

EXECUTIVE SUMMARY

PALATHURAI & MADUKKARAI ROUGH STONE AND GRAVEL QUARRIES

NAME OF PROPOSED PROJECT PROPONENTS APPLYING IN CLUSTER

S.Nos.	Proponent Name	Extent (Ha)
1	Thiru. D.Jayakumar	1.26.0
2	Tmt.V.Dhanalakshmi	2.17.0
3	Tmt.P.Vasanthi	0.81.0
4	Thiru.M.Saravanan	2.54.58
5	Thiru.M.Shanmugam	3.32.5

“B1” CATEGORY/ MINOR MINERAL /CLUSTER/ NON-FOREST LAND/ PATTALAND

*** CLUSTER EXTENT = 19.17.08 Ha**

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

ToR Obtained vide

- 1.Lr.No. SEIAA-TN/F.No.9126/SEAC/ToR-1253/2022 Dated:07.09.2022-Thiru. D.Jayakumar-P1
- 2.Lr.No. SEIAA-TN/F.No.9195/ToR-1223/2022 Dated:18.08.2022 - Tmt.V. Dhanalakshmi-P2
3. Lr.No. SEIAA-TN/F.No.9596/ToR-1363/2023 Dated:10.02.2023 - Tmt.P. Vasanthi-P3
- 4.Lr.No. SEIAA-TN/F.No.9341/SEAC/ToR-1238/2022 Dated:30.08.2022- Thiru.M. Saravanan-P4
- 5.Lr.No. SEIAA-TN/F.No.9342/SEAC/ToR-1248/2022 Dated:30.08.2022- Thiru.M.Shanmugam-P5

Environmental Consultant

GEO EXPLORATION AND MINING SOLUTIONS



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Baseline Monitoring Period - October to December 2022

Environmental Lab

Chennai Mettex Lab Pvt Ltd

(Approved by AAI, AGMARK, APEDA, BIS, EIC, FSSAI, GAFTA, IOPEPC, MOEF & TEA BOARD)

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

March 2023

1.0 INTRODUCTION

Rough Stone and Gravel are the major requirements for construction industry. This EIA report is prepared by considering Cumulative load of all proposed & existing quarries of Madhukkarai and Palathurai Rough Stone and Gravel Cluster Quarries consisting of five Proposed and one Existing Quarries with total extent of Cluster of 19.17.08 Ha in Madhukkarai and Palathurai Village, Madukkarai Taluk, Coimbatore 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 for the below proposals in Table 1.1 and the Baseline Monitoring study has been carried out during the period of Oct 2022-Dec2022

CODE	Name of the proponent	Extent (Ha)	Terms of Reference (ToR)
P1	Thiru. D.Jayakumar	1.26.0	Lr.No.SEIAA-TN/F.No.9126/SEAC/ToR-1253/2022 Dated:07.09.2022
P2	Tmt.V. Dhanalakshmi	2.17.0	Lr.No.SEIAA-TN/F.No.9195/ToR-1223/2022 Dated:18.08.2022
P3	Tmt.P. Vasanthi	0.81.0	Lr.No.SEIAA-TN/F.No.9596/ToR-1363/2023 Dated:10.02.2023
P4	Thiru.M. Saravanan	2.54.58	Lr.No.SEIAA-TN/F.No.9341/SEAC/ToR-1238/2022 Dated:30.08.2022
P5	Thiru.M. Shanmugam	3.32.5	Lr.No.SEIAA-TN/F.No.9342/SEAC/ToR-1248/2022 Dated:30.08.2022
	Total	10.11.08 Ha	

Source: ToR Letter's of the respective project proponents

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

1.1 DETAILS OF PROJECT PROPONENT

PROPOSAL – P1	
Name of the Company	Thiru. D.Jayakumar, Rough Stone & Gravel Quarry Project
Address	S/o. M. Duraisamy, No. 16/175, Palakkad Road, Marappalam, Madukkarai, Coimbatore District, Tamil Nadu State – 641 105
Mobile	+91 98945 15288
Status	Proprietor
PROPOSAL – P2	
Name of the Company	Tmt.V. Dhanalakshmi, Rough Stone & Gravel Quarry Project
Address	W/o. A. Velusamy, No. 97/B, North Garden, Rottigoundanur, Madukkarai Taluk, Coimbatore District – 641 105
Mobile	+91 98652 22337
Status	Proprietor
PROPOSAL – P3	
Name of the Company	Tmt.P. Vasanthi, Rough Stone & Gravel Quarry Project
Address	W/o. Ponnusamy, No.12/1012, Anbu Nagar, Madukkarai Market, Madukkarai, Coimbatore District – 641 045
Mobile	+91 9842265374
Status	Proprietor

PROPOSAL – P4	
Name of the Company	Thiru.M. Saravanan, Rough Stone & Gravel Quarry Project
Address	S/o. Mallaiyan, No. 16/176, Palakkad Road, Marappalam, Madukkarai, Coimbatore District - 641 105
Mobile	+91 93600 33961 & 90950 63363
Status	Proprietor
PROPOSAL – P5	
Name of the Company	Thiru.M. Shanmugam, Rough Stone & Gravel Quarry Project
Address	S/o. Mallaiyan, No. 12/1B, Santhosh Illam, Sri Lakshmi Nagar Marappalam, Madukkarai, Coimbatore District – 641 105
Mobile	+91 9366660041 & 90950 63363
Status	Proprietor

The project proponent is an individual.

1.2 QUARRY DETAILS WITHIN 500 M RADIUS

PROPOSED QUARRIES				
CODE	Name of the Proponent and Address	S.F. Nos, Village & Taluk	Extent in Ha	Status
P1	Thiru. D.Jayakumar, S/o. M. Duraisamy, No. 16/175, Palakkad Road, Marappalam, Madukkarai, Coimbatore District, Tamil Nadu State – 641 105.	S.F.Nos.16/2A (Part) and 16/2B of Palathurai Village, Madukkarai Taluk	1.26.0	Obtained ToR vide, Lr.No. SEIAA- TN/F.No.9126/SEAC/ToR- 1253/2022 Dated:07.09.2022
P2	Tmt.V. Dhanalakshmi, W/o. A. Velusamy, No. 97/B, North Garden, Rottigoundanur, Madukkarai Taluk, Coimbatore District.	15/1A1B & 15/3 Palathurai Village, Madukkarai Taluk	2.17.0	Obtained ToR vide, Lr.No. SEIAA- TN/F.No.9195/ToR- 1223/2022 Dated:18.08.2022
P3	Tmt.P. Vasanthi W/o. Ponnusamy, No.12/1012, Anbu Nagar, Madukkarai Market, Madukkarai, Coimbatore District – 641 045	617/1 and 618 of Madukkarai Village & Madukkarai Taluk,	0.81.0	Obtained ToR vide, Lr.No. SEIAA- TN/F.No.9596/ToR- 1363/2023 Dated:10.02.2023
P4	Thiru.M. Saravanan S/o. Mallaiyan, No. 16/176, Palakkad Road, Marappalam, Madukkarai, Coimbatore District - 641 105	509/2 of Madukkarai Village, Madukkarai Taluk,	2.54.58	Obtained ToR Vide Lr.No. SEIAA- TN/F.No.9341/SEAC/ToR- 1238/2022 Dated:30.08.2022
P5	Thiru.M. Shanmugam, S/o. Mallaiyan, No. 12/1B, Santhosh Illam, Sri Lakshmi Nagar Marappalam, Madukkarai, Coimbatore District – 641 105.	509/1(Part) & 15/1A2(Part) of Madukkarai and Palathurai Village, Madukkarai Taluk	3.32.5	Obtained ToR Vide Lr.No. SEIAA- TN/F.No.9342/SEAC/ToR- 1248/2022 Dated:30.08.2022
P6	Thiru.D. Jayakumar, S/o. M. Duraisamy, No. 16/175, Palakkad Road, Marappalam, Madukkarai, Coimbatore District, Tamil Nadu State – 641 105	631/2,632(P) &649 Madukkarai Village,	2.32.0	Under SEAC Examination
P7	Tmt.P. Vasanthi W/o. Ponnusamy, No.12/1012, Anbu	505 & 506/2 Madukkarai Village & Madukkarai	1.76.0	EC GRANTED

	Nagar, Madukkarai Market, Madukkarai ,Coimbatore District – 641 045	Taluk,		
Total			14.19.08	
EXISTING QUARRIES				
CODE	Name of the Proponent and Address	S.F.Nos , Village & Taluk	Extent in Ha	Lease Period
E1	Thiru.Vaalaithottathu Gounder	498/1,498/2,499/1,499/2(P), 510,511, Madukkarai	4.98.0	07.10.2017 to 06.10.2022
Total			4.98.0	
ABANDONED QURRIES				
CODE	Name of the Proponent and Address	S.F. Nos, Village & Taluk	Extent in Ha	Lease Period
A-1	Thiru .T.Selvakumar	619, Madukkarai	1.12.0	01.4.1999 to 31.3.2004
A-2	Thiru.Mayilsamy	515, Madukkarai	3.26.0	01.4.1999 to 31.3.2004
A-3	Thiru.P. Vasanthi	617/1 (P) &618, Madukkarai	0.63.0	25.7.2004 to 25.7.2009
A-4	Thiru.K.A. Krishnasamy	634/2 (P), Madukkarai	0.81.0	20.3.2004 to 19.3.2009
A-5	Thiru.K. Senthilkumar	501,502 &504, Madukkarai	4.15.0	22.10.2004 to 21.10.2009
A-6	Thiru.P.C. Ponnusamy	503, Madukkarai	0.60.0	08.12.2005 to 7.12.2010
A-7	Thiru.G. Gopalan	506/1, & 507, Madukkarai	1.80.5	21.5.2010 to 20.5.2015
A-8	Government Poramboke Land	623, Madukkarai	0.47.5	Lease Expired Before 1990
A-9	Thiru.S. Vaiyapuri Gounder	621, Madukkarai	0.41.5	14.12.2003 to 13.12.2008
A-10	Thiru. K.M. Ranganathan	513 & 514Madukkarai	1.92.0	25.07.2005 to 24.07.2010
A-11	N. Chinnasamy	631/1 (P), Madukkarai	0.32.0	27.11.2010 to 26.11.2015
A-12	V.Selvakumar	620, Madukkarai	0.85.0	14.09.2005 to 13.09.2010
A-13	Thiru.Vaalaithottathu Gounder	512, Madukkarai	1.22.0	19.05.2011 to 18.05.2016
Total			17.57.50	
EXPIRED QURRIES				
CODE	Name of the Proponent and Address	S.F. Nos, Village & Taluk	Extent in Ha	Lease Period
EX-1	Thiru.K. Thirumoorthi	633/2B, 633/3, 633/2A2A & Palathurai	0.97.5	01.06.2016 to 31.05.2021
Total			0.97.5	
TOTAL CLUSTER EXTENT			19.17.08	

TABLE 1.3: SALIENT FEATURES OF THE PROPOSED PROJECTS IN CLUSTER

SALIENT FEATURES OF PROPOSAL “P1”			
Name of the Mine	Thiru. D.Jayakumar , Rough Stone & Gravel Quarry Project		
Land Type	Patta land (No.989) Land Release deed Document No.5341/2021		
S.F. Nos	16/2A (Part) and 16/2B		
Extent	1.26.0 Ha		
Proposes pit dimensions	104m (L) x 88m (W) x 44m(D)		
Geological Reserves	Rough Stone	Weathered Rock	Gravel
	5,03,360 m ³	25,168	25,168 m ³
Mineable Reserves	Rough Stone	Weathered Rock	Gravel
	1,14,480 m ³	15,360 m ³	17,544 m ³
Mining Plan Period / Lease Period	5 Years		
Ultimate Pit Dimension	104m (L) x 88m (W) x 44m(D)		
Depth restricted as per ToR	The ultimate depth of mining is about 44m (2m Gravel +2m Weathered Rock + 40m Rough stone)		
Toposheet No	58 B/13		
Latitude	10°53'04.47"N to 10°53'09.01"N		
Longitude	76°56'25.85"E to 76°56'30.71"E		
Machinery proposed	Jack Hammer	4	
	Compressor	1	
	Excavator with Bucket and Rock Breaker	1	
	Tippers	2	
Blasting	Usage of Slurry Explosive with MSD detonators		
Manpower Deployment	20 Nos		
Total Project Cost	Project Cost	Rs. 44,75,000/-	
	EMP Cost	Rs. 3,80,000/-	
	Total	Rs. 48,55,000/-	
CER cost	Rs.5,00,000/-		
SALIENT FEATURES OF PROPOSAL “P2”			
Name of the Mine	Tmt.V. Dhanalakshmi , Roughstone and gravel quarry		
Land Type	Patta Land (No.299)		
S.F. No.	15/1A1B & 15/3		
Extent	2.17.0 Ha		
Previous quarry operation details	Operated by <ul style="list-style-type: none"> • Thiru.V. Radhakrishnan, 2.17.0 Ha, S.F.Nos 15/1A1B Lease period of five years from 23.12.2003 to 22.12.2008 • Tmt.V. Dhanalakshmi, Extent 1.08.5 Ha, S.F.Nos 15/1A1B Rc.No.279/2009/MM1, Dated: 26.09.2009, Lease period 26.09.2009 to 25.09.2014 • Thiru.P.Chinoydas,1.08.5Ha,S.F.No.15/3, Rc.No.374/Mines/2014, Dated: 03.03.2016 Lease period 03.03.2016 to 02.03.2021 		
Existing pit dimension	130m (L) x 123m (W) x 47m(D)		
Depth restricted as per ToR	47m bgl (2m Gravel + 45m Roughstone)		
Geological Resources	Rough Stone	Gravel	
	4,16,976m ³	1280 m ³	
Mineable Reserves	Rough Stone	Gravel	
	71,508 m ³	NIL	
Proposed production for five years upto the depth of 28m as per ToR	71,508 m ³	-	
Mining Plan Period / Lease Period	5 Years		
Ultimate Pit Dimension	133m(L)	63m (W)	28m (D)
Toposheet No	58 - B/13		
Latitude	10°53'10.57"N to 10°53'16.25"N		
Longitude	76°56'32.01"E to 76°56'38.00"E		
Highest Elevation	300 m AMSL		

Machinery	Jack Hammer	2	
	Compressor	1	
	Excavator with Bucket and Rock Breaker	1	
	Tippers	1	
Blasting	Usage of Slurry Explosive with MSD detonators		
Manpower Deployment	14 Nos		
Total Cost	Project Cost	Rs. 38,16,000/-	
	EMP Cost	Rs. 3,80,000/-	
	Total	Rs. 41,96,000/-	
CER cost	Rs.5,00,000/-		
SALIENT FEATURES OF PROPOSAL "P3"			
Name of the Mine	Tmt.P. Vasanthi , Rough stone and Gravel quarry		
Land Type	Patta land (S.F.No. 617/1 is registered in the name of the Applicant (Tmt. P. Vasanthi), vide Patta No.1252 and S.F.No. 618 is registered in name of Thiru. Ponnusamy. Vide Patta No.1114)		
S.F. No.	617/1 and 618		
Extent	0.81.0 Ha		
Previous quarry details	Operated by Tmt. P. Vasanthi, Extent 0.63.0 Ha, S.F.Nos 617/1 (part) and 618 Rc.No.747/2004/MM1, dated: 12.07.2004 Lease period 26.07.2004 to 26.07.2009		
Existing pit dimension	86m (L) X 68m (W) X 15m (D)		
Depth restricted as per ToR	30m bgl (2m Gravel + 28m Rough stone)		
Geological Reserves	Rough Stone	Gravel	
	1,24,065 m ³	300m ³	
Mineable Reserves	Rough Stone	Gravel	
	31,000 m ³	-	
Proposed production for five years	Rough Stone	Gravel	
	31,000 m ³	-	
Mining Plan Period / Lease Period	5 Years		
Depth of mining	30m(2m gravel + 28m Roughstone) Bgl		
Ultimate Pit Dimension	86m (L)	68m (W)	30m BGL (D)
Toposheet No	58-B/13		
Latitude	10°53'23.30"N to 10°53'26.50"N		
Longitude	76°56'21.36"E to 76°56'24.46"E		
Water Level	70 to 65m BGL		
Machinery	Jack Hammer	2	
	Compressor	1	
	Excavator with Bucket and Rock Breaker	1	
	Tippers	1	
Blasting	Usage of Slurry Explosive with MSD detonators		
Manpower Deployment	12 Nos		
Total Project Cost	Project Cost	Rs. 35,16,000/-	
	EMP Cost	Rs. 3,80,000/-	
	Total	Rs. 38,96,000/-	
CER cost	Rs.5,00,000/-		
SALIENT FEATURES OF PROPOSAL "P4"			
Name of the Mine	Thiru.M. Saravanan , Rough stone and Gravel quarry		
Land Type	Patta land (Patta No.3695)		
S.F. No.	509/2		
Extent	2.54.58 Ha		
Previous quarry details	Operated by 1. Thiru.M. Saravanan, Extent 3.74.0 Ha, S.F.Nos 509 Rc.No.1074/2008/MM1, dated: 27.02.2009, & Rc.No.838/2013/MM1, dated: 01.06.2016 Lease period 27.02.2009 to 26.02.2014 and 01.06.2016 to 31.05.202021		

Existing pit dimension	184m(L) X 113m (W) X 24m (D)		
Proposed depth	46m bgl (2m Gravel + 4m Weathered Rock + 40m Rough stone)		
Geological Reserves	Rough Stone	Weathered rock	Gravel
	6,42,256 m ³	11, 566 m ³	23,132 m ³
Mineable Reserves	Rough Stone	Weathered rock	Gravel
	2,33,497 m ³	3,744 m ³	2,640 m ³
Proposed production for five years	Rough Stone	Weathered rock	Gravel
	2,33,497 m ³	3,744 m ³	2,640 m ³
Mining Plan Period / Lease Period	5 Years		
Proposed Depth of Mining	46m (2m Gravel +4m Weathered Rock+40m Roughstone) Bgl.		
Ultimate Pit Dimension	196m (L) * 113m (W) * 46m BGL (D)		
Toposheet No	58-B/13		
Latitude	10°53'09.8142"N to 10°53'18.1889"N		
Longitude	76°56'40.4454"E to 76°56'46.8417"E		
Water Level	70 to 65m BGL		
Machinery	Jack Hammer	6	
	Compressor	2	
	Hydraulic Excavator	1	
	Tipper	3	
Blasting	Usage of Slurry Explosive with MSD detonators		
Manpower Deployment	26 Nos		
Total Project Cost	Project Cost	Rs. 1,43,65,000/-	
	EMP Cost	Rs. 3,80,000/-	
	Total	Rs. 1,47,45,000/-	
CER cost	Rs.5,00,000/-		
SALIENT FEATURES OF PROPOSAL "P5"			
Name of the Mine	Thiru.M. Shanmugam Rough stone and Gravel quarry		
Land Type	Patta land (Registered in the name of Thiru.S. Santhosh Mallaiya, vide Patta Nos.113 and 3694)		
S.F. No.	509/1(Part) ,15/1A2(Part)		
Extent	3.32.5 Ha		
Previous quarry details	Operated by 1. Thiru.M. Saravanan, Extent 3.74.0 Ha, S.F.Nos 509 Rc.No.1074/2008/MM1, dated: 27.02.2009, & Rc.No.838/2013/MM1, dated: 01.06.2016 Lease period 27.02.2009 to 26.02.2014 and 01.06.2016 to 31.05.2021		
Existing pit dimension	Pit1- 180m (L) * 100m (W) * 25m BGL (D) Pit2 -30m (L) * 30m (W) * 6m BGL (D) Pit3 -80m (L) * 50m (W) * 4m BGL (D)		
Proposed depth	51m (2m Gravel + 4m Weathered Rock + 45m Rough stone) below ground level		
Geological Reserves	Rough Stone	Weathered rock	Gravel
	11,67,457m ³	38,488 m ³	10,456 m ³
Mineable Reserves	Rough Stone	Weathered rock	Gravel
	3,32,018 m ³	10,123 m ³	754 m ³
Proposed production for five years as per ToR 46m depth	Rough Stone	Weathered rock	Gravel
	3,32,018 m ³	10,123 m ³	754 m ³
Mining Plan Period / Lease Period	5 Years		
Proposed Depth of mining	51 m (2m Gravel +4m Weathered Rock + 45m Roughstone Bgl)		
Ultimate Pit Dimension	196m (L) * 113m (W) * 46m BGL (D)		
Toposheet No	58-B/13		
Latitude	10°53'05.7553"N to 10°53'15.8811"N		

Longitude	76°56'37.3129"E to 76°56'43.2515"E	
Water Level	70 to 65m BGL	
Machinery	Jack Hammer	8
	Compressor	2
	Hydraulic Excavator with Bucket and Rock Breaker	2
	Tippers	5
Blasting	Jack hammer drilling and slurry blasting	
Manpower Deployment	37 Nos	
Total Project Cost	Project Cost	Rs. 1,06,96,000/-
	EMP Cost	Rs. 3,80,000/-
	Total	Rs. 1,10,76,000/-
CER cost	Rs.5,00,000/-	

Source: Approved Mining Plan of the respective proposals

1.4 STATUTORY DETAILS

Project – P1 –

- The proponent applied for Rough Stone and Gravel Quarry Lease Dated: 22.11.2021 & 01.02.2022
- Precise Area Communication Letter was issued by the District Collector, Coimbatore Rc.No. Rc.No.1268/Mines/2021 Dated: 15.02.2022.
- The Mining Plan was prepared by Recognized Qualified Person and approved by Joint Director / Assistant Director (i/c), Department of Geology and Mining, Coimbatore District, vide Rc.No.1268/Mines/2021 Dated: 02.03.2022
- Proponent applied for ToR for Environmental Clearance vides online Proposal No. SIA/TN/MIN/73993/2022, Dated:22.03.2022

Project – P2 –

- The proponent applied for Rough Stone and Gravel Quarry Lease Date from 21.12.2021.
- Precise Area Communication Letter was issued by the District Collector, Coimbatore Rc.No. 1391/Mines/2021, Dated: 09.03.2022
- The Mining Plan was prepared by Recognized Qualified Person and approved by Joint Director / Assistant Director (i/c), Department of Geology and Mining, vide Rc.No. 1391/Mines/2021 Dated: 24.03.2022
- Proponent applied for ToR for Environmental Clearance vides online Proposal No. SIA/TN/MIN/76102/2022, Dated:25.04.2022

Project – P3 –

- The proponent applied for Rough Stone and Gravel Quarry Lease Dated: 14.12.2018
- Precise Area Communication Letter was issued by the District Collector, Coimbatore Rc.No.658 / Mines / 2018, Dated: 06.07.2022
- The Mining Plan was prepared by Qualified Person and approved by Joint Director / Assistant Director (i/c), Department of Geology and Mining, Coimbatore 658/Mines/2018 Dated: 11.07.2022
- Proponent applied for ToR for Environmental Clearance vide proposal No SIA/TN/MIN/407137/2022, Dated:19.11.2022.

Project – P4–

- The proponent applied for Rough Stone and Gravel Quarry Lease Dated: 23.03.2022
- Precise Area Communication Letter was issued by the District Collector, Coimbatore Rc.No. 294/Mines/2022, Dated:02.05.2022
- The Mining Plan was prepared by Recognized
- Qualified Person and approved by Joint Director / Assistant Director (i/c), Department of Geology and Mining, Coimbatore Rc.No. 294/Mines/2022, Dated:13.05.2022
- Proponent applied for ToR for Environmental Clearance vide proposal No SIA/TN/MIN/78617/2022, Dated:20.06.2022.

Project – P5–

- The proponent applied for Rough Stone and Gravel Quarry Lease Dated: 23.03.2022
- Precise Area Communication Letter was issued by the District Collector, Coimbatore Rc.No.295/Mines/2022, Dated:05.05.2022
- The Mining Plan was prepared by Recognized Qualified Person and approved by Joint Director / Assistant Director (i/c), Department of Geology and Mining, Coimbatore Rc.No.295/Mines/2022, Dated:13.05.2022
- Proponent applied for ToR for Environmental Clearance vide proposal No SIA/TN/MIN/78657/2022 Dated:21.06.2022.

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. Rough Stone and Gravel are proposed to be excavated by opencast mechanized method involving splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and blasting, hydraulic excavators are used for loading the Rough Stone from pithead to the needy crushers and rock breakers to avoid secondary blasting.

2.1 SITE CONNECTIVITY TO THE PROJECT AREA

Nearest Roadway	NH544 - Salem – Ernakulam Road -1.0km-N SH163 - Palladam – Othakalmandapam Road – 6.0km-E
Nearest Village	Paladurai village – 1.0km-SE
Nearest Town	Madukkarai – 3.0km – NE
Nearest Railway	Madukkarai – 2.0km-N
Nearest Airport	Coimbatore Airport – 14 km – NorthEast
Seaport	Kochi- 130 Km-SW
Interstate Boundary	Tamilnadu-Kerala-13km-W

2.2 LAND USE PATTERN OF THE PROPOSED PROJECT

LAND USE PATTERN OF PROJECT – P1		
Description	Present area in (ha)	Area at the end of life of quarry (Ha)
Area under quarry	Nil	0.81.2
Infrastructure	Nil	0.01.0
Roads	Nil	0.02.0

Green Belt	Nil	0.18.0
Un – utilized area	1.26.0	0.23.8
Grand Total	1.26.0	1.26.0
LAND USE PATTERN OF PROJECT – P2		
Description	Present area in (ha)	Area at the end of life of quarry (Ha)
Area under quarry	1.59.0	1.59.0
Infrastructure	Nil	0.01.0
Road	0.02.0	0.02.0
Green Belt	Nil	0.13.0
Unutilized area	0.56.0	0.42.0
Grand Total	2.17.0	2.17.0
LAND USE PATTERN OF PROJECT – P3		
Description	Present area in (ha)	Area at the end of life of quarry (Ha)
Area under quarry	0.59.0	0.59.0
Infrastructure	Nil	0.01.0
Roads	0.02.0	0.02.0
Green Belt	Nil	0.10.0
Un – utilized area	0.20.0	0.09.0
Grand Total	0.81.0	0.81.0
LAND USE PATTERN OF PROJECT – P4		
Description	Present area in (ha)	Area at the end of life of quarry (Ha)
Area under quarry	2.03.00	2.16.56
Infrastructure	Nil	0.01.0
Roads	0.01.00	0.02.00
Green Belt	Nil	0.25.70
Un – utilized area	0.50.58	0.09.32
Grand Total	2.54.58	2.54.58
LAND USE PATTERN OF PROJECT – P5		
Description	Present area in (ha)	Area at the end of life of quarry (Ha)
Area under quarry	2.55.0	2.68.9
Infrastructure	Nil	0.01.0
Roads	0.01.00	0.02.00
Green Belt	Nil	0.24.0
Un – utilized area	0.76.5	0.36.6
Grand Total	3.32.5	3.32.5

2.3 OPERATIONAL DETAILS OF LEASE APPLIED AREA

OPERATIONAL DETAILS FOR PROJECT – P1			
PARTICULARS	DETAILS		
	Rough Stone (m³) (5Year Plan period)	Weathered Rock (m³)	Gravel (m³) (3 Years Plan per iod)
Geological Resources	5,03,360 m ³	25,168	25,168 m ³
Mineable Reserves	1,14,480 m ³	15,360	17,544 m ³
Production for five-year plan period	1,14,480 m ³	15,360	17,544 m ³
Mining Plan Period / Lease Applied Period	5Years		
Number of Working Days	300 Days		
Production per day	76	17	19
No of Lorry loads (6m ³ per load)	13	3	3 lorry load per week
Total Depth of Mining	44m (2m Gravel +2m Weathered Rock + 40m Roughstone)		
OPERATIONAL DETAILS FOR PROJECT – P2			
PARTICULARS	DETAILS		

	Rough Stone (m³) (5Year Plan period)	Weathered Rock (m³)	Gravel (m³) (3 Years Plan period)
Geological Resources	4,16,976 m ³	-	1,280 m ³
Mineable Reserves	71,508 m ³	-	-
Production for five years Plan	71,508 m ³	-	-
Mining Plan Period / Lease Applied Period	5Years		
Number of Working Days	300 Days		
Production per day	48	-	1
No of Lorry loads (6m ³ per load)	8	-	1 lorry load per week
Total Depth of mining	47m (2m Gravel + 45m Rough Stone)		
OPERATIONAL DETAILS FOR PROJECT – P3			
DETAILS			
PARTICULARS	Rough Stone (m³) (5Year Plan period)	Weathered Rock (m³)	Gravel (m³) (3 Years Plan period)
Geological Resources	1,24,065	-	300m ³
Mineable Reserves	31,000 m ³	-	-
Production for five year plan period	31,000 m ³	-	-
Mining Plan Period / Lease Applied Period	5 Years		
Number of Working Days	300 Days		
Production per day	21 m ³	-	-
No of Lorry loads (6m ³ per load)	3	-	-
Proposed Depth for Mining Plan Period	30m (2m Gravel + 28m Rough Stone)		
OPERATIONAL DETAILS FOR PROJECT – P4			
DETAILS			
PARTICULARS	Rough Stone (m³) (5 Year Plan period)	Weathered Rock (m³)	Gravel (m³) (3 Years Plan period)
Geological Resources	6,42,256	23,132	11,566
Mineable Reserves	2,33,497	3,744	2,640
Production for five-year plan period	2,33,497	3,744	2,640
Mining Plan Period / Lease Applied Period	5 Years		
Number of Working Days	300 Days		
Production per day	156 m ³	4	1 m ³
No of Lorry loads (6m ³ per load)	26 Nos	1 lorry load	1 lorry load per week
Proposed Depth for Mining Plan Period	46m (2m Gravel + 4m Weathered Rock + 40m Rough Stone) below ground level		
OPERATIONAL DETAILS FOR PROJECT – P5			
DETAILS			
PARTICULARS	Rough Stone (m³) (5 Year Plan period)	Weathered Rock (m³)	Gravel (m³) (3 Years Plan period)
Geological Resources	11,67,457	38,488	10,456
Mineable Reserves	3,32,018	10,123	754
Production for five-year plan period	3,32,018	10,123	754
Mining Plan Period / Lease Applied Period	5 Years		
Number of Working Days	300 Days		
Production per day	221 m ³	11	1 m ³
No of Lorry loads (6m ³ per load)	37 Nos	2 lorry load	1 lorry load per week
Proposed Depth for Mining Plan Period	51m (2m Weathered Rock + 4m Gravel + 45m Rough Stone) below ground level		

FIGURE – 1: GOOGLE IMAGE SHOWING PROJECT AREA



SATELLITE IMAGERY OF P1



SATELLITE IMAGERY OF P2



SATELLITE IMAGERY OF P3



SATELLITE IMAGE OF P4



SATELLITE IMAGERY OF P5

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

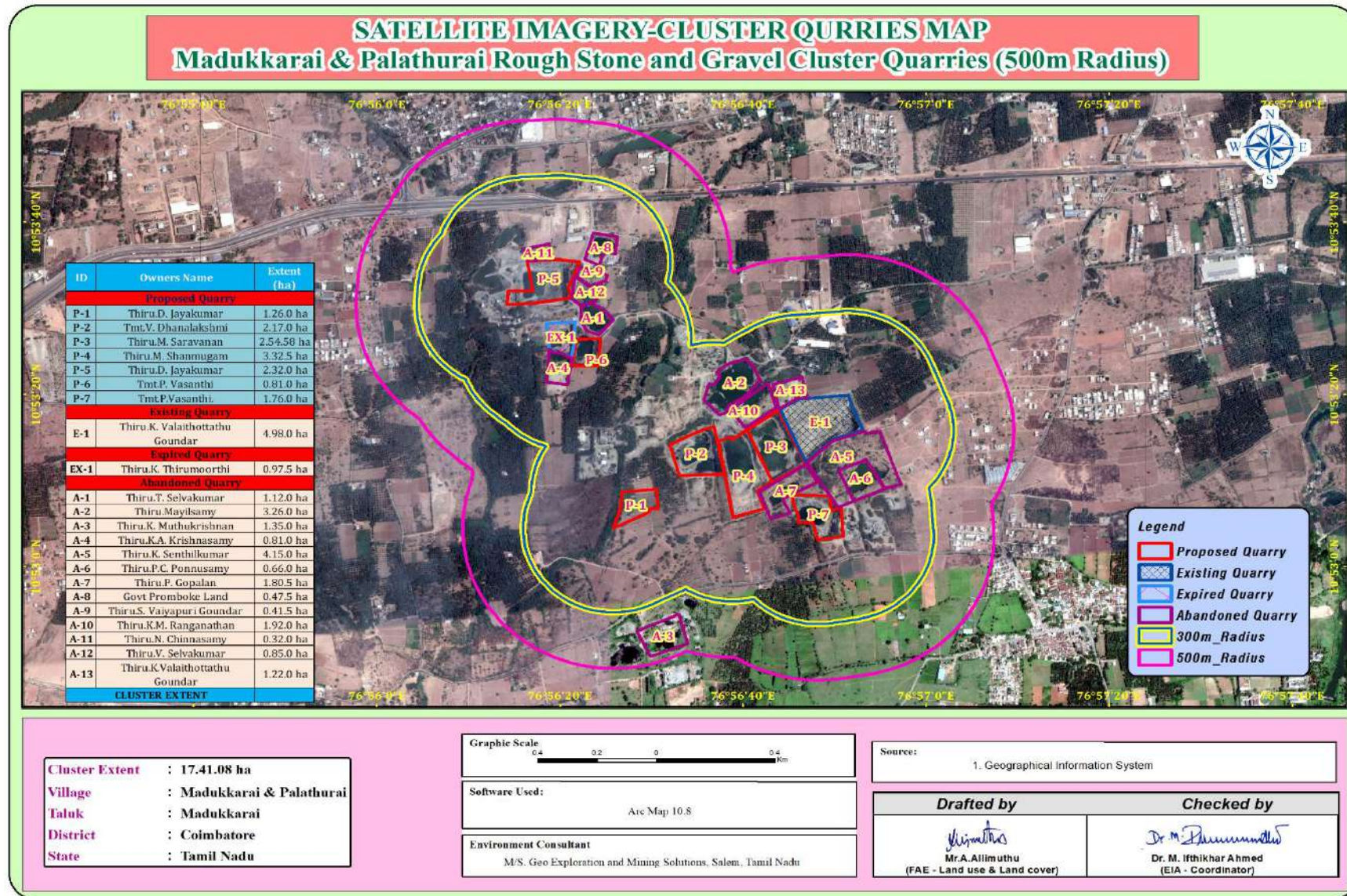


FIGURE – 3: TOPOSHEET MAP COVERING 10 KM RADIUS

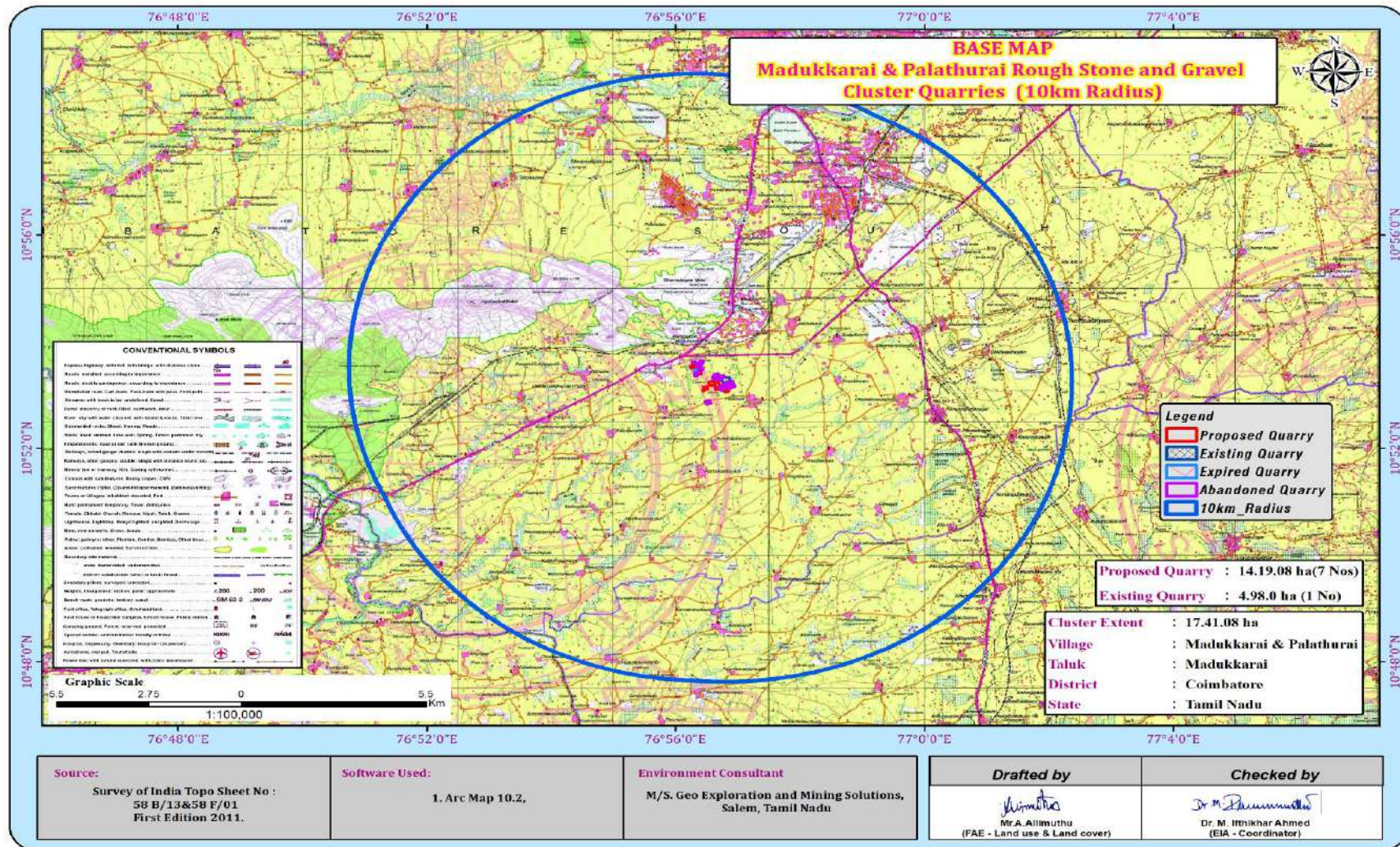
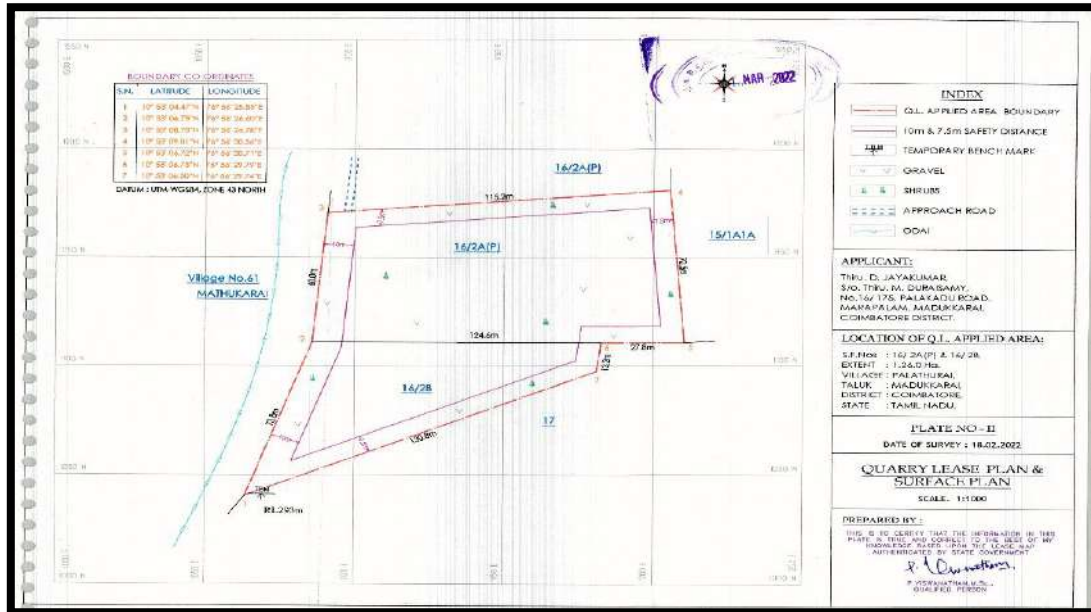
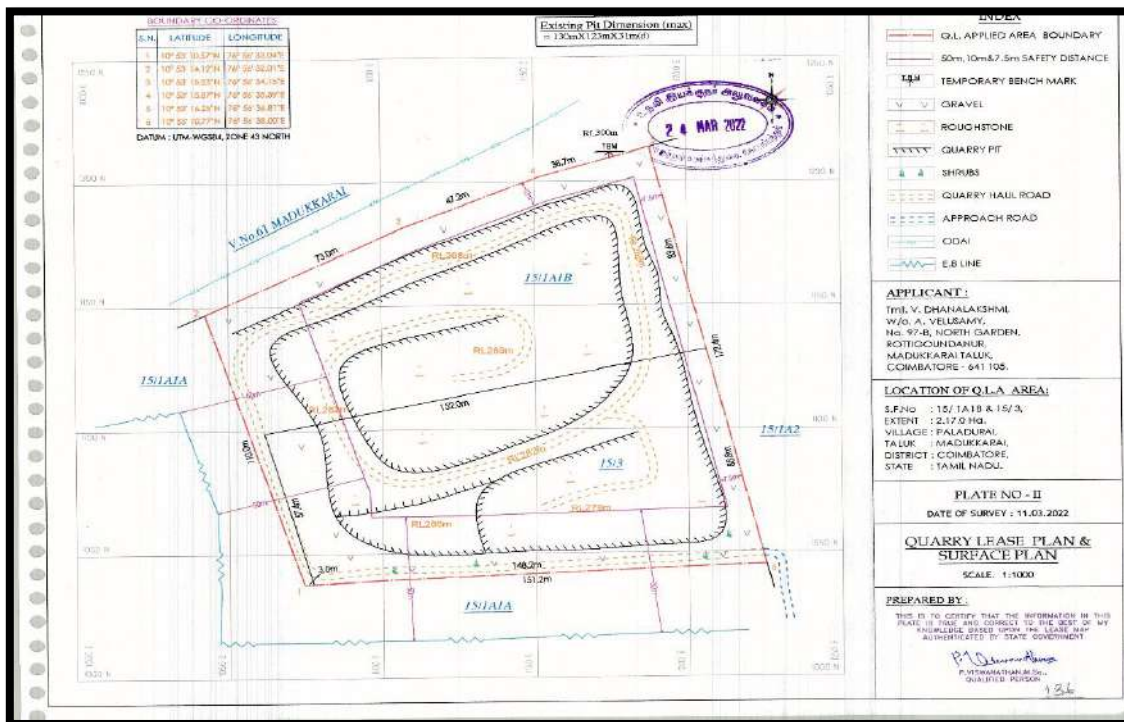


FIGURE – 4: QUARRY LEASE PLAN & SURFACE PLAN

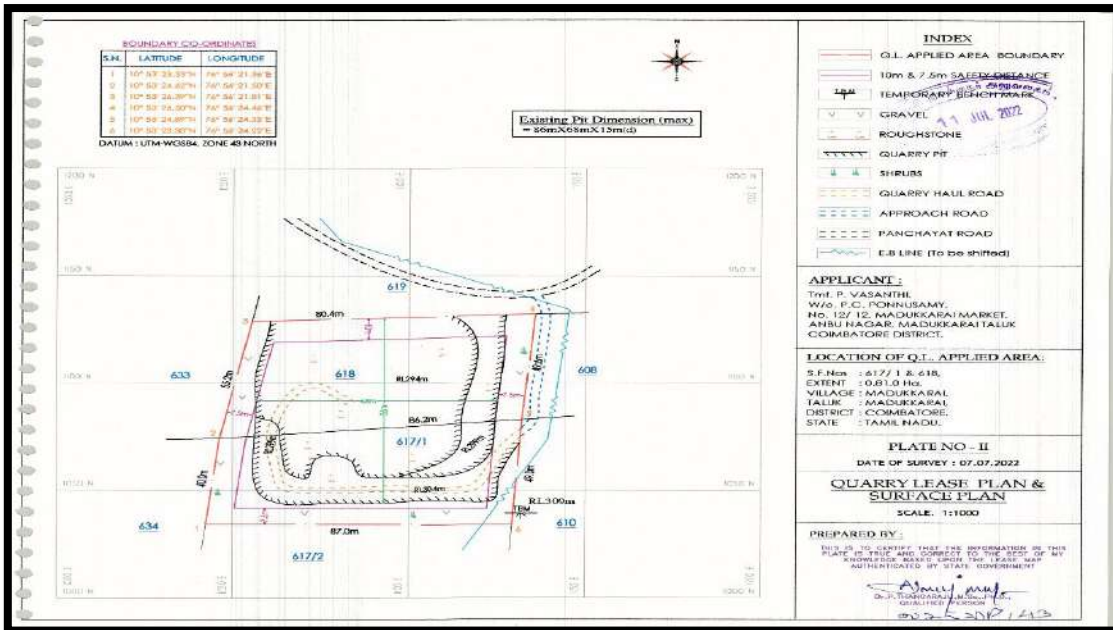
P1- D.Jayakumar



P2- Tmt.V.Dhanalakshmi



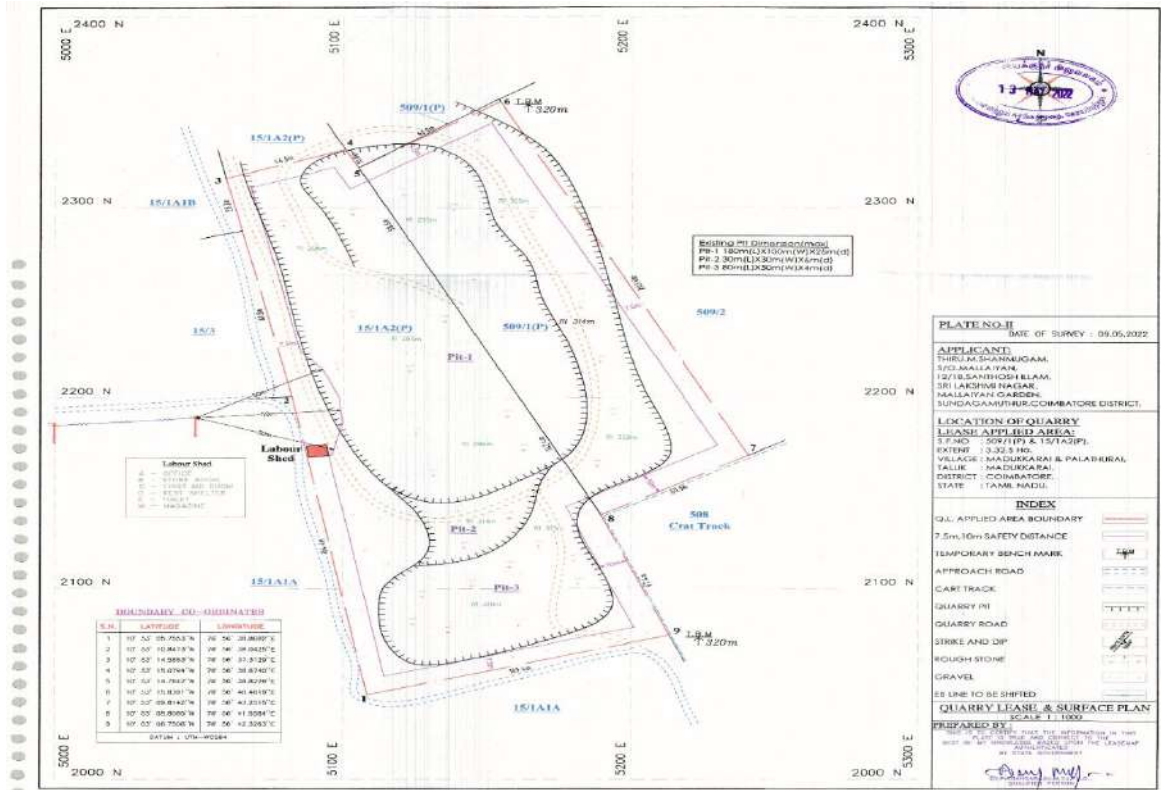
P3- Tmt.P. Vasanthi



P4- Thiru.M. Saravanan



P5- Thiru. M. Shanmugam



2.4 METHOD OF MINING

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

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

2.5 PROPOSED MACHINERY DEPLOYMENT

PROPOSAL – P1				
S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammers	4	1.2m to 2.0m	Compressed air
2	Compressor	1	400psi	Diesel Drive
3	Excavator with Bucket / Rock Breaker	1	300 HP	Diesel Drive
4	Tippers	2	20 Tonnes	Diesel Drive
PROPOSAL – P2				
S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammers	4	1.2m to 2.0m	Compressed air
2	Compressor	1	400psi	Diesel Drive
3	Excavator with Bucket / Rock Breaker Unit 4	1	300 HP	Diesel Drive
4	Tippers	1	20 Tonnes	Diesel Drive
PROPOSAL – P3				
S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammers	2	1.2m to 2.0m	Compressed air
2	Compressor	1	400psi	Diesel Drive
3	Excavator with Bucket / Rock Breaker Unit 4	1	300 HP	Diesel Drive
4	Tippers	1	20 Tonnes	Diesel Drive
PROPOSAL – P4				
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 / Rock Breaker Unit 4	1	300 HP	Diesel Drive
4	Tippers	3	20 Tonnes	Diesel Drive
PROPOSAL – P5				
S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammers	8	1.2m to 2.0m	Compressed air

2	Compressor	2	400psi	Diesel Drive
3	Excavator with Bucket / Rock Breaker Unit 4	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

PROPOSAL – P1			
Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max)
I	104	88	44m bgl
PROPOSAL – P2			
Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max)
I	133	63	28 m bgl
PROPOSAL – P3			
Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max)
I	86	68	30m bgl
PROPOSAL – P4			
Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max)
I	196	113	46 m bgl
PROPOSAL – P5			
Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max)
Pit – 1	180	100	25m below ground level
Pit – 2	30	30	6m below ground level
Pit – 3	80	50	4m below ground level

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 October – December 2022 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's from census handbook 2011 and from the satellite imagery	Study Area	Satellite Imagery Primary Survey
*Soil	Physio-Chemical Characteristics	Once during the study period	6 (2 core & 4 buffer zone)	IS 2720 Agriculture Handbook - Indian Council of Agriculture Research, New

				Delhi
*Water Quality	Physical, Chemical and Bacteriological Parameters	Once during the study period	6 (1 surface water & 5 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	PM ₁₀ PM _{2.5} SO ₂ NO _x Fugitive Dust	24 hourly twice a week (Oct – Dec 2022)	8 (2 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	8 (2 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 – Forest Working Plan
Socio Economic Aspects	Socio–Economic Characteristics, Population Statistics and Existing Infrastructure in the study area	Site Visit & Census Handbook, 2011	Study Area	Primary Survey, census handbook & need based assessments.

3.2 LAND ENVIRONMENT

To study the land use pattern of the core as well as a buffer zone, land use/land cover details have been identified/ maps have been prepared in accordance with the Standard ToR point. A visual interpretation technique has been adopted for land use supervised classification based on training site by Level III classification with 1:50,000 scale for the preparation of land use mapping. Land use pattern of the area was studied through **Landsat8-9** imagery of **USGS-Earth Explorer**. 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

sno	Landuse/Landcover class	Area (Ha)	Area in (%)
1	Existing Quarries	480.32	1.53

2	Water bodies/Lakes	193.38	0.61
3	Hill with Dense Vegetation	3111.76	9.88
4	Sparse Vegetation	2298.12	7.30
5	Builtup Land	5673.12	18.02
6	Vegetation	4771.04	15.16
7	Crop Land	6322.28	20.08
8	Non-Agriculture Land	8629.82	27.41
	Total	31479.84	100

From the above table and bar diagram, it is inferred that the majority of the land in the study area is Agriculture land 15.16 % followed by Built-Up land 18.02%, sparse vegetation land 15.16%. Non-Agriculture Land is about 27.41% in the core and buffer zone area. Water Bodies such as Ponds and Lakes with a water channel locally called comprise 0.61% of the total buffer area SOI Toposheet, there is total one major water bodies in the agriculture fields of the buffer area. The total Existing mining area within the study area is 480.32 ha i.e., 1.53 %. The cluster area of 19.17.08 ha contributes about 1.53 % of the total mining area within the study area. This 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

- The nature of soil is slightly alkaline to strongly alkaline in nature with pH range 8.45 to 8.85
- The available Nitrogen content range between 290 to 543 mg/kg
- The available Phosphorus content range between 1.32 to 2.6 mg/kg
- The available Potassium range between 32 to 289 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 of surface 7.09-7.89 while turbidity found within the standards. Total Dissolved Solids 725mg/l and Chloride 140-166.3 mg/l. Nitrates 12 -14.1 mg/l, while sulphates 60.3-72.4 mg/l,pH).

Total Dissolved Solids:

The Total Dissolved Solids were found in the range of 560 - 750 mg/l in all samples. The Total hardness varied between 182.5 – 236.2 mg/l for all samples.

Ground Water

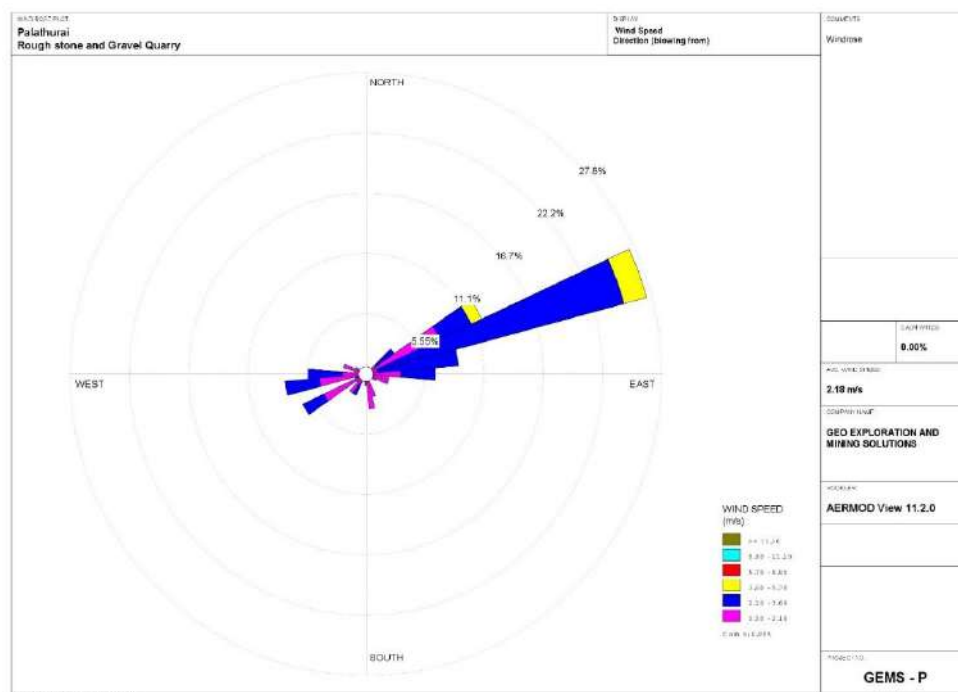
The pH of the water samples collected ranged from 6.97 to 7.55 and within the acceptable limit of 6.5 to 8.5. pH, Sulphates and Chlorides of water samples from all the sources are within the limits as per the Standard. on Turbidity, the water samples meet the requirement. The Total Dissolved Solids were found in the range of 560 - 750 mg/l in all samples. The Total hardness varied between 182.5 – 236.2 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 – 6: WIND ROSE DIAGRAM



3.6 SUMMARY OF AMBIENT AIR QUALITY

As per monitoring data, PM₁₀ ranges from 17.1 µg/m³ to 22.6 µg/m³, PM_{2.5} data ranges from 25 µg/m³ to 46.9 µg/m³, SO₂ ranges from 5.2 µg/m³ to 6.9 µg/m³ and NO₂ data ranges from 2.9 µg/m³ to 22.9 µg/m³. The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB. The minimum & maximum concentrations of PM₁₀ were found to be 40.2 µg/m³ in Palathurai and Madukkarai village & 46.7 µg/m³ in Project area respectively.

3.7 NOISE ENVIRONMENT

Ambient noise levels were measured at 8 (Eight) locations around the proposed project area.

Ambient noise levels were measured at 8 (eight) locations around the project area considering cluster quarries. Noise levels recorded in core zone during day time were from 42.3 – 45.3 dB (A) Leq and during night time were from 38.1 – 38.5 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 44.1 – 48.7dB (A) Leq and during night time were from 38.2 – 39.0 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

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

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

3.9 SOCIO ECONOMIC ENVIRONMENT

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

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

The proposed project will aim to provide preferential 145 persons to the local people there by improving the indirect employment opportunity for 50 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 monitoring (every 6 month once) and analysing the quality of water in open well, bore wells and surface water 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

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 tarpaulin
- The speed of tippers plying on the haul road will be limited below 20 km/hr to avoid generation of dust.
- Water sprinkling on haul roads & loading points will be carried out twice a day
- Main source of gaseous pollution will be from vehicle used for transportation of mineral; therefore, weekly maintenance of machines improves combustion process & makes reduction in the pollution.
- The un-metalled haul roads will be compacted weekly before being put into use.
- Over loading of tippers will be avoided to prevent spillage.
- It will be ensured that all transportation vehicles carry a valid PUC certificate
- Grading of haul roads and service roads to clear accumulation of loose materials

Green Belt –

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

Occupational Health –

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

4.5 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**

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

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

MITIGATION MEASURES

Keeping all this in mind the mitigations have been suggested under environmental management plan. With the understanding of the role of plant species as bio-filter to control air pollution, appropriate plant species (mainly tree species) have been suggested conceding the area/site requirements and needed performance of specific species. The details of year wise proposed plantation program are given in Table 4.13.

The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas

In order to compensate the loss of vegetation cover, it is suggested to carry out afforestation program mainly in proposed areas falls in the cluster earmarked for plantation program as per Approved Mining Plan in different phases. This habitat improvement program would ensure the faunal species to re-colonize and improve the abundance status in the core zone.

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

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

4.7 SOCIO ECONOMIC ENVIRONMENT

ANTICIPATED IMPACT

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

MITIGATION MEASURES

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

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

5. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

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

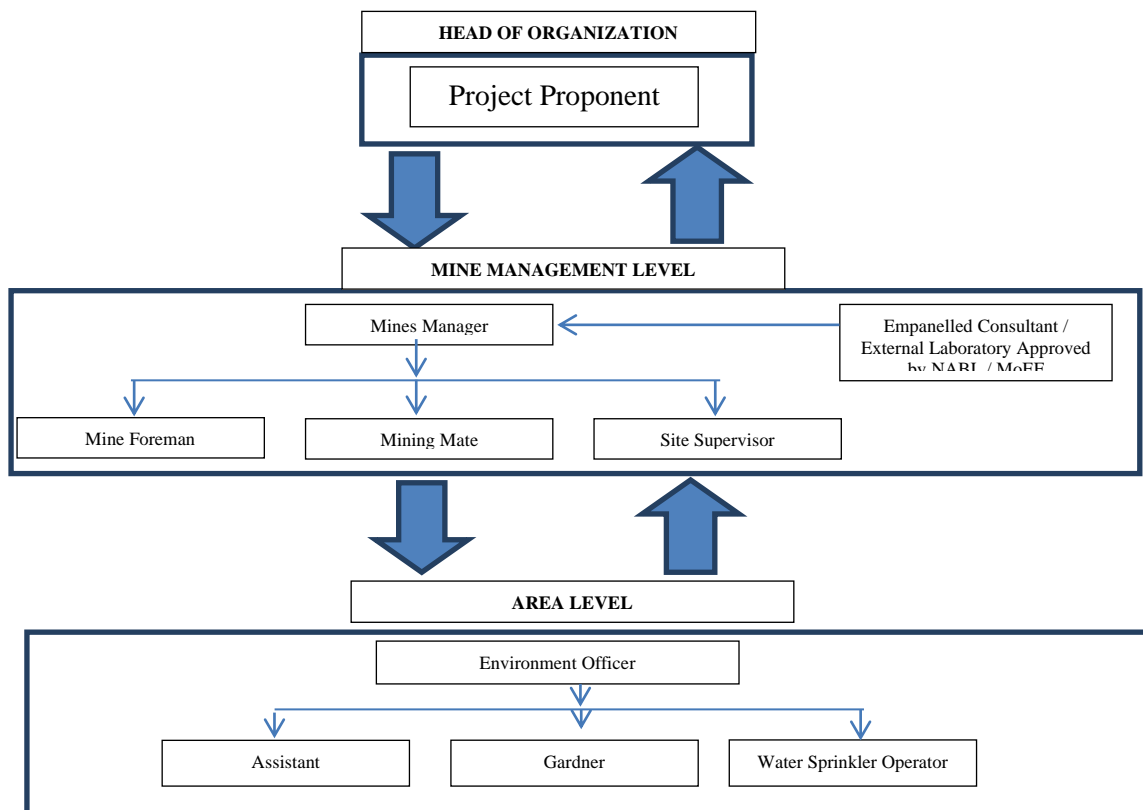
6. ENVIRONMENT MONITORING PROGRAM

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

The responsibilities of this cell will be:

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

6.1 ENVIRONMENTAL MONITORING CELL



6.2 POST ENVIRONMENTAL CLEARANCE MONITORING SCHEDULE

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

7. ADDITIONAL STUDIES

7.1 RISK ASSESSMENT

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

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

7.2 DISASTER MANAGEMENT PLAN

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

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

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

- Rescue and medical treatment of casualties;
- Safeguard other people;
- Minimize damage to property and the environment;
- Initially contain and ultimately bring the incident under control;
- Secure the safe rehabilitation of affected area; and
- Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency.

7.3 CUMULATIVE IMPACT STUDY

CUMULATIVE PRODUCTION LOAD OF ROUGH STONE IN CLUSTER

Quarry	Production for five-year plan period	Per Year Production in m ³	Per Day Production in m ³	Number of Lorry Load Per Day @ 12m ³ per load
P1	1,14,480	22,896	76	6Trips /Day
P2	71,508	14,301	48	4 Trips /Day
P3	31,000	6,200	21	2Trips /Day
P4	2,33,497	46,699	155	13 Trips /day
P5	3,32,018	66,403	221	18 Trips /Day
P6	1,68,775	33,755	112	9 Trips /Day
P7	1,03,215	20,643	69	6 Trips /day
Total	1,054,493	2,10,897	702	58 Trips /Day
E1	3,13,815	62,763	209	17 Trips /Day
Total	3,13,815	62,763	209	17 Trips /Day
Gran Total	1,36,8,308	2,73,660	911	75 Trips /Day

CUMULATIVE PRODUCTION LOAD OF GRAVEL IN CLUSTER

Quarry	Mineable Reserves in m ³	Per Year Production in m ³	Per Day in m ³	Number of Lorry Load @ 12m ³ per load
P1	15,360	5,120	17	1 Trips /Day, 6- Trips /week
P2	-	-	-	-
P3	-	-	-	-
P4	2,640	880	3	1- Trips /week
P5	754	251	1	1Trips /Day, 24 trips per week
P6	-	-	-	-
P7	-	-	-	-
TOTAL	18,754	6,251	21	2 Trips/ week
E1	5,596	1,865	6	1 Trips\ day

Total	5,596	1,865	6	1 Trips\ day
Grand total	24,350	8116	27	3Trips\ day

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)
N1	54.6	46.1	55.2	Residential Day Time– 55 dB (A) Night Time- 45 dB (A)
N2	51.6	46.1	52.7	
N3	53.4	32.1	53.4	
N4	52.7	28.5	52.7	
N5	53.4	26.6	53.4	
N6	56.7	29.2	56.7	
N7	52.6	26.1	52.6	
N8	54.9	25.2	54.9	

SOCIO ECONOMIC BENEFITS

Location Code	Employment	Project Cost	CER
P1	20	Rs. 44,75,000/-	Rs.5,00,000/-
P2	14	Rs. 38,16,000/-	Rs.5,00,000/-
P3	12	Rs. 35,16,000/-	Rs.5,00,000/-
P4	26	Rs. 1,43,65,000/-	Rs.5,00,000/-
P5	37	Rs. 1,06,96,000/-	Rs.5,00,000/-
P6	20	Rs. 94,76,000	Rs.5,00,000/-
P7	16	Rs.60,71,000/-	Rs.5,00,000/-
Total	145	Rs. 5,24,15,000/-	Rs. 35,00,000/-
E1	32	Rs. 58,62,000/-	Rs. 5,00,000/-
Total	32	Rs. 58,62,000/-	Rs. 40,00,000/-
Grand Total	177	Rs.5,82,77,000/-	Rs.40,00,000/-

8. PROJECT BENEFITS

The seven Proposed Projects for Quarrying Rough Stone and Gravel at Palathurai and Madukkarai Village aims to produce cumulatively 7,82,503 m³ Rough Stone & 18,754m³ of Gravel over a period of 5 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.