

EXECUTIVE SUMMARY

M/S. A.G. GRANITES (PRIVATE) LIMITED BLACK GRANITE QUARRY

At

Kilpachar Village, Thandrapattu Taluk, Tiruvannamalai District, Tamil Nadu State

TOTAL CLUSTER EXTENT = 7.36.50 Ha

PROJECT PROPONENT

Proponent Name	S.F.no	Extent (Ha)
M/s.A.G.Granites Pvt Limited, Tmt.R.Shanthi - Director, Muthu gounder Colony, Harur, Dharmapuri District, Tamilnadu State – 636 903	65 (Part-2),	3.21.5 ha

“B1” CATEGORY – MINOR MINERAL – CLUSTER - NON-FOREST - GOVERNMENT LAND

Complied as per ToR Obtained vide

File.No.13259, ToR Identification No.TO26B0108TN5258198N Dated.05.03.2026.

Environmental Consultant

GEO EXPLORATION AND MINING SOLUTIONS



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Laboratory

ENVIRONMENTAL LAB CHENNAI METTEX LAB PRIVATE LIMITED

(Approved by AAI, AGMARK, APEDA, BIS, EIC FSSAI,
GAFTA,

IOPEPC, MOEF & TEA BOARD)

Jothi Complex, 83,
M.K.N Road, Guindy,
Chennai – 600 032



Baseline Monitoring Period - December 2025 – February 2026

April 2026

* Calculated as per MoEF & CC Notification – S.O. 2269(E) Dated: 01.07.2016

● INTRODUCTION

The project proponent M/s.A.G.Granites Pvt Ltd Black Granite Quarry Extent 3.21.5 Ha in S.F.No 65(Part-2), Kilpachar Village, Thandrapattu Taluk, Tiruvannamalai District, Tamil Nadu State.

- Proponent applied for Black Granite Quarry on 23.09.2025
- The Mining plan was prepared for the period of 5 Years. The Mining Plan was approved by the State Geology and Mining Department, Guindy, Chennai vide letter Letter Rc.No. 11441/MM4/2025, Dated.01.01.2026
- The Mining plan has been approved for the quantity of 15,335 m³ of ROM (Granite Recovery @ 10% is 1,534 m³) 8,580 m³ of Weathered Rock and 4,290 m³ of Topsoil up to the depth of 20m (5m AGL + 15m BGL).

As per the EIA Notification, 2006 and subsequent amendments and OM The proposal falls in the B1 Category (cluster quarries - 1 applied proposal quarry and 1 Existing quarry forming Cluster Category {Total Extent of the Cluster is 7.36.50 Ha}- Cluster area calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016).

- Proponent applied for Terms of Reference vide Proposal No. SIA/TN/MIN/5641542026 Dated 07.01.2026 and the ToR Was Granted vide File.No.13259, ToR Identification No.TO26B0108TN5258198N Dated.05.03.2026

Based on the ToR Baseline Monitoring study has been carried out for one season i.e., **December 2025 – February 2026** and this EIA and EMP report is prepared for considering cumulative impacts arising out of these projects, the Cumulative Environmental Impact Assessment study is undertaken, which is followed by preparation of a detailed Environmental Management Plan (EMP) to minimize those adverse impacts.

“Draft EIA report prepared on the basis of ToR Issued for carrying out public hearing for the grant of Environmental Clearance from SEIAA, Tamil Nadu”

1.1 DETAILS OF PROJECT PROPONENT

PROPOSAL	
Name of the Project Proponent	M/s.A.G.Granites Pvt Ltd – Tmt. R.Shanthi - Director
Address	Muthu Gounder Colony, Harur, Dharmapuri District
Mobile	+91 9894455389
Aadhar No	5795 4210 3091
Status	Government Land

1.2 QUARRY DETAILS WITHIN 500 M RADIUS

APPLIED PROPOSED QUARRY				
CODE	Name of the Owner	S.F. Nos	Extent	Status
P-1	M/s.A.G.Granites Pvt Ltd	65 Part - 2	3.21.5 Ha	File.No.13259, ToR Identification No.TO26B0108TN5258 198N Dated.05.03.2026.
		Total	3.21.5 Ha	
EXISTING QUARRY				
E-1	M/s.A.G.Granites Pvt Ltd	65 Part – 1	4.15.0 Ha	30.12.2024 – 29.12.2044.
		Total	4.15.0 Ha	
TOTAL CLUSTER EXTENT			7.36.50 Ha Cluster Quarry	

TABLE 1.3 SALIENT FEATURES OF THE PROPOSED PROJECT

Name of the Quarry		M/s.A.G.Granites (Private) Limited Black Granite quarry
SF.no		65 (Part-2),
Extent		3.21.5 Ha
Village & Taluk		Kilpachar Village, Thandrapattu Taluk
Lease period		20 years
Life of the Mine		20 years
Land use classification		It is a Government Land, Classified as Kallankuthu and the entire land is covered by Granite boulders and sheet rock.
Proposed Depth for five years plan period		20m(5m AGL + 15m BGL)
Ultimate depth of Mining		20m(5m AGL + 15m BGL)
Ultimate Pit Dimension		117m (L) X 80m (W) X 20m (D)
Toposheet No		57 L/16
Latitude between		12°05'40.09"N to 12°05'45.76"N
Longitude between		78°45'26.42"E to 78°45'34.71"E
Topography		The area is Exhibits Undulated terrain. The gradient is gentle towards South west side and altitude of the area is 250 - 255m above from MSL. The area is concealed under reddish gravelly soil having an average thickness of 1m, 2m weathered rock and followed by fresh black granite..
Ground water level		The water level is found to occur at a depth of 104 m - 109m in rainy season below from the ground level.
Machinery proposed	Mine Manager	1
	Geologist	1
	Mine Foreman	1
	Blaster/Mate	1
	Excavator - Operator	1
	Wire Saw Operator	1
	Tipper Driver	2
	Water Sprinkler Driver	1
	Jack Hammer Drillers	12
	Security	1
	Helper	4
	Co-Operator & Cleaner	5
Proposed manpower deployment		31
Project cost		Rs.6,01,57,873/-
EMP Cost		Rs. 15,05,000/-
Total Project Cost		Rs. 6,16,62,873/-
CER cost		Rs. 5,00,000/-
Nearby Water Bodies		• Odai 270m West • Tank 470m NW • Pamban Stream 790m SE • Tank 1.8km East • Thenpennai River 4.6km NW • Sathanur Reservoir 9km NW
Nearest Habitation		420m-S
Nearest Reserve Forest		Ponnaiyar R.F. – 90m – North
Nearest Wild Life Sanctuary		Cauvery South Wildlife Sanctuary – 86.5km – NW Cauvery North Wildlife Sanctuary – 91.5km – NW

Source: Approved mining plan.

1.3 STATUTORY DETAILS**SCREENING**

- Proponent applied for Black Granite Quarry on 23.09.2025.
- Precise area communication letter has been obtained from State Geology and Mining Department, Guindy, Chennai vide Lettre .No. 1920/MMB-1/2025-1 Dated.17.12.2025

- 8 The Mining plan was prepared for the period of 5 Years. The Mining Plan was approved by the State Geology and Mining Department, Guindy, Chennai vide letter Letter Rc.No. 11441/MM4/2025, Dated.01.01.2026. The Mining plan period is for Five Years
- 8 Proponent applied for ToR to get Environmental Clearance vide online Proposal No. SIA/TN/MIN/564154/2026 Dated 07.01.2026

SCOPING

- The proposal was placed in 675th SEAC meeting held on 04.02.2026 and the committee recommended for issue of ToR.
- The proposal was considered in 970th SEIAA meeting held on 26.02.2026 and issued ToR vide File.No.13259, Tor Identification.No. TO26B0108TN5258198N

• PROJECT DESCRIPTION

The Proposed project is located in Kilpachar Village, Thandrapattu Taluk, Tiruvannamalai District and Tamil Nadu State. The proposed projects are site specific and there is no additional area required for this project. There is no effluent generation/discharge from the proposed quarry. Black Colour granite quarry operation will be carried out by opencast mechanized method involving Eco-friendly Diamond Wire Saw Cutting, Heavy earth moving machineries like Excavators Trucks for Granite exploitation. Shot hole drilling with controlled blasting using slurry explosives for removal of overburden and Weathered portions during initial stage of quarry operation.

2.1 SITE CONNECTIVITY TO THE PROJECT AREA

Nearest Roadway	NH179B- Tiruvannamalai – Harur - 19.5km - NW SH6A - Thandarampattu – Harur – 1.3km - South
Nearest Village	420m-South
Nearest Town	Thanipadi -4.0km – NE
Nearest Railway Station & Railway Line	Tiruvannamalai Railway Station- 38.2km – NE
Nearest Airport	Banagalore Airport- 160 km-NW
Seaport	Chennai -200km-NE
Interstate Boundary	66 km – NW – Andhra Pradesh boundary

2.2 LAND USE PATTERN OF THE PROPOSED PROJECT

<i>Description</i>	<i>Present Area (Ha)</i>	<i>Area to be Required at the present Scheme period(ha)</i>	<i>Area to be Required at the end of lease period (ha)</i>
Area under Quarry	Nil	0.47.95	0.99.46
Waste dump	Nil	0.28.83	0.87.78#
Infrastructure	Nil	0.02.00	0.02.00
Roads	Nil	0.02.00	0.04.00
Green Belt	Nil	0.20.42	0.58.31
Stocking Blocks	3.21.50	2.20.30	0.69.95
Grand Total	3.21.50	3.21.50	3.21.50

2.3 OPERATIONAL DETAILS OF LEASE APPLIED AREA

Description	Details
Geological Resources ROM	81,040
Granite Recovery (10 % in m ³)	8,104
Granite Waste (90 % in m ³)	72,936

Weathered rock(m ³)	54,252
Side Burden(m ³)	3,07,480
Top Soil in m ³	27,126
Mineable Reserves ROM	62,240
Granite Recovery (10 % in m ³)	6,224
Granite Waste (90 % in m ³)	56,016
Weathered rock (m ³)	16,380
Side Burden (m ³)	18,060
Top Soil in m ³	8,190
Proposed Production for five years plan period ROM	15,335
Granite Recovery (10% in m ³)	1,534
Granite Waste (90 % in m ³)	13,801
Weathered rock(m ³)	8,580
Top Soil in m ³	4,290
Number of Working Days	300
Production of ROM per day in five-year plan period	10
Production of Granite per day	1
Total Waste per day (Granite waste)	9
No of Lorry Loads per day for Transportation to Granite cutting units	1
No of Lorry loads for dump	1

FIGURE – 1: GOOGLE IMAGE SHOWING PROJECT AREA

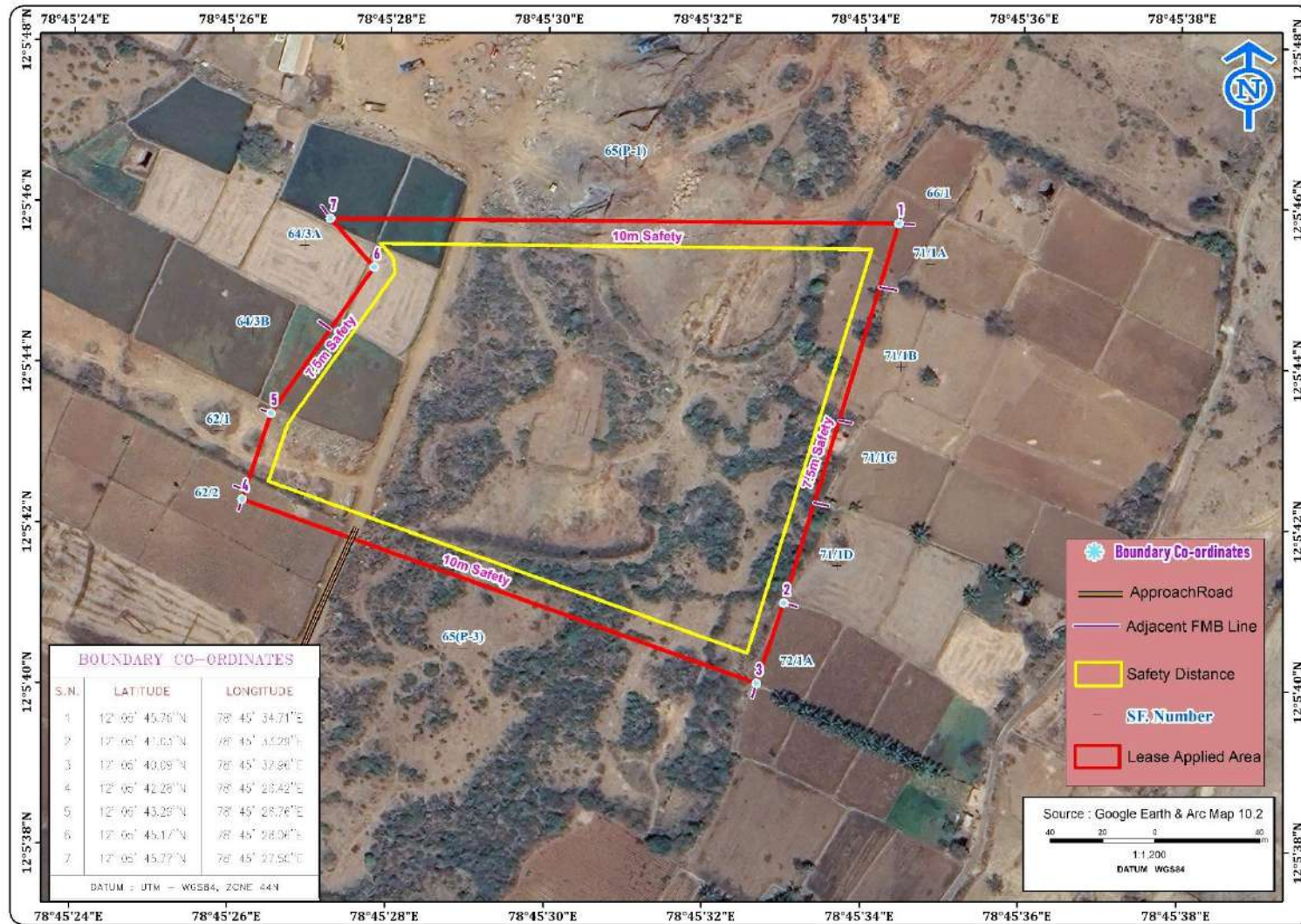


FIGURE – 3: GOOGLE IMAGE SHOWING CLUSTER (500m QUARRIES)

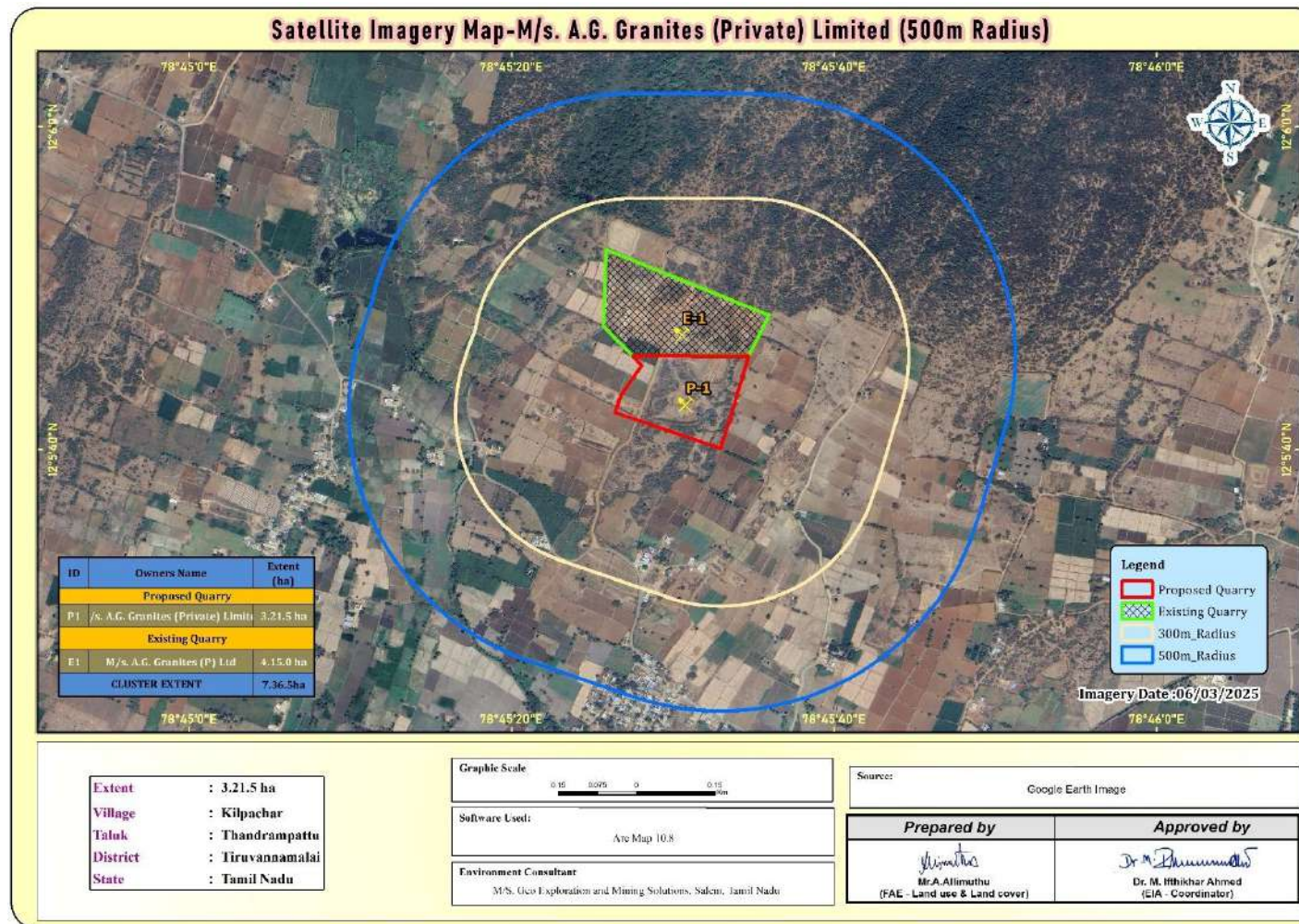


FIGURE – 4: TOPOSHEET MAP COVERING 10 KM RADIUS

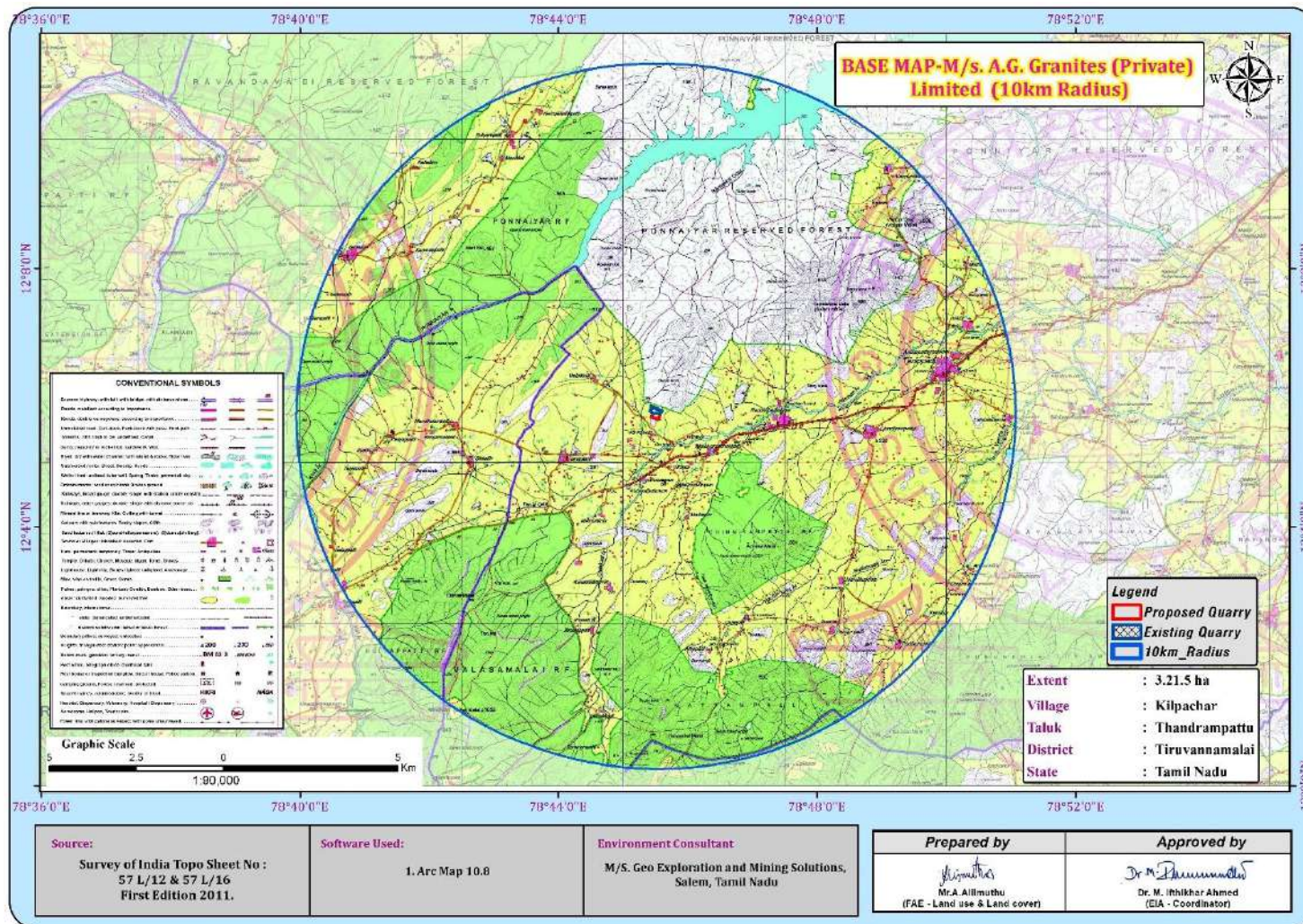


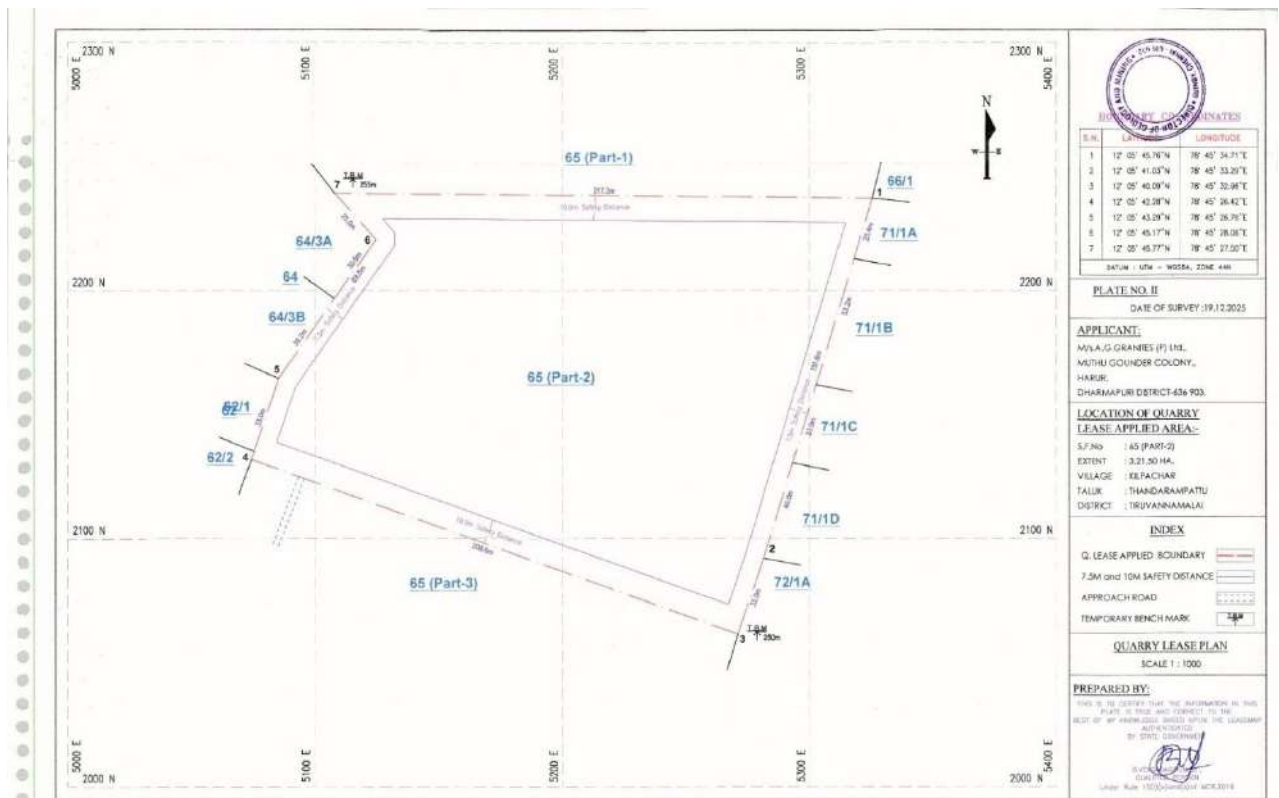
FIGURE – 5: QUARRY LEASE PLAN & SURFACE PLAN

Figure 6 PHOTOGRAPHS OF THE PROJECT AREA



Figure 7: FENCING AND PLANTATION PHOTOGRAPHS





2.4 METHOD OF MINING

The method of mining is Opencast mechanized method

- Eco-friendly dimensional wire saw cutting for liberation and splitting up of blocks from parent sheet rocks
- Splitting of rock body of considerable volume from the parent rock formation by carefully avoiding visibly seen defects such as patches veins, etc., is done by adopting the method of “Diamond wire cutting” along the horizontal as well as two vertical sides on the front face of the formation
- Jackhammer drilling with 32mm dia, this huge portion is further split into several blocks of required dimensions, only slurry explosives are used for secondary fragmentation and handling of waste.
- Hydraulic Excavator coupled with tippers is deployed for the formation of benches and loading

- There is no mineral processing or ore beneficiation proposed
- Proposed bench height is 5m and 5m width with 90° slope
- The waste material generated during quarrying activity includes rock fragments of different sizes, and waste chips during dressing of the blocks. The waste materials are taken in tippers and proposed to be dumped in the respective approved places ear-marked for the purpose and the same will be utilized for backfilling in the northern side of the lease area during conceptual stage.

2.5 PROPOSED MACHINERY DEPLOYMENT

Drilling Equipment's					
Type	No of Unit	Dia of Hole mm	Size capacity	Make	Motive Power
Jack Hammer	4	32	1.2m to 6m	Atlas Copco	Compressed air
Compressor	1	-	450/150psi	Atlas Copco	Diesel drive
Diamond Wire Saw	2	-	20m³/day	optima	Diesel Generator
Diesel Generator	1	-	125kva	Powerica	Diesel
Loading Equipment					
Type	No of Unit	Capacity	Make	Motive Power	
Excavator	1	350	Kobelco	Diesel Drive	
Haulage within the Mine & Transport Equipment					
Type	No of Unit	Capacity	Make	Motive Power	
Tipper	2	20 tonnes	Tata	Diesel Drive	
Water Sprinkling Tanker	1	10,000 Litres	TATA	Diesel Drive	

2.6 CONCEPTUAL MINING PLAN/ FINAL MINE CLOSURE PLAN

- At the end of life of mine, the excavated mine pit / void will act as artificial reservoir for collecting rain water and helps to meet out the demand or crises during drought season.
- After mine closure the greenbelt developed along the safety barrier and top benches and temporary water reservoir will enhance the ecosystem.
- Mine Closure is a process of returning a disturbed site to its natural state or which prepares it for other productive uses that prevents or minimizes any adverse effects on the environment or threats to human health and safety.
- The principle closure objectives are for rehabilitated mines to be physically safe to humans and animals, geo-technically stable, geo-chemically non-polluting/ non-contaminating, and capable of sustaining an agreed post-mining land use.

2.7 ULTIMATE PIT DIMENSION

Length In m	Width in m	Depth in m
117	80	20

3.0 DESCRIPTION OF THE ENVIRONMENT

Field monitoring studies to evaluate the base line status of the project site were carried out covering December 2025 – February 2026 as per CPCB guidelines. Environmental Monitoring data has been collected with reference to proposed mine by CHENNAI METTEX LAB PRIVATE LIMITED, – An accredited by ISO/IEC 17025:2017 (NABL) Laboratory.

3.1 ENVIRONMENT MONITORING ATTRIBUTES

Sl.No.	Attributes	Parameters	Source and Frequency
1	Ambient Air Quality	PM10, PM 2.5, SO2, NO2	Continuous 24-hourly samples twice a week for three months at 7 locations (1Core & 6 Buffer)
2	Meteorology	Wind speed and direction, temperature, relative humidity and rainfall	Near project site continuous for three months with hourly recording and from secondary sources of IMD station Near by Tiruvannamalai
3	Water quality	Physical, Chemical and Bacteriological parameters	Grab samples were collected at 4 ground water and 2 surface water locations once during study period.
4	Ecology	Existing terrestrial and aquatic flora and fauna within 10 km radius circle.	Limited primary survey and secondary data was
5	Noise levels	Noise levels in dB(A)	8 locations (1Core & 7 Buffer) – data monitored once for 24 hours during EIA study.
6	Soil Characteristics	Physical and Chemical Parameters	Once at 6 locations (1 Core & 5 Buffer) during study period.
7	Land use	Existing land use for different categories	Based on Survey of India topographical sheet and satellite imagery and primary survey.
8	Socio-Economic Aspects	Socio-economic and demographic characteristics, worker characteristics	Based on primary survey and secondary sources data like census of India 2011.
9	Hydrology	Drainage pattern of the area, nature of streams, aquifer characteristics, recharge and discharge areas	Based on data collected from secondary sources as well as hydro-geology study report prepared.
10	Risk assessment and Disaster Management Plan	Identify areas where disaster can occur by fires and explosions and release of toxic substances	Based on the findings of Risk analysis done for the risk associated with mining.

3.2 LAND ENVIRONMENT

Land use pattern of the area was studied through LISS III imagery of Bhuvan (ISRO). The 10 km radius map of study area was taken for analysis of Land use cover. The main objective of this section is to provide a baseline status of the study area covering 10 km radius around the mine site so that temporal changes due to the mining activities on the surroundings can be assessed in future.

Table 3.1: Land Use / Land Cover Table 10 Km Radius

		10km Radius		2km Radius	
S.No	CLASSIFICATION	AREA_HA	AREA_%	AREA_HA	AREA_%
	BUILTUP				
1	Builtup Urban	435.33	1.35	68.02	5.17
2	Builtup Mining	21.00	0.07	7.40	0.56
	AGRICULTURAL LAND				
3	Crop Land	10055.91	31.27	508.60	38.64
4	Fallow Land	4579.76	14.24	121.85	9.26

	FOREST				
5	Forest	12533.67	38.98	286.32	21.75
	BARREN/WASTE LANDS				
6	Barren Land	2136.78	6.65	249.18	18.93
	WETLANDS/ WATER BODIES				
7	Waterbodies	2392.25	7.44	75.02	5.70
TOTAL		32154.70	100.00	1316.39	100.00

Source: Bhuvan, NRSC

- ∞ The 10 km radius study area mainly comprises of crop land & Fallow land accounting of 31.27% & 14.24% of the total study area.
- ∞ Water Bodies such as ponds/ lakes comprises of 7.44% of the core and buffer area. .
- ∞ 0.07% of the total study area is occupied by the mine area. The area occupied by Mainly Black granite of the total buffer area. As also observed within the primary survey, the 10 km buffer area is also occupied by the medium scaled granite and marble and small Brick kiln industries also located in the study area.

3.3 SOIL ENVIRONMENT

The physical properties of the soil samples were examined for texture, bulk density and water holding capacity. The soil texture found in the study area is Clay Loam Soil and Bulk Density of Soils in the study area varied between 0.99 – 1.32 g/cc. The Water Holding Capacity between 39.9%-47.8%.

- The nature of soil is slightly alkaline to strongly alkaline with pH range 6.25 - 7.10
- The available Nitrogen content range between 218 to 486.5 kg/hc
- The available Phosphorus content range between 1.29 to 5.24 Mg/Kg
- The available Potassium range between 18.7 to 29.3 meq/l
- Whereas, the micronutrient as zinc (Zn) were found in the range of 5.03 to 7.98 mg/kg;

3.4 WATER ENVIRONMENT

The study area is studded with few tanks that serve as the source of drinking water and also their surplus feeds adjoining tanks. The rainfall over the area is moderate, the rainwater storage in open wells and trenches are in practice over the area and the stored water acts as source of freshwater for couple of months after rainy season.

Surface Water

Ph:

The pH varied from 7.99-8.02 while turbidity found within the standards (Optimal pH range for sustainable aquatic life is 6.5 to 8.5 pH).

Total Dissolved Solids:

Total Dissolved Solids varied from 630 - 644 mg/l, the TDS mainly composed of carbonates, bicarbonates, Chlorides, phosphates and nitrates of calcium, magnesium, sodium and other organic matter.

Other parameters:

Chloride varied between 212.3 mg/l- 218.6 mg/l. Nitrates varied from BDL(DL:2.0) while sulphates varied from 42.1 to 42.6 mg/l.

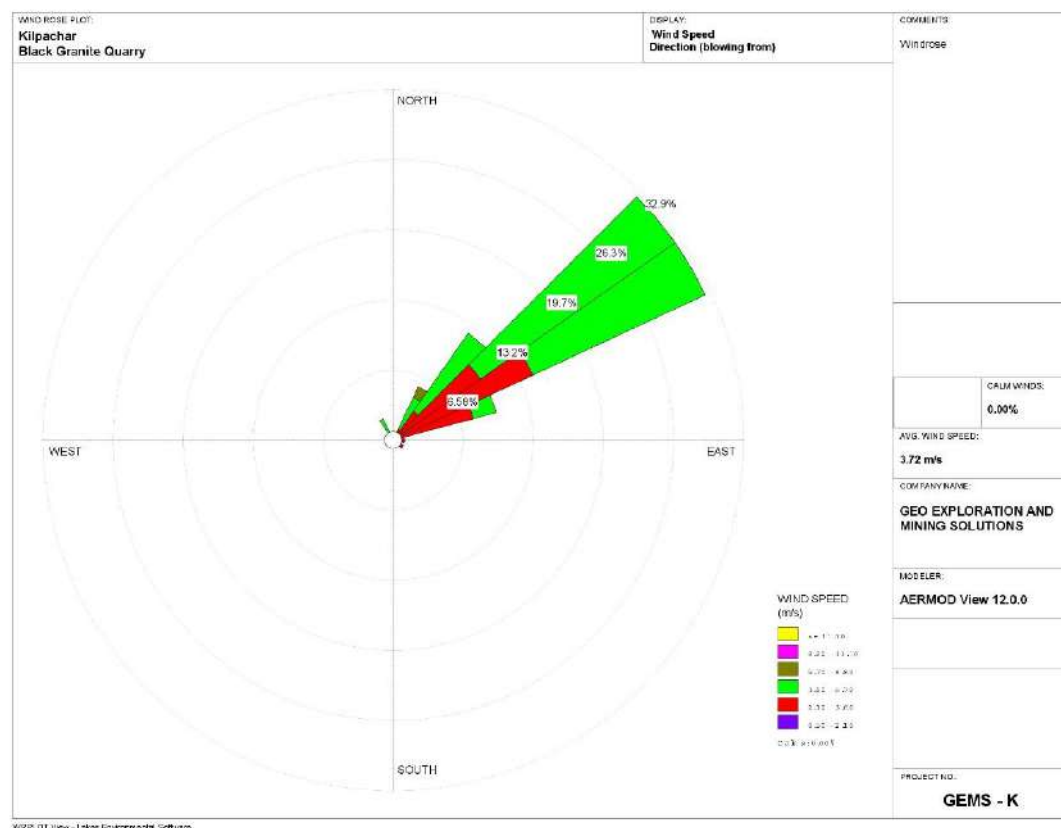
Ground Water

The pH of the water samples collected ranged from 7.12 to 7.56 and within the acceptable limit of 6.5 to 8.5. pH, Sulphates and Chlorides of water samples from all the sources are within the limits as per the Standard. On Turbidity, the water samples meet the requirement. Total Dissolved Solids were found in the range of 499-565mg/l in all samples. Total hardness varied between 140 - 168 mg/l. On Microbiological parameters, the water samples from all the locations meet the requirement. The parameters thus analysed were compared with IS 10500:2012 and are well within the prescribed limits.

3.5 AIR ENVIRONMENT

The baseline studies on air environment include identification of specific air pollution parameters and their existing levels in ambient air. The ambient air quality with respect to the study zone of 10 km radius around the proposed quarry forms the baseline information.

FIGURE – 10: WIND ROSE DIAGRAM



3.6 SUMMARY OF AMBIENT AIR QUALITY

As per monitoring data, PM₁₀ ranges from 33.3 µg/m³ to 43.5 µg/m³, PM_{2.5} data ranges from 18.0 µg/m³ to 25.0 µg/m³, SO₂ ranges from 5.1 µg/m³ to 7.5 µg/m³ and NO₂ data ranges from 17.3 µg/m³ to 25.5 µg/m³. The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB.

3.7 NOISE ENVIRONMENT

Ambient noise levels were measured at 7 locations around the proposed and existing project area. Noise levels recorded in core zone during day time were from 43.1 – 45.2 dB (A) Leq and during night time were from 34.5 – 38.3 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 41.0 – 46.1 dB (A) Leq and during night time were from 34.5 – 41.5 dB (A) Leq.

3.8 ECOLOGICAL ENVIRONMENT

There is no forest land, National Parks, Eco sensitive areas, wild life sanctuaries within the radius of 10 km. An ecological survey of the study area was conducted particularly with reference to the listing of species and assessment of the existing baseline ecological (terrestrial) condition in the study area.

There is no schedule I species of animals observed within study area as per Wildlife Protection Act 1972 as well as no species is in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area. Hence this small operation over short period of time will not have any significant impact on the surrounding flora and fauna.

3.9 SOCIO ECONOMIC ENVIRONMENT

It includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as feature like temples, historical monuments etc., at the baseline level. This will help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project.

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

The proposed project will aim to provide preferential 38 persons to the local people there by improving the indirect employment opportunity in the area were around 100 persons in turn the social standards will improve.

4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

In order to maintain the environmental commensuration with the mining operation, it is essential to undertake studies on the existing environmental scenario and assess the impact on different environmental components. This would help in formulating suitable management plans sustainable resource extraction.

4.1 LAND ENVIRONMENT:

ANTICIPATED IMPACT

The main anticipated impact on the Land Environment due to quarrying operation is change in Landscape, change in Land – use Pattern. M/s.A.G.Granites Pvt Ltd Black Granite Quarry area is calculated as per MoEF & CC Notification – S.O. 2269 (E) Dated: 01.07.2016) including proposed quarry. The proposed project area is proponent own patta land, no forest land involved in this lease applied area. The ultimate depth of the proposed project is quarrying is varying from 30m below the ground level and will not intersect the ground water table. The project is site specific.

MITIGATION MEASURES

Due to the quarrying activities in the project the land use pattern will be altered. In order to minimize the adverse effects, the following control measures will be implemented:

- In the Granite quarrying operation the degradation of land is insignificant, after completion of the quarrying operation the land will be allowed to collect rain water which will act as temporary reservoir, this Granite does not produce any toxic effluents in the form of solid, liquid or gas.
- The periphery of the mining lease area will be converted to a greenbelt to prevent Noise and sound propagation to the nearby lands.
- Construction of garland drains all around the quarry pit and construction of check dam at strategic location in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area.

- Barbed wire fencing will be carried out at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle.

4.2 Soil Environment

Impact on Soil Environment

Solid waste is in the form of Granite waste which does not produce any toxic effluent during dumping. Garland drains will be constructed around the waste dump to prevent the rainwater entering into the quarrying pit besides this garland drain will also help in facilitating the rainwater to the natural gradient.

There will be generation of topsoil is about 2,970 m³ up to depth for 1m during this Scheme period, the same will be preserved all along the safety barrier and utilized for construction of bund and afforestation purpose. Granite waste forms nearly 90% of ROM and the total quantity of granite waste in the next five years will be around 90,456 m³ (Granite waste 56,016 m³ + side burden 18,060 m³+ weathered rock 8,190 m³) the same will be dumped on the Northeast with dimensions of L73m X W39.5m X H 12.14m(h).

Mitigation measures for Soil Conservation

- The top soil will be preserved in the safety barrier and kept in moisture condition. The preserved top soil will be utilized for greenbelt development in the safety barrier and utilized for plantation on the top bench.
- Garland drains will be constructed around the project area to arrest any soil from the quarry area being carried away by the rainwater. This will also avoid the soil erosion and siltation in the mining pits and maintaining the stability of the benches.

4.3 WATER ENVIRONMENT

The impact due to mining on the water quality is expected to be insignificant because of no use of chemicals or hazardous substances during quarrying process. For the quarrying activity water will be utilized for wire saw cutting (which will be recycled), water sprinkling on haul roads and greenbelt development encountered at the depth between 55- 50 m. The maximum depth proposed out of proposed projects is 20m BGL for the entire period. Hence there is no possibilities of water table intersection during the entire mine life period besides it is also inferred topographically that there are no major water bodies intersecting the project area.

MITIGATION MEASURES

- The following mitigation measures are suggested for water management
- The quarrying operation will be carried out well above the water table. There is no intersection of surface water bodies (Streams, Canal, Odai etc.,) in the proposed project area. During rainy season rain water will be collected in the quarry pit and later used for greenbelt development and for the water sprinkling in the haul roads. There is no proposal for discharging of quarry pit water outside the project area.
- There is no proposal Granite processing or workshop within the project area thus there is no effluent anticipated in the mine.
- Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits.
- Wastewater discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes
- De-silting will be carried out before and immediately after the monsoon season
- Regular monitoring and analysing the quality of water in open well, bore wells and surface water.

4.3 AIR ENVIRONMENT

The air borne particulate matter is the main air pollutant in this opencast mining. The mining operation will be carried out by jackhammer drilling (35mm dia) and Hydraulic Excavators will be utilized for excavation of Granite.

ANTICIPATED IMPACT

The air borne particulate matter generated by quarrying operation, and transportation. The emissions of Sulphur dioxide (SO₂), Oxides of Nitrogen (NO_x) due to excavation/loading equipment and vehicles plying on haul roads are marginal. Loading - unloading and transportation of Granite and overburden, wind erosion of the exposed area and movement of light vehicles will be the main polluting source in the mining activities releasing Particulate Matter (PM₁₀) affecting Ambient Air of the area. Prediction of impacts on air environment has been carried out taking into consideration proposed production of cluster mines on air environment and net increase in emissions by Open pit source modelling in AERMOD Software.

Anticipated incremental concentration due to this quarrying activity and net increase in emissions due to quarrying activities within 500meters around the project area is predicted by Open Pit Source modelling using AERMOD Software.

MITIGATION MEASURES

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

Advantages of Wet Drilling: -

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

Blasting

- Blasting will be carried out only to remove the overburden and weathered portion
- Establish time of blasting to suit the local conditions and water sprinkling on blasting face
- Controlled blasting includes Adoption of suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone and restricting blasting to a particular time of the day i.e., at the time lunch hours, controlled charge per hole as well as charge per round of hole

Haul Road & Transportation

- Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation
- Transportation of material will be carried out during day time and material will be covered with tarpaulin
- The speed of tippers plying on the haul road will be limited below 20 km/hr to avoid generation of dust.
- Water sprinkling on haul roads & loading points will be carried out twice a day
- Main source of gaseous pollution will be from vehicle used for transportation of mineral; therefore, weekly maintenance of machines improves combustion process & makes reduction in the pollution.

- The un-metalled haul roads will be compacted weekly before being put into use.
- Over loading of tippers will be avoided to prevent spillage.
- It will be ensured that all transportation vehicles carry a valid PUC certificate.
- Grading of haul roads and service roads to clear accumulation of loose materials.

Green Belt –

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

Occupational Health –

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

4.4 NOISE ENVIRONMENT

ANTICIPATED IMPACT

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

MITIGATION MEASURES

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

4.5 BIOLOGICAL ENVIRONMENT

ANTICIPATED IMPACT

- ✚ None of the plants will be cut during operational phase of the mine.
- ✚ There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly.
- ✚ Most of the land in the buffer area is undulating terrain with crop lands, grass patches and small shrubs. Hence, there will be no effect on flora of the region.

Wild life is not commonly found in the cluster area and its immediate environs because of lack of vegetal cover and surface water. Except few domestic animals, reptiles, hares and some common birds are observed in the study area.

MITIGATION MEASURES

The project site has a land to develop greenbelt within the lease area, along roads and other vacant areas. The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas. Although, the project will not lead to any tree cutting, it is proposed to improve the greenery of the locality by plantation services. To avoid dust emissions, the mined materials will be covered with tarpaulin during transportation.

- Plants that grow fast will be preferred.
- Preference for high canopy covers plants with local varieties.
- Perennial and evergreen plants will be preferred.
- The development of Green Belt is an important aspect for any plant because:
- It helps in noise abatement for the surrounding area.
- It maintains the ecological balance.
- It increases the aesthetic value of site.

GREENBELT DEVELOPMENT PLAN

Plantation Details	Required	1 st Year
No. of plants	1400	1400
Yearly %	100 %	100 %

4.6 SOCIO ECONOMIC ENVIRONMENT

ANTICIPATED IMPACT

From the primary Socio-economic survey & through secondary data available from established literature and census data 2011, it is found that there would be positive impact on Socio-economic condition of the nearby area. There is no habitation within 300 m of the proposed mining lease area. Therefore, no major impact is anticipated on the nearby habitation during the entire life of the mine.

MITIGATION MEASURES

- Good maintenance practices will be adopted for plant machinery and equipment, which will help to avert potential noise problems
- Green belt will be developed in and around the project site as per Central Pollution Control Board (CPCB) guidelines
- Air pollution control measure will be taken to minimize the environmental impact within the core zone
- For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices will be provided as per mines act and rules

- Benefit to the State and the Central governments through financial revenues by way of royalty, tax, duties, etc., from this project directly and indirectly
- From above details, the quarry operations will have highly beneficial positive impact in the area

5. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

The quarrying operation like drilling, blasting, excavation, loading & transportation are being carried out. The site has been selected based on geological investigation and exploration as below:

- Transportation facility for materials & manpower
- Overall impact on environment and mitigation feasibility
- Socio – economic background.

Enough infrastructures exists and lesser resources are required to be deployed. Since, any further construction for infrastructure is not required and hence does not affect the environment considerably. The mineral deposits are site specific in nature; hence question of seeking alternate site does not arise for this project.

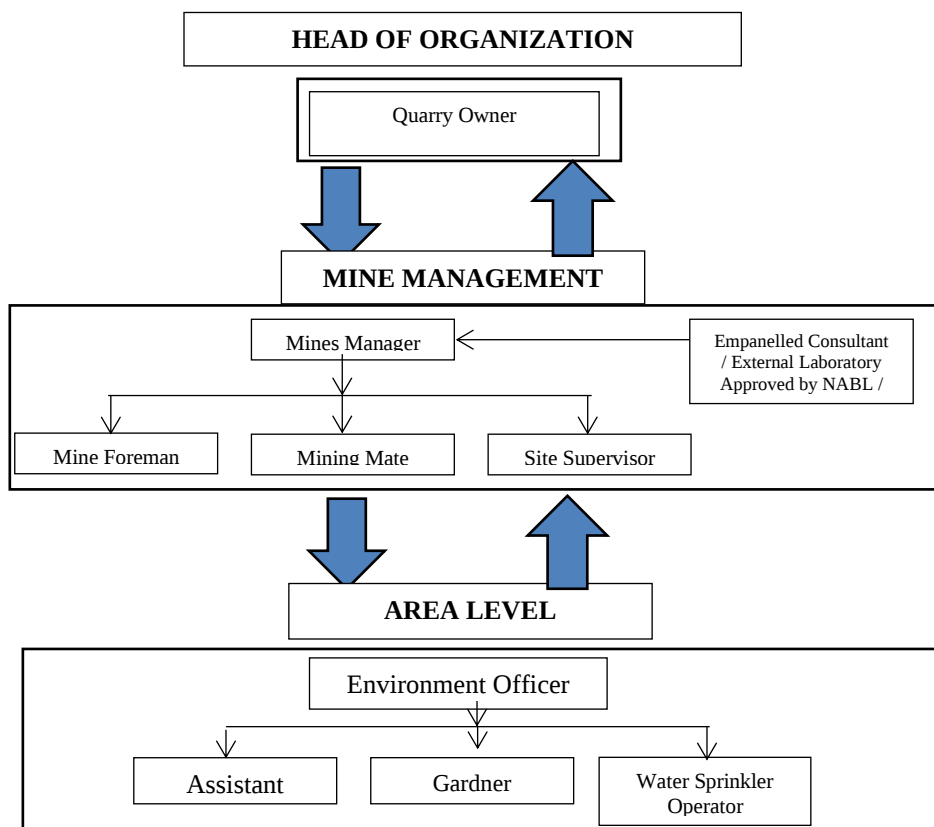
6. ENVIRONMENT MONITORING PROGRAM

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

The Objective of Monitoring -

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

6.1 ENVIRONMENTAL MONITORING CELL



6.2 POST ENVIRONMENTAL CLEARANCE MONITORING SCHEDULE

S. No.	Environment Attributes	Location	Monitoring	Parameters
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			Duration	Frequency	
1	Air Quality	2 Locations (1 Core & 1 Buffer)	24 hours	Once in 6 months	Fugitive Dust, PM _{2.5} , PM ₁₀ , SO ₂ and NO _x .
2	Meteorology	At mine site before start of Air Quality Monitoring & IMD Secondary Data	Hourly / Daily	Continuous online monitoring	Wind speed, Wind direction, Temperature, Relative humidity and Rainfall
3	Water Quality Monitoring	2 Locations (1 SW & 1 GW)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms
4	Hydrology	Water level in open wells in buffer zone around 1 km at specific wells	-	Once in 6 months	Depth in bgl
5	Noise	2 Locations (1 Core & 1 Buffer)	Hourly – 1 Day	Once in 6 months	Leq, Lmax, Lmin, Leq Day & Leq Night
6	Vibration	At the nearest habitation (in case of reporting)	–	During blasting Operation	Peak Particle Velocity
7	Soil	2 Locations (1 Core & 1 Buffer)	–	Once in six months	Physical and Chemical Characteristics
8	Greenbelt	Within the Project Area	Daily	Monthly	Maintenance

7. ADDITIONAL STUDIES

7.1 RISK ASSESSMENT

The methodology for the risk assessment has been based on the specific risk assessment guidance issued by the Directorate General of Mine Safety (DGMS), Dhanbad, vide Circular No.13 of 2002, dated 31st December, 2002. The DGMS risk assessment process is intended to identify existing and probable hazards in the work environment and all operations and assess the risk levels of those hazards in order to prioritize those that need immediate attention. Further, mechanisms responsible for these hazards are identified and their control measures, set to timetable are recorded along with pinpointed responsibilities.

The whole quarry operation will be carried out under the direction of a Qualified Competent Mine Manager holding certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad. Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening.

7.2 DISASTER MANAGEMENT PLAN

The objective of the Disaster Management Plan is to make use of the combined resources of the mine and the outside services to achieve the following:

-  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;
-  Secure the safe rehabilitation of affected area; and
-  Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency

7.3 CUMULATIVE IMPACT STUDY

CUMULATIVE PRODUCTION LOAD OF GRANITE

Quarry	Mineable Reserves ROM In m ³	Mineable Reserves of Granite	Proposed production ROM for five-year period	Production of ROM Per Day	Proposed production Granite for five-year period	Production of Granite Per day in m ³	Weathered rock in Production in m ³	Weathered rock per day in m ³	Topsoil in Production m ³	Topsoil per day in m ³	Number of Lorry loads per day (ROM)
P1	62,240	6,224	15,335	10	1,534	1	8,580	14	4,290	8	1
Total	62,240	6,224	15,335	10	1,534	1	8,580	14	4,290	8	1
P2	1,21,821	18,273	30,420	20	4,563	3	7,616	25	4,189	13	2
Total	1,21,821	18,273	30,420	20	4,563	3	7,616	25	4,189	13	2
Grand Total	1,84,061	24,497	45,755	30	6,097	4	16,116	39	8,479	21	3

Source: First Scheme of Mining Plan

PREDICTED NOISE INCREMENTAL VALUES

Location ID	Background Value (Day) dB(A)	Incremental Value dB(A)	Total Predicted dB(A)	Residential Area Standards dB(A)
Habitation Near P1	49.7	47.6	51.8	55
Habitation Near P2	55.8	47.6	56.4	

SOCIO ECONOMIC BENEFITS FROM CLUSTER QUARRIES

Location code	Employment	Project Cost	CER
P1	31	Rs.6,01,57,873	5,00,000
P2	29	Rs.4,99,25,000/-	5,00,000
Total	60	Rs. 11,00,82,873/-	10,00,000/-

8. PROJECT BENEFITS

There is one applied proposed project for M/s.A.G.Granites Pvt Ltd Black Granite Quarry aims to Proposed production 15,335 (ROM for five-year period) for Life of Mine of 20 Years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits

- ☞ Increase in Employment Potential
- ☞ Improvement in Socio-Economic Welfare
- ☞ Improvement in Physical Infrastructure
- ☞ Improvement in Social infrastructure
- ☞ To meet out the demand supply gap of Granite and enhance the foreign exports

9. ENVIRONMENT MANAGEMENT PLAN

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

The said team will be responsible for:

- 🚧 Monitoring of the water/ waste water quality, air quality and solid waste generated
- 🚧 Analysis of the water and air samples collected through external laboratory
- 🚧 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
-  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. CONCLUSION

It can be concluded from overall assessment of the impacts, in terms of positive and negative effects on various environmental components, that the mining activities will not have any adverse effect on the surrounding environment. To mitigate any impacts due to the mining activities, a well-planned EMP and a detailed post project monitoring system is provided for regular monitoring and immediate rectification at site. Due to the cluster quarrying activities, socio economic conditions in and around the project site will be improved substantially. Hence, the Prior Environmental Clearance shall be granted at the earliest.
