : 896
EXTENT OF LEASE : 17.50.0 Ha.

PLATE No. 6

AJJANAHALLI BLACK GRANITE QUARRY

CONCEPTUAL PLAN AND SECTIONS

MINING PLAN

20 0 100 200

SCALE= 1:2,000 (1CM = 20 M.)
ALL DIMENSIONS ARE IN METRES

APPLICANT: M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789,
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

77° 49'07.5609" 77° 49'37.3636"

12° 04'13.7287"

12° 03'48.1953"

NO.85,KODIHALLI

420/A BEVANUR RESERVED FOREST

420/B

420/C

338/A MASAKKAL RESERVED FOREST

223/B

VATHAIAPURAM

405 367 372 370 620 343 342 341 384 408 416 404 406 373 371 619 621 340 888 339 386 417 407 409 412 415 622 623 887 410 610 618 884 889 891 411 413 885 886 611 617 414 616 890 612 878 615 892 877 879 614 613 893 880 881 894 874 624 882 625 873 875 876 883 419 626 655 663 652 897 896 627 656 666 658 898 660 651 657 629 654 662 419 631 632 630 661 660 658 650 628 734 633 695 733 735 660 694 649 642 641 732 736 670 659 634 731 737 648 647 646 643 644 640 730 671 645 639 635 728 698 692 729 738 691 673 638 637 726 727 739 740 196 690 689

LEGEND

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	VILLAGE ROAD	
3.	CART TRACK	
4.	KULAM / ERI	
5.	KALVAI	
6.	STREAM	
7.	WELL	
8.	VILLAGE BOUNDARY	
9.	BUFFER ZONE 500m RADIUS	
10.	SURVEY FIELD No.	896
11.	RESIDENTIAL AREA	

COMMISSIONER OF GEOLOGY AND MINING * CHENNAI-600 032

DISTRICT : DHARMAPURI
TALUK : PENNAGARAM
VILLAGE No. : 30
VILLAGE NAME : AJJANAHALLI
SURVEY FIELD No. : 896
EXTENT OF LEASE : 17.50.0 Ha.

PLATE No. 7

AJJANAHALLI BLACK GRANITE QUARRY

ENVIRONMENTAL PLAN

50 0 250 500

SCALE= 1:5,000(1CM = 50 M)
ALL DIMENSIONS ARE IN METRES

APPLICANT: M/s.TAMILNADU MINERALS LIMITED,
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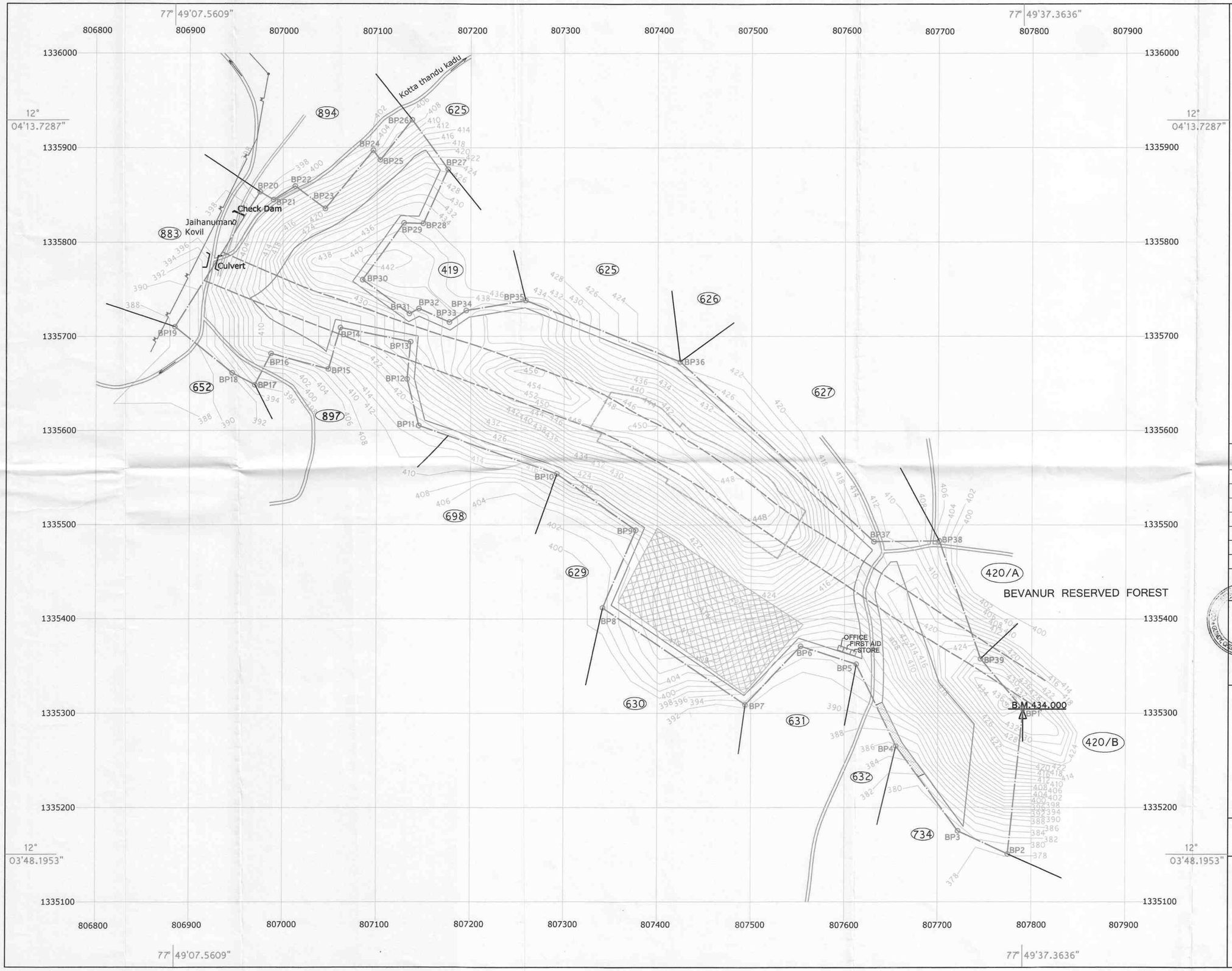

INDEX

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	MINING LEASE APPLIED BOUNDARY CORNER PILLAR WITH No.	BP1 TO BP39
3.	TAR ROAD	
4.	TEMPORARY SHED	
5.	CONTOUR INTERVAL AT 2m	
6.	BENCH MARK	B.M-434.000
7.	ELECTRICAL POWER LINE	
8.	CHECK DAM	
9.	ODAI	
10.	BLACK GRANITE DYKE	
11.	SAFETY DISTANCE 7.5M FROM BOUNDARY FOR PATTA LANDS 10M FROM TAR ROAD (Easten Side) 50M FROM BEVANUR RESERVED FOREST 50M FROM ELECTRIC LINE 50M FROM CHECK DAM AND ODAI 50M FROM JAI HANUMAN TEMPLE 50M FROM TAR ROAD (Western Side)	
12.	PROPOSED WASTE DUMP	
13.	PROPOSED PIT DEVELOPMENT DURING MINING PLAN PERIOD	
14.	PROPOSED AFFORESTATION DURING MINING PLAN PERIOD	

LANDUSE PATTERN

SL.No.	DESCRIPTION	PRESENT AREA (In Ha.)	AREA TO BE REQUIRED IN MINING PLAN PERIOD (In Ha.)
1.	MINING	--	1.49.0
2.	WASTE DUMP	--	1.61.5
3.	OFFICE INFRASTRUCTURE	0.01.0	--
4.	TAR ROAD	0.20.5	--
5.	AFFORESTATION	--	0.06.5
6.	UNUTILIZED AREA	17.28.5	14.11.5
	TOTAL	17.50.0	17.28.5

DISTRICT : DHARMAPURI
TALUK : PENNAGARAM
VILLAGE No. : 30
VILLAGE NAME : AJJANAHALLI
SURVEY FIELD No. : 896
EXTENT OF LEASE : 17.50.0 Ha.

PLATE No. 8

AJJANAHALLI BLACK GRANITE QUARRY
PROGRESSIVE QUARRY CLOSURE PLAN
MINING PLAN

20 0 100 200

SCALE= 1:2,000 (1CM = 20 M)
ALL DIMENSIONS ARE IN METRES

APPLICANT: M/s.TAMILNADU MINERALS LIMITED,
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CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
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