

EXECUTIVE SUMMARY

THIRU. M. GANESAN ROUGH STONE AND GRAVEL QUARRY

Quarry Code	S.F. Nos	Extent in ha	ToR Letter No.
P1	320/1A, 1B,2	1.98.0	Lr. No. SEIAA-TN/F.No.8968/SEAC/ToR-1254/2022 Dated: 19.09.2022
P2	323/1B, 2B, 2C, 3, 4, 5B,5C	2.13.0	Lr. No. SEIAA-TN/F.No.8978/SEAC/ToR-1257/2022 Dated: 19.09.2022
P3	324/1A,1B1,1B2,2A, 2B, 2C1, 2C2, 3, 8A, 9A, 9B2	2.40.0	Lr. No. SEIAA-TN/F.No.8966/SEAC/ToR-1255/2022 Dated: 19.09.2022

Sirudhamur Village, Uthiramerur Taluk, Kanchipuram District

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

CLUSTER EXTENT = 24.46.06 ha

Project Proponent

Thiru. M. Ganesan,

S/o. Manivel,

No. 36/1, Mallampatti Village,

Kalamavur Post, Kulathur Taluk,

Pudukkottai District – 622 502

Environmental Consultant



GEO EXPLORATION AND MINING SOLUTIONS



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

1. INTRODUCTION

Environmental Impact Assessment (EIA) is the management tool to ensure the sustainable development and it is a process, used to identify the environmental, social and economic impacts of a project prior to decision-making. It is a decision-making tool, which guides the decision makers in taking appropriate decisions for any project. EIA systematically examines both beneficial and adverse consequences of the project and ensures that these impacts are considered during the project designing. It also reduces conflicts by promoting community participation, information, decision makers, and helps in developing the base for environmentally sound project.

Rough Stone & Gravel is the major requirements for construction industry. This EIA report is prepared by considering Cumulative load of proposed & existing quarries of Thiru. M. Ganesan Rough Stone and Gravel Quarry consisting of Three Proposed and Seven Existing and Ten Abandoned Quarry with total extent of Cluster of 24.46.06 ha in Sirudhamur Village, Uthirameru Taluk, Kanchipuram District and 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 vide

1. **Lr.No.SEIAA-Tn/F.No.8968/Tor-1254/2022 dated 19.09.2022 – P1**
2. **Lr.No.SEIAA-TN/F.No.8978/Tor-1257/2022 dated 19.09.2022 – P2**
3. **Lr.No. SEIAA-TN/F.No.8966/Tor-1255/2022 dated 19.09.2022– P3**

Baseline Monitoring study has been carried out during the period of October 2022 to December 2022 and this EIA and EMP report is prepared for considering cumulative impacts arising out of this project, the Cumulative Environmental Impact Assessment study is undertaken, which is followed by preparation of a detailed Environmental Management Plan (EMP) individually to minimize those adverse impacts.

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

1.1 DETAILS OF PROJECT PROPONENT –

TABLE 1.1 DETAILS OF PROJECT PROPONENT

Name of the Company	Thiru. M.Ganesan
Address	S/o. Manivel, No. 36/1, Mallampatti Village, Kalamavur Post, Kulathur Taluk, Pudukkottai District, Tamil Nadu State – 622 502
Mobile	+91 97509 71109
Status	Individual

1.2 QUARRY DETAILS WITHIN 500 M RADIUS

TABLE 1.2: LIST OF QUARRIES WITHIN 500 METER RADIUS FROM THIS PROPOSAL

Proposed Quarries					
Code	Name of the Owner	Name of the Village, and Taluk, & S.F. Nos.	Extent in (ha)	Status	Remarks
P1	M.Ganesan, S/o. Manivel, No.36/1, Mallampatti village, Kalamavur Post, Kulathur Taluk, Pudukkottai District.	Sirudhamur Village, Uthiramerur Taluk 320/1A, 1B,2	1.98.00	Obtained TOR Vide Lr.No.SEIAA- TN/F.No.8968/ Tor-1254/2022 dated 19.09.2022	-
P2	M.Ganesan, S/o. Manivel, No.36/1, Mallampatti village, Kalamavur Post, Kulathur Taluk, Pudukkottai District.	Sirudhamur Village, Uthiramerur Taluk 323/1B, 2B, 2C, 3, 4, 5B,5C Govt.Land	2.13.00	Obtained TOR Vide Lr.No.SEIAA- TN/F.No.8978/ Tor-1257/2022 dated 19.09.2022	-
P3	M.Ganesan, S/o. Manivel, No.36/1, Mallampatti village, Kalamavur Post, Kulathur Taluk, Pudukkottai District.	Sirudhamur Village, Uthiramerur Taluk 324/1A,1B1,1B2,2A, 2B, 2C1, 2C2, 3, 8A, 9A, 9B2	2.40.00	Obtained TOR Vide Lr.No.SEIAA- TN/F.No.8966/ Tor-1255/2022 dated 19.09.2022	-
Total			6.51.00		
Existing Quarries					
SL.No.	Name of the Owner	Name of the Village, and Taluk, & S.F. Nos.	Extent (ha)	Lease Period	Remarks
E1	D. Uma Sankar S/o. Devaraj No.1, Thiru.Vi.Ka. Salai, Thiruvalluvar Nagar, Salavanpettai, Vellore.	Sirudhamur Village, Uthiramerur Taluk 334/1B	2.72.00	31.01.2017 To 30.01.2022	-
E2	S. Vaithialingam S/o. Sivaganapathy Subramaniam, No.13, First street, Swamy Nagar Extn -1, Ullagaram,	Sirudhamur Village, Uthiramerur Taluk 314/6B,314/7A,314/7 B,314/8,314/10	1.08.00	22.02.2018 To 21.02.2023	-
E3	S.Murugesan, S/o. Swaminathan, No.1/52, Palaiyur, Aalangudi Taluk, Pudukkottai District	Sirudhamur Village, Uthiramerur Taluk 324/4A, 4B1, 4B2, 5, 6, 7A, 8B, 10A, 10C, 11, 327/2, 3A	3.11.0	09.05.2018 to 08.05.2023	-

E4	N. Kanniyappan , S/o. Narayanapillai, No.55, Mariyamman Koil Street, Neerkundram Village, Aamambakkam Post, Salavakkam Via, Uthiramerur Taluk, Kancheepuram.	Sirudhamur Village, Uthiramerur Taluk 320/3A, 3B, 4, 332/1A, 1B, 2	2.41.00	15.06.2018 To 14.06.2023	-
E5	D.Sarathkumar, S/o. Devu, No.5/265, Annai Therasa street, Prem nagar, Pozhichaloor, Chennai - 74	Sirudhamur Village, Uthiramerur Taluk 325/4, 109/1A1, 1A2	3.01.50	20.12.2018 to 19.12.2023	-
E6	S. Kothandaraman,	Sirudhamur Village, Uthiramerur Taluk 115/1A, 1B, 2A1, 2A2B, 2B1, 2C,2D1	2.69.06	07.08.2017 to 06.08.2022	-
E7	R. Selvendrakumar	Sirudhamur Village, Uthiramerur Taluk 308/1,2,3A, 3B, 3C, 3D, 3E, 3F, 5, 6, 7A, 7B, 8, 9, 10A, 10B, 10C, 11	2.92.50	08.11.2018 to 07.11.2023	-
		Total	17.95.06		
Abandoned Quarries					
Sl.No.	Name of the Owner	Name of the Village, and Taluk, & S.F. Nos.	Extent (ha)	Lease Period	Remarks
AB1	S.Jayachandran, No.9A, Melamedu village, Balavedu Post, Thiruvallur Dist.	Sirudhamur Village, Uthiramerur Taluk 326(P)	2.00.00	16.02.2007 to 15.02.2012	-
AB2	PJR Sathishkumar PJR Bluemetals 4hennai pvt Ltd No.8, PJR Square, Sivashanmugam Salai, Tambaram,Chennai – 45	Sirudhamur Village, Uthiramerur Taluk 334/1(P)	1.80.00	20.05.2010 To 19.05.2015	-
AB3	M/s.RCS Infrastructures Ltd, Chairman, Thriu.R.Chidambaram, No.358, Ganapathy, Colony, 2 nd Street, Ekkaduthangal, Chennai- 32	Sirudhamur Village, Uthiramerur Taluk 327/6	2.39.00	20.12.2011 To 19.12.2016	-
AB4	RCS Infrastructure Pvt Ltd, 359, Ganapathy, Colony, 2 nd Street, Ekkaduthangal, Chennai- 72	Sirudhamur Village, Uthiramerur Taluk 323/1A, 2A, 324/10B, 7B, 327/3B, 327/4	1.80.00	23.02.2015 to 22.02.2020	-

AB5	S.Kothandaraman, Kancheepuram.	Sirudhamur Village, Uthiramerur Taluk 338(P) Q.No.1 (Govt. Land)	5.00.0	09.08.2005 To 08.08.2010	Lease Expired
AB6	C. Ranganathan No.12, Thiruvalluvar Road, Unamancherry, Chennai - 48.	Sirudhamur Village, Uthiramerur Taluk338(P) Q.No.2 (Govt. Land)	5.00.0	04.10.2005 To 03.10.2010	Lease Expired
AB7	B.S.Mohan	Sirudhamur Village, Uthiramerur Taluk 107(P)	5.00.0	05.02.2007 to 04.02.2017	Lease Expired
AB8	Tvl.Annai Blue Metals	Sirudhamur Village, Uthiramerur Taluk 109/D, 114/4, 5, 6, 7A, 7B, 113/2B, 3B	2.26.50	15.04.2015 to 14.04.2020	Lease Expired
AB9	Tvl.Arupadai Infrastructure Company,	Sirudhamur Village, Uthiramerur Taluk 109/1B, 1F, 1G, 1H, 114/1, 2, 3	3.77.00	15.04.2015 to 14.04.2020	Lease Expired
AB10	S.Krishnakumar	Sirudhamur Village, Uthiramerur Taluk 338(P) 106	0.79.50	22.12.2011 To 21.12.2016	Lease Expired
	Total		29.82.0		
	Total Cluster Extent		24.46.06		

1.3 SALIENT FEATURES OF THE PROPOSAL

TABLE 1.3 SALIENT FEATURES OF THE PROPOSED PROJECT

Name of the quarry	Thiru. M.Ganesan Rough stone & Gravel Quarry	
Toposheet No	57- P/14	
Latitude	12°43'14.06"N to 12°43'22.54"N	
Longitude	79°51'01.92"E to 79°51'06.63"E	
Highest elevation	52 m AMSL	
Proposed depth of mining	Five Years Plan Period	Ten Year Plan Period
	32m BGL (2 m Gravel +30 m Rough Stone)	37m BGL (2 m Gravel +35 m Rough Stone)
Geological resources	Rough stone in m³	Gravel m³
	6,93,000	39,600
Minable reserves	1,64,165	22,338
First Five-year production	1,03,520	22,338
Next Five-Year Production	60,645	-
Existing pit dimension	It is New Quarry	
Ultimate pit dimension	I -V Year	180m (L) x 81 m (W) x 32m (D)
	VI-X Year	180m (L) x 81 m (W) x 37m (D)
Water level in the surrounding area	48-53 m BGL	
Method of mining	Opencast semi mechanized mining involving drilling and blasting	

Topography	The applied lease area is exhibits plain with altitude of 52m maximum from the MSL. The area is sloping towards South eastern side covered clayey soil with rough stone which does not sustain any type of vegetation.	
Machinery proposed	Jack hammer	2
	Compressor	1
	Excavator	1
	Tippers	1
Blasting method	Controlled blasting method by shot hole drilling and small dia. of 25 mm slurry explosives are proposed to be used for shattering and heaping effect for removal and winning of rough stone. No deep hole drilling is proposed.	
Project cost	Rs. 52,18,000/-	
CER cost	Rs. 5,00,000/-	
Proposed water requirement	2.5 KLD	
Nearest habitation	720m Southeast	

Source: Approved Mining Plan

TABLE 1.4: SALIENT FEATURES OF THE PROPOSED PROJECT – P2

Name of the quarry	Thiru.M.Ganesan Rough Stone and Gravel Quarry	
Toposheet No	57- P/14	
Latitude	12°43'22.38"N to 12°43'28.94"N	
Longitude	79°50'58.58"E to 79°51'05.50"E	
Highest elevation	56m AMSL	
Proposed depth of mining for ten years as per ToR	42m BGL (2 m Gravel +40 m rough stone)	
Geological resources	Rough stone in m³	Gravel m³
	9,58,500	42,600
Mineable reserves	2,57,455	21,366
First Five-year production (As per TOR)	1,80,940	21,366
Next Five-Year Production	79,515	-
Existing pit dimension	It is New Quarry	
Ultimate pit dimension	149m (L) x 117m (W) x 42m (D)	
Water level in the surrounding area	53-58 m BGL	
Method of mining	Opencast semi mechanized mining involving drilling and blasting	
Topography	The applied lease area is exhibits plain with altitude of 56m maximum from the MSL. The area is sloping towards Southeastern side covered clayey soil with rough stone	
Machinery proposed	Jack hammer	3
	Compressor	1
	Excavator	1
	Tippers	2
Blasting method	Controlled blasting method by shot hole drilling and small dia. of 25 mm slurry explosives are proposed to be used for shattering and heaping effect for removal and winning of rough stone. No deep hole drilling is proposed.	
Project cost	Rs. 65,24,000/-	
CER cost @ 2% of project cost	Rs 5,00,000	
Proposed water requirement	2.5 KLD	
Nearest habitation	950m Southeast	

TABLE 1.5: SALIENT FEATURES OF THE PROPOSED PROJECT – P3

Name of the quarry	Thiru. M. Ganesan Rough Stone and Gravel Quarry	
Toposheet No	57- P/14	
Latitude	12°43'30.90"N to 12°43'37.05"N	
Longitude	79°51'00.54"E to 79°51'10.04"E	
Highest elevation	62m AMSL	
Proposed depth of mining for ten years	47m BGL (2 m Gravel +45 m rough stone)	
Geological resources	Rough stone in m³	Gravel m³
	10,80,000	48,000
Minable reserves	2,82,475	33,312
First Five-year production	1,59,350	33,312
Next Five-Year Production	1,23,125	-
Existing pit dimension	It is New Quarry	
Ultimate pit dimension	167m (L) x 125m (W) x 47m (D)	
Water level in the surrounding area	53-58 m BGL	
Method of mining	Opencast semi mechanized mining involving drilling and blasting	
Topography	The applied lease area is exhibits plain with altitude of 62m maximum from the MSL. The area is sloping towards Southeastern side covered clayey soil with rough stone which does not sustain any type of vegetation.	
Machinery proposed	Jack hammer	4
	Compressor	1
	Excavator	1
	Tippers	2
Blasting method	Controlled blasting method by shot hole drilling and small dia. of 25 mm slurry explosives are proposed to be used for shattering and heaping effect for removal and winning of rough stone. No deep hole drilling is proposed.	
Project cost	Rs. 68,99,000/-	
CER cost	Rs. 5,00,000/-	
Proposed water requirement	4.2 KLD	
Nearest habitation	950m Southeast	

1.4 STATUTORY DETAILS

PROPOSAL – P1

- The proponent applied for Rough Stone and Gravel Quarry Lease, Dated: 27.07.2021
- Precise Area Communication Letter was issued by the Deputy Director, Geology and Mining, Kanchipuram, vide Rc.No. 220/Q3/2021, Dated 08.10.2021
- The Mining Plan was prepared and got approved by Assistant Director, Geology and Mining, Kanchipuram District, vide Rc.No: 220/Q3/2021, Dated 08.10.2021
- Proponent applied for ToR for Environmental Clearance vide online Proposal No. SIA/TN/MIN/71526/2022 Dated: 28.01.2022
- The proposal was placed in 306th SEAC Meeting held on 08.04.2022 and the committee recommended for issue of ToR.
- The proposal was considered in 551st SEIAA Meeting Dated: 19.09.2022 and issued ToR vide Letter No SEIAA-TN/F.No.8968/SEAC/ToR- 1254/2022 Dated: 19.09.2022

PROPOSAL – P2

- The proponent applied for Rough Stone and Gravel Quarry Lease, Dated: 27.07.2021
- Precise Area Communication Letter was issued by the Deputy Director, Geology and Mining, Kanchipuram, vide Rc.No. 221/Q3/2021, Dated 08.10.2021
- The Mining Plan was prepared and got approved by Assistant Director, Geology and Mining, Kanchipuram District, vide Rc.No: 221/Q3/2021, Dated 11.10.2021
- Proponent applied for ToR for Environmental Clearance vide online Proposal No. SIA/TN/MIN/71533/2022 Dated: 28.01.2022
- The proposal was placed in 306th SEAC Meeting held on 25.08.2022 and the committee recommended for issue of ToR.
- The proposal was considered in 551st SEIAA Meeting Dated:.19.09.2022 and issued ToR vide Letter No SEIAA-TN/F.No.8978/SEAC/ToR- 1257/2022 Dated: 19.09.2022

PROPOSAL – P3

- The proponent applied for Rough Stone and Gravel Quarry Lease, Dated: 27.07.2021
- Precise Area Communication Letter was issued by the Deputy Director, Geology and Mining, Kanchipuram, vide Rc.No. 222/Q3/2021, Dated 08.10.2021
- The Mining Plan was prepared and got approved by Assistant Director, Geology and Mining, Kanchipuram District, vide Rc. No: 222/Q3/2021, Dated 11.10.2021
- Proponent applied for ToR for Environmental Clearance vide online Proposal No. SIA/TN/MIN/71654/2022 Dated: 29.01.2022
- The proposal was placed in 306th SEAC Meeting held on 25.08.2022 and the committee recommended for issue of ToR.
- The proposal was considered in 551st SEIAA Meeting Dated:.19.09.2022 and issued ToR vide Letter No SEIAA-TN/F.No.8966/SEAC/ToR- 1255/2022 Dated: 19.09.2022

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.

Method is mining is common for the 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 pithead to the needy crushers and rock breakers to avoid secondary blasting.

2.1 SITE CONNECTIVITY TO THE PROJECT AREA**TABLE 2.1 SITE CONNECTIVITY**

Description	Details
Nearest Village	Sirudhanur village– 1.8km - SE
Nearest Town	Uthiramerur – 15.0 km – Southwest
Nearest Roadway	The approach (metal) road is situated on the Southeast side which connects the Panchayat Road at a distance of 900m of the applied area.

	NH-132B – Chengalpattu – Kanchipuram – 6.0km – North SH-118A – Kanchipuram – Uthiramerur – 10.0km – West
Nearest Railway	Chengalpattu Railway station – 14km – SE The Nearest Railway line Arakkonam – Chengalpattu – 7km – North
Nearest Airport	Chennai Airport – 46km – NE
Seaport	Chennai 61 km Northeast side
Interstate boundary	Andhra Pradesh Interstate boundary – 54 km –North

Source: Survey of India Toposheet

2.2 LAND USE PATTERN OF THE PROPOSED PROJECT

TABLE 2.2 LAND USE PATTERN OF THE PROPOSED PROJECT

P1			
Description	Present area (ha)	Area required during the first five years of the plan period (ha)	Area at the end of life of quarry (ha)
Area under quarry	Nil	1.24.0	1.24.0
Infrastructure	Nil	0.01.0	0.01.0
Roads	Nil	0.02.0	0.03.0
Green Belt	Nil	0.35.0	0.70.0
Unutilized area	1.98.0	0.36.0	Nil
Total	1.98.0	1.98.0	1.98.0
P2			
Description	Present area (ha)	Area required during the first five years of the plan period (ha)	Area at the end of life of quarry (ha)
Area under quarry	Nil	1.37.0	1.37.0
Infrastructure	Nil	0.01.0	0.01.0
Roads	Nil	0.02.0	0.03.0
Green Belt	Nil	0.40.3	0.72.0
Unutilized area	2.13.0	0.32.7	Nil
Total	2.13.0	2.13.0	2.13.0
P3			
Description	Present area (ha)	Area required during the first five years of the plan period (ha)	Area at the end of life of quarry (ha)
Area under quarry	Nil	1.74.0	1.74.0
Infrastructure	Nil	0.01.0	0.01.0
Roads	Nil	0.02.0	0.03.0
Green Belt	Nil	0.29.0	0.58.0
Unutilized area	2.40.0	0.34.0	0.04.0
Total	2.40.0	2.40.0	2.40.0

2.3 OPERATIONAL DETAILS OF LEASE APPLIED AREA

TABLE 2.3 OPERATIONAL DETAILS FOR PROPOSED PROJECT

P1		
PARTICULARS	DETAILS	
	Rough Stone (10 Year Plan period)	Gravel (3 Years Plan period)
Geological Resources	6,93,000 m ³	39,600m ³
Mineable Reserves	1,64,165 m ³	22,338 m ³
Mining Plan Period	10 Years	

Proposed Production for first five-year plan	1,03,520 m ³	22,338 m ³
Proposed Production for next five year plan	60,645 m ³	-
Number of Working Days	300 Days	
Production per day	55 m ³	25 m ³
No of Lorry loads (6m ³ per load)	9 Nos	4 Nos
Total Depth of Mining	37 meters (35m Rough Stone + 2m Gravel)	
P2		
PARTICULARS	DETAILS	
	Rough Stone (10 Year Plan period)	Gravel (3 Years Plan period)
Geological Resources	9,58,500	42,600
Mineable Reserves	2,57,455	21,366
Mining Plan Period	10 Years	
Proposed Production for first five year plan	1,80,940 m ³	21,366 m ³
Proposed Production for next five year plan	76,515 m ³	-
Number of Working Days	300 Days	
Production per day	86 m ³	24 m ³
No of Lorry loads (6m ³ per load)	14 Nos	4 Nos
Total Depth of Mining	42 meters (40m Rough Stone + 2m Gravel)	
P3		
PARTICULARS	DETAILS	
	Rough Stone (10 Year Plan period)	Gravel (3 Years Plan period)
Geological Resources	10,80,800 m ³	48,000m ³
Mineable Reserves	2,82,475 m ³	33,315 m ³
Mining Plan Period	10 Years	
Proposed Production for first five year plan	1,59,350 m ³	33,315 m ³
Proposed Production for next five year plan	1,23,125 m ³	-
Number of Working Days	300 Days	
Production per day	94 m ³	37 m ³
No of Lorry loads (6m ³ per load)	16 Nos	6 Nos
Total Depth of Mining	47 meters (45m Rough Stone + 2m Gravel)	

Source: Approved mining plan

FIGURE – 1: SATELLITE IMAGERY OF CLUSTER QUARRIES

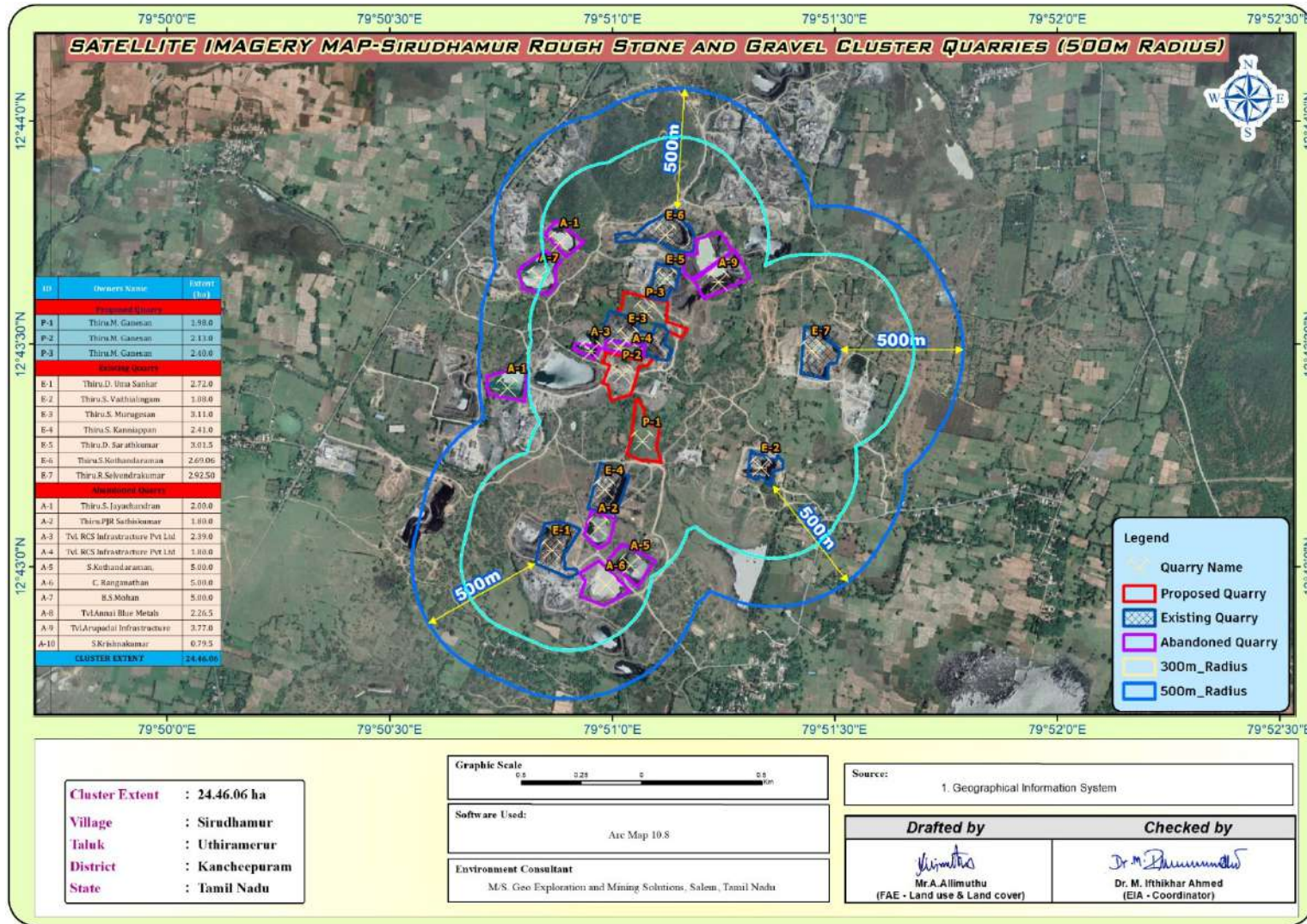


FIGURE – 2: GOOGLE IMAGE SHOWING PROJECT AREA -P1



FIGURE –3: GOOGLE IMAGE SHOWING PROJECT AREA -P2



FIGURE –4: GOOGLE IMAGE SHOWING PROJECT AREA -P3

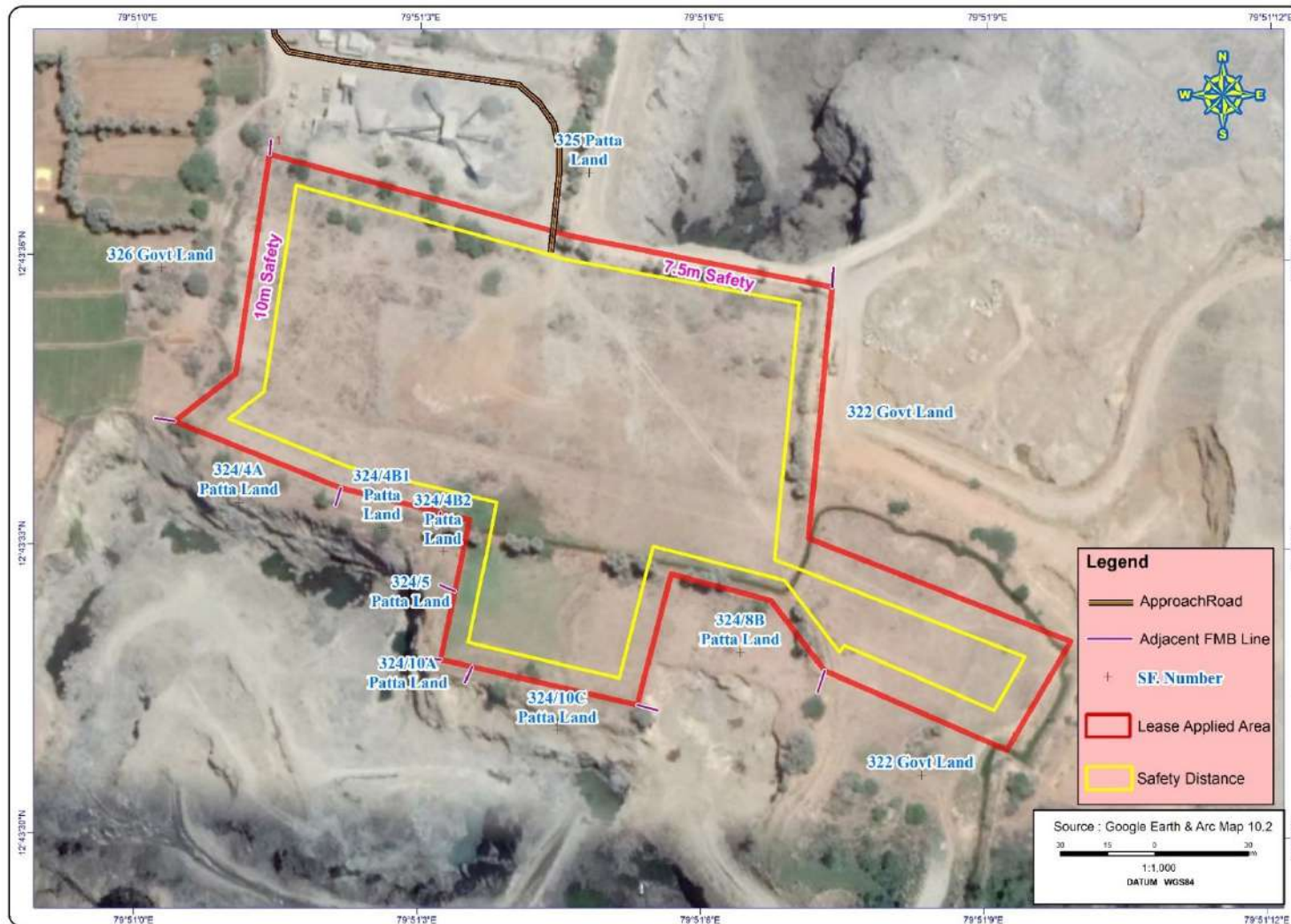


FIGURE – 5: TOPOSHEET MAP COVERING 10 KM RADIUS

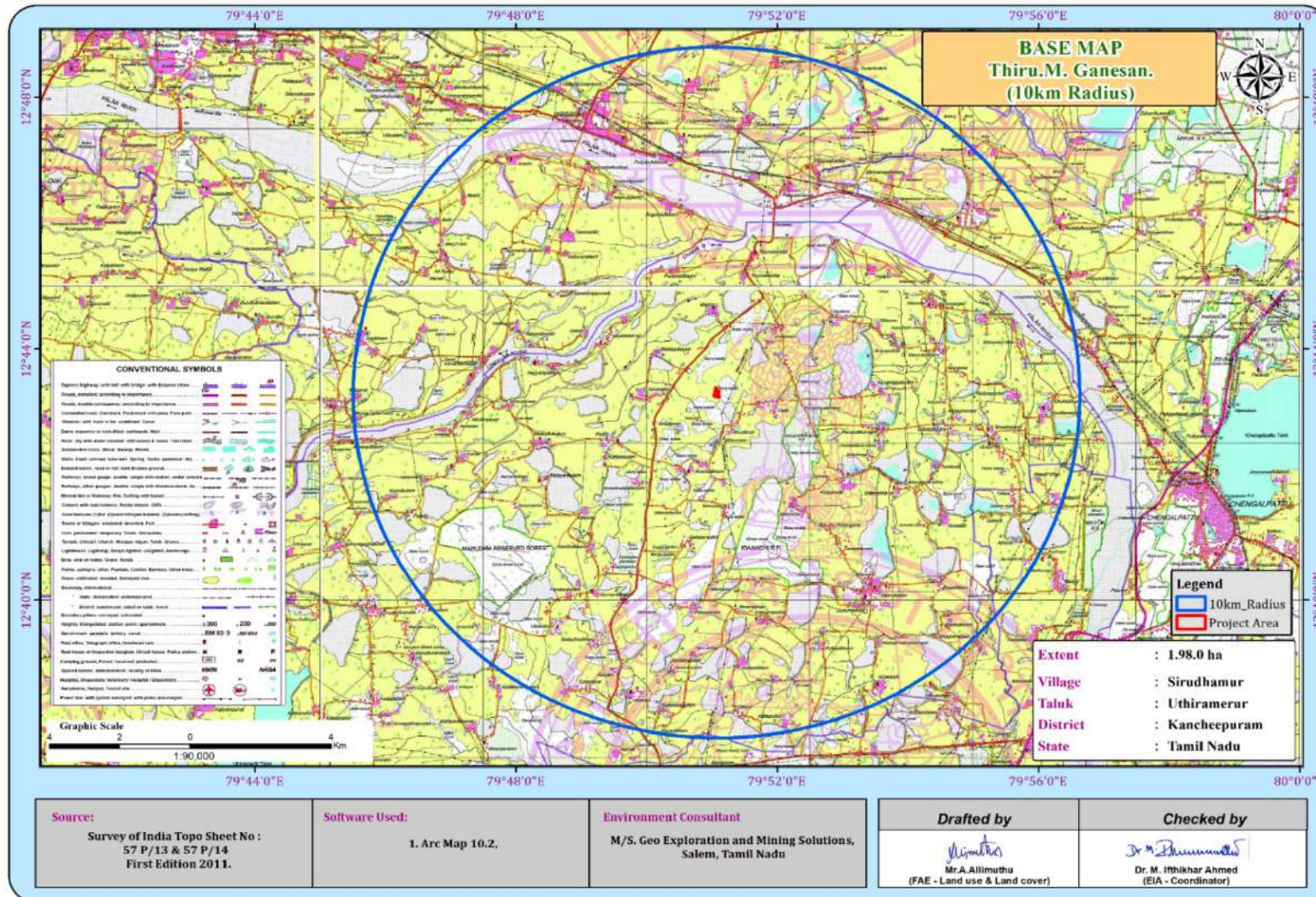


FIGURE – 6: QUARRY LEASE PLAN & SURFACE PLAN -P1

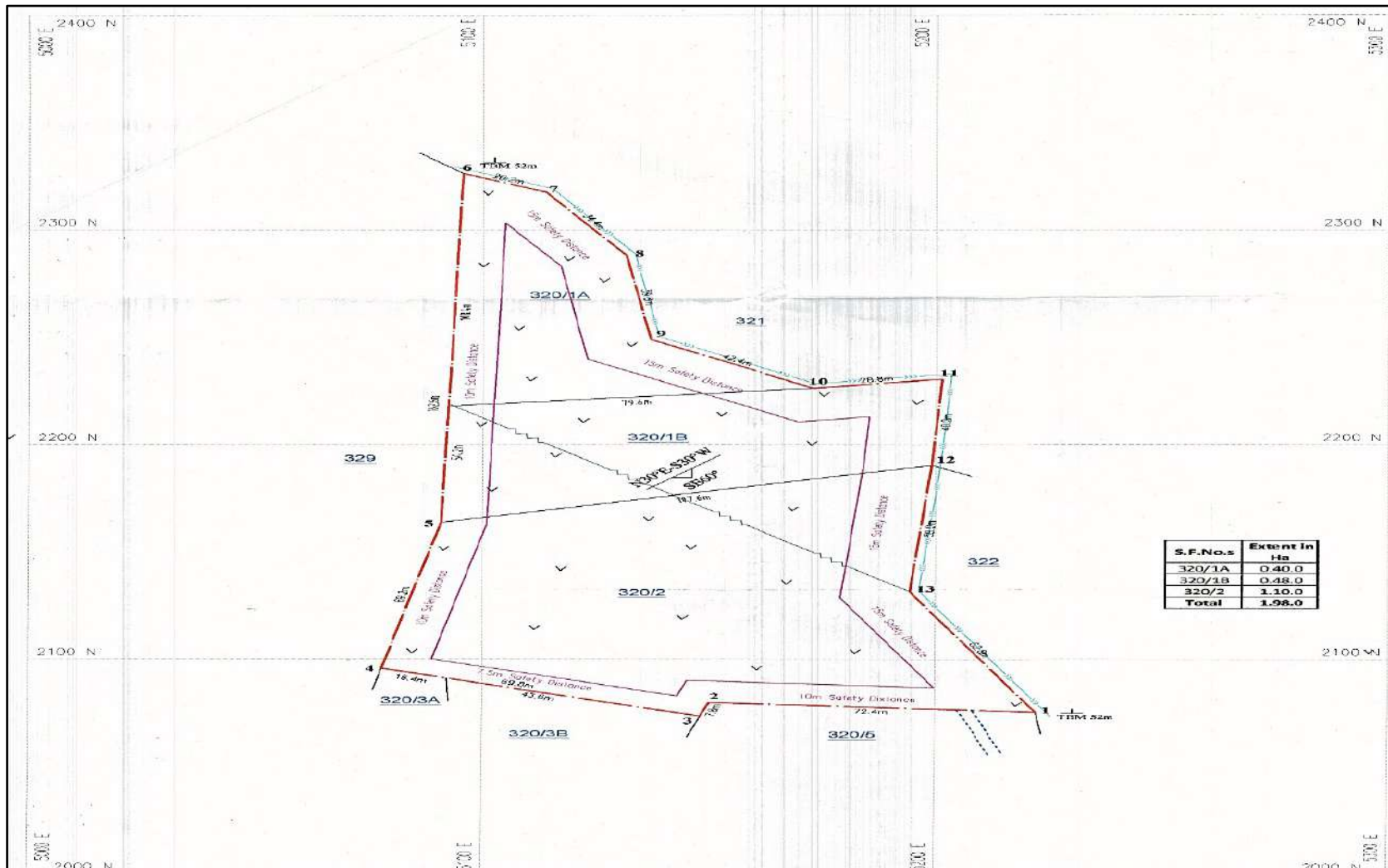


FIGURE – 7: QUARRY LEASE PLAN & SURFACE PLAN -P2

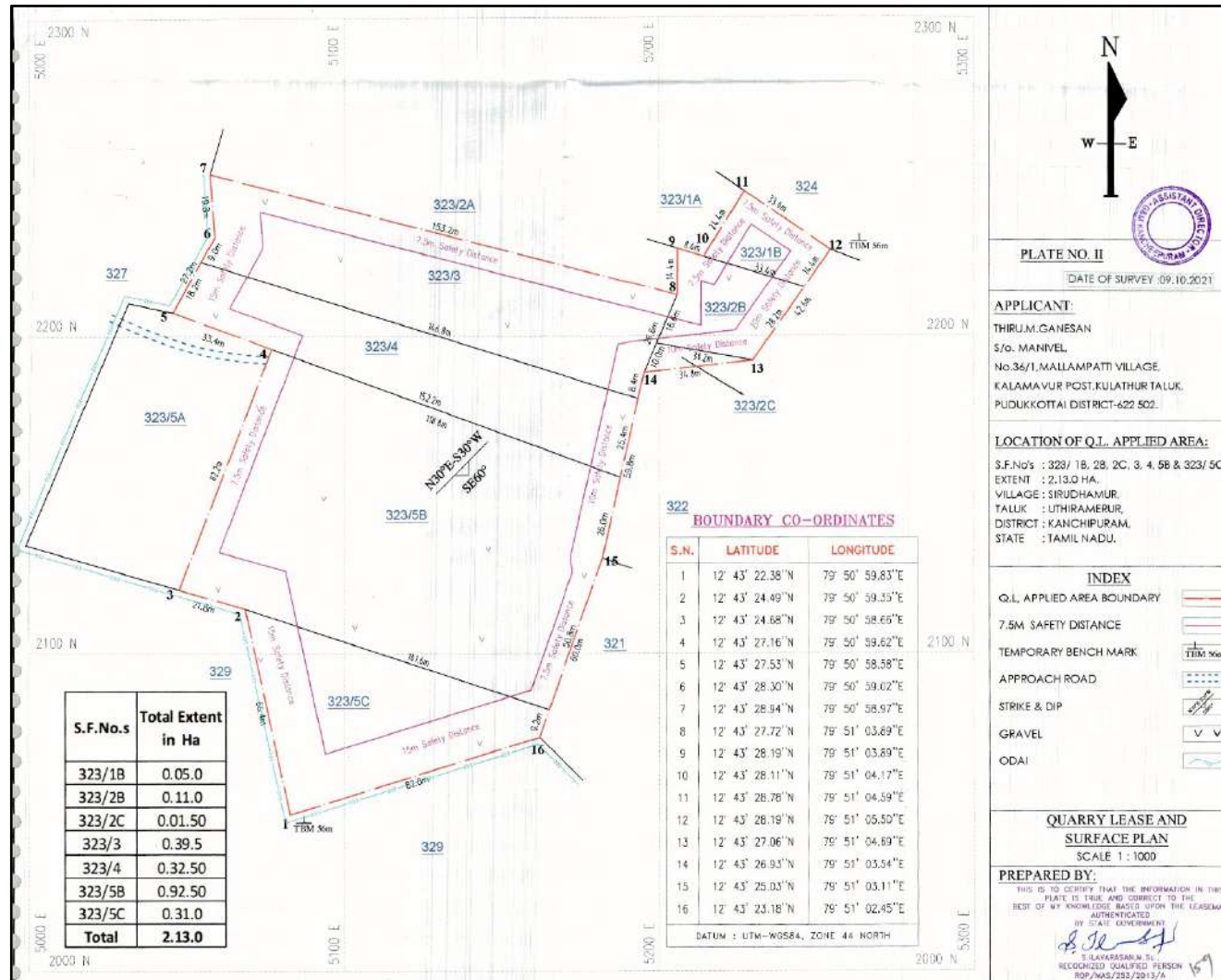
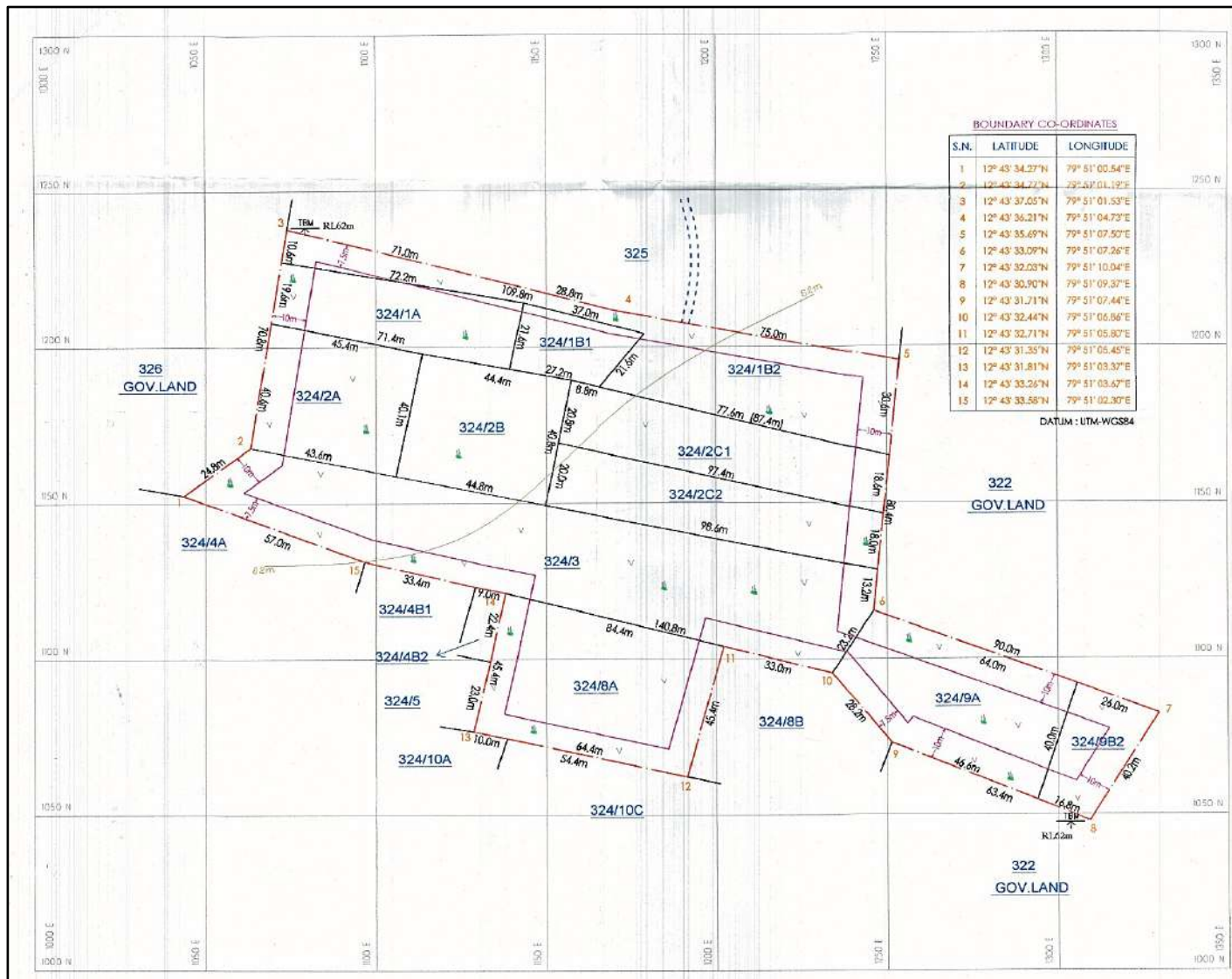


FIGURE – 8: QUARRY LEASE PLAN & SURFACE PLAN -P3



2.4 METHOD OF MINING

The method of mining Opencast Mechanized Mining Method is being proposed by formation of 5.0meter height bench with a bench width not less than the bench height.

The top layer of overburden (Gravel) will be Excavate directly by Hydraulic Excavators and loaded into tippers directly and sold to needy customers. 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

TABLE 2.4 MACHINERY DETAILS FOR PROPOSED PROJECTS

P1				
S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammers	2	1.2m to 2.0m	Compressed air
2	Compressor	1	400 psi	Diesel Drive
3	Excavator with Bucket and Rock breaker	1	300 HP	Diesel Drive
4	Tippers / Dumpers	1	20 Tonnes	Diesel Drive
P2				
S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammers	2	1.2m to 2.0m	Compressed air
2	Compressor	1	400 psi	Diesel Drive
3	Excavator with Bucket and Rock breaker	1	300 HP	Diesel Drive
4	Tippers / Dumpers	2	20 Tonnes	Diesel Drive
P3				
S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammers	4	1.2m to 2.0m	Compressed air
2	Compressor	1	400 psi	Diesel Drive
3	Excavator with Bucket and Rock breaker	1	300 HP	Diesel Drive
4	Tippers / Dumpers	2	20 Tonnes	Diesel Drive

Source: Approved Mining Plan

2.6 CONCEPTUAL MINING PLAN/ FINAL MINE CLOSURE PLAN

- At the end of life of mine, the excavated mine pit / void will act as artificial reservoir for collecting rain water and helps to meet out the demand or crises during drought season.
- After mine closure the greenbelt developed along the safety barrier and top benches and temporary water reservoir will enhance the ecosystem

- Mine Closure is a process of returning a disturbed site to its natural state or which prepares it for other productive uses that prevents or minimizes any adverse effects on the environment or threats to human health and safety.
- The Principle closure objectives are for rehabilitated mines to be physically safe to humans and animals, geo-technically stable, geo-chemically non-polluting/ non-contaminating, and capable of sustaining an agreed post-mining land use.

3.0 DESCRIPTION OF THE ENVIRONMENT

Field monitoring studies to evaluate the base line status of the project site were carried out during the Post Monsoon (October to December 2022) with CPCB guidelines. Environmental data has been collected with reference to proposed mine by CHENNAI METTEX LAB PRIVATE LIMITED Approved by AAI, AGMARK, APEDA, BIS, EIC FSSAI, GAFTA, IOPEPC, MOEF & TEA BOARD Certified & MoEF Notified Laboratory, for the below attributes –

- Land
- Water
- Air
- Noise
- Biological
- Socio-economic status

3.1 ENVIRONMENT MONITORING ATTRIBUTES

TABLE 3.1 ENVIRONMENTAL MONITORING ATTRIBUTES AND FREQUENCY OF MONITORING

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	Physico - Chemical Characteristics	Once during the study period	7 (3 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	1 Hourly Continuous Mechanical/Automatic Weather Station	1	Site specific primary data&

	Cloud cover Dry bulb temperature Rainfall			Secondary Data from IMD Station
Ambient Air Quality	PM10 PM2.5 SO2 & NOX CO & Fugitive Dust	24 hourly twice a week (October – December 2022)	9 (3 core & 6 buffer)	IS 5182 Part 1- 23 National Ambient Air Quality Standards, CPCB
Noise Levels	Ambient Noise	Hourly observation for 24 Hours per location	9 (3 core & 6 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
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 are been carried out as per the Guidelines of CPCB and MoEF & CC.

3.2 LAND ENVIRONMENT

A visual interpretation technique has been adopted for land use classification based on the keys suggested in the chapter – V of the guidelines issued by NNRMS Bangalore & Level III classification with 1:50,000 scale for the preparation of land use mapping. Land use pattern of the area was studied through LISS III imagery of Bhuvan (ISRO). The 10 km radius map of study area was taken for analysis of Land use cover.

TABLE 3.2: LAND USE / LAND COVER TABLE 10 KM RADIUS

S.No	CLASSIFICATION	AREA HA	AREA %
	BUILTUP		
1	SETTLEMENT	550	1.71
2	MINING	175	0.54
	AGRICULTURAL LAND		
3	CROP LAND	13250	41.11
4	PLANTATION	5248	16.28
5	FALLOW LAND	4240	13.16

	FOREST		
6	DENSE FOREST	1518	4.71
	BARREN/WASTE LANDS		
7	SCRUB LAND	3820	11.85
	WETLANDS/ WATER BODIES		
8	WATER BODIES/LAKE/RIVER	3428	10.64
	TOTAL	32229.00	100.00

From the above table and pie diagram it is inferred that the majority of the land in the study area is Agriculture land (includes crop land) 70.55 % followed by water bodies (Rivers Stream Canals) 10.64 %.

The total mining area within the study area is 175 ha i.e., 0.54%. The cluster area of 18.84.5 ha contributes about 10.76 % 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.

Interpretation & Conclusion

Physical Characteristics –

The physical properties of the soil samples were examined for texture, bulk density, porosity and water holding capacity. The soil texture found in the study area is Clay Loam Soil and Bulk Density of Soils in the study area varied between 1.22 – 1.51 g/cc. The Porosity of the soil samples is found to be medium i.e., ranging from 38 – 41.4 %.

Chemical Characteristics –

- The nature of soil is slightly alkaline to strongly alkaline in nature with pH range 8.2 to 8.56
- The available Nitrogen content range between 176 to 192 kg/ha
- The available Phosphorus content range between 1.30 to 1.60 kg/ha
- The available Potassium range between 34.8to 37.4 mg/kg

3.4 WATER ENVIRONMENT

The water resources, both surface and groundwater play a significant role in the development of the area. The purpose of this study is to assess the water quality characteristics for critical parameters and evaluate the impacts on agricultural productivity, domestic community usage, recreational resources and aesthetics in the vicinity. The water samples were collected and transported as per the norms in pre-treated sampling cans to laboratory for analysis.

Surface Water

The pH varied from 7.58 to 7.78 while turbidity found within the standards. Total Dissolved Solids varied from 549 to 552mg/l and Chloride varied between 140 mg/l and 146.0 mg/l. Nitrates varied from 18.2 to 24.8mg/l, while sulphates varied from 32 to 42mg/l.

Ground Water

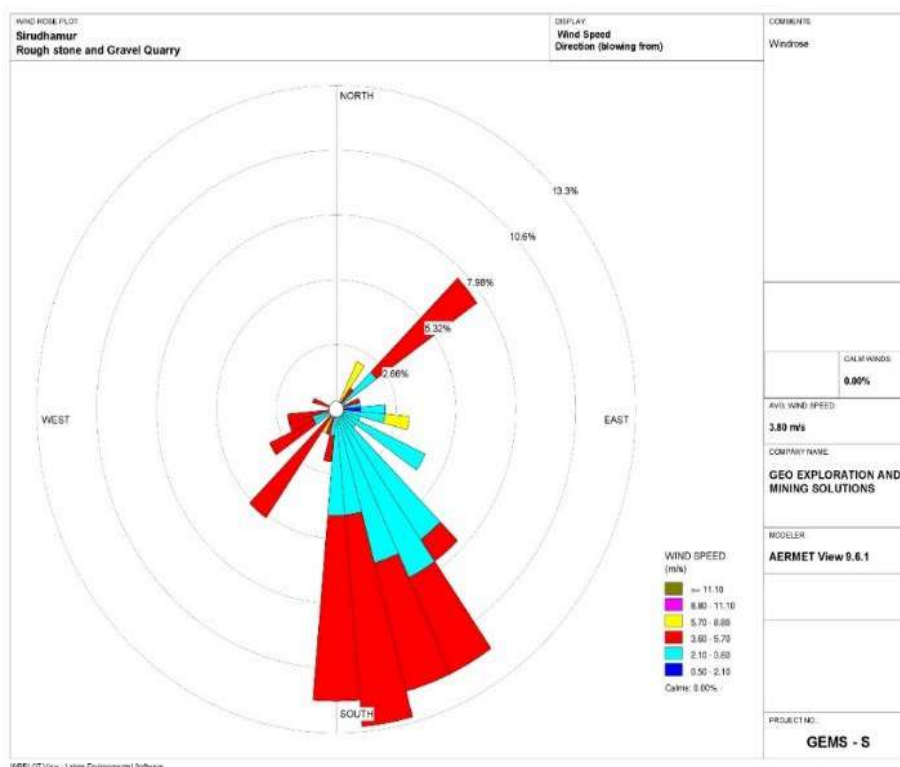
The pH of the water samples collected ranged from 7.52 to 7.78 and within the acceptable limit of 6.5 to 8.5. pH, Sulphates and Chlorides of water samples from all the sources are within the limits as per the Standard. on Turbidity, the water samples meet the requirement. The Total Dissolved Solids were found in the range of 480-524 mg/l in all samples. The Total hardness varied between 148-168 mg/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 – 9: WIND ROSE DIAGRAM



3.6 SUMMARY OF AMBIENT AIR QUALITY

As per monitoring data, PM10 ranges from 52.2 µg/m³ to 61.2 µg/m³, PM2.5 data ranges from 22.1 µg/m³ to 39.4 µg/m³, SO₂ ranges from 6.5 µg/m³ to 9.8 µg/m³ and NO₂ data ranges from 20.7 µg/m³ to 23.7 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 9 (Nine) locations around the proposed quarry lease area. Noise levels recorded in core zone during day time were from 54.4 – 64.3 dB (A) Leq and during night time were from 50.9 – 52.7 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 48.2 – 50.1 dB (A) Leq and during night time were from 40.5 – 44.2 dB (A) Leq.

The values of noise observed in some of the areas are primarily owing to quarrying activities due to cluster of quarries within 500m radius, movement of vehicles and other anthropogenic activities.

3.8 ECOLOGICAL ENVIRONMENT

Ecology is a branch of science which dealing the relations and interactions between organisms and their environment. An ecological survey of the study area was conducted, particularly with reference to listing of species and assessment of the existing baseline ecological conditions in the study area. The main objective of biological study is to collect the baseline data regarding flora and fauna in the study area. Data has been collected through extensive survey of the area with reference to flora and fauna. Information is also collected from different sources i.e., government departments such as District Forest Office, Government of Tamil Nadu. On the basis of onsite observations as well as forest department records the checklist of flora and fauna was prepared.

3.9 SOCIO ECONOMIC ENVIRONMENT

Socio-economic study is an essential part of environmental study. 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 features 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.

It is expected that the socio-economic status of the area will substantially improve because of this proposed project. As the proposed project will provide direct and indirect employment and improve the infrastructural facilities in that area, thus leading to the improvement of their standard of living.

The proposed project will aim to provide preferential 15 persons to the local people there by improving the indirect employment opportunity for 10 persons and in turn the social standards will improve.

4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

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

4.1 LAND ENVIRONMENT:

ANTICIPATED IMPACT

- The main anticipated impact on the Land Environment due to quarrying operation is change in Landscape, change in Land – use Pattern.
- The total extent of the proposed area is 6.51.0 ha and proposed depth of the quarrying is 47m Maximum below the ground level and will not intersect the ground water table.
- The project is site specific.

MITIGATION MEASURES

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

In the Rough stone and Gravel quarrying operation the degradation of land is insignificant, after completion of the quarrying operation the land will be allowed to collect rain water which will act as temporary reservoir, this rough stone does not produce any toxic effluents in the form of solid, liquid or gas. It is a simple quarrying operation where 100% of stones will be removed systematically as per the approved Mining plan. The periphery of the mining lease area will be converted to a greenbelt to prevent Noise and sound propagation to the nearby lands.

- Construction of garland drains all around the quarry pit and construction of check dam at strategic location in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area
- Barbed wire fencing will be carried out at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle.

4.2 SOIL ENVIRONMENT

IMPACT ON SOIL ENVIRONMENT

There is no top soil anticipated in this project, the surface consists of gravelly formation followed by Rough stone which is proposed to excavate completely during the quarrying operation, hence preservation of top soil does not exist. Erosion of top layer (gravel), extracted fine material can result in substantial sediment loading to surface waters and drainage ways. During rainy season surface run off may cause siltation in low lying areas.

MITIGATION MEASURES FOR SOIL EROSION AND SOIL CONSERVATION

- Garland drains will be constructed around the project area with silt traps to control the surface erosion during rainy seasons.
- Greenbelt development all along the periphery of the project area (i.e., 7.5m & 15m safety barrier) will ensure binding strength and minimizes soil erosion.
- Soil sampling will be carried out in the core zone for every six months to ensure the soil quality is not affected due to the quarrying activities.

4.3 WATER ENVIRONMENT

ANTICIPATED IMPACT

The impact due to quarrying on the water quality is expected to be insignificant because of no use of chemicals or hazardous substances during quarrying process. The quarrying activity will not intersect ground water table as quarrying is proposed up to 47m and water table is found at a depth of 53 - 58m BGL.

The quarrying operation will be carried out well above the water table. There is no intersection of surface water bodies (Streams, Canal, Odai etc.,) in the project area. During rainy season rain water will be collected in the quarry pit and later used for greenbelt development and for the water sprinkling in the haul roads. There is no proposal for discharging of quarry pit water outside the project area Rough stone processing.

Detail of water requirements in KLD as given below:

TABLE 4.1: WATER REQUIREMENTS

P1		
Purpose	Quantity	Source
Domestic & Drinking	0.5KLD	From Existing, bore wells and drinking water
Dust Suppression	1.0KLD	From Existing bore wells from nearby area/
Green Belt	1.0KLD	From Existing bore wells from nearby area /
Total	2.5KLD	
P2		
Purpose	Quantity	Source
Domestic & Drinking	0.5KLD	From Existing, bore wells and drinking water
Dust Suppression	1.0KLD	From Existing bore wells from nearby area/
Green Belt	1.0KLD	From Existing bore wells from nearby area /
Total	2.5KLD	
P3		
Purpose	Quantity	Source
Domestic & Drinking	1.5KLD	From Existing, bore wells and drinking water
Dust Suppression	1.2KLD	From Existing bore wells from nearby area/
Green Belt	1.5KLD	From Existing bore wells from nearby area /
Total	4.2KLD	

* Water for drinking purpose will be brought from approved water vendors
Source: Approved Mining Plan Pre-Feasibility Report

MITIGATION MEASURES

- The following mitigation measures are suggested for water management for the cluster quarries Rainwater will be collected in lower part of the quarry pit by construction of garland drains to divert surface run-off and will be connected to setting tank of 5m (l) x 5m (w) x 3m (d) to allow suspended solids to settle down if any. This collected water will act as a rain water harvesting system and will be used for dust suppression and greenbelt development.
- Six months once analysis of quarry pit water and ground water quality in nearby villages will be carried out to ensure the water quality is not affected due to the quarrying activities.
- Domestic sewage from site office & urinals/latrines provided in project area will be discharged through septic tank followed by soak pit system.
- Only clear and settled water free from silt content will be used for dust suppression and greenbelt development.
- De-silting will be carried out before and immediately after the monsoon season and the settling tank and drains will be cleaned weekly, especially during monsoons.
- Tippers & HEMM will be washed in a designated area and the washed water will be routed through drains to a settling tank, which has an oil & grease trap, only clear water will be reused for greenbelt development.

4.4 AIR ENVIRONMENT

ANTICIPATED IMPACT

Wind erosion of the exposed areas and the air borne particulate matter generated by quarrying operation, and transportation are mainly PM₁₀ & PM_{2.5} and emissions of Sulphur dioxide (SO₂) & Oxides of Nitrogen (NO_x) due to excavation/loading equipment and vehicles plying on haul roads are the cause of air pollution in the project area.

Similarly, loading - unloading and transportation of Rough Stone and Gravel, wind erosion of the exposed area and movement of light vehicles will be a cause of pollution due to quarrying activities within a radius of 500 meters from the project area. This leads to a cumulative impact on the ambient air environment around the project area.

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

MITIGATION MEASURES

The pollutants from moving vehicles, residential and commercial activities are the primary sources of air pollution at present. However, in the study area adequate control measures will be implemented in future at the time of quarrying operation. Mitigation measures suggested for air pollution controls are based on the baseline ambient air quality of the area. From the point of view of maintenance of an acceptable ambient air quality in the region, it is

desirable that air quality is monitored on a regular basis to check compliance of standards as prescribed by regulatory authorities. However, to further minimize the pollutant concentration the following control measure should be adopted by the project proponent.

The following additional measures will also be adopted such as:

- Use of Sharp drill bits for drilling holes and charging the holes by using optimum charge and using time delay detonator
 - * The drilling and blasting will be carried out occasionally as per the proposals laid down in the approved plan. Use of low charge explosives for blasting and avoiding overcharging of blast holes
- Water sprinkling twice a day on haul roads, service roads and approach road will help in reducing considerable dust pollution
- Closed Cabins with AC for shovel and dumpers and dust masks to workers will be provided
- Comprehensive green belt in the safety zone will be carried out to reduce to propagation of fugitive dust emissions in order to create clean and healthy environment
- Weekly maintenance of quarrying equipment's will be carried out
- Transport of Rough stone and Gravel in tippers covered with tarpaulin
- Information on wind direction and meteorology will be considered while planning, so that pollutants, which cannot be fully suppressed by engineering technique, will be prevented from reaching the nearby agriculture area
- PPE will be provided to all workers
- Regular health check-up of workers and nearby villagers in the near vicinity of the project area will be carried out and also yearly occupational health assessment of employees will be carried out as per DGMS Guidelines
- Ambient Air Quality Monitoring will be conducted on half-yearly basis to assess the quality of ambient air

As discussed above under each activity, there will be increase in terms of dust load and gaseous emissions. However, it can be stated that these incremental contributions will remain within the prescribed limits/norms. Further, the mitigation measures will further bring down these concentrations making the mining activities more Eco friendly.

4.5 NOISE ENVIRONMENT

ANTICIPATED IMPACT

Noise pollution is mainly due to operation like drilling & blasting and plying of trucks & HEMM. These activities will not cause any problem to the inhabitants of this area because there is no human settlement in close proximity to the project area. Noise modelling has been carried out considering blasting and compressor operation (drilling) and transportation activities.

Attenuation due to Green Belt has been taken to be 4.9 dB (A). The inputs required for the model are:

- Source data
- Receptor data

- Attenuation factor

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.

Ground Vibrations

Ground vibrations due to mining activities in the project area are anticipated due to operation of Mining Machines like Excavators, drilling and blasting, transportation vehicles, etc. However, the major source of ground vibration from the proposed mine is blasting. The major impact of the ground vibrations is observed on the domestic houses located in the villages nearby the mine lease area. The kuchha houses are more prone to cracks and damage due to the vibrations induced by blasting whereas RCC framed structures can withstand more ground vibrations. Apart from this, the ground vibrations may develop a fear factor in the nearby settlements.

Another impact due to blasting activities is fly rocks. These may fall on the houses or agricultural fields nearby the mining lease area and may cause injury to persons or damage to the structures. Considering nearest habitation from the project area is located 1.0km of sirudhamur village

Mitigation measures for Control of Vibration

- The blasting operations in the mine are proposed to be carried out by jackhammer drilling and blasting using delay detonators, which reduces the ground vibrations;
- Proper quantity of explosive, suitable stemming materials and appropriate delay system should be adopted to avoid overcharging and for safe blasting;
- Adequate safe distance from blasting should be maintained as per DGMS guidelines;
- Blasting shelter should be provided as per DGMS guidelines;

- Blasting operations shall be carried out only during day time;
- The charge per delay shall be minimized and preferably a greater number of delays will be used per blasts;
- During blasting, other activities in the immediate vicinity shall be temporarily stopped;
- Drilling parameters like depth, diameter and spacing will be properly designed to give proper blast;
- A fully trained explosives blast man (Mining Mate, Mines Foreman, 2nd Class Mines Manager/ 1st Class Mines Manager) will be appointed.
- A set of shot firing rules will be drawn up and blasting shall commence outlining the detailed operating procedures that will be followed to ensure that shot firing operations on site take place without endangering the workforce or public.
- Sufficient angular stemming material will be used to confine the explosive force and minimise environmental disturbance caused by venting / misfire.
- The detonators will be connected in a predetermined sequence to ensure that only one charge is detonated at any one time and a NONEL or similar type initiation system will be used.
- The detonation delay sequence shall be designed so as to ensure that firing of the holes is in the direction of free faces so as to minimise vibration effects.
- Appropriate blasting techniques shall be adopted such that the predicted peak particle velocity shall not exceed 8 mm/s.
- Vibration monitoring should be carried out every 6 months to check the efficacy of blasting practices

4.6 BIOLOGICAL ENVIRONMENT

ANTICIPATED IMPACT

There are no migratory corridors, migratory Avian-Fauna, Rare endemic, Endangered species and 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 project area is dry barren land and devoid of plantation, the area is surround by seasonal agriculture lands, Existing Rough stone quarries and crushers hence no requirement for the uprooting of trees due to this quarry project.

Barbed wire fencing will be constructed around the project area to prevent the entry of cattles. In the post mining stage, fencing is proposed constructed all around the mined-out void to prevent fall of animals in the mine pits

No medicinal plant identified in core and buffer area.

The fauna in the vicinity of the project site is restricted to few common small species. There will be no impact on fauna due to this quarry project.

Even though there are no impact on bio diversity and flora/fauna status due to project operations, positive impacts will arise due to well-planned reclamation measures for restoration of land status in the area ultimately to productive land category with elaborately planned green belt development activities and along with creation of water resources in the working 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.

In order to compensate the loss of vegetation cover, it is suggested to carry out afforestation program mainly in proposed mine lease area 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.

TABLE 4.2 GREENBELT DEVELOPMENT PLAN

PROPOSAL – P1					
Year	No. of trees proposed to be planted	Survival %	Area to be covered sq.m	Name of the species	No. of trees expected to be grown
I	1200	80%	Safety barrier, Village roads & Approach roads	Neem, Pongamia Pinnata, etc.,	960
PROPOSAL – P2					
I	1300	80%	Safety barrier, Village roads & Approach roads	Neem, Pongamia Pinnata, etc.,	1040
PROPOSAL – P3					
I	1620	80%	Safety barrier, Village roads & Approach roads	Neem, Pongamia Pinnata, etc.,	1296

4.7 SOCIO ECONOMIC ENVIRONMENT

ANTICIPATED IMPACT

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

MITIGATION MEASURES

- Mining in this cluster quarries area will give job opportunities to 54 Nos of the local people. Local people mainly depend upon agricultural and small cottage industries where

the income is irregular and low. Jobs in the mines will increase their per capita income and improve the life style of the people.

- With the operation of proposed mining lease, various indirect employment opportunities will also be generated. Several persons of the neighbouring villages will be benefited with contract works, employment through contractors, running jeeps, trucks, tractors and buses on hire, running canteens, different kinds of shops and transport related business avenues.
- Local Villagers will be provided with either direct employment or indirect employment such as business, contract works and development work like roads etc. Villagers also get access to the other welfare amenities such as drinking water, foods and provisions, shed etc.,
- Benefit to the State and the Central governments through financial revenues by way of royalty, tax, duties, etc., from this project directly and indirectly.
- Proper arrangements will be made for safe and healthy conditions such as dust suppression during loading, unloading & transporting, etc. Development of allied business centres and other small-scale industries will help to improve social standards of the surrounding villagers
- Mine management will contribute for the upliftment of these villages by conducting regular medical camps, assistance in developing necessary infrastructure facilities like maintenance of schools, village roads, drinking water supply, etc.,

5. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

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

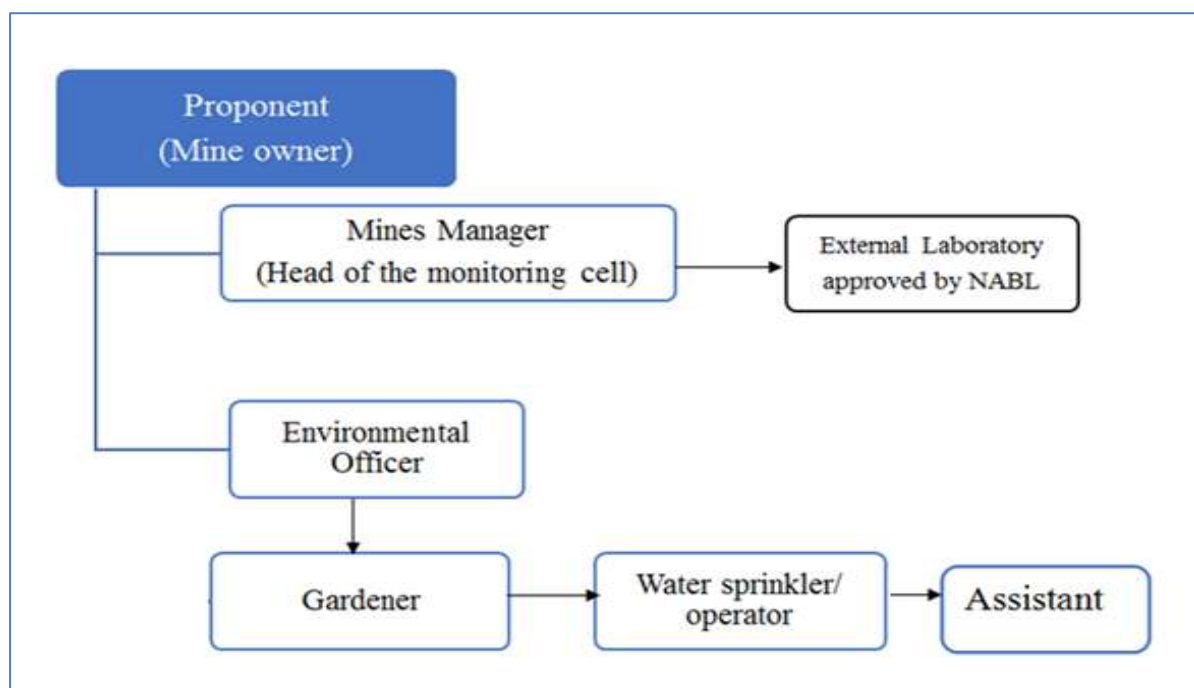
6. ENVIRONMENT MONITORING PROGRAM

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

TABLE 6.1: MONITORING SCHEDULE

S. No.	Environment Attributes		Monitoring		Parameters
			Duration	Duration	
1	Air Quality	9 locations (One station in the core zone and one in 500 m radius, two stations in the upwind, three stations on the downwind direction)	24 hours	Twice in a week for every 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	Mine Pit Water, Nearby project area (Surface water and ground water)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms
4	Hydrology	Water level in open wells in buffer zone around 1km at specific wells	-	Once in 6 months	Depth in BGL

5	Noise	Near Mine Equipment / machineries, Mines Office, Operator Cabin, Surrounding Villages in Buffer Area	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	Core Zone and Buffer zone (Grab samples)	–	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 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 cluster quarry operation will be carried out under the direction of a Qualified Competent Mine manager holding certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad. Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening.

7.2 DISASTER MANAGEMENT PLAN

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

TABLE 7.1: PREDICTED NOISE INCREMENTAL VALUES IN 500 M RADIUS QUARRIES

Location ID	Background Value (Day) dB(A)	Incremental Value dB(A)	Total Predicted dB(A)	Residential Area Standards dB(A)
Habitation Near P1	47	43.0	48.4	55
Habitation Near P2	48.2	40.5	48.9	
Habitation Near P3	48.7	40.5	49.3	
Habitation Near E1	40.2	40.0	43.1	
Habitation Near E2	41.3	52.1	52.5	
Habitation Near E3	40.5	40.8	43.7	
Habitation Near E4	40.9	41.6	44.3	
Habitation Near E5	42.1	39.1	43.9	
Habitation Near E6	40.9	41.6	44.3	
Habitation Near E7	41.2	38.3	43.0	

TABLE 7.2: NEAREST HABITATION FROM EACH MINE

Location ID	Distance in Meters
Habitation Near P1	720m
Habitation Near P2	950m
Habitation Near P3	950m
Habitation Near E1	1100m
Habitation Near E2	310m
Habitation Near E3	920m
Habitation Near E4	820m
Habitation Near E5	1200m
Habitation Near E6	560m
Habitation Near E7	950m

TABLE 7.3: GROUND VIBRATIONS AT 10 MINES

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s
P1	55	720m	0.170
P2	86	950m	0.304
P3	41	950m	0.168
E1	69	930m	0.600
E2	21	770m	0.310
E3	97	1300m	0.202

E4	28	880m	0.032
E5	20	1200m	0.065
E6	28	880m	0.032
E7	99	950m	0.340

TABLE 7.4: SOCIO ECONOMIC BENEFITS FROM 3 MINES

Location ID	Employment in Nos	Project Cost	CER
P1	15	Rs. 52,18,000/-	Rs. 5,00,000/-
P2	18	Rs. 65,24,000/-	Rs. 5,00,000/-
P3	21	Rs. 68,99,000/-	Rs. 5,00,000/-
Total	54	Rs 1,86,41,000/-	Rs 15,00,000/-

8. PROJECT BENEFITS

The proposed quarry aims to produce 77,010 m³ of Gravel and 7,04,095 m³ of Rough Stone during this Mining Plan Period. The quarrying operation in the area will create rural employment. It has been observed that conditions of the villages around quarry areas are better than that of distant villages. 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

It can be concluded from overall assessment of the impacts, in terms of positive and negative effects on various environmental components, that the mining activities will not have any adverse effect on the surrounding environment.

To mitigate any impacts due to the mining activities, a well-planned EMP and a detailed post project monitoring system is provided for regular monitoring and immediate rectification at site. Due to the cluster quarrying activities, socio economic conditions in and around the project site will be improved substantially. Hence, the Prior Environmental Clearance shall be granted at the earliest.