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# EXECUTIVE SUMMARY

**“B1” CATEGORY (Cluster) – MINOR MINERAL – CLUSTER – PATTALAND**

## KEERANUR ROUGH STONE AND GRAVEL CLUSTER QUARRIES

At

Keeranur Village, Kangayam Taluk, Tiruppur District, Tamil Nadu State

For Obtaining

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

**IN CLUSTER OVER AN EXTENT OF 10.45.38ha**



NAME OF PROPOSED PROJECT PROPONENTS APPLYING IN CLUSTER

Code	Proponent Name	Extent (Ha)
P1	Thiru. B. Vishnu Kumar	2.00.21 ha
P2	Thiru. P.Sasikumar	4.44.0 ha

**Compiled as per Tor Obtained Vide**

Lr No.SEIAA-TN/F.No.10458/SEAC/ToR-1627/2023 Dated: 12.12.2023-P1

Lr No.SEIAA-TN/F.No.9456/SEAC/1(a) ToR-1692/2024 Dated: 23.04.2024-P2

<p><b>Environmental Consultant</b> <b>GEO EXPLORATION AND MINING SOLUTIONS</b>  Old No. 260-B, New No. 17, Advaita Ashram Road, Alagapuram, Salem – 636 004, Tamil Nadu, India <b>Accredited for sector 1 Cat ‘A’, sector 31 &amp; 38 Cat ‘B’</b> Certificate No : NABET/EIA/2225/RA 0276 Phone: 0427-2431989, Email: ifthiahmed@gmail.com, geothagam@gmail.com Web: <a href="http://www.gemssalem.com">www.gemssalem.com</a> </p>	<p><b>Laboratory</b> <b>EHS 360 LABS PRIVATE LIMITED,</b> 10/2 Ground floor, 50th street, 7th Avenue, Ashok Nagar, Chennai – 600 083.</p>
<p><b><u>Baseline Monitoring Period</u></b> <b>December 2023 to February 2024</b></p>	
<p><b>APRIL 2024</b></p>	

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## 1. INTRODUCTION

Rough Stone quarry are the major requirements for construction industry. This EIA report is prepared by considering Cumulative load of all proposed & existing quarries of Keeranur Rough Stone and Gravel Quarries Cluster consisting of 2 proposal, 1 Approved EC Proposal and 1 Existing quarries with total extent of Cluster of 10.45.38Ha in Keeranur Village, Kangayam Taluk, Tiruppur District, Tamil Nadu State, cluster area calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016.

The proponent has obtained necessary statutory clearances from the Department of Geology and Mining, Tiruppur District, Tamil Nadu (Statutory Clearance Documents are enclosed along with Mining plan as Annexure No III). The total Extent of the quarries within the radius of 500m from this proposal is > 5Ha, hence the proposal falls under “B1” Category project as per the EIA notification, 2006 (As amended timely).

Proponent applied for Environmental Clearance to SEIAA, Tamil Nadu and obtained

CODE	Name of the proponent	Extent (Ha)	Terms of Reference (ToR)
P1	Thiru. B. Vishnu Kumar	2.00.21 ha	Lr No.SEIAA-TN/F.No.10458/SEAC/ToR-1627/2023 Dated: 12.12.2023
P2	Thiru. P. Sasi kumar	4.44.0 ha	Lr No.SEIAA-TN/F.No.9456/SEAC/1(a) ToR-1692/2024 Dated: 23.04.2024

for carrying out EIA and EMP studies for the rough stone quarry.

To carry out the EIA studies and to prepare EIA and EMP studies the proposed & existing quarries of Keeranur Rough Stone And Gravel Cluster Quarries have engaged a consultant M/s. Geo Exploration and Mining Solutions, Salem, Tamil Nadu. The Baseline Monitoring study has been carried out during Post Monsoon season (Dec 2023 – Feb 2024) considering the provisions of MoEF & CC Office Memorandum Dated: 29.08.2017 and MoEF & CC Notification S.O. 996 (E) Dated: 10.04.2015.

### **“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

Project	P1	P2
Name of the Project Proponent	Thiru. B. Vishnu Kumar	Thiru. P. Sasi kumar
Address	S/o. Balasubramaniam, No.4/114-G, Sedarpalayam, Vavipalayam, Tiruppur District, Tamil Nadu State – 641 666	S/o. Palanisamy, No. 5/257, Keeranur Village, Kangayam Taluk, Tiruppur District – 638 701
Mobile	+91 96888 54077	+91 98945 44917
Status	Individual	Individual

**1.2 QUARRY DETAILS WITHIN 500 M RADIUS**

<b>PROPOSED QUARRIES</b>					
<b>CODE</b>	<b>Name of the Owner</b>	<b>Village</b>	<b>S.F. Nos</b>	<b>Extent in Ha</b>	<b>Status</b>
<b>P1</b>	Thiru.B. Vishnu Kumar, S/o. Balasubramaniam, No.4/114-G, Sedarpalayam, Vavipalayam, Tiruppur District – 641 666	Keeranur	441/A1 (P), A2 (P), A3 (P) & A4 (P)	2.00.21	<b>Lr.No.SEIAA- TN/F.No.10458/ToR- 1627/2023 Dated: 12.12.2023.</b>
<b>P2</b>	Thiru.P.Sasikumar, S/o. Palanisamy, No. 5/257, Keeranur Village, Kangayam Taluk, Tiruppur District – 638 701	Keeranur	449 (P) & 450	4.44.0	<b>Lr.No.SEIAA- TN/F.No.9456/SEAC/1(a) ) ToR-1692/2024 Dated: 23.04.2024</b>
<b>P3</b>	Thiru.P. Sasikumar, S/o. Palanisamy, No. 5/257, Keeranur Village, Kangayam Taluk, Tiruppur District – 638 701	Keeranur	442(P)	2.00.0	File No.: 8549 EC Granted on 25.03.2024
<b>TOTAL EXTENT</b>				<b>8.44.21</b>	
<b>EXISTING QUARRIES</b>					
<b>CODE</b>	<b>Name of the Owner</b>	<b>Village</b>	<b>S.F. Nos</b>	<b>Extent in Ha</b>	<b>Status</b>
E-1	<b>S.P.Balasubramaniam</b>	Keeranur	603/3 (P), 603/4(P)	2.01.17	01.10.2018 to 30.09.2023
<b>TOTAL EXTENT</b>				<b>2.01.17</b>	
<b>EXPIRED QUARRIES</b>					
EX-1	<b>C.P.Velusamy</b>			<b>2.15.0</b>	
EX-2	<b>Thiru.N.Subramaniam</b>			<b>2.15.0</b>	
EX-3	<b>Thiru.A.M.Palanisamy</b>			<b>2.41.0</b>	
<b>TOTAL EXTENT</b>				<b>6.71.0</b>	
<b>TOTAL CLUSTER EXTENT</b>				<b>10.45.38ha</b>	

Cluster area is calculated as per MoEF & CC Notification – S.O. 2269 (E) Dated: 01.07.2016

**TABLE 1.3 SALIENT FEATURES OF THE PROPOSAL - P1**

Name of the Project	Thiru. B. Vishnu Kumar Rough Stone and gravel quarries
S.F. No.	441/A1 (P), A2 (P), A3 (P) & A4 (P)
Extent	2.00.21 ha
Village Taluk and District	Keeranur Village, Kangayam Taluk, Tiruppur District.
Land Type	It is a patta lands, registered in the name of the applicant (Thiru.B. Vishnu Kumar) vide patta no. 3902 and Tmt B. Vijay Lakshmi, vide patta no.556,508 & 518. The applicant has obtained consent from the pattadhars.
Previous history	The lease was previously operated by Thiru.Sasikumar vide proceeding No.Rc.No.900/Mines/2009, dated:08.05.2010 and lease period from 08.05.2010 to 07.05.2015 at S.F.Nos. 449(P) & 450 (Extent :4.44.0 ha).
Existing Pit Dimensions	68m (L)*23m (W)*12m (D) bgl
Toposheet No	58-E/12
Latitude between	11° 04' 56.20"N to 11° 05' 02.05"N

Longitude between	77° 33' 27.55"E to 77° 33' 33.06"E		
Elevation of the area	282m AMSL		
Lease period/Mining Plan period	5 years		
Proposed Depth of Mining	45m bgl (2m Gravel + 3m weathered rock+ 40m Rough stone)		
Geological Resources	Rough Stone in m <sup>3</sup>	Weathered Rock m <sup>3</sup>	Gravel m <sup>3</sup>
	7,94,365	55,770	36,894
Mineable Reserves	2,64,320	42,480	30,240
Year wise Production	2,64,320	42,480	30,240
Peak Production	61,120	18,054	13,680
Ultimate Pit Dimension	126m (L) x 131 (W) x 45m(D) bgl		
Water Level in the region	58 m bgl		
Method of Mining	Opencast Mechanized Mining Method involving drilling and Controlled blasting using Slurry Explosives		
Topography	The lease applied area is plain terrain. The area has gentle sloping towards Northeastern side and altitude of the area is 282m above from Mean sea level. The area is covered by 2m thickness of Gravel,3m of weathered rock and followed by Massive Charnockite is found after 5m(2m Gravel + 3m weathered rock)which is clearly inferred from existing quarry pit.		
Machinery proposed	Jack Hammer	6 Nos	
	Compressor	2 No	
	Excavator with Bucket and Rock Breaker	2No	
	Tippers	4 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	32 Nos		
Project Cost	Rs. 73,48,000/-		
EMP Cost	Rs. 3,80,000/-		
Total Project cost	Rs. 77,28,000/-		
CER Cost	Rs. 5,00,000/-		
Nearby Water Bodies	Noyyal River	3Km_N	
	Karaikattupudur Eri	3.5km_SW	
	Odai	4Km_SE	
	Tank	7.5Km_NW	
	Canal	6Km_N	
	Palatholuvu Kulam	9Km_NW	
Greenbelt Development Plan	Proposed to plant 1000 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	1.0 KLD		
Nearest Habitation	790m – S.West		
Nearest Reserve Forest	Chennimalai – 7.43 km –North (Source - TNGIS)		
Nearest Wild Life Sanctuary	Vellode Birds Sanctuary -20.5km-North East		

Source: Approved Mining & Land Documents.

**TABLE 1.4 SALIENT FEATURES OF THE PROPOSAL – P2**

Name of the Project	Thiru. P. Sasi Kumar Rough Stone Quarry	
S.F. No.	449(P) & 450	
Extent	4.44.0 ha	
Village Taluk and District	Keeranur Village, Kangayam Taluk, Tiruppur District.	
Land Type	It is a patta lands, registered in the name of the applicant (Thiru.P. Sasi Kumar).	
Previous history	The lease was previously operated by Tmt. B. Vijaylakshmi vide proceeding No.Rc.No.166/Mines/2011, dated:03.07.2012 and lease period from 03.07.2012 to 02.07.2017 at S.F.Nos. 441/A1,441/A2 & 441/A3 (Extent :2.78.0 ha. A penalty of Rs.32,86,890/- has been levied and amount paid by Tmt. B. Vijaylakshmi	
Existing Pit Dimensions	210m (L)*220m (W)*12m (D) bgl	
Toposheet No	58-E/12	
Latitude between	11° 04' 45.60"N to 11° 04' 53.95"N	
Longitude between	77° 33' 19.87"E to 77° 33' 29.50"E	
Elevation of the area	273m AMSL	
Lease period/Mining Plan period	5 years	
Proposed Depth of Mining	37m bgl (2m Gravel + 35m Rough stone)	
Geological Resources	Rough Stone in m <sup>3</sup>	Gravel m <sup>3</sup>
	11,64,716	2,552
Mineable Reserves	6,76,350	-
Year wise Production	4,52,430	-
Peak Production	92,430	-
Ultimate Pit Dimension	210m (L) x 220 (W) x 37m(D) bgl	
Water Level in the region	65 m bgl	
Method of Mining	Opencast Mechanized Mining Method involving drilling and Controlled blasting using Slurry Explosives	
Topography	The lease applied area is flat terrain. The area has gentle sloping towards West side and altitude of the area is 273m above from Mean sea level. The area is covered by 2m thickness of Gravel and followed by Massive Charnockite is found after 2m Gravel which is clearly inferred from existing quarry pit.	
Machinery proposed	Jack Hammer	10 Nos
	Compressor	3 No
	Excavator with Bucket and Rock Breaker	2 No
	Tippers	5 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	40 Nos	
Project Cost	Rs. 75,56,000/-	
EMP Cost	Rs. 3,80,000/-	
Total Project cost	Rs. 79,36,000/-	
CER Cost	Rs. 5,00,000/-	
Nearby Water Bodies	Noyyal River	3.1Km_N
	Karaikattupudur Eri	3.2Km_W
	Odai	3.9Km_SE
	Tank	7.5Km_NW
	Canal	6Km_NE

	Palatholuvu Kulam	9.1Km_NW
Greenbelt Development Plan	Proposed to plant 2,220 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	2.0 KLD	
Nearest Habitation	610m – SW	
Nearest Reserve Forest	Chennimalai – 7.65 km –North (Source - TNGIS)	
Nearest Wild Life Sanctuary	Vellode Birds Sanctuary -21 km-North East	

Source: Approved Mining & Land Documents.

## 1.5 STATUTORY DETAILS

### Project – P1

- The proponent applied for Rough Stone and Gravel Quarry Lease Dated: 10.10.2022.
- Precise Area Communication Letter was issued by the District Collector, Tiruppur vide RC.No. 685/mines/2022 Dated 21.03.2023
- The Mining Plan was prepared by Recognized Qualified Person and approved by Assistant Director, Geology and Mining, Tiruppur District, vide RC.No. 685/mines/2022 Dated 03.04.2023
- 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/446038/2023. dated: 27.09.2023
- The proposal was placed in 423<sup>th</sup> SEAC meeting held on 15.11.2023 and the committee recommended for issue of ToR.
- The proposal was considered in 678<sup>th</sup>SEIAA meeting held on 11.12.2023 & 12.12.2023 and issued ToR vide Lr No. SEIAA-TN/F.No.10458/SEAC/ToR-1627/2023 Dated: 12.12.2023

### Project – P2

- The proponent applied for Rough Stone and Gravel Quarry Lease Dated: 01.09.2021
- Precise Area Communication Letter was issued by the District Collector, Tiruppur vide RC.No. 1309/mines/2021 Dated 25.04.2022
- The Mining Plan was prepared by Recognized Qualified Person and approved by Assistant Director, Geology and Mining, Tiruppur District, vide RC.No. 1309/mines/2021 Dated 22.06.2022.
- 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/81244/2021. dated: 28.07.2022
- The proposal was placed in 319<sup>th</sup> SEAC meeting held on 12.10.2022 and the committee recommended for issue of ToR.
- The proposal was considered in 564<sup>th</sup> and 679<sup>th</sup> and 713<sup>rd</sup> SEIAA meeting held on 28.10.2022 & 13.12.2023 and 23.04.2024 issued ToR vide Lr No.SEIAA-TN/F.No.9456/SEAC/1(a) ToR-1692/2024 Dated: 23.04.2024

## 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 is 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 pit head to the needy crushers and rock breakers to avoid secondary blasting.

### 2.1 SITE CONNECTIVITY TO THE PROJECT AREA

Nearest Roadway	NH81- Coimbatore – Trichy – 9.0km-S SH96- Chennimalai to Kangayam – 2.0km-E
Nearest Village	Keeranur – 630m- SW
Nearest Town	Kangayam - 9.0km-S
Nearest Railway Station	Tiruppur – 24.0km-NW
Nearest Airport	Coimbatore –66.0km –SW
Seaport	Kochi-191km – SW

### 2.2 LAND USE PATTERN OF THE PROPOSED PROJECT

#### LAND USE PATTERN-P1

Description	Present area (Ha)	Area at the end of this quarrying period (Ha)
Area under quarrying	0.10.11	1.60.31
Infrastructure	Nil	0.01.0
Roads	0.02.00	0.02.0
Green Belt	Nil	0.16.00
Unutilized Area	1.88.10	0.20.90
<b>Grand Total</b>	<b>2.00.21</b>	<b>2.00.21</b>

#### LAND USE PATTERN-P2

Description	Present area (Ha)	Area at the end of this quarrying period (Ha)
Area under quarrying	3.54.0	3.54.0
Infrastructure	Nil	0.01.0
Roads	0.02.00	0.02.0
Green Belt	Nil	0.16.00
Unutilized Area	0.88.0	0.71.00
<b>Grand Total</b>	<b>4.44.0</b>	<b>4.44.0</b>

### 2.3 OPERATIONAL DETAILS FOR PROPOSED PROJECTS

#### RESOURCES AND RESERVES-P1

PARTICULARS	DETAILS		
	Rough Stone in m <sup>3</sup>	Weathered Rock in m <sup>3</sup>	Gravel in m <sup>3</sup>
Geological Resources	7,94,365	55,770	36,894
Mineable Reserves	2,64,320	42,480	30,240
Production for five-year plan period	2,64,320	42,480	30,240
Peak Production	61,120	18054	13680

Mining Plan Period / Lease Applied Period	5 Years		
Number of Working Days	300 Days		
Production per day	204	60	46
No of Lorry loads (12m <sup>3</sup> per load)	17	5	4
Total Depth of Mining	45m (2m Gravel +3m Weathered ock+40m Rough stone) below ground level.		

Source: Approved Mining Plan

**RESOURCES AND RESERVES-P2**

PARTICULARS	DETAILS
	Rough Stone in m <sup>3</sup>
Geological Resources	11,64,716
Mineable Reserves	6,76,350
Production for five-year plan period	4,52,430
Peak Production	92,430
Mining Plan Period / Lease Applied Period	5 Years
Number of Working Days	300 Days
Production per day	308
No of Lorry loads (12m <sup>3</sup> per load)	26
Total Depth of Mining	37m (2m Gravel +35m Rough stone) below ground level.

Source: Approved mining plan.

**FIGURE – 1: GOOGLE IMAGE SHOWING PROJECT AREA-P1-P2**



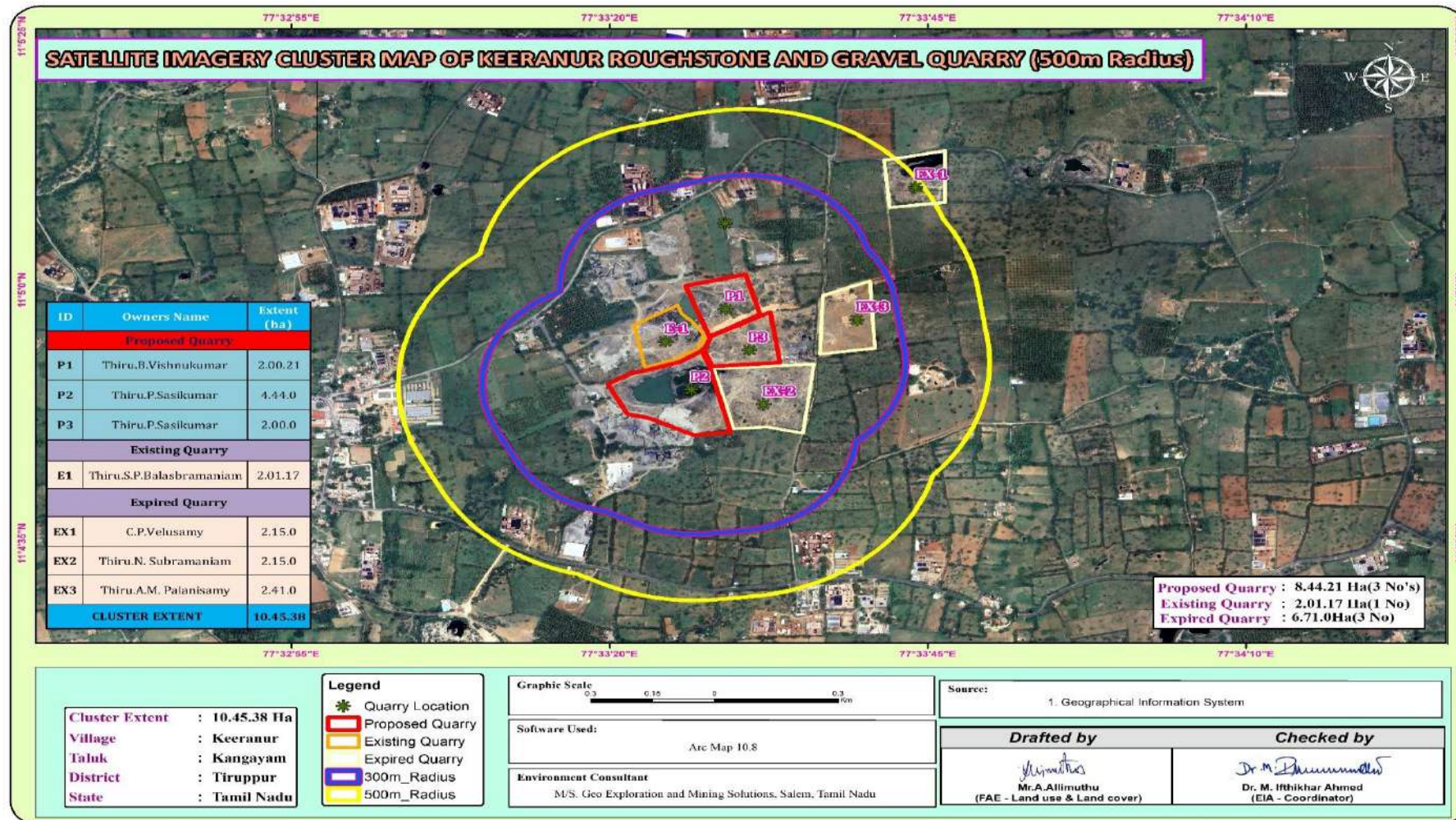
**SATELLITE IMAGERY OF P1**



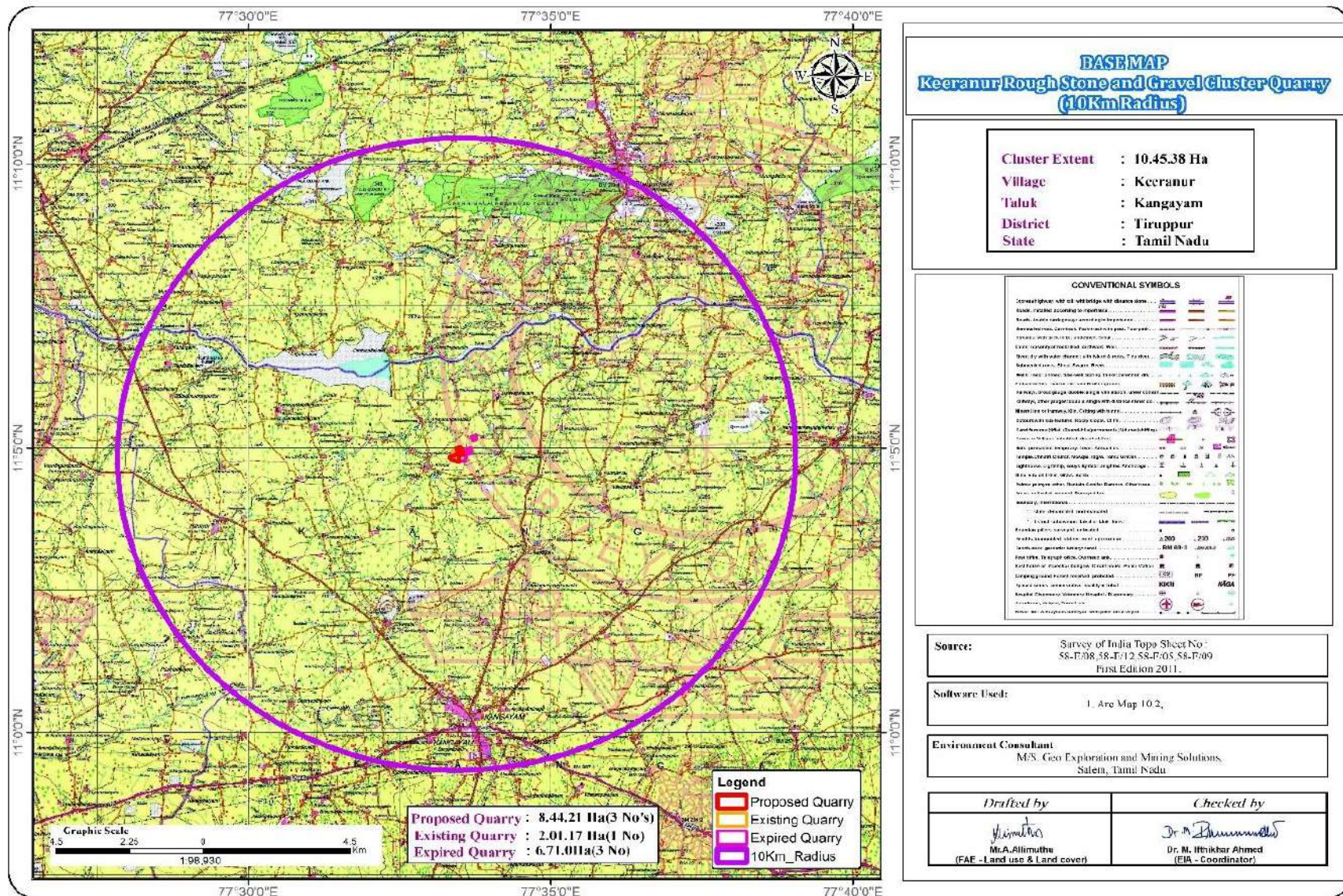
SATELLITE IMAGERY OF P2



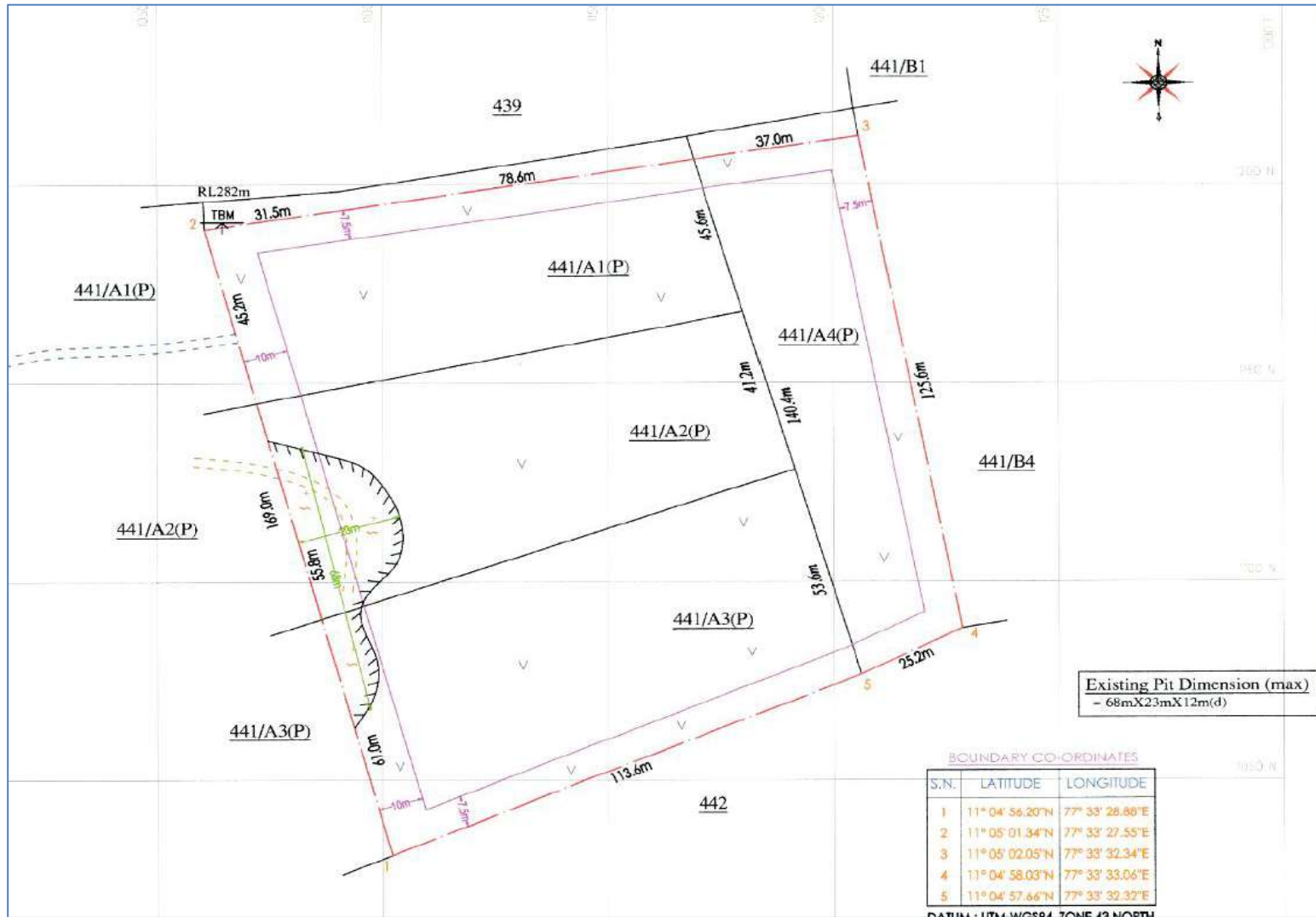
FIGURE – 2: GOOGLE IMAGE SHOWING CLUSTER (500 m QUARRIES)



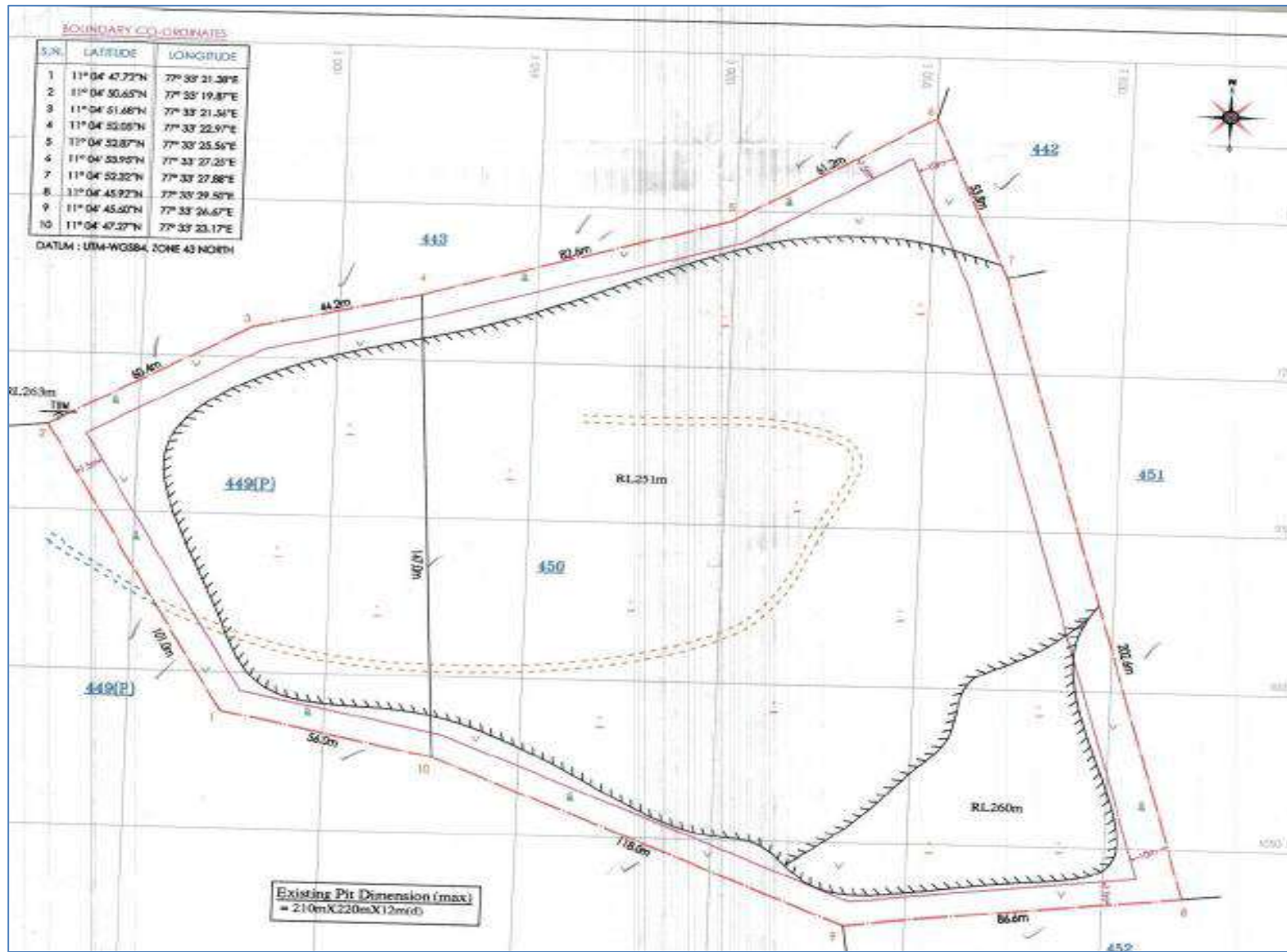
**FIGURE – 3: TOPOSHEET MAP COVERING 10 KM RADIUS**



**FIGURE 4: QUARRY LEASE PLAN / SURFACE PLAN P1**



**FIGURE 5: QUARRY LEASE PLAN / SURFACE PLAN 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

### PROPONENT – P1

S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammers	6	1.2m to 2.0m	Compressed air
2	Compressor	2	400psi	Diesel Drive
3	Excavator with Bucket and Rock Breaker	2	300 HP	Diesel Drive
4	Tippers	4	20 Tonnes	Diesel Drive

Source: Approved Mining Plan.

### PROPONENT – P2

S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammers	10	1.2m to 2.0m	Compressed air
2	Compressor	3	400psi	Diesel Drive
3	Excavator with Bucket and Rock Breaker	2	300 HP	Diesel Drive
4	Tippers	5	20 Tonnes	Diesel Drive

## 2.6 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.,

### 2.7 ULTIMATE PIT DIMENSION-P1

Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max)
I	126	131	45m bgl

Source: Approved Mining Plan

### ULTIMATE PIT DIMENSION-P2

Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max)
I	210	220	37m bgl

Source: Approved Mining Plan

### 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– Dec 2023 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 (1 core & 5 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 hourly twice a week (December 2023 – February 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 Quadrant & 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.

Source: On-site monitoring/sampling by Chennai Mettex Lab Private Limited in association with GEMS

\* All monitoring and testing have been carried out as per the Guidelines of CPCB and MoEF & CC.

### 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, Bhuvan, NRSC**. 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_%
<b>BUILTUP</b>			
1	Builtup Urban	704.18	2.21
2	Builtup Rural	1039.78	3.27
3	Builtup Mining	245.84	0.77
<b>AGRICULTURAL LAND</b>			
4	Agricultural Land	2093.39	6.58
5	Crop Land	17031.90	53.55
6	Fallow Land	7644.18	24.03
<b>BARREN/WASTE LANDS</b>			
7	Scrub Land	715.79	2.25
8	Barren Rocky	73.46	0.23
<b>FOREST</b>			
9	Forest	1345.22	4.23
<b>WETLANDS/ WATER BODIES</b>			
10	Waterbodies	910.93	2.86
<b>TOTAL</b>		31804.67	100.00

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) 84.16% followed by Built-up Lands – 5.48%, Scrub land – 2.25%, and Water bodies 2.86%.

The total mining area within the study area is 245.84 ha i.e., 0.77%. The cluster area of 10.45.38 ha contributes about 0.04% 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 (29.8 % to 33.4 %) to Sandy Loam Soil and Bulk Density of Soils in the study area varied between 0.99– 1.08g/cc. The Water



Holding Capacity and Porosity of the soil samples is found to be medium i.e., ranging from 46.3 – 49.4 % and 46.6-48.8 %.

#### **Chemical Characteristics –**

- The nature of soil is slightly alkaline to strongly alkaline with pH range 8.17 to 8.74
- The available Nitrogen content range between 425.5 to 400 mg/kg
- The available Phosphorus content range between 2.2 to 7.26 mg/kg
- The available Potassium range between 17 mg/kg to 42 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 7.66 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 586 mg/l the TDS mainly composed of carbonates, bicarbonates, Chlorides, phosphates and nitrates of calcium, magnesium, sodium and other organic matter.

##### **Other parameters:**

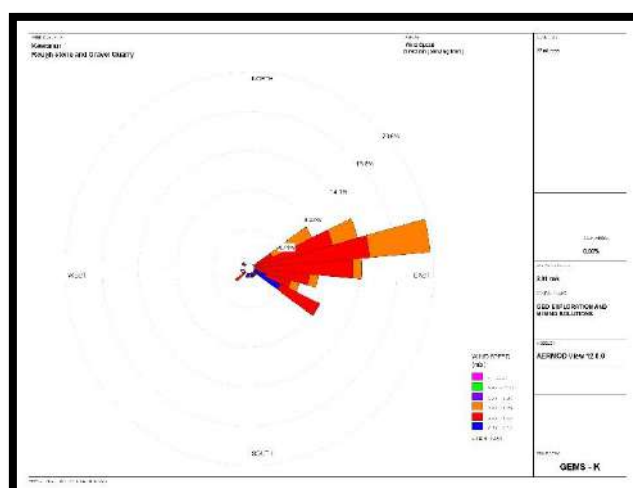
Chloride varied between 102.0 mg/l, Nitrates varied from 11.2 mg/l, while sulphates varied from 62.7 mg/l. **Ground Water**

The pH of the water samples collected ranged from 7.03 to 7.60 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. The Total Dissolved Solids were found in the range of 471-593 mg/l in all samples. The Total hardness varied between 185.18–199.12 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

From the above data's, the concentration of main criteria pollutants has been observed that maximum concentration of PM<sub>10</sub> is 46.9 µg/m<sup>3</sup> recorded at Core area and minimum is 41.5µg/m<sup>3</sup> recorded at Neikkarapalayam Village. The concentration of PM<sub>2.5</sub> varies from 18.2 – 22.9 µg/m<sup>3</sup> Minimum concentration was recorded at Neikkarapalayam Village and Maximum concentration of PM<sub>2.5</sub> recorded at Core zone. SO<sub>2</sub> concentration level ranged from 4.1 – 6.9 µg/m<sup>3</sup> and NO<sub>2</sub> concentration ranged from 20.3– 25.1µg/m<sup>3</sup> in the study area. 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 42.3 dB (A) Leq and during night time were from 35 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 38.5 to 41.8 dB (A) Leq and during night time were from 35.2 to 37.9 dB (A) Leq.

### 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 projects will aim to provide preferential 72 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.
- Rainwater will be collected in sump in the mining pits and will be allowed to store and pumped out to surface settling 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 judiciously 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.

#### **4.4 AIR ENVIRONMENT**

##### **ANTICIPATED IMPACT**

- During mining, at various stages activities such as excavation, drilling, blasting, and transportation of materials, particular matter (PM), gases such as Sulphur dioxide, oxides of Nitrogen from vehicular exhaust are the main air pollutants.
- Emissions of noxious gases due to incomplete detonation of explosive may sometimes pollute the air.
- The fugitive dust released from the mining operations may cause effect on the mine workers who are directly exposed to the fugitive dust.
- Simultaneously, the air-borne dust may travel to longer distances and settle in the villages located near the mine lease area.

##### **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
- Ambient Air Quality 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 through 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**

The developmental programs, policies, and projects operated or managed by government or private bodies can cause potentially significant changes in the physical, biological, and socio-economic environment. In some cases, the changes may be beneficial while in others it may be detrimental to the environment. Accordingly, environmental impact studies are required for systematic identification, qualification, and interpretation of the anticipated changes. The main environmental problems associated with mining activities are deforestation, land degradation (change in topography, soil erosion), visual intrusion, disturbance to the hydrological system, and water, air, and noise pollution which ultimately impact upon the floral and faunal status of the project area.

**MITIGATION MEASURES**

Greenbelt means the planting of special types of plants suitable to that particular agroclimatic zone and soil characteristics in a place that will make the area cooler, reduce air pollution, prevent soil erosion, and further improve the soil fertility status. A green belt around the periphery of the boundary and roadside will be created to avoid erosion of soil, prevention of landslides, and minimize air pollution and noise pollution in the project area. Green plants are capable of absorbing air pollutants and forming sinks for



pollutants. Leaves with their vast area in a tree crown, absorb pollutants on their surface, effectively reducing their concentration and noise level in the ambient.

**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.

**GREENBELT DEVELOPMENT PLAN**

**PROPOSAL FOR P1**

Year	No. of tress proposed to be planted	Area to be covered	Name of the species
I	1000	The plantation is along the safety distance, village road etc..	Neem, Casuarina, etc

**PROPOSAL FOR P2**

Year	No. of tress proposed to be planted	Area to be covered	Name of the species
I	2,220	The plantation is along the safety distance, village road etc..	Neem, Casuarina, etc

**4.7 SOCIO ECONOMIC ENVIRONMENT**

***Anticipated Impacts:***

- ♣ No. of people will get employment during the construction stage resulting in the ancillary development and growth. Nearby Local people will be given preference for employment on the basis of their skill and experience.
- ♣ Further due to proposed project, influx of working community will also generate an indirect employment through development of nearby market/ shops, trade centers, activities, transportation etc.
- ♣ Population influx during the construction phase can introduce various water and vector borne diseases which can lead to various unhygienic health problems in the area by disturbing the existing sanitation infrastructure.
- ♣ Rapid diverse population influx at the project site can create unusual behavioural activity such as worker-community conflicts, increase violence such as theft/stabbing and increased consumption of drugs/alcohol within the area.

♣ Impacts on the health of nearby villagers can be envisaged due to the transportation activities leading to short term exposure of fugitive dust, resulting in various acute diseases such as increased eye irritation, nausea, headache etc.

**Mitigation measures:**

♣ Deploying of mobile toilets or the construction of temporary toilets will be done near to the construction site with the adequate water supply.

♣ Awareness programme will be conducted before the monsoon season regarding the spread of water borne/ vector diseases.

♣ Mosquito repellents will be provided in the nearby villages and at construction site to avoid the spread of diseases.

♣ To overcome behavioural impact, proper site in charge with timely supervision will be done. In advance, facilities with equipped medical and safety services will be provided to take a control over the incident/violence if any caused.

♣ To overcome behavioural impact, supervision will be done by site in charge. In advance, emergency cell will be formed with fully equipped communication system, medical and safety services to take control over the incident/violence caused.

**4.6.2 Operation Phase:**

***Anticipated Impacts:***

♣ Long term exposure to the pollutants such as PM, SO<sub>2</sub> and NO<sub>2</sub> dust have a potential to create health impacts such as risk of cardiovascular and respiratory disease, eye irritation, bronchitis, lung damage, increased heart ailments, etc.

♣ Other impacts, associated with the applied for rough stone quarry Project will create a positive impact as it will result in the overall development of the area in respect to the infrastructure development, educational growth, health facilities etc., as a part of the CSR activity.

***Mitigation Measures:***

♣ In order to mitigate the long-term health impacts, efficient Air Pollution Control Equipment (APCE) like Bag House / Bag Filter / ESP will be installed at all major stacks to keep the emissions within the permissible limits. To reduce the gaseous emission, Pyro-process itself acts as a long SO<sub>2</sub> scrubber and De - NO<sub>x</sub> system will be installed for fuel burning along with calciner for low NO<sub>x</sub> formation. To reduce fugitive emission from vehicles and machineries will be regularly monitored and maintained.

♣ For emergency, proposed to develop an occupational health centre for its employees and nearby villagers.

**4.3 Impact Evaluation:**

***Table 4.3.1 Impact Evaluation Impact evaluation is given in table below.***

<b>Impact Evaluation Element</b>	Impact on socio economics due to the applied for Keeranur Rough Stone and Gravel Cluster quarries over an extent of P1 2.00.21 ha & P2
----------------------------------	--

	<b>4.44.0 ha</b> of Patta land of Keeranur Village, Kangayam Taluk, Tiruppur District, Tamil Nadu State.			
<b>Potential Effect/ Concern</b>	Proposed project will provide direct & indirect employment opportunities to the local residents, which will help to increase their earning and better living standard as well as further up-liftment of socio-economic status of the area.			
<b>Characteristics of Impacts</b>				
Nature	Positive		Negative	Neutral
	✓			
Type	Direct	Indirect	Cumulative	
			✓	
Extent	Project area	Local	Zonal	Regional
		✓		
Duration	Short time		Long term	
			✓	
Intensity	Low		Medium	High
			✓	
Frequency	Remote (R)	Occasional (O)	Periodic (P)	Continuous (C)
			✓	
<b>Significance of Impact</b>				
Significance	Insignificant	Minor	Moderate	Major
			✓	

## 5. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

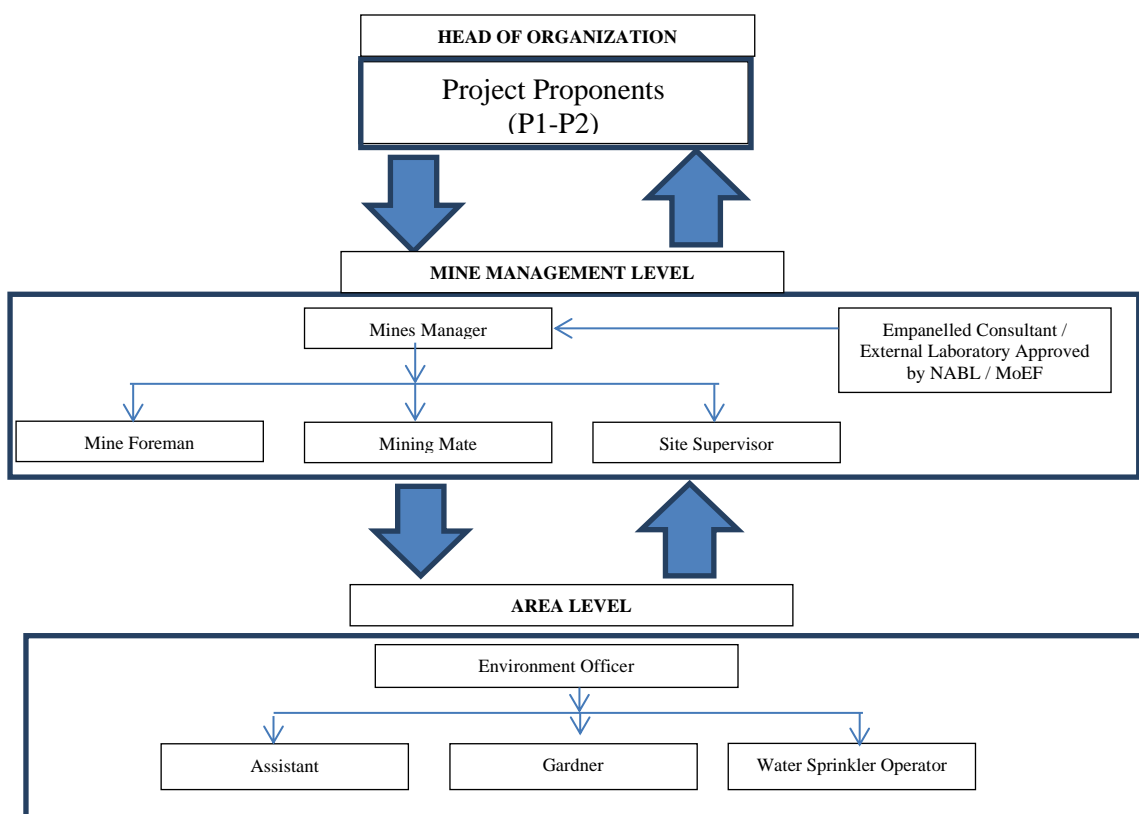
No alternatives are suggested as all the mine sites are mineral specific.

## 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 FOR P1 – P2

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 <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> and NO <sub>x</sub> .
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

Source: Guidance of manual for mining of minerals, February 2010

## 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 31<sup>st</sup> 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 <sup>3</sup>	Per Day Production in m <sup>3</sup>	Number of Lorry Load Per Day
P1	2,64,320	52,864	176	15
P2	4,52,430	90,486	302	25
P3	2,87,800	57,560	192	16
<b>Total</b>	<b>10,04,550</b>	<b>2,00,910</b>	<b>670</b>	<b>56</b>
E1	96,560	19,312	64	5
<b>Total</b>	<b>96,560</b>	<b>19,312</b>	<b>64</b>	<b>5</b>

<b>Grand Total</b>	<b>11,01,110</b>	<b>22,0222</b>	<b>734</b>	<b>61</b>
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**CUMULATIVE PRODUCTION LOAD OF GRAVEL IN CLUSTER**

Quarry	Production for three-year plan period	Per Year Production in m <sup>3</sup>	Per Day Production in m <sup>3</sup>	Number of Lorry Load Per Day
P1	30,240	10,080	34	3
P2	-	-	-	-
P3	30,888	10,296	34	3
<b>Total</b>	<b>61,128</b>	<b>20,376</b>	<b>68</b>	<b>6</b>
<b>PROPOSED PRODUCTION OF GRAVEL</b>				
E1	9,656	3,219	11	1
<b>Total</b>	<b>9,656</b>	<b>3,219</b>	<b>11</b>	<b>1</b>
<b>Grand Total</b>	<b>70,784</b>	<b>23,595</b>	<b>79</b>	<b>7</b>

**CUMULATIVE PRODUCTION OF WEATHERED ROCK IN CLUSTER**

Quarry	Production during three-year plan period	Per Year Production in m <sup>3</sup>	Per Day Production in m <sup>3</sup>	Number of Lorry Load Per Day
P1	42,480	14,160	47	4
P2	-	-	-	-
P3	-	-	-	-
<b>Total</b>	<b>42,480</b>	<b>14,160</b>	<b>47</b>	<b>4</b>

**PREDICTED NOISE INCREMENTAL VALUES FROM CLUSTER**

Location ID	Background Value (Day) dB(A)	Incremental Value dB(A)	Total Predicted dB(A)	Residential Area Standards dB(A)
Habitation Near P1	48.3	42.1	49.2	55
Habitation Near P2	49.7	44.4	50.8	
Habitation Near P3	41.70	37.5	43.1	

**SOCIO ECONOMIC BENEFITS FROM 4 MINES**

Location ID	Project Cost	CER
P1	Rs. 77,28,000/-	Rs.5,00,000
P2	Rs. 79,36,000/-	Rs.5,00,000
P3	Rs. 74,25,000/-	Rs. 5,00,000
<b>Total</b>	<b>Rs. 2,30,89,000/-</b>	<b>Rs.15,00,000</b>

A total of 96 people will get employment due to 3 proposed mines

Allocation for Corporate Environment Responsibility (CER) shall be made as per Government of India, MoEF & CC Office Memorandum F.No.22-65/2017-IA.III, Dated: 01.05.2018 by all the mines.

**8. PROJECT BENEFITS**

The Proposed Project for Quarrying Rough Stone and gravel at Keeranur Village aims to produce Cumulatively 7,16,750m<sup>3</sup> Rough Stone over a period of 5 Years and Gravel 30,240m<sup>3</sup> and weathered rock 42,480 m<sup>3</sup> for period of 3 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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