EXECUTIVE SUMMARY

M/s.MAHASEN EXPORTS

MULTI-COLOUR GRANITE QUARRY

S.F. Nos: 489/3B, 489/ 4B, 489/ 5A2 – Extent: 2.20.5 ha

Sithampoondi Village, Paramathi–Velur Taluk, Namakkal District

Tamil Nadu State

"B1" CATEGORY – MINOR MINERAL – CLUSTER – NON FOREST LAND

*** CLUSTER EXTENT = 6.55.5 HA**

Complied as per ToR Obtained vide

Lr.No.SEIAA-TN/F.No.7392/SEAC/TOR-730/2020 Dated: 30.06.2020

Project Proponent

Mrs. S. Mahalakshmi,

Managing partner

M/s.MAHASEN EXPORTS,

No.4/88 G2, Ulagapalayam Maniyanur (Post),

Paramathi-Velur Taluk, Namakkal-634201

Environmental Consultant

GEO EXPLORATION AND MINING SOLUTIONS

Old No. 260-B, New No. 17,

Advaitha Ashram Road, Alagapuram,

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Accredited for sector 1, 28 & 38 Category 'A'

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

1. INTRODUCTION

Granite is the major requirements for construction and ornamental stone industries. This EIA report is prepared for M/s Mahasen Exports – Multicolour Granite Quarry at S.F.Nos. 489/3B, 489/4B and 489/5A2 over an extent of 2.20.5 ha in Sithampoondi Village, Paramathi-Velur Taluk, Namakkal District, Tamil Nadu.

This EIA report is prepared by considering Cumulative load of proposed & existing multi-colour Granite Cluster Quarries consisting of One Proposed and five Existing Quarries with total extent of Cluster of **6.55.5** ha; the cluster area calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016.

This EIA Report is prepared in compliance with ToR obtained vide letter No Lr.No.SEIAA-TN/F.No.7392/SEAC/TOR-730/2020 Dated: 30.06.2020.

Now, as per Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green Tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. 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 for EIA, EMP and therefore, Public Consultation for all areas from 5 to 25 ha falling in Category B- 1 and appraised by SEAC/ SEIAA as well as for cluster situation.

The proposed projects is categorized under category "B1" Activity 1(a) (mining lease area in cluster situation) and will be considered at SEIAA – TN after conducting Public Hearing and Submission of EIA/EMP Report for Grant of Environmental Clearance.

"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 –

Name of the Project Proponent	:	**Mrs. S. Mahalakshmi,**
Address	:	M/s. Mahasen Exports No.4/88 G2, Ulagapalayam, Maniyanur Post, Paramathi-Velur Taluk Namakkal District
State	:	Tamil Nadu
Pin code	:	634201
Mobile No	:	+91 9442131403

1.2 QUARRY DETAILS WITHIN 500 M RADIUS

CLUSTER QUARRIES			
PROPOSED QUARRY			
CODE	**Name and address of the project**	**Extent**	**Status**
P1	**M/s.Mahesen Exports,** S.FNos 489/3B, 489/4B and 489/5A2 Sithampoondi Village, Paramathi–Velur Taluk, Namakkal District	2.20.5 ha	Obtained ToR vide – Lr.No.SEIAA-TN/F.No.7392/SEAC/TOR-730/2020 Dated: 30.06.2020.
TOTAL		**2.20.5 ha**	
EXISTING QUARRIES			
CODE	**Name and address of the project**	**Extent**	**Status**
E1	**Tvl. P.K.K Exports,** S.F.Nos 488/1B(P) & 503/3(P) Sithampoondi Village, Paramathi–Velur Taluk, Namakkal District	2.42.9 ha	Lease Period – 05.04.2007 to 04.04.2027 Obtained EC vide – Lr.No.SEIAA-TN/F.No.4850/EC/1(a)/2889/2016 Dated: 15.02.2016
E2	**Tvl. P.K.K Exports,** S.F.Nos 488/1B(P), 488/2(P), 489/3(P), 489/4(P), 489/5A(P), 497 & 503/3(P) Sithampoondi Village, Paramathi–Velur Taluk, Namakkal District	4.86.0 ha	Lease Period – 17.04.2015 to 16.04.2035 Obtained EC vide – Lr.No.SEIAA-TN/F.No.2645/EC/1(a)/1567/2014 Dated: 11.02.2015
E3	**Thiru.M.Sengottuvel,** S.F.No 503/1 Sithampoondi Village, Paramathi–Velur Taluk, Namakkal District	2.28.5 ha	Lease Period – 17.02.2016 to 16.02.2036 Obtained EC vide – Lr.No.SEIAA-TN/F.No.4157/EC/1(a)/2494/2015 Dated: 01.12.2015
E4	**M/s.Kalpa Exports,** S.F.No 504, 505/1, 505/2 and 856/2A Sithampoondi Village, Paramathi–Velur Taluk, Namakkal District	4.35.0 ha	Lease Period – 05.04.2018 to 04.04.2038 Obtained EC vide – Lr.No.DEIAA-NMK-TN/F.No.259/Mines/03/EC.No.01/2018 Dated: 14.08.2014
E5	**Tvl.M.P,Granite,** S.F.Nos 501/1&501/2B Sithampoondi Village, Paramathi–Velur Taluk, Namakkal District	2.49.0 ha	Lease Period – 28.10.2014 to 27.10.2034 Obtained EC vide – Lr.No.SEIAA-TN/F.No.2603/EC/1(a)/1507/2014 Dated: 14.08.2014
TOTAL EXTENT OF THE QUARRIES		**16.41.4 ha**	
Note – Cluster area is calculated as per MoEF & CC Notification – S.O. 2269 (E) Dated: 01.07.2016			
TOTAL CLUSTER EXTENT		**6.55.5 ha**	

TABLE 1.3 SALIENT FEATURES OF THE PROPOSAL – P1

Name of the Quarry	Sithampoondi Multi-Color Granite Quarry by M/s. Mahasen Exports	
Mining Plan Period	5 Years	
Lease period	20 years	
Toposheet No	58 E/16	
Latitude between	11°14'34.68"N to 11°14'40.93"N	
Longitude between	77°54'21.54"E to 77°54'28.13”E	
Topography	Plain topography with highest elevation 172 m AMSL	
Machinery proposed	Jackhammer	5
	Compressor	2
	Hydraulic Excavator	2
	Tippers	2
	Diamond wire saw	2
	Diesel Generator	1
	Crane crawler	1
Blasting method	Controlled blasting using Small dia slurry explosives only for overburden and weathered rock removal	
Proposed manpower deployment	40	
Project cost	Rs 3,02,8,812/-	

1.3 STATUTORY DETAILS

- The proponent applied for Granite Quarry Lease, Dated: 11.12.2018
- Precise area communication letter received for the preparation of Mining plan vide Letter No. 7829/MMB.2/2019-1, Dated 02.08.2019
- Mining plan got approved by the Director of Geology and Mining Industrial Estate Guindy, Chennai vide Rc.No. 1847/MM4/2019, Dated 18.10.2019
- Proponent applied for ToR to get Environmental Clearance vide online Proposal No. SIA/TN/MIN/48153/2020 Date.09.12.2020
- The proposal was placed in 156th SEAC meeting held on 18.06.2020 and the committee recommended for issue of ToR.
- The proposal was considered in 384th SEIAA meeting held on 30.06.2020 and issued ToR vide Letter No SEIAA-TN/F.No. 7392/SEAC/ToR-730/2020 Dated 30.06.2020

2. PROJECT DESCRIPTION

- The proponent applied for Quarry lease dated 11.12.2018. The precise area communication letter issued by Industries (MME.2) Department, Secretariat Chennai, vide Lr. No. 7829/MMB.2/2019-1, Dated 02.08.2019, the mining plan has been prepared and got approved Director of Geology and Mining Guindy, Chennai, vide Rc.No1847/MM4/2019, Dated 18.10.2019.

- The area is fresh land, no mining activities carried out before, Topography of the area is plain terrain with gentle gradient towards Northeast side. No major vegetation or trees within the project area, the project is site specific and there is no additional area required for this project. There is no effluent generation/discharge from the proposed quarry.
- Multi-Colour Granite is proposed to quarry by opencast mechanized method involving Eco-friendly Diamond Wire Saw Cutting. Heavy earth moving machineries like Excavators Trucks will be deployed in this quarrying operation 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.

1.4 SITE CONNECTIVITY TO THE PROJECT AREA

Nearest Roadway	Village road 140m West (NH 7) Karur – Salem - 15.0Km –Southeast side (SH 86) – Paramathi – Dindigul-5.0Km-Eastern side.
Nearest Village	Sithampoondi – 450m – South side
Nearest Town	Parmathi-velur – 18.0 km - Southeast
Nearest Railway Station & Railway Line	Pasur – 5.0 km - west Erode – Karur line 5.0 km - West
Nearest Airport	Coimbatore Airport - 102.0Km - West
Seaport	Cochin 220 km South west

2.2 LAND USE PATTERN OF THE PROPOSED PROJECTS

DESCRIPTION	AREA TO BE REQUIRED DURING THE PRESENT PLAN PERIOD (HA)	AREA AT THE END OF LIFE OF QUARRY (HA)
Area under quarry	0.97.4	1.73.4
Waste dump	0.29.4	Backfilled
Infrastructure	0.02.0	0.02.0
Roads	0.01.0	0.04.0
Green Belt	0.11.3	0.44.4
Stocking blocks	0.79.4	0.03.3
Total	**2.20.5**	**2.20.5**

2.3 OPERATIONAL DETAILS OF LEASE APPLIED AREA

Description	ROM in m^3	Granite Recovery @ 65 % in m^3	Granite Waste @ 35 % in m^3	Weathered rock in m^3	Topsoil in m^3
Geological Resources	8,88,120	5,77,280	3,10,840	66,609	44,406
Mineable Reserves	2,21,535	1,44,000	77,535	44,706	33,236
Year-wise Production	55,170	35,862	19,308	22,680	17,484
Number of Working Days	300 Days				
Production per day	37	24	13	15	12
No of Lorry loads ($6m^3$ per load)	6	4	2	3	2

FIGURE – 1: GOOGLE IMAGE SHOWING PROJECT AREA

FIGURE – 2: GOOGLE IMAGE SHOWING CLUSTER (500 m QUARRIES)

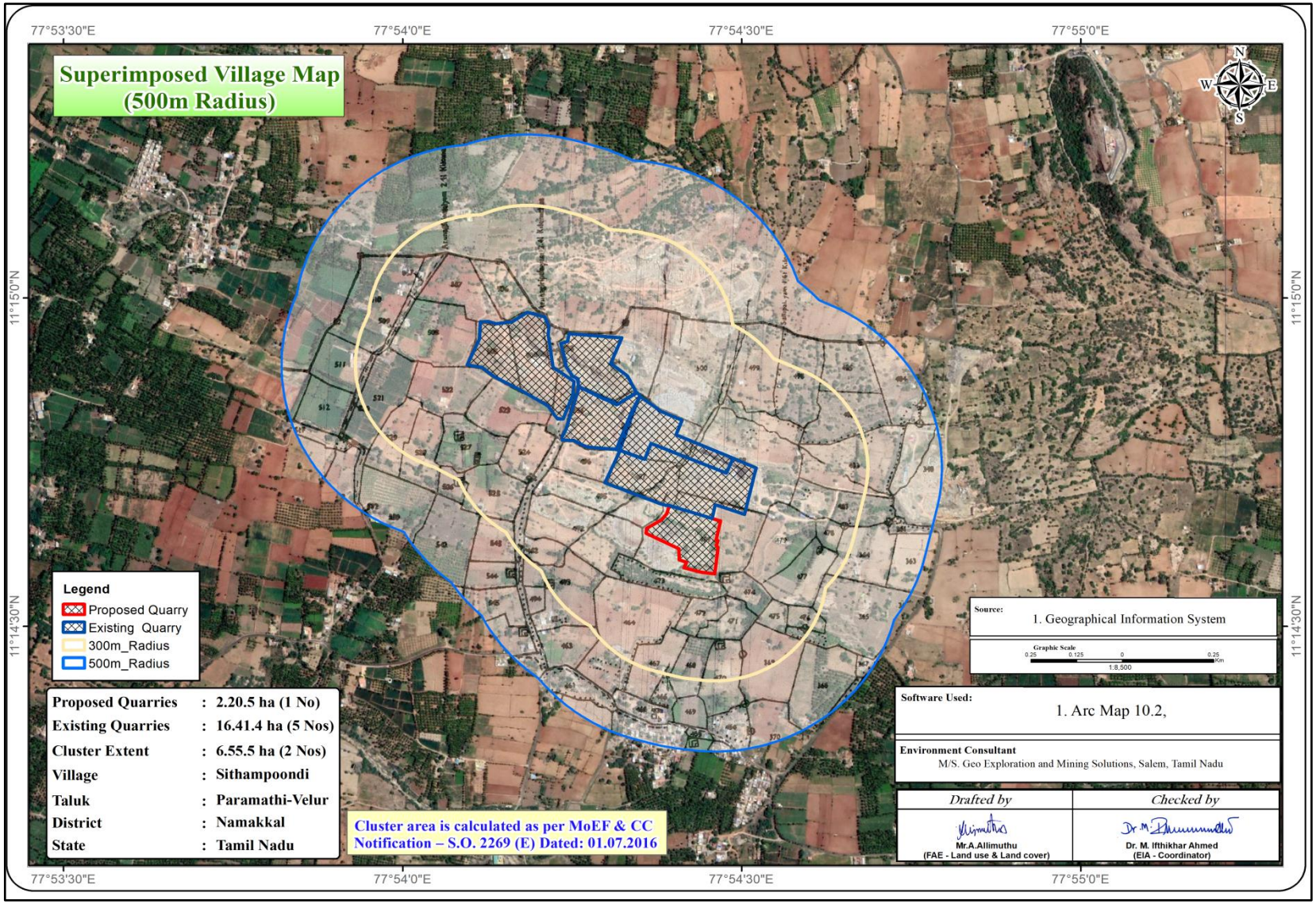


FIGURE – 3: TOPOSHEET MAP COVERING 10 KM RADIUS

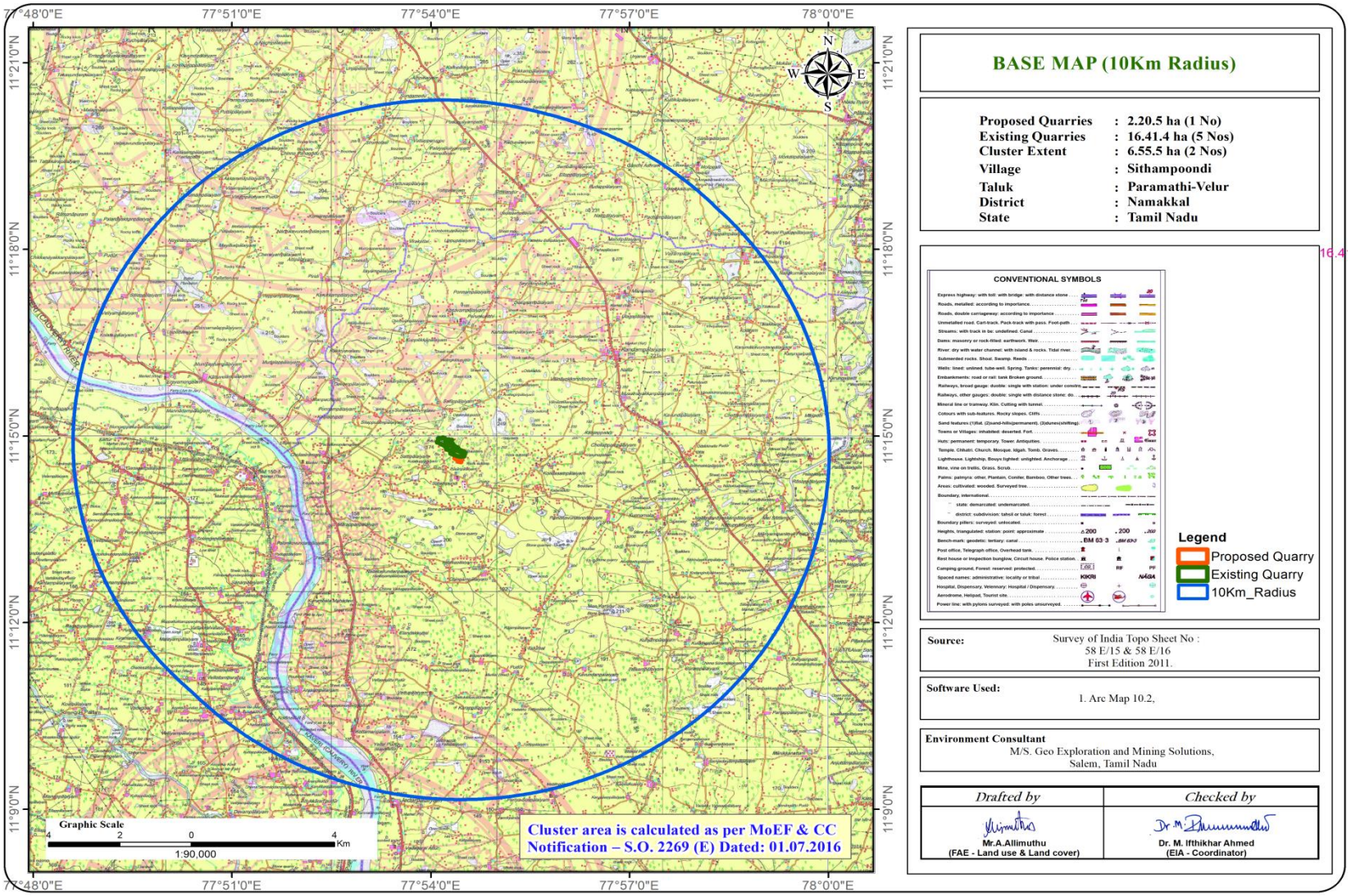


FIGURE – 4: QUARRY LEASE PLAN & SURFACE PLAN

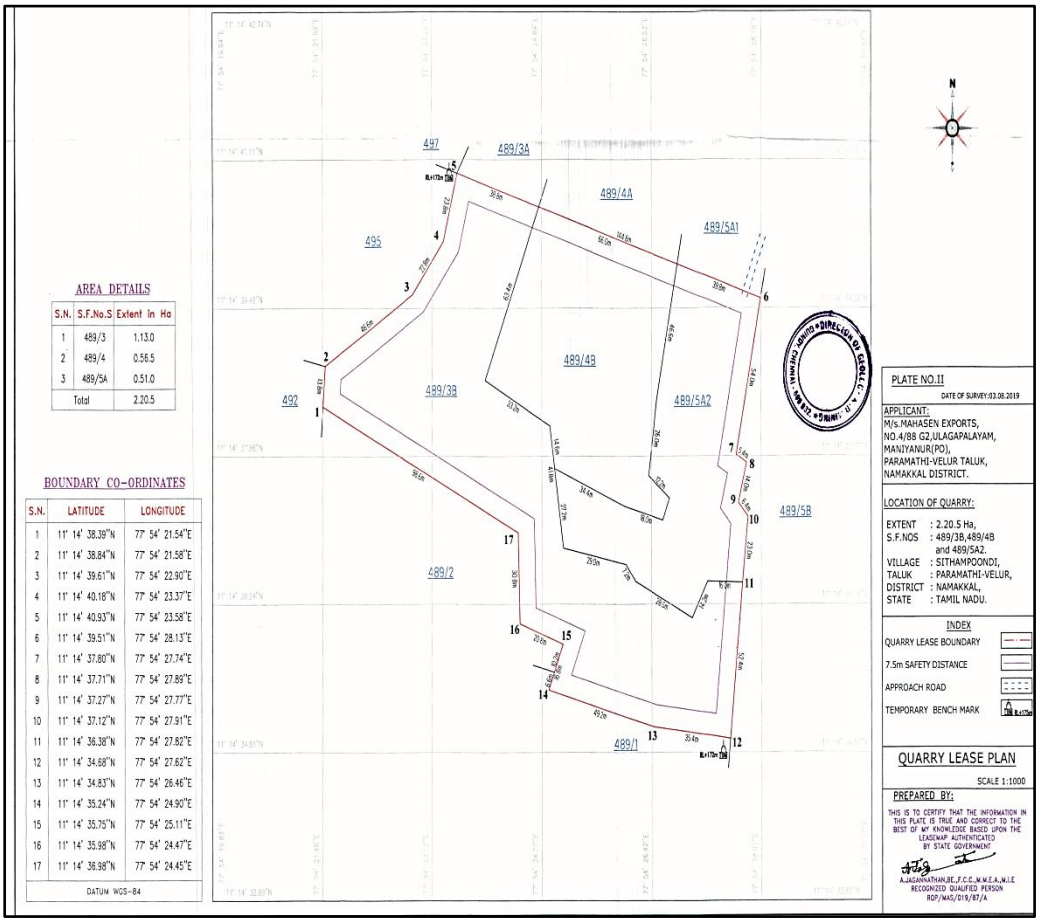
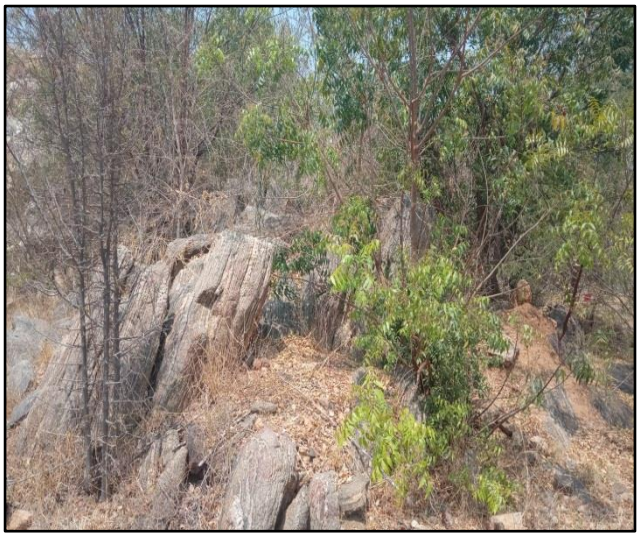


FIGURE – 5: PHOTOGRAPHS OF THE PROJECT AREA



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 6m and 6m width with 90^0slope
- 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

S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammer	5	1.2m to 6m	Compressed air
2	Compressor	2	140cfm/400psi	Diesel Drive
3	Diamond wire saw	2	$20m^3$/day	Diesel Generator
4	Diesel Generator	1	125kva	Diesel Drive
5	Crawler Crane	1	855	Generator
6	Excavator	2	300	Diesel Drive
7	Tipper	2	20 tonnes	Diesel Drive

2.6 CONCEPTUAL MINING PLAN/ FINAL MINE CLOSURE PLAN

Conceptual mining plan is prepared with an object of long-term systematic development of benches, lay outs, selection of permanent ultimate pit limit, depth of quarrying and ultimate pit, selection of sites for construction of infrastructure etc. The ultimate pit size is designed

based on certain practical parameters such as economical depth of quarrying, safety zones, permissible area etc.

2.7 ULTIMATE PIT DIMENSION

Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max) (m)
I	141	137	45

3.0 DESCRIPTION OF THE ENVIRONMENT

Field monitoring studies to evaluate the base line status of the project site were carried out covering October 2020, November 2020 & December 2020 as per CPCB guidelines. Environmental Monitoring data has been collected with reference to proposed mine by OMEGAA LABORATORIES ISO 9001: 2008, OHSAS 18001: 2007 Certified & MoEF Notified 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 8locations (2 Core & 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
3	Water quality	Physical, Chemical and Bacteriological parameters	Grab samples were collected at 5 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)	7 locations (2 Core & 5 Buffer) – data monitored once for 24 hours during EIA study
6	Soil Characteristics	Physical and Chemical Parameters	Once at 5 locations (2Core & 3 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.

S.No	Classification	Area_Ha	Area_%
1	Scrub Land	1286.96	3.81
2	Builtup-Rural	5078.72	15
3	Water Bodies	144.921	0.42
4	River	640.029	1.89
5	Fallow Land	8581.51	25.4
6	Builtup-Mining	171.554	0.5
7	Builtup-Urban	154.681	0.45
8	Salt Affected Area	69.4442	0.2
9	Crop Land	17165.8	50.8
10	Agricultural Plantation	453.182	1.34
Total		33746.9	100

From the above table it is inferred that the majority of the land in the study area are Fallow and Crop land 77.54%.

The total mining area within the study area is 171.554 ha i.e., 0.5 %. The cluster area of 6.55.5 ha contributes about 3.82 % of the total mining area within the study area. This percentage of Mining Activities shall not have any significant impact on the environment.

The project area is situated a plain terrain and the topography of the area is undulated terrain with gradient towards Southeast and the altitude of the area is ranges from 172m AMSL

3.3 SOIL ENVIRONMENT

Physical Characteristics –

The physical properties of the soil samples were examined for texture, bulk density, porosity 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 1.24 – 1.56 g/cc. The Water Holding Capacity and Porosity of the soil samples is found to be medium i.e. ranging from 36.4 – 45.3 %.

Chemical Characteristics –

- The nature of soil is slightly alkaline to strongly alkaline with pH range 7.83 to 8.75
- The available Nitrogen content range between 134 to 165 kg/ha
- The available Phosphorus content range between 28.6 to 46.2 kg/ha
- The available Potassium range between 26.3 to 46.8 mg/kg

Whereas, the micronutrient as zinc (Zn) and iron (Fe) were found in the range of 0.43 to 0.75 mg/kg; 1.67 to 2.38 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 7.31 to 8.01 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 140 to 197.7mg/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 138 mg/l and 146 mg/l. Nitrates varied from 8.3 to 9.2 mg/l, while sulphates varied from 19.5 to 26.7 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.

Ground water

Ph:

The pH varied from 7.16 to 7.41 while turbidity found within the standards (Optimal pH range for sustainable aquatic life is 3.6 to 4.6 pH).

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Total Dissolved Solids:

Total Dissolved Solids varied from 396 to 449mg/l, the TDS mainly composed of carbonates, bicarbonates, Chlorides, phosphates and nitrates of calcium, magnesium, sodium and other organic matter.

Other parameters:

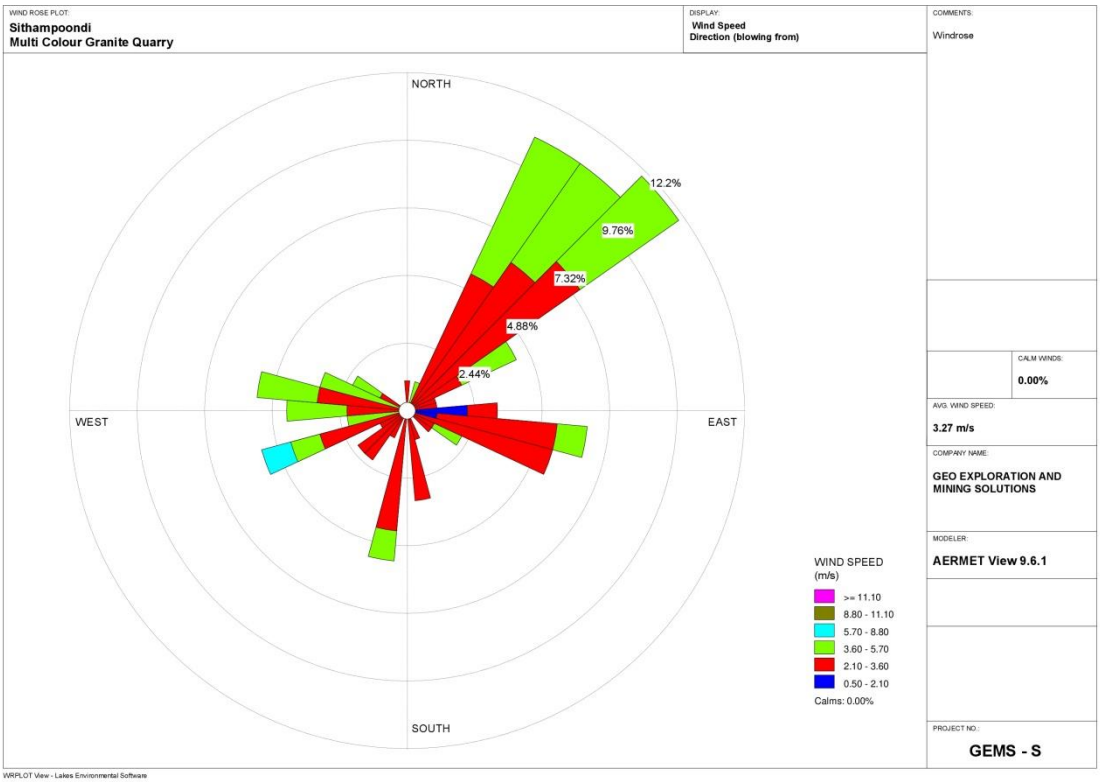
Chloride varied between 118 mg/l and 136mg/l. Nitrates varied from 7.3 to 12.4 mg/l, while sulphates varied from 25.7 to 32.5 mg/l.

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

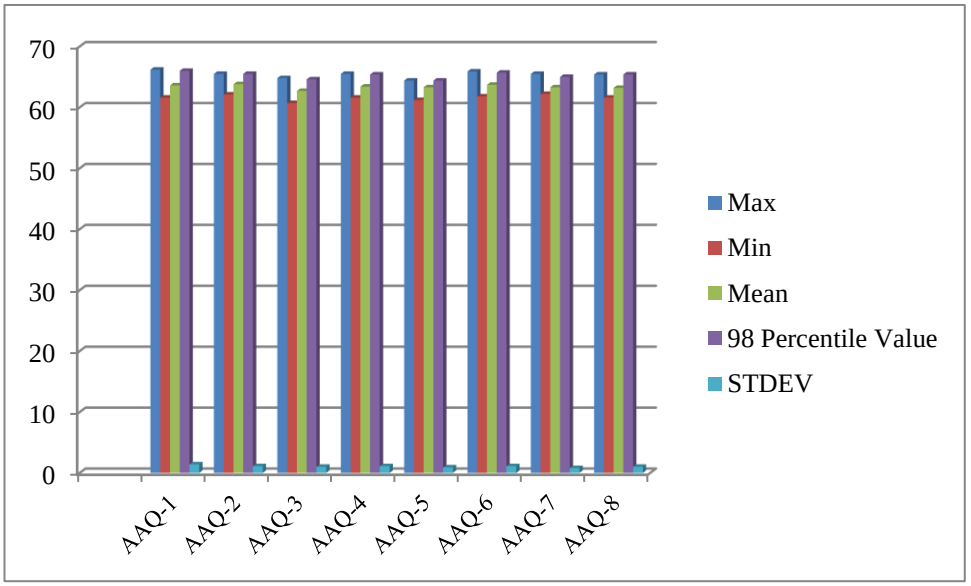
The baseline studies on air environment include identification of specific air pollution parameters and their existing levels in ambient air. The ambient air quality with respect to the study zone of 10 km radius around the proposed quarry forms the baseline information.

FIGURE – 6: WIND ROSE DIAGRAM



3.6 SUMMARY OF AMBIENT AIR QUALITY

FIGURE – 6: BAR DIAGRAM FOR AMBIENT AIR QUALITY



3.7 NOISE ENVIRONMENT

Ambient noise levels were measured at 7 (Seven) locations around the proposed project area. Noise levels recorded in core zone during day time were from 41.4 – 42.3 dB (A) Leq and during night time were from 37.2 – 38.7dB (A) Leq. Noise levels recorded in buffer zone during day time were from 39.5 – 42.2dB dB (A) Leq and during night time were from 37.7 – 38.8 dB (A) Leq.

The values of noise observed in some of the areas are primarily owing to quarrying activities due to cluster of quarries within 500m radius, movement of vehicles and other anthropogenic activities. Noise monitoring results reveal that the maximum & minimum noise levels at day time were recorded in the range of 42.3 dB(A) in core zone and 39.5 dB(A) in Sithampoondi village and 38.8 dB(A) in Perunkurichi Village & 37.2 dB(A) in Core zone village at night time. Thus, the noise level for Industrial and Residential area meets the requirements of CPCB.

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 40 persons to the local people there by improving the indirect employment opportunity for 60 persons and 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. The total area applied for quarry lease is 2.20.5 Ha, the total extent of the cluster is 6.55.5 Ha (Cluster area is calculated as per MoEF & CC Notification – S.O. 2269 (E) Dated: 01.07.2016) including existing and proposed quarries. 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 varies from 45m below the ground level and will not intersect the ground water table. The project is site specific.

MITIGATION MEASURES

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

- In the Opencast Method of Mining the degradation of land is insignificant, after completion of the quarrying operation the land, the land will be partially backfilled with dumped material and part of the area will be allowed to collect rainwater which will act as temporary reservoir, this Granite waste, overburden not produce any toxic effluents in the form of solid, liquid or gas
- Top Soil will be removed and utilized for greenbelt development in the safety barrier
- 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 re constructed at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle.

4.2 WATER ENVIRONMENT

ANTICIPATED IMPACT ON SURFACE AND GROUND WATER

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. The quarrying activity will not intersect ground water table as ultimate depth of the quarry is 45 m and water table is found at a depth of 63-60m BGL.

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.

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 Diamond wire saw cutting, jackhammer drilling (35mm dia) and Hydraulic Excavators will be utilized for handling of Granite waste.

ANTICIPATED IMPACT

The air borne particulate matter is generated by quarrying operation, and transportation. The emissions of Sulphur dioxide (SO_2), Oxides of Nitrogen (NOx) 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 (PM_{10}) affecting Ambient Air of the area. Prediction of impacts on air environment has been carried out taking into consideration proposed production of 1,06,122 cbm (ROM) on air environment and net increase in emissions by Open pit source modelling in 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 –

- Establish time of blasting to suit the local conditions and water sprinkling on blasting face

- Avoid blasting i.e., when temperature inversion is likely to occur and strong wind blows towards residential areas
- Controlled blasting include 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
- Before loading of material water will be sprayed on blasted material
- Dust mask will be provided to the workers and their use will be strictly monitored

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 taurpaulin
- 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 month 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 existing 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 though 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

There is no Forest land, National Parks, Eco sensitive areas, Wild life sanctuaries within the radius of 10km.

There are no migratory corridors, migratory avian-fauna, and rare endemic and endangered species. There are no wild animals in the area. No breeding and nesting site were identified in project site. No National park and Wildlife Sanctuary found within 10km radius. The dumps / bunds around the mine itself act as a good barrier for entry of stray animals. In the post mining stage, barbed wire fencing is proposed all around the mined-out void to prevent fall of animals in the mine pits.

MITIGATION MEASURES

To reduce the adverse effects on natural flora/fauna status of the area due to deposition of dust generated from mining operations, water sprinkling and water spraying systems will be ensured in all dust prone areas to arrest dust generation. Methodical and well-planned plantation scheme will be carried out.

GREENBELT DEVELOPMENT PLAN

Year	***No.of trees proposed to be***	***Survial %***	***Area to be covered***	***Name of the species***	***No. of trees expected to be***
I	25	80%	226	Neem, Pongamia Pinnata, Casuarina	20
II	25	80%	226		20
III	25	80%	226		20
IV	25	80%	226		20
V	25	80%	226		20

4.6 SOCIO ECONOMIC ENVIRONMENT

ANTICIPATED IMPACT

Employment generation due to the project will provide direct employment for about 40 persons and indirectly will get employment around 60 persons.

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.
- Appropriate 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, DMF, NMET etc, from this project directly and indirectly.

3. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

The site has been selected based on geological investigation and exploration as below:

- Occurrence of minerals at the specific site.
- Transportation facility for materials & manpower.
- Overall impact on environment and mitigation feasibility
- Socio – economic background.

The mineral deposits are site specific in nature; hence question of seeking alternate site does not arise for this project.

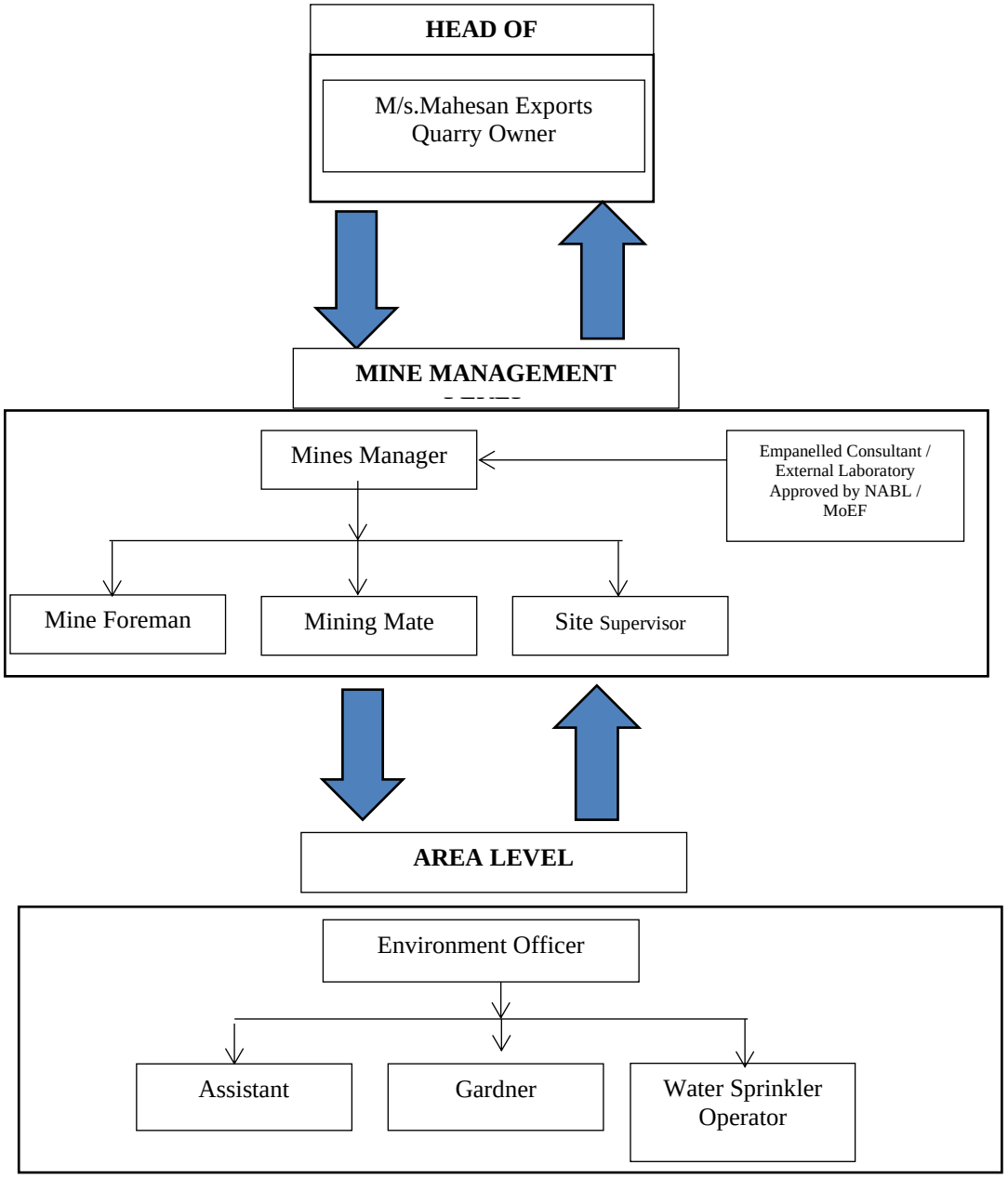
4. ENVIRONMENT MONITORING PROGRAM

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

IN COMMON FOR P1 – P5					
S. No.	Environment Attributes	Location	Monitoring		Parameters
			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 (1SW & 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 for five-year period	Production of ROM Per Day	Production of Granite Per day in m^3	Number of Lorry loads per day
P1	2,21,535	1,44,000	35,862	34	24	4
E1	2,13,170	85,268	12,064	50	20	3
E2	2,82,980	1,69,788	6,000	7	4	1
E3	37,800	22,680	5,400	6	4	1
E4	2,93,555	1,76,133	42,021	47	28	5
E5	1,36,600	81,960	6,000	7	4	1
Total	**11,85,640**	**6,79,829**	**1,07,347**	**151**	**84**	**15**

PREDICTED NOISE INCREMENTAL VALUES FROM CLUSTER

Quarry	Mineable Reserves ROM In m^3	Mineable Reserves of Granite	Proposed production for five-year period	Production of ROM Per Day	Production of Granite Per day in m^3	Number of Lorry loads per day
P1	2,21,535	1,44,000	35,862	34	24	4
E1	2,13,170	85,268	12,064	50	20	3
E2	2,82,980	1,69,788	6,000	7	4	1
E3	37,800	22,680	5,400	6	4	1
E4	2,93,555	1,76,133	42,021	47	28	5
E5	1,36,600	81,960	6,000	7	4	1
Total	**11,85,640**	**6,79,829**	**1,07,347**	**151**	**84**	**15**

SOCIO ECONOMIC BENEFITS FROM 6 MINES

Quarry	Mineable Reserves ROM In m^3	Mineable Reserves of Granite	Proposed production for five-year period	Production of ROM Per Day	Production of Granite Per day in m^3	Number of Lorry loads per day
P1	2,21,535	1,44,000	35,862	34	24	4
E1	2,13,170	85,268	12,064	50	20	3
E2	2,82,980	1,69,788	6,000	7	4	1
E3	37,800	22,680	5,400	6	4	1
E4	2,93,555	1,76,133	42,021	47	28	5
E5	1,36,600	81,960	6,000	7	4	1
Total	**11,85,640**	**6,79,829**	**1,07,347**	**151**	**84**	**15**

8. PROJECT BENEFITS

Multi Colour Granite Quarry of M/s.Mahasen Exports 1,44,000m^3 of Granite @ 65% recovery (ROM 2,21,535m^3 for the entire period- Life of the mine) 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.