EXECUTIVE SUMMARY

KODANGIPALAYAM ROUGH STONE AND GRAVEL CLUSTER QUARRIES

At

Kodangipalayam Village, Palldam Taluk, Tiruppur District

For Obtaining

Environmental Clearance under EIA Notification – 2006
Schedule Sl. No. 1 (a) (i): Mining Project

IN CLUSTER OVER AN EXTENT OF 15.02.89 Ha

NAME OF PROPOSED PROJECT PROPONENTS APPLYING IN CLUSTER

Code	Proponent Name	S.F No	Village & Taluk	Extent (Ha)
P1	Thiru.M.Devaraj	311/3 and 311/4B	Kodangipalayam Village, Palladam Taluk	1.60.5
P2	Thiru.A.Duraisamy	315/2B		1.08.0

File No.11105 TOR Identification No. TO24B0108TN5222655N Dated: 06.03.2025- P1

File No.11129 TOR Identification No TO24B0108TN5544123N Dated: 10.03.2025 - P2

Environmental Consultant

GEO EXPLORATION AND MINING SOLUTIONS

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Accredited for sector 1 Category 'A', sector 31 Category 'B' & 38 Category 'B'

Certificate No : NABET/EIA/2225/RA 0276 Dated: 20.02.2023

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ENVIRONMENTAL LAB

GLOBAL LAB AND CONSULTANCY SERVICES

Approved by ISO:9001:2015, NABL, FSSAI, Experts in QHSE

S.F No:92/3A2, Geetha Nagar, Alagapuram Pudur, Salem-636016.

Baseline Monitoring Season – Oct to Dec 2024

APRIL -2025

1.0 INTRODUCTION

Rough Stone and Gravel are the major requirements for construction industry. This EIA report is prepared by considering Cumulative load of all proposed quarries of Kodangipalayam Rough Stone and Gravel Cluster Quarries consisting of five Proposed quarries and nine existing quarries total extent of Cluster of 19.38.11Ha in Kodangipalayam Village, Palladam Taluk Tiruppur District, Tamil Nadu State, 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 for the below proposals in Table 1.1 and the Baseline Monitoring study has been carried out during the period of **Oct to Dec 2024**

TABLE 1.1: ToR OBTAINED PROJECTS

Code	Proponent Name	S.F No	Village & Taluk	Extent (Ha)
P1	Thiru.M.Devaraj	311/3 and 311/4B	Kodangipalayam Village, Palladam Taluk	1.60.5
P2	Thiru.A.Duraisamy	315/2B		1.08.0

Source: ToR Letters of the respective project proponents.

"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 – P1	
Name of the Company	**Thiru.M.Devaraj**
Address	S/o. Marappa Gounder, No.2/456, Amma Kadu, Kodangipalayam, Palladam Taluk, Tiruppur District
Mobile	+91 98422 67507
Status	Proprietor (Individual)
PROPOSAL – P2	
Name of the Company	**Thiru.A.Duraisamy**
Address	S/o. Arumugam, No.4/33, Karanampettai, Palladam Taluk, Tiruppur District
Mobile	+91 98422 39591
Status	Proprietor (Individual)

The project proponent is an individual.

1.2 QUARRY DETAILS WITHIN 500 M RADIUS

PROPOSED QUARRIES					
Code	**Name of the Owner**	**Village**	**S.F. Nos**	**Extent in Ha**	**Status**
P1	Thiru.M.Devaraj	Kodangipalayam	311/3 & 311/4B	1.60.5	Applied for quarry lease
P2	Thiru.A. Duraisamy	Kodangipalayam	315/2B	1.08.0	Applied for quarry lease
P3	Thiru.R.Shanmugam	Kodangipalayam	316/4	1.29.0	Applied for quarry lease
P4	Thiru.K.Selvakumar	Kodangipalayam	311/2	1.16.5	Applied for quarry lease
P5	Thiru.K.Sivakumar	Kodangipalayam	308/1B,38/2	1.69.0	Applied for quarry lease

	TOTAL EXTENT			**6.83.0 Ha**	
EXISTING QUARRIES					
Code	**Name of the Owner**	**Village**	**S.F. Nos**	**Extent in Ha**	**Status**
E-1	Thiru.S.Velusamy	Kodangipalayam	324/2A	1.62.0	08.03.2022 to 07.03.2027
E-2	Thiru.M.Ramasamy	Kodangipalayam	314/1A(P),314/1B,324/2B & 324/2C	3.61.5	17.03.2022 to 16.03.2027
E-3	Thiru.P.Shanmugasundaram	Kodangipalayam	315/A3B1,320/2B2	0.74.39	EC Granted
E-4	Thiru.S.Thangavel	Kodangipalayam	315/2D	2.22.0	EC Granted
	TOTAL EXTENT			**8.19.89**	
ABANDONED / EXPIRED QUARRIES					
Code	**Name of the Owner**	**Village**	**S.F. Nos**	**Extent in Ha**	**Status**
Ex-1	Thiru.M.Devaraj	Kodangipalayam	312/3,313/1,313/2(P)	3.16.0	20.09.2018 to 19.09.2023
EX-2	Thiru.S.Rangasamy	Kodangipalayam	315/2A1,315/2A3A	1.86.0	24.07.2014 to 27.08.2019
EX-3	Thiru.R.Shanmugam	Kodangipalayam	312/4	0.94	
	TOTAL EXTENT			**5.96.0**	
	TOTAL CLUSTER EXTENT			**15.02.89**	

TABLE 1.3: SALIENT FEATURES OF THE PROPOSED PROJECTS IN CLUSTER

SALIENT FEATURES OF THE PROPOSED PROJECT- P1					
Name of the Project	Thiru. M. Devaraj Rough stone and Gravel quarry				
S.F. No.	**311/3 & 311/4B**				
Extent	1.60.5 ha				
Village Taluk and District	Kodangipalayam Village, Palladam Taluk, Tiruppur District.				
Land Type	Proponent own patta land				
Land Ownership	It is a Patta lands. Registered in the name of the applicant (Thiru.M.Devaraj), vide Patta Nos. 2009 and 1989				
Previous lease details	It is a fresh application. But the applied area has been considered quarrying operastion earlier				
	S.No	**Name of Lessee**	**Ditrict collector's Proceeding Number and date**	**Extent and S.F.Nos**	**Lease Period**
	1	Thiru.K.R.Rathinasamy	Rc.No.1556/2005/MM2 Dated: 16.08.2005	1.60.5ha and 311/3&311/4B	14.09.2005 to 13.09.2010
	2	Thiru.K.R.Rathinasamy	Rc.No.655/Mines/2010 Dated: 26.02.2011	1.60.5Ha and 311/3&311/4B	26.02.2011 to 25.02.2016
Toposheet No	58 - E/04				
Latitude between	**11° 00' 57.66''N to 11° 01' 04.72''N**				
Longitude between	**77° 12' 47.33''E to 77° 12' 50.78''E**				
Elevation of the area	410m(Max) AMSL				
Lease period	5 Years				
Mining Plan period	5 years				
Proposed Depth of Mining	42m Bgl				
	Rough Stone in m^3		Gravel m^3		

Geological Resources	454744	2672
Mineable Reserves	137627	608
Year wise Production	137627	608
Peak Production	29375	608
Ultimate Pit Dimension	Pit I- 70m(L) x 22m(W) x 7m(D) Bgl Pit II- 123m(L) x 89m(W) x 42m(D) Bgl	
Water Level in the region	58-62m bgl	
Method of Mining	Opencast Mechanized Mining Method involving small drilling and Controlled blasting using Slurry Explosives	
Topography	The lease applied area is situated in flat terrain. The area has gentle sloping towards Northwestern side. The altitude of the area is 410m (max) above Mean Sea level. The area is covered by gravel having an average thickness of 2m and followed by Massive Charnockite Which is clearly inferred from the adjacent existing quarry pit	
Machinery proposed	Jack Hammer	4 Nos
	Compressor	1 Nos
	Excavator with Bucket and Rock Breaker	1 No
	Tippers	2 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Proposed Manpower Deployment	22 Nos	
Project Cost	Rs.1,86,91,000/-	
EMP Cost	Rs. 3,80,000/-	
Total Project cost	Rs. 1,90,71,000/-	
CER Cost	Rs. 5,00,000/-	
Nearby Water Bodies	Odai	520m SW
	Odai	530m West
	Kuttai	720m NE
	Odai	2km NE
	Samalapuram Lake	6.0km NW
	Noyyal River	6.5km NW
Greenbelt Development Plan	Proposed to plant 810 Nos of trees considering 500 Nos of trees/ Ha criteria The plantation will be developed around the project site and nearby village roads	
Proposed Water Requirement	1.5 KLD	
Nearest Habitation	390m – North West	
Nearest Reserve Forest	Boluvampatti R.F I – 30.0 km – South West	
Nearest Wild Life Sanctuary	Nanjarayan bird Sanctuary – 22.7km – NE Sathiyamangalam Tiger Reserve- 50.8km NW	

Source: Approved Mining Plan of the respective proposals

SALIENT FEATURES OF THE PROPOSED PROJECT- P2				
Name of the Project	Thiru.A.Duraisamy Rough stone and Gravel quarry			
S.F. No.	**315/2B**			
Extent	1.08.0 ha			
Village Taluk and District	Kodangipalayam Village, Palladam Taluk, Tiruppur District.			
Land Type	Proponent own patta land			
Land Ownership	It is a Patta lands. Jointly registered in the name of the applicant Thiru.A.Duaraisamy and Thiru.A.Thangavel, vide Patta Nos. 1447			
Previous lease details	It is a fresh application. But the applied area has been considered quarrying operastion earlier			
	S.No	**Name of Lessee**	**Ditrict collector's Proceeding Number and date**	**Extent and S.F.Nos**	**Lease Period**

	1	Thiru.A.Duraisamy	Rc.No.2335/2005/X1 Dated: 30.11.2005	1.08.0ha and 315/2B	30.11.2005 to 29.11.2010

Toposheet No	58 - E/04	
Latitude between	**11° 00' 49.97''N to 11° 00' 58.85''N**	
Longitude between	**77° 12' 41.74''E to 77° 12' 43.50''E**	
Elevation of the area	408m(Max) AMSL	
Lease period	5 Years	
Mining Plan period	5 years	
Proposed Depth of Mining	22m Bgl	
	Rough Stone in m^3	Gravel m^3
Geological Resources	200648	13648
Mineable Reserves	90371	8754
Year wise Production	90371	8754
Peak Production	18655	3392
Ultimate Pit Dimension	254m(L) x 35m(W) x 22m(D) Bgl	
Water Level in the region	58-62 m bgl	
Method of Mining	Opencast Mechanized Mining Method involving small drilling and Controlled blasting using Slurry Explosives	
Topography	The lease applied area is situated in flat terrain. The area has gentle sloping towards North-Western side. The altitude of the area is 408m (max) above Mean Sea level. The area is covered by gravel having an average thickness of 2m and followed by Massive Charnockite Which is clearly inferred from the adjacent existing quarry pit	
Machinery proposed	Jack Hammer	3 Nos
	Compressor	1 Nos
	Excavator with Bucket and Rock Breaker	1 No
	Tippers	2 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Proposed Manpower Deployment	20 Nos	
Project Cost	Rs.1,10,10,000/-	
EMP Cost	Rs. 3,80,000/-	
Total Project cost	Rs. 1,16,18,000/-	
CER Cost	Rs. 5,00,000/-	
Nearby Water Bodies	Odai	240m SW
	Odai	350m West
	Kuttai	980m NE
	Odai	2.2km NE
	Samalapuram Lake	6.2km NW
	Noyyal River	7.0km NW
Greenbelt Development Plan	Proposed to plant 540Nos of trees considering 500 Nos of trees/ Ha criteria The plantation will be developed around the project site and nearby village roads	
Proposed Water Requirement	2.0 KLD	
Nearest Habitation	310m – North West	
Nearest Reserve Forest	Boluvampatti R.F I – 30.5 km – South West	
Nearest Wild Life Sanctuary	Nanjarayan bird Sanctuary – 23km – NE Sathiyamangalam Tiger Reserve- 51km NW	

Source: Approved Mining Plan of the respective proposals

1.4 STATUTORY DETAILS

Project – P1

- Proponent applied for Rough stone and Gravel quarry lease on 04.05.2022
- Precise area communication letter was issued by the Assistant Director vide Rc.No.410/Mines/2022, Dated: 10.01.2024.
- The Mining plan has been prepared by the Qualified person and got approval vide Letter Rc.No. 410/Mines/2022 Dated: 12.06.2024.
- The proposed project falls under "B1" Category 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
- Proponent applied for ToR for Environmental Clearance vide online Proposal No. SIA/TN/MIN/488076/2024 dated 16.07.2024.
- The proposal was placed in 492nd SEAC meeting held on 29.08.2024 and the committee recommended for issue of ToR.
- The proposal was considered in 753rd Authority meeting held on 10.09.2024 &11.09.2024
- The proposal was placed in 533rd SEAC meeting held on 14.02.2025 and the committee recommended for issue of ToR.
- The proposal was considered in 799th Authority meeting held on 03.03.2025 & 04.03.2025, issued ToR vide **File No.11105. TOR Identification No TO24B0108TN5222655N, dated: 06.03.2025**

Project – P2

- Proponent applied for Rough stone and Gravel quarry lease on 04.05.2022
- Precise area communication letter was issued by the Assistant Director vide Rc.No.411/Mines/2022, Dated: 12.01.2024
- The Mining plan has been prepared by the Qualified person and got approval vide Letter Rc.No. 411/Mines/2022 Dated: 18.06.2024
- The proposed project falls under "B1" Category 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
- Proponent applied for ToR for Environmental Clearance vide online Proposal No. SIA/TN/MIN/488203/2024 dated 16.07.2024
- The proposal was placed in 492nd SEAC meeting held on 29.08.2024 and the committee recommended for issue of ToR.
- The proposal was considered in 753rd Authority meeting held on 10.09.2024 &11.09.2024
- The proposal was placed in 533rd SEAC meeting held on 14.02.2025 and the committee recommended for issue of ToR.
- The proposal was considered in 799th Authority meeting held on 03.03.2025 & 04.03.2025, issued ToR vide **File No.11129. TOR Identification No TO24B0108TN5544123N, dated: 10.03.2025**

2. PROJECT DESCRIPTION

The proposed project is site specific and there is no additional area required for this project. There is no effluent generation/discharge from the proposed quarries. Rough Stone and Gravel are proposed to be excavated by opencast mechanized method involving splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and blasting, hydraulic excavators are used for loading the Rough Stone from pithead to the needy crushers and rock breakers to avoid secondary blasting.

2.1 SITE CONNECTIVITY TO THE PROJECT AREA

Nearest Roadway	NH (81) - Coimbatore – Trichy – 1.0 km – South West SH (165) - Kamanaikenpalayam – Annur Road- 3.1km –West
Nearest Village	Kodangipalayam - 330m-W
Nearest Town	Palladam – 8.0 km-SE
Nearest Railway Station	Somanur – 8.2 km – North West
Nearest Airport	Coimbatore– 19.0 km –West
Seaport	Kochi– 156.0 km – South West

Source: Survey of India Toposheet

2.2 LAND USE PATTERN OF THE PROPOSED PROJECT

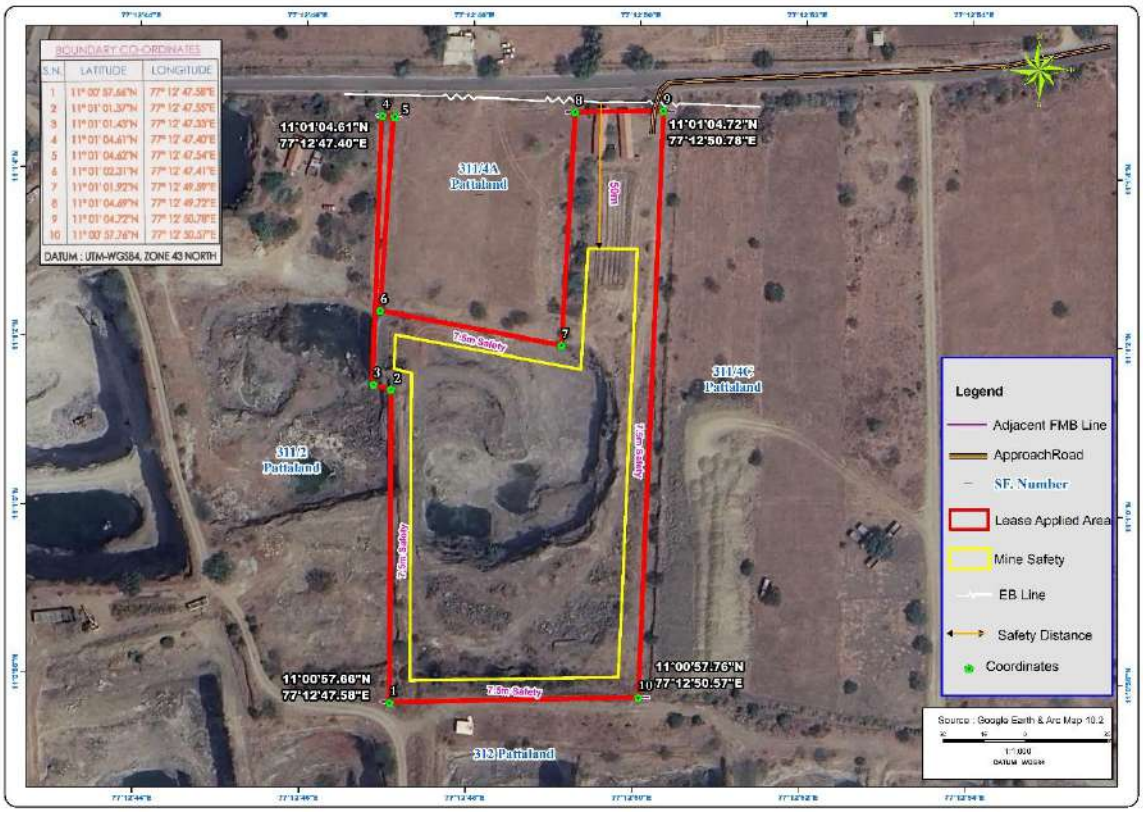
LAND USE PATTERN OF PROJECT – P1		
Description	**Present area in (ha)**	**Area at the end of life of quarry (Ha)**
Area under quarrying	1.23.0	1.24.43
Dump	0.01.0	0.01.00
Sire Services	0.02.0	0.02.00
Roads	Nil	0.21.00
Green Belt	0.34.5	0.12.07
Un – utilized area	**1.60.5**	**1.60.5**
Grand Total	1.23.0	1.24.43
LAND USE PATTERN OF PROJECT – P2		
Description	**Present area in (ha)**	**Area at the end of life of quarry (Ha)**
Area under quarrying	0.40.50	0.88.20
Infrastructure	Nil	0.01.00
Roads	0.01.0	0.01.00
Green Belt	Nil	0.14.28
Unutilized area	0.66.50	0.04.52
Grand Total	**1.08.00**	**1.08.00**

2.3 OPERATIONAL DETAILS OF LEASE APPLIED AREA

OPERATIONAL DETAILS FOR PROJECT – P1		
PARTICULARS	**DETAILS**	
	Rough Stone (m^3) (5Year Plan period)	**Gravel (m^3) (3 Years Plan period)**
Geological Resources	4,54,744	2,672
Mineable Reserves	1,37,627	608
Production for five-year plan period	1,37,627	608
Mining Plan Period / Lease Applied Period	29375	
Number of Working Days	5 Years	
Production per day	300 Days	
No of Lorry loads (12m^3 per load)	92	2
Total Depth of Mining	8	
OPERATIONAL DETAILS FOR PROJECT – P2		
PARTICULARS	**DETAILS**	
	Rough Stone (m^3) (5Year Plan period)	**Gravel (m^3)**
Geological Resources	2,00,648	13,648
Mineable Reserves	90,371	8,754
Production for five years Plan	90,371	8,754
Mining Plan Period / Lease Applied Period	18,655	
Number of Working Days	5 Years	
Production per day	300 Days	
No of Lorry loads (12m^3 per load)	60	10
Total Depth of mining	5	

FIGURE – 1: GOOGLE IMAGE SHOWING PROJECT AREA

SATELLITE IMAGERY OF P1



SATELLITE IMAGERY OF P2

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

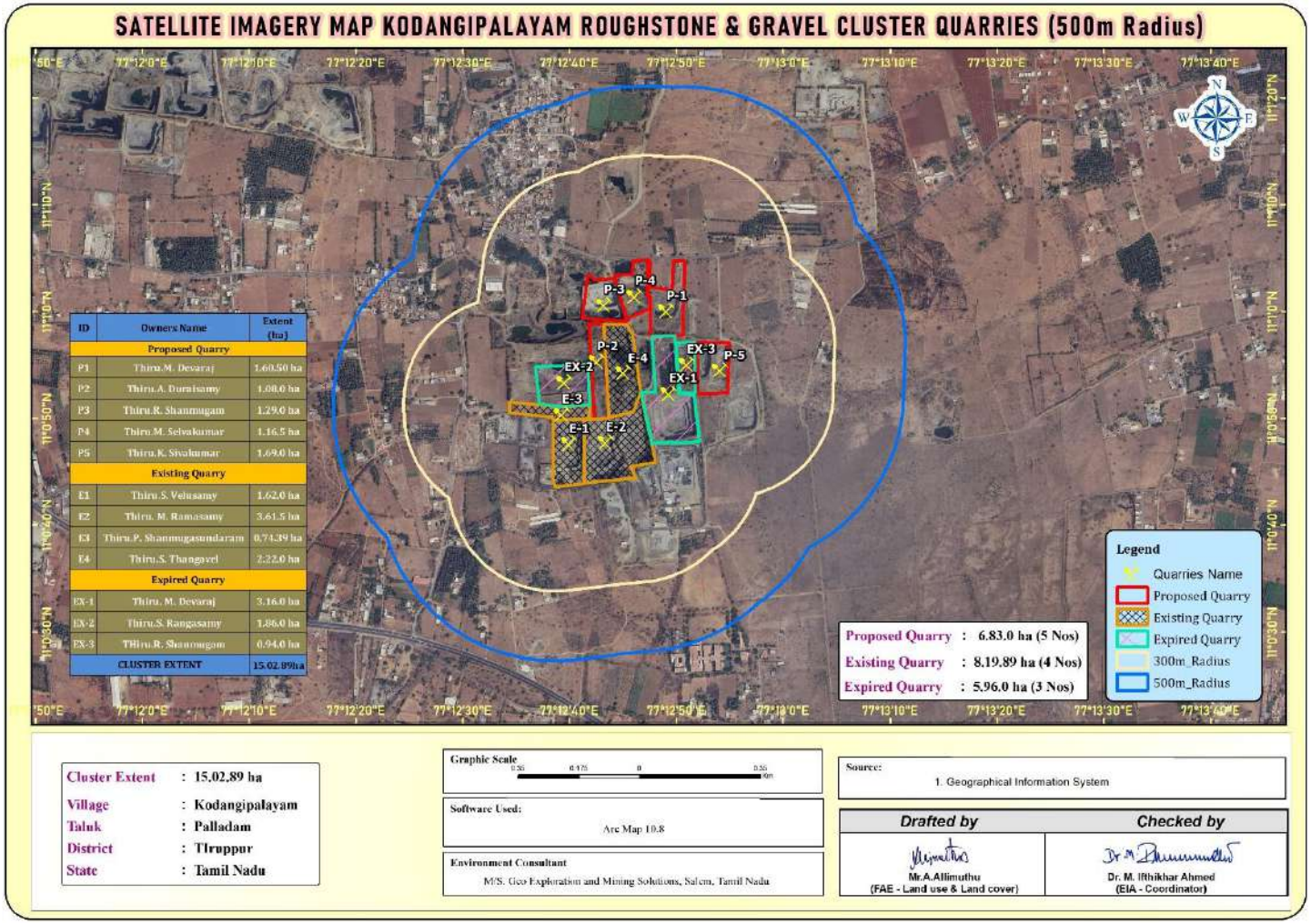


FIGURE – 3: TOPOSHEET MAP COVERING 10 KM RADIUS

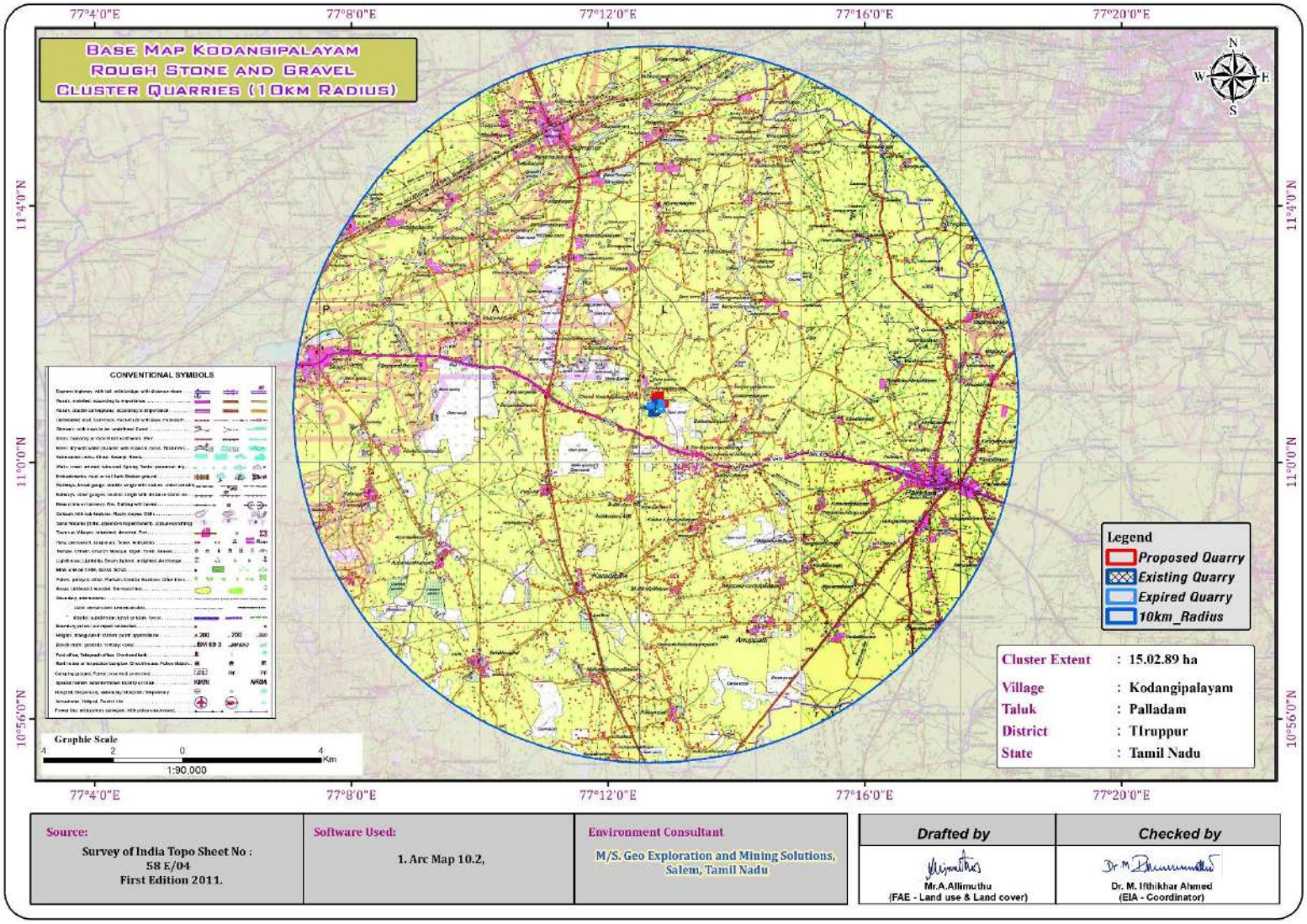
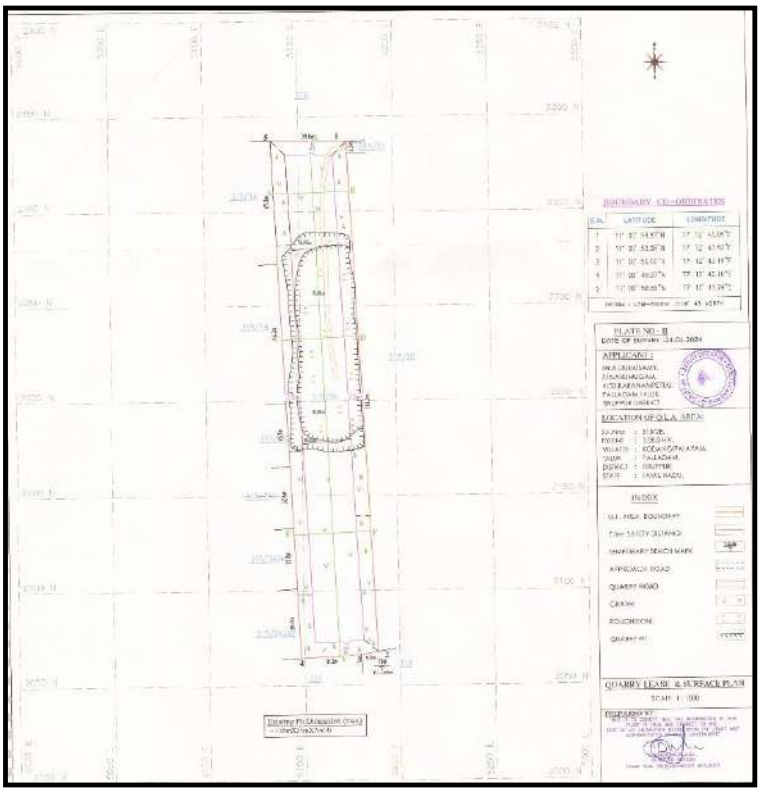


FIGURE – 4: QUARRY LEASE PLAN & SURFACE PLAN

P1

P2



2.4 METHOD OF MINING

Opencast Mechanized Mining Method is being proposed by formation of 5.0-meter height bench with a bench width not less than the bench height. However, as far as the quarrying of Rough Stone is concerned, observance of the provisions of Regulation 106 (2) (b) as above is seldom possible due to various inherent petro genetic factors coupled with mining difficulties. Hence it is proposed to obtain relaxation to the provisions of the above regulation from the Director of Mines Safety for which necessary provision is available with the Regulation 106 (2) (b) of MMR-1961, under Mine Act – 1952.

The top layer of Topsoil will be Excavate directly by Hydraulic Excavators and preserved all along the safety barrier to facilitate greenbelt development during Mine Closure Stage. The Rough Stone is a batholith formation and the splitting of rock mass of considerable volume from the parent rock mass will be carried out by deploying jackhammer drilling and Slurry Explosives will be used for blasting. Hydraulic Excavators attached with Rock Breakers unit will be deployed for breaking large boulders to required fragmented sizes to avoid secondary blasting and hydraulic excavators attached with bucket unit will be deployed for loading the Rough Stone into the tippers and then the stone is transported from pithead to the nearby crushers.

2.5 PROPOSED MACHINERY DEPLOYMENT

PROPOSAL – P1				
S.NO.	**TYPE**	**NOS**	**SIZE/CAPACITY**	**MOTIVE POWER**
1	Jack hammers	4	1.2m to 2.0m	Compressed air
2	Compressor	1	400psi	Diesel Drive
3	Excavator with Bucket / Rock Breaker	1	300 HP	Diesel Drive
4	Tippers	2	20 Tonnes	Diesel Drive
PROPOSAL – P2				
S.NO.	**TYPE**	**NOS**	**SIZE/CAPACITY**	**MOTIVE POWER**
1	Jack hammers	3	1.2m to 2.0m	Compressed air
2	Compressor	1	400psi	Diesel Drive
3	Excavator with Bucket / Rock Breaker	1	300 HP	Diesel Drive
4	Tippers	2	20 Tonnes	Diesel Drive

2.6 WATER REQUIREMENTS

PROPOSAL – P1		
***Purpose**	**Quantity**	**Source**
Domestic & Drinking purpose	0.3KLD	From existing, bore wells and drinking water will be sourced from Approved water vendors.
Dust Suppression	0.7KLD	From Existing bore wells from nearby area
Green Belt	1.0KLD	From Existing bore wells from nearby area
Total	**2.0 KLD**	
PROPOSAL – P2		
***Purpose**	**Quantity**	**Source**
Domestic & Drinking purpose	0.3KLD	From Existing, bore wells and drinking water will be sourced from Approved Water vendors.
Dust Suppression	0.7KLD	From Existing bore wells from nearby area
Green Belt	1.0KLD	From Existing bore wells from nearby area
Total	**2.0 KLD**	

2.7 CONCEPTUAL MINING PLAN/ FINAL MINE CLOSURE PLAN

The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc.,

2.8 ULTIMATE PIT DIMENSION P1 & P2

Code	Length (Max) (m)	Width (Max) (m)	Depth (Max) (m)
PI	70	22	7m bgl
	123	89	42m bgl
P2	254	35	22m bgl

3.0 DESCRIPTION OF THE ENVIRONMENT

The baseline status of the project environment is described section wise for better understanding of the broad-spectrum conditions. The baseline environment quality represents the background environmental scenario of various environmental components such as Land, Water, Air, Noise, Biological and Socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering Oct to Dec 2024 as per CPCB & MoEF & CC guidelines.

3.1 ENVIRONMENT MONITORING ATTRIBUTES

Attribute	Parameters	Frequency of Monitoring	No. of Locations	Protocol
Land-use Land cover	Land-use Pattern within 10 km radius of the study area	Data from census handbook 2011 and from the satellite imagery	Study Area	Satellite Imagery Primary Survey
*Soil	Physio-Chemical Characteristics	Once during the study period	6 (2 core & 4 buffer zone)	IS 2720 Agriculture Handbook - Indian Council of Agriculture Research, New Delhi
*Water Quality	Physical, Chemical and Bacteriological Parameters	Once during the study period	6 (2 surface water & 4 ground water)	IS 10500& CPCB Standards
Meteorology	Wind Speed Wind Direction Temperature Cloud cover Dry bulb temperature Rainfall	1 Hourly Continuous Mechanical/Automatic Weather Station	1	Site specific primary data& Secondary Data from IMD Station
*Ambient Air Quality	PM10 PM2.5 SO2 NOX Fugitive Dust	24 hourlies twice a week (Oct to Dec 2024)	7 (2 core & 5 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
*Noise Levels	Ambient Noise	Hourly observation for 24 Hours per location	7 (2 core & 5 buffer zone)	IS 9989 As per CPCB Guidelines
Ecology	Existing Flora and Fauna	Through field visit during the study period	Study Area	Primary Survey by Quadrate & Transect Study Secondary Data – Forest Working Plan

Socio Economic Aspects	Socio–Economic Characteristics, Population Statistics and Existing Infrastructure in the study area	Site Visit & Census Handbook, 2011	Study Area	Primary Survey, census handbook & need based assessments.

3.2 LAND ENVIRONMENT

To study the land use pattern of the core as well as a buffer zone, land use/land cover details have been identified/ maps have been prepared in accordance with the Standard ToR point**.** A visual interpretation technique has been adopted for land use supervised classification based on training site by Level III classification with 1:50,000 scale for the preparation of land use mapping. Land use pattern of the area was studied through **LISSIII** imagery of **NRSC-Bhuvan.** The 10 km radius map of study area was taken for analysis of **Land use/Landcover.**

TABLE 3.1: LAND USE / LAND COVER TABLE 10 KM RADIUS

S.No	CLASSIFICATION	AREA_HA	AREA_%
BUILTUP			
1	Builtup Urban	1955.05	5.84
2	Builtup Rural	2702.57	8.08
3	Builtup Mining	549.28	1.64
AGRICULTURAL LAND			
4	Agricultural Land	1619.42	4.84
5	Crop Land	19921.02	59.55
6	Fallow Land	5076.08	15.17
BARREN/WASTE LANDS			
7	Scrub Land	1092.56	3.27
WETLANDS/ WATER BODIES			
8	Waterbodies	537.81	1.61
TOTAL		**33453.80**	**100**

LU/LC Interpretation:

From the above table, pie diagram and land use map it is inferred that the majority of the land in the study area is Agriculture and fallow land (includes crop land) 79.56 % followed by Built-up Lands – 13.92 %, Scrub land – 3.27%, and Water bodies 1.61%.

The total mining area within the study area is 549.28 ha i.e., 1.64%. The cluster area of 15.02.89ha contributes about 2.73% of the total mining area within the study area. This small percentage of Mining Activities shall not have any significant impact on the environment.

3.3 SOIL ENVIRONMENT

The samples were analysed as per the standard methods prescribed in “Soil Chemical Analysis (M.L. Jackson, 1967) & Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India”. The important properties analysed for soil are bulk density, porosity, infiltration rate, pH and Organic matter, kjeldahi Nitrogen, Phosphorous and Potassium

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 (21.25 % to 27.5%) to Sandy Loam Soil and Bulk Density of Soils in the study area varied between 1.12 to 1.16 g/cc. The Water Holding Capacity is found to be medium i.e., ranging from 48 – 72 %.

Chemical Characteristics

- The nature of soil is slightly alkaline to strongly alkaline with pH range 7.48 to 8.12
- The available Nitrogen content range between 276 to 526.8mg/kg
- The available Phosphorus content range between 3.0 to 8.3mg/kg
- The available Potassium range between 0.6 to 1.3 mg/100g

Wilting coefficient in significant level would mean that the soil would support the vegetation. The soil properties in the buffer zone reveal that the soil can sustain vegetation. If amended suitability the core area can also withstand plantation.

Observation:

The pH of the Soil indicates that the soil is Neutral and arid region and ideal for plant growth.

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

The pH varied from 7.68 to 7.92 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 625 to 1056 mg/l, the TDS mainly composed of carbonates, bicarbonates, Chlorides, phosphates and nitrates of calcium, magnesium, sodium and other organic matter.

Other parameters:

Chloride content is 220–260 mg/l. Nitrates varied from BDL (DL:2.0), while sulphates varied from 93-281 mg/l

Ground Water

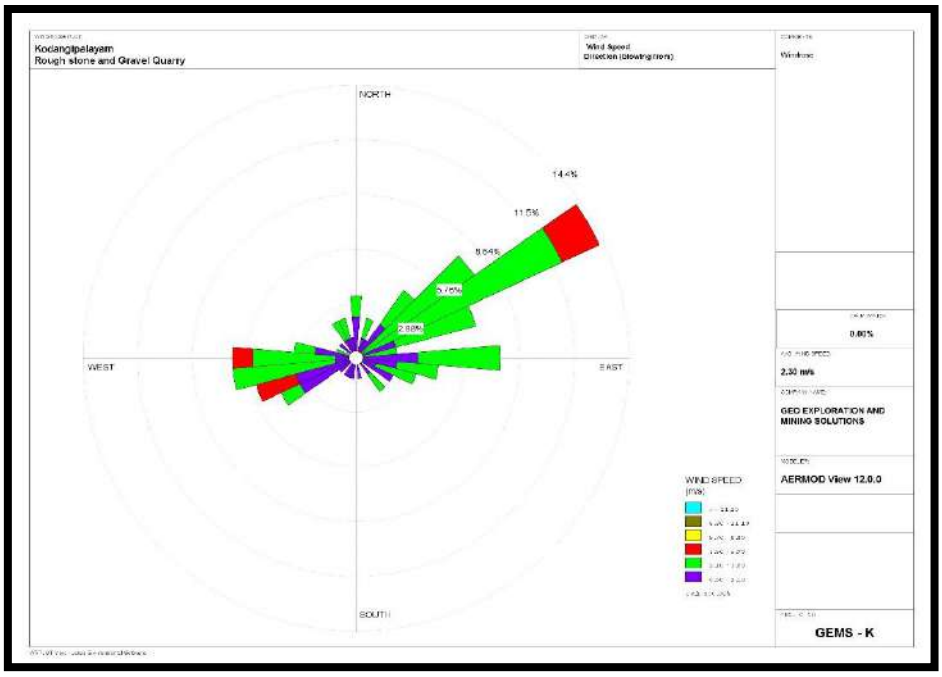
The pH of the water samples collected ranged from 7.28 to 7.63 and within the acceptable limit of 6.5 to 8.5. pH, Sulphates and Chlorides of water samples from all the sources are within the limits as per the Standard. On Turbidity, the water samples meet the requirement. Total Dissolved Solids were found in the range of 625-1056 mg/l in all samples. Total hardness varied between 360-570mg/l for all samples.

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

As per monitoring data, PM_{10} ranges from 41.5 µg/m3 to 46.0 µg/m3, $PM_{2.5}$ data ranges from 20.4 µg/m3 to 25.4 µg/m3, SO_2 ranges from 4.6µg/m3 to 5.0µg/m3 and NO_2 data ranges from 19.8 µg/m3 to 20.6 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 (Seven) locations around the proposed project area. Noise levels recorded in core zone during day time were from 43.1 -43.4 dB (A) Leq and during night time were from 35.0 – 36.6 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 47.7 to 49.7dB (A) Leq and during night time were from 35.2 to 39.4 dB (A) Leq. Thus, the noise level for Industrial and Residential area meets the requirements of CPCB.

3.8 ECOLOGICAL ENVIRONMENT

The study involved in the collection of primary data by conducting a survey in the field, examination of floral and faunal records in previously published reports and records. Analysis of the information is the view of the possible alteration in the environment of the project site. For the survey of fauna, both direct and indirect observation methods were used.

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 54 persons to the local people there by improving the indirect employment opportunity for 100 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

- Permanent or temporary change on land use and land cover.
- Change in Topography: Topography of the ML area will change at the end of the life of the mine.
- Movement of heavy vehicles sometimes cause problems to agricultural land, human habitations due to dust, noise and it also causes traffic hazards.
- Due to degradation of land by pitting the aesthetic environment of the core zone may be affected.
- Earthworks during the rainy season increase the potential for soil erosion and sediment laden water entering the water ways.
- If no due care is taken wash off from the exposed working area may choke the water course & can also causes the siltation of water course.

MITIGATION MEASURES

- The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigative measures like phase wise development of greenbelt etc.,
- Construction of garland drains all around the quarry pits and construction of check dam at strategic location in lower elevations to prevent erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area
- Green belt development along the boundary within safety zone. The small quantity of water stored in the mined-out pit will be used for greenbelt.
- Thick plantation will be carried out on unutilized area, top benches of mined out pits, on safety barrier, etc.,
- At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir.

- In terms of aesthetics, natural vegetation surrounding the quarry will be retained (such as in a buffer area i.e., 7.5 m safety barrier and other safety provided) so as to help minimise dust emissions.
- Proper 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

Erosion and Sedimentation (Removal of protective vegetation cover; Exposure of underlying soil horizons that may be less pervious, or more erodible than the surface layers; Reduced capacity of soils to absorb rainfall; Increased energy in storm-water runoff due to concentration and velocity; and Exposure of subsurface materials which are unsuitable for vegetation establishment).

MITIGATION MEASURES FOR SOIL CONSERVATION

- Run-off diversion – Garland drains will be constructed all around the project boundary to prevent surface flows from entering the quarry works areas. And will be discharged into vegetated natural drainage lines, or as distributed flow across an area stabilised against erosion.
- Sedimentation ponds - Run-off from working areas will be routed towards sedimentation ponds. These trap sediment and reduce suspended sediment loads before runoff is discharged from the quarry site. Sedimentation ponds should be designed based on runoff, retention times, and soil characteristics. There may be a need to provide a series of sedimentation ponds to achieve the desired outcome.
- Retain vegetation – Retain existing or re-plant the vegetation at the site wherever possible.
- Monitoring and maintenance – Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season

4.3 WATER ENVIRONMENT

ANTICIPATED IMPACT

- The major sources of water pollution normally associated due to mining and allied operations are:
    - Generation of waste water from vehicle washing.
    - Washouts from surface exposure or working areas
    - Domestic sewage
    - Disturbance to drainage course in the project area
    - Mine Pit water discharge
- Increase in sediment load during monsoon in downstream of lease area
- This being a mining project, there will be no process effluent. Waste from washing of machinery may result in discharge of Oil & grease, suspended solids.
- The sewage from soak pit may percolate to the ground water table and contaminate it.
- Surface drainage may be affected due to Mining
- Abstraction of water may lead to depletion of water table

MITIGATION MEASURES

- Garland drain, settling tank will be constructed along the project area. The Garland drain will be connected to settling tank and sediments will be trapped in the settling traps and only clear water will be discharged out to the natural drainage
- Providing benches with inner slopes and through a system of drains and channels, allowing rain water to descent into surrounding drains, so as to minimize the effects of erosion & water logging arising out of uncontrolled descent of water
- Reuse the water collected during storm for dust suppression and greenbelt development within the mines
- Installing interceptor traps/oil separators to remove oils and greases. Water from the tipper wash-down facility and machinery maintenance yard will pass through interceptor traps/oil separators prior to its reuse;
- Using flocculating or coagulating agents to assist in the settling of suspended solids during monsoon seasons;

4.4 AIR ENVIRONMENT

ANTICIPATED IMPACT

- Garland drain, settling tank will be constructed along the proposed mining lease area. The Garland drain will be connected to settling tank and sediments will be trapped in the settling traps and only clear water will be discharged out to the natural drainage
- Rainwater will be collected in sump in the mining pits and will be allowed to store and pumped out to surface setting tank of 15 m x 10m x 3m to remove suspended solids if any. This collected water will be judiciously used for dust suppression and such sites where dust likely to be generated and for developing green belt. The proponent will collect and judicially utilize the rainwater as part of rainwater harvesting system.
- Providing benches with inner slopes and through a system of drains and channels, allowing rain water to descent into surrounding drains, so as to minimize the effects of erosion & water logging arising out of uncontrolled descent of water.
- Reuse the water collected during storm for dust suppression and greenbelt development within the mines
- Installing interceptor traps/oil separators to remove oils and greases. Water from the tipper wash-down facility and machinery maintenance yard will pass through interceptor traps/oil separators prior to its reuse;
- Using flocculating or coagulating agents to assist in the settling of suspended solids during monsoon seasons;
- Periodic (every 6 month once) analysis of quarry pit water and ground water quality in nearby villages.
- Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits.
- Waste water 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 (every 6 month once) and analysing the quality of water in open well, bore wells and surface water.

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 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.
- 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
- AAQ monitoring will be conducted six months once to assess effectiveness of mitigation measures proposed

4.5 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.

4.6 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

Keeping all this in mind the mitigations have been suggested under environmental management plan. With the understanding of the role of plant species as bio-filter to control air pollution, appropriate plant species (mainly tree species) have been suggested conceding the area/site requirements and needed performance of specific species. The details of year wise proposed plantation program.

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 in proposed areas falls in the cluster earmarked for plantation program as per

Approved Mining Plan in different phases. This habitat improvement program would ensure the faunal species to re-colonize and improve the abundance status in the core zone.

The objectives of the green belt cover will cover the following:

- Noise abatement
- Ecological restoration
- Aesthetic, biological and visual improvement of area due to improved vegetative and plantations cover.

4.7 SOCIO ECONOMIC ENVIRONMENT

ANTICIPATED IMPACT

- Dust generation from mining activity can have negative impact on the health of the workers and people in the nearby area.
- Approach roads can be damaged by the movement of tippers.
- Increase in Employment opportunities both direct and indirect thereby increasing economic status of people of the region.

MITIGATION MEASURES

- Good maintenance practices will be adopted for all 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)

No alternatives are suggested as all the mine sites are mineral specific

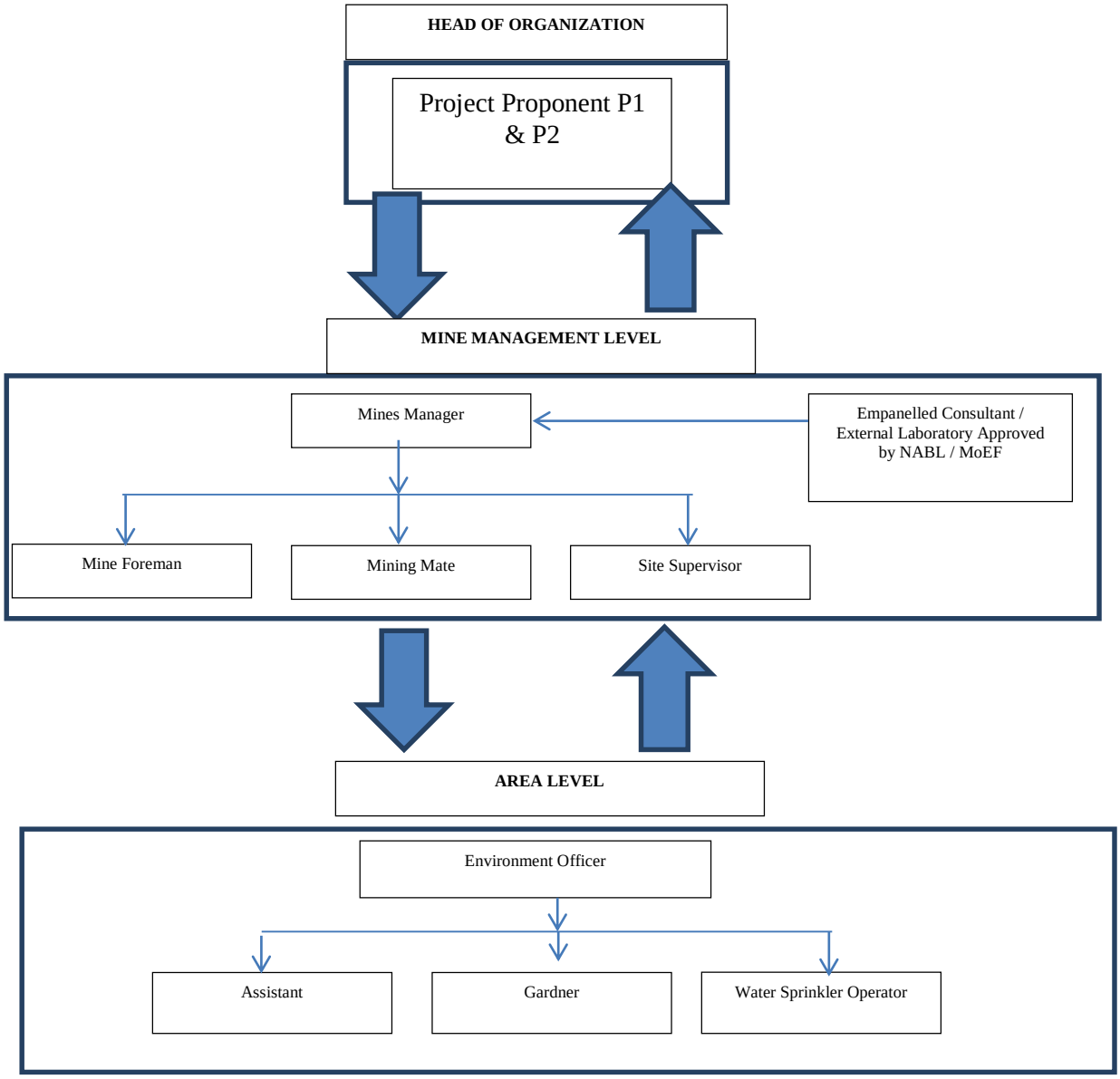
6. ENVIRONMENT MONITORING PROGRAM

An Environment monitoring cell (EMC) will be constituted to monitor the implementation of EMP and other environmental protection measures in all the proposed quarries.

The responsibilities of this cell will be:

- Implementation of pollution control measures
- Monitoring programme implementation
- Post-plantation care
- To check the efficiency of pollution control measures taken
- Any other activity as may be related to environment
- Seeking expert's advice when needed.

6.1 ENVIRONMENTAL MONITORING CELL



6.2 POST ENVIRONMENTAL CLEARANCE MONITORING SCHEDULE

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 for proposed project. Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening

7.2 DISASTER MANAGEMENT PLAN

Natural disasters like Earthquake, Landslides have not been recorded in the past history as the terrain is categorized under seismic zone III. The area is far away from the sea hence the disaster due to heavy floods and tsunamis are not anticipated.

The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities.

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 ROUGH STONE IN CLUSTER

Quarry	Production for five-year plan period	Per Year Production in m^3	Per Day Production in m^3	Number of Lorry Load Per Day
P1	137627	27525	92	8
P2	90371	18074	60	5
P3	69756	13951	47	4
P4	73870	14774	49	4
P5	-	-	-	-
Total	**371624**	**74324**	**248**	**21**
E1	126000	25200	84	7
E2	301402	60280	201	17
E3	13815	2763	9	1
E4	235150	47030	157	13
Total	**676367**	**135273**	**451**	**38**
Grand Total	**1047991**	**209597**	**699**	**59**

CUMULATIVE PRODUCTION LOAD OF GRAVEL IN CLUSTER

Quarry	Production for one / three-year plan period	Per Year Production in m^3	Per Day Production in m^3	Number of Lorry Load Per Day
P1	608	608	2	1
P2	8754	2918	10	1
P3	-	-	-	-
P4	2,688	896	3	1
P5	-	-	-	-
Total	**12050**	**4422**	**15**	**3**
E1	11760	3920	13	1
E2	2262	754	3	1
E3	6662	2221	7	1
E4	1337	446	1	1
Total	**22021**	**7341**	**24**	**4**
Grand Total	**34071**	**11763**	**39**	**7**

PREDICTED NOISE INCREMENTAL VALUES FROM MINES

VLocation ID	N1	N2	N3	N4	N5	N6	N7
Maximum Monitored Value (Day) dB(A)	49.7	46.2	46.8	45.9	49.8	48.1	47.9
Incremental Value dB(A)	56.6	52.1	43.8	33.9	24.2	25.7	25.3
Total Predicted Noise level dB(A)	54.5	53.1	48.6	46.2	49.8	48.1	47.9

EMISSION ESTIMATION FROM CLUSTER MINES

EMISSION ESTIMATION FOR QUARRY "P1"				
	Activity	**Source type**	**Value**	**Unit**
Estimated Emission Rate for PM_{10}	Drilling	Point Source	0.091254631	g/s
	Blasting	Point Source	0.001530696	g/s
	Mineral Loading	Point Source	0.043515527	g/s
	Haul Road	Line Source	0.002494893	g/s/m
	Overall Mine	Area Source	0.060543171	g/s
Estimated Emission Rate for SO_2	Overall Mine	Area Source	0.000877502	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000055013	g/s
EMISSION ESTIMATION FOR QUARRY "P2"				

	Activity	Source type	Value	Unit
Estimated Emission Rate for PM_{10}	Drilling	Point Source	0.070151617	g/s
	Blasting	Point Source	0.000410963	g/s
	Mineral Loading	Point Source	0.040018016	g/s
	Haul Road	Line Source	0.002487668	g/s/m
	Overall Mine	Area Source	0.045925490	g/s
Estimated Emission Rate for SO_2	Overall Mine	Area Source	0.00036078	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000012684	g/s
EMISSION ESTIMATION FOR QUARRY "P3"				
	Activity	**Source type**	**Value**	**Unit**
Estimated Emission Rate for PM_{10}	Drilling	Point Source	0.079151983	g/s
	Blasting	Point Source	0.000751490	g/s
	Mineral Loading	Point Source	0.041154605	g/s
	Haul Road	Line Source	0.002489449	g/s/m
	Overall Mine	Area Source	0.050311742	g/s
Estimated Emission Rate for SO_2	Overall Mine	Area Source	0.000495456	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000021140	g/s
EMISSION ESTIMATION FOR QUARRY "P4"				
	Activity	**Source type**	**Value**	**Unit**
Estimated Emission Rate for PM_{10}	Drilling	Point Source	0.035535927	g/s
	Blasting	Point Source	0.000013707	g/s
	Mineral Loading	Point Source	0.038682461	g/s
	Haul Road	Line Source	0.002486083	g/s/m
	Overall Mine	Area Source	0.046209504	g/s
Estimated Emission Rate for SO_2	Overall Mine	Area Source	0.000223263	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000008062	g/s
EMISSION ESTIMATION FOR QUARRY "E1"				
	Activity	**Source type**	**Value**	**Unit**
Estimated Emission Rate for PM_{10}	Drilling	Point Source	0.060829329	g/s
	Blasting	Point Source	0.000201456	g/s
	Mineral Loading	Point Source	0.038605263	g/s
	Haul Road	Line Source	0.002486005	g/s/m
	Overall Mine	Area Source	0.048980782	g/s
Estimated Emission Rate for SO_2	Overall Mine	Area Source	0.000252885	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000010385	g/s
EMISSION ESTIMATION FOR QUARRY "E2"				
	Activity	**Source type**	**Value**	**Unit**
Estimated Emission Rate for PM_{10}	Drilling	Point Source	0.049321908	g/s
	Blasting	Point Source	0.000070601	g/s
	Mineral Loading	Point Source	0.035765516	g/s
	Haul Road	Line Source	0.00248395	g/s/m
	Overall Mine	Area Source	0.035201641	g/s
Estimated Emission Rate for SO_2	Overall Mine	Area Source	0.000110276	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000002180	g/s
EMISSION ESTIMATION FOR QUARRY "E3"				
	Activity	**Source type**	**Value**	**Unit**
Estimated Emission Rate for PM_{10}	Drilling	Point Source	0.085816323	g/s
	Blasting	Point Source	0.001125807	g/s
	Mineral Loading	Point Source	0.041990717	g/s
	Haul Road	Line Source	0.002491073	g/s/m
	Overall Mine	Area Source	0.062836506	g/s

Estimated Emission Rate for SO_2	Overall Mine	Area Source	0.000644729	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000044886	g/s
EMISSION ESTIMATION FOR QUARRY "E4"				
Estimated Emission Rate for PM_{10}	**Activity**	**Source type**	**Value**	**Unit**
	Drilling	Point Source	0.070151617	g/s
	Blasting	Point Source	0.000410963	g/s
	Mineral Loading	Point Source	0.040018016	g/s
	Haul Road	Line Source	0.002487668	g/s/m
	Overall Mine	Area Source	0.045925490	g/s
Estimated Emission Rate for SO_2	Overall Mine	Area Source	0.00036078	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000012684	g/s

NEAREST HABITATION FROM EACH MINE

Location ID	Distance & Direction
Habitation Near P1	390m – NW
Habitation Near P2	310m – NW
Habitation Near P3	1.0km -NW
Habitation Near P4	320 m - NW
Habitation Near P5	-
Habitation Near E1	500 m -NW
Habitation Near E2	550 m -NW
Habitation Near E3	380 m -NW
Habitation Near E4	1.0km-NW

SOCIO ECONOMIC BENEFITS

Location ID	Project Cost	CER
P1	Rs. 1,90,71,000/-	Rs.5,00,000
P2	Rs. 1,16,18,000/-	Rs.5,00,000
P3	Rs.92,55,000/-	Rs.5,00,000
P4	Rs.83,05,593/-	Rs.5,00,000
P5	-	-
E1	Rs.87,17,800/-	Rs.5,00,000
E2	Rs.1, 70,52,500/-	Rs.5,00,000
E3	Rs.43, 36,000/-	Rs.5,00,000
E4	Rs. 1,46,95,000	Rs.5,00,000
Total	**Rs.9,30,50,893/-**	**Rs.40,00,000**

8. PROJECT BENEFITS

The Proposed Project for Quarrying Rough Stone and gravel at Kodangipalayam Village aims to produce about 2,27,998m3 Rough Stone over a period of 5 Years and Gravel 9,362m3 for period of Three 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

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

Various aspects of mining activities were considered and related impacts were evaluated. Considering all the possible ways to mitigate the environmental concerns Environmental Management Plan was prepared and fund has been allocated for the same. The EMP is dynamic, flexible and subjected to periodic review. For project where the major environmental impacts are associated, EMP will be under regular review. Senior Management responsible for the project will conduct a review of EMP and its implementation to ensure that the EMP remains effective and appropriate. Thus, the proper steps will be taken to accomplish all the goals mentioned in the EMP and the project will bring the positive impact in the study area.

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