COMBINED DRAFT EIA / EMP REPORT

FOR

GARNET SAND DEPOSIT MINES

G.O.No.	3(D) 43	3(D) 69	3(D) 70	3(D) 71	3(D) 57
Project Proponent	Riverways Mines and Minerals Ltd.				SS Minerals
SITE DETAILS					
Extent	4.75.5 Ha	4.90.0	4.75.0	4.80.0	4.75.0
Location	Kottathur Village, Musiri Taluk, Trichy District, Tamil Nadu				
Land Type	Eri Poramboke Land				
PRODUCTION DETAILS					
Peak Production- T	9000	6912	9750	13814	10800
Ultimate Depth	2m	2m	2m	2m	2m
Mining Method	Open cast mining without drilling and blasting operations involving direct loading into tippers				
Baseline Studies	Post monsoon Season 2024 (October 2024 to December 2024)				

PROJECT PROPONENTS

Tvl. Riverways Mines and Minerals Ltd
No 20/4, 1st floor, Naveed castle,
Balakrishnan Road,
Mylapore, Chennai.

Tvl. S.S.Minerals
6/9, Kasthuri Estate, III street,
Poes Garden,
Chennai - 600086.

CREATIVE ENGINEERS & CONSULTANTS

NABET ACCREDITED CONSULTANCY, NABL ACCREDITED TESTING LAB

9B/4, Bharathwajar Street, East Tambaram, Chennai-600059.

Ph: 044-22395170, Cell: 09444133619 Email : cecgiri@yahoo.com,

Sector 1(a)
Category B1

JUNE 2025

REVISIONS OF EIA/EMP REPORT

Revision number	Report Status	Date of submission
00/MAY/25	Draft EIA /EMP Report	29.05.2025

Environmental Impact Assessment & Environmental Management Plan Report for the following proposed 5 nos of Garnet Sand Deposit Mines of Tvl.Riverways Mines and Minerals Ltd (4 nos) and Tvl.S.S.Minerals (1no) located in Kottathur Village, Musiri taluk, Trichy district, Tamil Nadu, was prepared by Creative Engineers & Consultants and authorized for submission by Mr. P.Giri, EIA Coordinator, CEO, of Creative Engineers & Consultants on 29.05.2025 after due review by the personnel and consultation with the project proponents.

S.No	Name of lease	Location	Extent	Status of leases
1	GO 43	S.F.No.390(P) – Eri poramboke land, Kottathur village, Musiri taluk, Trichy district, Tamil Nadu.	4.75.5	Fresh lease
2	GO 69		4.90.0	
3	GO 70		4.75.0	
4	GO 71		4.80.0	
5	GO 57		4.75.0	

Current Revision number of the EIA/EMP report is 00/MAY/25, signifying as per the revision mentioned in the above table that this is a draft EIA/EMP report.

Signature:

(P. Giri)
Chief Executive & EIA Coordinator
Creative Engineers & Consultants

Date: 29.05.2025

RIVERWAAYS MINES AND MINERALS LTD.

Admin. Office : No. 20/4, "Naveed Castle", Balakrishna Street, Mylapore, Chennai - 600 004.
Phone :+91-44-2498 0330 E-mail : ls.baskaran@gmail.com

PROJECT PROPONENT DECLARATION

We, Tvl.Riverways Mines and Minerals Ltd received Terms of Reference under EIA Notification 2006 from SEIAA, Tamil Nadu for Garnet Sand Deposit Mines of Tvl.Riverways Mines and Minerals Ltd, in Eri poramboke land, Kottathur Village, Musiri Taluk, Trichy District, Tamil Nadu, for the following 4 projects:

S.No	Name of lease	Location	Extent	Terms of Reference No
1	GO 43	S.F.No.390(P) – Eri poramboke land, Kottathur village, Musiri taluk, Trichy district, Tamil Nadu.	4.75.5	TO25B0108TN5433895A
2	GO 69		4.90.0	TO25B0108TN5161343A
3	GO 70		4.75.0	TO25B0108TN5980789A
4	GO 71		4.80.0	TO25B0108TN5179960A

We have entrusted the EIA study to M/s. Creative Engineers & Consultants (CEC), Chennai who have been accredited by the National Accreditation Board for Education & Training (NABET), Quality Council of India with their accreditation valid upto 23.12.2026.

The Combined Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) have been prepared as per the generic structure proposed in the EIA notification 2006, ToR issued by SEIAA, Tamil Nadu. The prescribed ToR along with compliance is also incorporated in the EIA/EMP Report.

This report is prepared based on the information and data obtained from the approved review of Mining Plan and other records and the field study carried out by the consultant. The data given in the EIA/EMP report are factually correct to the best of my knowledge.

Your's truly,

Riverways Mines and Minerals Ltd. Chennai 600 086

For Tvl. **Riverways Mines and Minerals Ltd**

Works : 389/8 & 389 / 10A-1, Nagalapuram Village, Thuraiyoor Taluk, Trichirapalli District, Trichy.
Mines : Kannapadi Village Kunnam Taluk, Perambalur District, Kottathur Village, Musiri Taluk, Trichy District.

GST No. : 33AAECR7219P1ZY

S. S. MINERALS

Admin. Office : No. 20/4, Naveed Castle, Balakrishna Street, Mylapore, Chennai - 600 004.
Phone :+91-44-2498 0330 E-mail : ls.baskaran@gmail.com

PROJECT PROPONENT DECLARATION

We Tvl.S.S.Minerals received Terms of Reference under EIA Notification 2006 from SEIAA, Tamil Nadu, vide their letter No - TO25B0108TN5161343A dated 07.04.2025 for Garnet Sand Deposit Mines of Tvl.S.S.Minerals, over an extent of 4.75 Ha at S.F.No.390(P) – Eri poramboke land, Kottathur village, Musiri taluk, Trichy district, Tamil Nadu.

We have entrusted the EIA study to M/s. Creative Engineers & Consultants (CEC), Chennai who have been accredited by the National Accreditation Board for Education & Training (NABET), Quality Council of India with their accreditation valid upto 23.12.2026.

The Combined Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) have been prepared as per the generic structure proposed in the EIA notification 2006,ToR issued by SEIAA, Tamil Nadu. The prescribed ToR along with compliance is also incorporated in the EIA/EMP Report.

This report is prepared based on the information and data obtained from the approved review of Mining Plan and other records and the field study carried out by the consultant. The data given in the EIA/EMP report are factually correct to the best of my knowledge.

Thank you.

Yours Sincerely,

For S S Minerals

Authorised signatory

S.S. MINERALS * CHENNAI-86 *

Works : 389/8 & 389 / 10A-1, Nagalapuram Village, Thuraiyoor Taluk, Trichirapalli District, Trichy.
Mines : Kannapadi Village Kunnam Taluk, Perambalur District, Kottathur Village, Musiri Taluk, Trichy District.

GST No. : 33ABTFS9132R126

EIA Consultant Undertaking

[In compliance with MoEF Office Memorandum No. J-11013/41/2006-IA.II (I) dated 04.08.2009]

Creative Engineers & Consultants (CEC) is an NABL accredited testing Laboratory, and also NABET accredited Category–A environment consultancy organization for preparing EIA/EMP reports for the sectors Mining of minerals, Thermal power plants, Mineral Beneficiation & Cement plants.

CEC has been accredited by the National Accreditation Board for Education & Training (NABET), Quality Council of India for empanelment of EIA Consultants with accreditation valid upto 23.12.2026.

Combined Environmental Impact Assessment & Environmental Management Plan Report for the following proposed 5 nos of Garnet Sand Deposit Mines of Tvl.Riverways Mines and Minerals Ltd (4 nos) and Tvl.S.S.Minerals (1no) located in kottathur Village, Musiri taluk, Trichy district, Tamil Nadu, was prepared based on the respective TOR obtained from SEIAA- Tamil Nadu.

S.No	Name of lease	Location	Extent	Status of leases
1	GO 43	S.F.No.390(P) – Eri poramboke land, Kottathur village, Musiri taluk, Trichy district, Tamil Nadu.	4.75.5	Fresh lease
2	GO 69		4.90.0	
3	GO 70		4.75.0	
4	GO 71		4.80.0	
5	GO 57		4.75.0	

The prescribed TOR is complied with and incorporated in the above 5no's of combined EIA Reports and submitted. This report is based on the information and data obtained from Approved Mining Plan, other records and data from the field study by CEC. The data generated and given in the EIA/EMP Report are factually correct. The sample analyses are carried out through CEC's laboratory.

(P. Giri)
Chief Executive & EIA Coordinator
Creative Engineers & Consultants
Date: 29.05.2025

Annexure – VII

Declaration by Experts contributing to the EIA Report for

Combined EIA/EMP Report for the proposed 5 nos of Garnet Sand Deposit Mines of GO-43, S.No-390(P), 4.75.50Ha & GO-69, S.No-390(P), 4.90Ha & GO-70, S.No-390(P), 4.75Ha & GO-71, S.No-390(P), 4.80Ha of Tvl.Riverways Mines and Minerals Ltd (4 nos) and GO-57, S.No-390(P), 4.75Ha of Tvl.S.S.Minerals (1no) located in Kottathur Village Musiri taluk, Trichy district, Tamil Nadu.

I, hereby, certify that I was a part of the EIA team in the following capacity that developed the above EIA.

EIA coordinator:

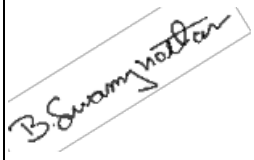
Name: **P.Giri**

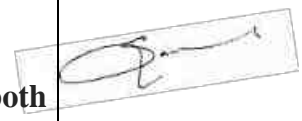
Signature and Date: 

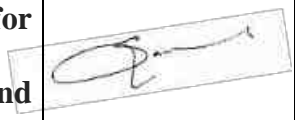
Period of involvement: **September 2024 onwards**

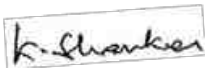
Contact information: **09444133619**

Functional area experts:

S. No.	Functional areas	Name of the expert/s	Involvement (period and task**)	Signature and date
1	AP*	**P.Giri**	• **Identification of baseline monitoring stations and study of the monitored data with respect to the applicable standards.** • **Identification of sources of air pollution comprising dust, gaseous emission due to mining & other activities** • **Identification of Impacts & suggestion of mitigation measures** **Period: September 2024 onwards**	
		B.Swamynathan	• **Data interpretation of Micro meteorological data for wind rose.** • **Identification of polluting source and suggestion of suitable mitigation measures.** **Period: October 2024 onwards**	

2	WP*	**G.Sandhya**	• **Study of the monitored data with respect to the applicable standards.** • **Identification of Water requirement & Source** • **Preparation of water balance diagram** • **Identification of Water polluting sources** • **Impact of the project on the water quality, both surface and groundwater** • **Suggestion of Mitigation measures to control water pollution** **Period: October 2024 onwards**	
3	SHW*	**P.Giri**	• **Quantification of mineral & waste from mining operation** • **Waste disposal method evaluation** • **Providing dump management plan** • **Providing Surface Runoff Management Structure Requirements.** • **Identification of Hazardous waste and its details of disposal** **Period: September 2024 onwards**	
4	SE*	**R.Baburaj**	• **Identification of villages in the study area and finalization of demographic profile of the villages within the study area.** • **Preparation of sections relevant to SE functional area in the EIA/EMP report** **Period: October 2024 onwards**	
5	EB*	**B.Swamynathan**	• **Perusal of existing data relevant to this project.** • **Studying the details of flora and fauna, separately for core, buffer zone and forest area based on primary field survey.** • **Identification of species , Indicating the Schedule of the fauna present in the study area** • **Assessment of impact on Biological environment and suggestion of mitigative measures** • **Collecting & providing details of existing and proposed Green belt development /plantation in the core zone** **Period: October 2024 onwards**	
6	HG*	**K.Shankar**	• **Study of existing surface drainage arrangements in the core and buffer zone, impact due to mining on these drainage courses and suggestion of mitigative measures**	

			• **Perusal of site specific ground water table details for the core zone and the study area.** • **Studied the hydrological aspects of surface and groundwater in study area** • **Study about impact on the hydrology due to mining operation** • **Suggesting mitigative measures like RWH for enhancement of ground water level** **Period: October 2024 onwards**	
7	GEO*	**K.Shankar**	• **Study of geology of the ML area and the surrounding areas.** • **Provide details about Mineral composition** **Period: October 2024 onwards**	
8	SC*	**B.Swamynathan**	• **Study of soil profile** • **Assessment of Impact on soil and suggesting plantation scheme.** **Period: October 2024 onwards**	
9	AQ*	**G.Sandhya**	• **Quantification of emission particulars** • **Air quality modelling for post project impact on the air quality prediction of the study area.** **Analysis of the Isopleth generated** • **Arriving at the post project concentration at the AAQ monitoring locations** • **Preparation of meteorological data in suitable form for input into the model** • **Simulation of model for generation of Isopleth and data interpretation.** • **Studying the impact on AAQ monitoring locations due to the generated emissions.** • **Preparation of sections relevant to AQ functional area in the EIA/EMP report.** **Period: October 2024 onwards**	
10	NV*	**P.Giri**	• **Identification of baseline monitoring stations and study of the monitored data with respect to the applicable standards.** • **Predict the noise level and vibration level due to proposed mining operation based on scientific evaluation.** • **Suggesting the Mitigation measures to control noise pollution, Suggesting the Mitigation measures to**	

			control ground vibration **Period: September 2024 onwards**	
11	LU	**B.Swamynathan**	• **Collection of Remote sensing satellite data to study the land use pattern.** • **Primary field survey and limited field verification** • **Preparation of Land use map using Satellite data of the project area separately for the core zone and the buffer zone and providing the land use pattern.** **Period: October 2024 onwards**	
12	RH*	**K.Shankar**	• **Identified Major risks involved in the project Mitigation measures suggested to avoid risk.** • **Preparation of onsite and offsite emergency management plan** **Period: October 2024 onwards**	

*One TM against each FAE may be shown
**Please attach additional sheet if required

Declaration by the Head of the accredited consultant organization/ authorized person

I, **P.Giri** hereby,confirm that the above mentioned experts prepared the EIA report for **Combined EIA/EMP Report for the proposed 5 nos of Garnet Sand Deposit Mines of GO-43, S.No-390(P), 4.75.50Ha & GO-69, S.No-390(P), 4.90Ha & GO-70, S.No-390(P), 4.75Ha & GO-71, S.No-390(P), 4.80Ha of Tvl.Riverways Mines and Minerals Ltd (4 nos) and GO-57, S.No-390(P), 4.75Ha of Tvl.S.S.Minerals (1no) located in Kottathur Village Musiri taluk, Trichy district, Tamil Nadu.**

I also confirm that EIA Coordinator (EC) has gone through the report, and the consultant organization shall be fully accountable for any misleading information. It is certified that no unethical practices, plagiarism involved in carrying out the work and external data / text has not been used without proper acknowledgement while preparing this EIA report.

Signature: 

Name: **P.Giri**

Designation: **Chief Executive**

Name of the EIA consultant organization: **Creative Engineers & Consultants, Chennai – 59**
NABET Certificate No. & Issue Date: **No- NABET/EIA/23-26/RA 0331 & date 23.12.2026**

CONTENTS

CONTENTS

S.No	PARTICULARS	PG NO.
TERMS OF REFERENCE & ITS COMPLIANCE		
A.	COPY OF TOR	--
B.	COMPLIANCE TO TOR POINTS	T-1
EIA/ EMP REPORT- CHAPTERS		
I	INTRODUCTION	1-1
II	PROJECT DESCRIPTION	2-1
III	DESCRIPTION OF ENVIRONMENT	3-1
IV	ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES	4-1
V	ANALYSIS OF ALTERNATIVES	5-1
VI	ENVIRONMENTAL MONITORING PROGRAMME	6-1
VII	ADDITIONAL STUDIES	7-1
VIII	PROJECT BENEFITS	8-1
IX	ENVIRONMENTAL COST BENEFIT ANALYSIS	9-1
X	ENVIRONMENTAL MANAGEMENT PLAN	10-1
XI	SUMMARY & CONCLUSION	11-1
XII	DISCLOSURE OF CONSULTANTS ENGAGED	12-1
ADDITIONAL ENCLOSURES WITH EIA/EMP REPORT CHAPTERS		
	ANNEXURES	A-1

CHAPTER-WISE CONTENTS

CHAPTER 1 INTRODUCTION 1-1

1.1 PURPOSE OF THE REPORT: 1-1

1.2 IDENTIFICATION OF PROJECT & PROJECT PROPONENT: 1-2

1.3 BRIEF DESCRIPTION OF NATURE, SIZE, LOCATION & PROJECT IMPORTANCE 1-4

1.4 SCOPE OF THE STUDY: 1-6

1.5 LEGAL AND REGULATORY FRAMEWORK: 1-7

1.6 STRUCTURE OF THE EIA/EMP REPORT: 1-8

CHAPTER 2. PROJECT DESCRIPTION 2-1

2.1 TYPE OF PROJECT: 2-1

2.2 NEED & JUSTIFICATION FOR THE PROJECT: 2-1

2.3 LOCATION: 2-1

2.4 GEOLOGY: 2-11

2.5 SIZE AND MAGNITUDE OF THE OPERATION: 2-24

2.6 TECHNICAL DETAILS: 2-24

2.7 PROPOSED SCHEDULE FOR APPROVAL AND IMPLEMENTATION: 2-26

2.8 PROJECT DESCRIPTION: 2-26

2.10 PROJECT REQUIREMENTS: 2-40

2.11 DESCRIPTION OF MITIGATION MEASURES: 2-40

2.12 ASSESSMENT OF NEW & UNTESTED TECHNOLOGY: 2-40

2.13 CONCLUSION: 2-40

CHAPTER 3. DESCRIPTION OF ENVIRONMENT 3-1

3.1 GENERAL: 3-1

3.2 SOCIO-ECONOMIC CONFIGURATIONS OF THE AREA: 3-6

3.3 3.3 EXISTING ENVIRONMENTAL QUALITY: 3-13

3.3 3.3 EXISTING ENVIRONMENTAL QUALITY: 3-14

3.4 LAND ENVIRONMENT: 3-35

3.5 BIOLOGICAL ENVIRONMENT: 3-44

3.6 HYDROGEOLOGICAL STATUS: 3-53

CHAPTER 4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES 4-1

4.1 GENERAL 4-1

4.2 AIR ENVIRONMENT: 4-1

4.3 WATER ENVIRONMENT: 4-19

4.4 NOISE AND VIBRATION: 4-20

4.5 LAND ENVIRONMENT: 4-21

4.6 BIOLOGICAL ENVIRONMENT: 4-22

4.7 SOCIO ECONOMIC ENVIRONMENT: 4-24

4.8 OCCUPATIONAL HEALTH AND SAFETY: 4-25

4.9 LOGISTICAL SYSTEM: 4-26

4.10 WASTE MANAGEMENT: 4-26

CHAPTER 5 ANALYSIS OF ALTERNATIVES 5-1

5.1 ALTERNATE TECHNOLOGY: 5-1

5.2 ALTERNATE SITE: 5-1

CHAPTER 6 ENVIRONMENTAL MONITORING PROGRAMME 6-1

6.1 GENERAL 6-1

6.2 MONITORING SCHEDULES FOR VARIOUS PARAMETERS 6-1

6.3 LEGISLATIVE AND REGULATORY FRAME WORK: 6-2

6.4 ENVIRONMENTAL MONITORING COST: 6-7

CHAPTER 7 ADDITIONAL STUDIES 7-1

7.1 GENERAL 7-1

7.2 PUBLIC CONSULTATION PROCESS 7-1

7.3 CUMULATIVE IMPACT ASSESSMENT: 7-2

7.4 RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN 7-6

7.5 MINE CLOSURE PLAN: 7-7

CHAPTER 8 8-1

PROJECT BENEFITS 8-1

CHAPTER 9 9-1

ENVIRONMENTAL COST BENEFIT ANALYSIS 9-1

CHAPTER 10 ENVIRONMENTAL MANAGEMENT PLAN 10-1

10.1 INTRODUCTION: 10-1

10.2 COMPONENTS OF THE ENVIRONMENTAL MANAGEMENT PLAN: 10-1

10.3 ENVIRONMENTAL POLLUTION CONTROL COST: 10-6

10.4 CONCLUSION: 10-9

CHAPTER 11 SUMMARY & CONCLUSION 11-1

11.1 INTRODUCTION: 11-1

11.2 Salient details of the project: 11-2

11.2.1 Technical Description 11-5

11.3 EXISTING ENVIRONMENTAL SCENARIO: 11-6

11.3.1 GENERAL: 11-6

11.3.2 SOCIO-ECONOMIC STATUS: 11-6

11.3.2.1 SAMPLE SURVEY: 11-7

11.3.3 EXISTING ENVIRONMENTAL QUALITY: 11-7

11.3.4 LAND ENVIRONMENT: 11-9

11.3.5 BIOLOGICAL ENVIRONMENT: 11-9

11.3.5.1 Flora: 11-9

11.3.5.2 Fauna: 11-10

11.3.6 HYDROLOGICAL STUDY: 11-10

11.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES: 11-11

11.5 ENVIRONMENTAL MONITORING PROGRAMME: 11-16

11.6 ADDITIONAL STUDIES: 11-16

11.7 CONCLUSION: 11-17

CHAPTER 12 DISCLOSURE OF CONSULTANTS ENGAGED 12-1

List Of Figures

Figure 1.1: Site Vicinity Map 1-3
Figure 2.1: Location Map 2-2
Figure 2.2: Approachability Map 2-3
Figure 2.3: Lease Plan 2-4
Figure 2.4: Satellite Imagery Showing Corner Co-Ordinates Of The Leases G.O.Ms.No.43 2-5
Figure 2.5: Satellite Imagery Showing Corner Co-Ordinates Of The Leases G.O.Ms.No.69 2-6
Figure 2.6: Satellite Imagery Showing Corner Co-Ordinates Of The Leases G.O.Ms.No.70 2-6
Figure 2.7: Satellite Imagery Showing Corner Co-Ordinates Of The Leases G.O.Ms.No.71 2-7
Figure 2.8: Satellite Imagery Showing Corner Co-Ordinates Of The Leases G.O.Ms.No.57 2-7
Figure 2.9: Site Photographs 2-8
Figure 2.10: Details Of Features Within 300 & 500m Radius 2-10
Figure 2.11: Geological Plan & Cross Section Of G.O.43 2-14
Figure 2.12: Geological Plan & Cross Section Of G.O.69 2-15
Figure 2.13: Geological Plan & Cross Section Of G.O.70 2-16
Figure 2.14: Geological Plan & Cross Section Of G.O.71 2-17
Figure 2.15: Geological Plan & Cross Section Of G.O.57 2-18
Figure 2.16: Surface Plan Of G.O.43 2-19
Figure 2.17: Surface Plan Of G.O.69 2-20
Figure 2.18: Surface Plan Of G.O.70 2-21
Figure 2.19: Surface Plan Of G.O.71 2-22
Figure 2.20: Surface Plan Of G.O.57 2-23
Figure 2.21: Mine Position At The End Of Present Plan Period Of G.O.43 2-28
Figure 2.22: Mine Position At The End Of Present Plan Period Of G.O.69 2-29
Figure 2.23: Mine Position At The End Of Present Plan Period Of G.O.70 2-30
Figure 2.24: Mine Position At The End Of Present Plan Period Of G.O.71 2-31
Figure 2.25: Mine Position At The End Of Present Plan Period Of G.O.57 2-32
Figure 2.26: Conceptual Plan And Section Of G.O.43 2-34
Figure 2.27: Conceptual Plan And Section Of G.O.69 2-35

Figure 2.28: Conceptual Plan And Section Of G.O.70 2-36
Figure 2.29: Conceptual Plan And Section Of G.O.71 2-37
Figure 2.30: Conceptual Plan And Section Of G.O.57 2-38
Figure 3.1:Features Within 500 M Radius 3-2
Figure 3.2:Study Area Within 10 Km Radius (Index Plan) 3-3
Figure 3.3:Demographic Structure Within The Buffer Zone 3-8
Figure 3.4:The History Of Cyclonic Storms 3-15
Figure 3.5: The Seismic Zone Map Of India 3-16
Figure 3.6: Average Windrose 3-18
Figure 3.7: Ambient Air Quality Study Stations 3-21
Figure 3.8: Ambient Air Quality Data 3-24
Figure 3.9: Location Of Water Sampling Stations 3-26
Figure 3.10: Location Of Noise Sampling Stations 3-29
Figure 3.11: Noise Levels For All Locations 3-31
Figure 3.12: Location Of Soil Sampling Stations 3-33
Figure 3.13 : Landsat 8 Satellite Data Of The Study Area 3-36
Figure 3.14: Map Showing Land Use Categories Around 10km Buffer 3-37
Figure 3.15 : Drainage Map Around 10 Km Radius From Project Site 3-54
Figure 3.16 : Ground Water Prospect Map 3-55
Figure 3.17 : Open Well Contour Map – October 2024 3-57
Figure 3.18 : Open Well Contour Map – November 2024 3-58
Figure 3.19 : Open Well Contour Map – December 2024 3-59
Figure 3.20 : Borewell Contour Map – October 2024 3-60
Figure 3.21 : Borewell Contour Map – November 2024 3-61
Figure 3.22 : Borewell Contour Map – December 2024 3-62
Figure 4.1: Isopleth Of Glc Prediction For – Go43- Pm_{10} 4-5
Figure 4.2: Isopleth Of Glc Prediction For – Go43- $Pm_{2.5}$ 4-6
Figure 4.3: Isopleth Of Glc Prediction For – Go57-Pm_{10} 4-7
Figure 4.4: Isopleth Of Glc Prediction For – Go57 - Pm_{25} 4-8

Figure 4.5: Isopleth Of Glc Prediction For – Go69-Pm_{10} 4-9

Figure 4.6: Isopleth Of Glc Prediction For – Go69 - Pm_{25} 4-10

Figure 4.7: Isopleth Of Glc Prediction For – Go70-Pm_{10} 4-11

Figure 4.8: Isopleth Of Glc Prediction For – Go70- Pm_{25} 4-12

Figure 4.9: Isopleth Of Glc Prediction For – Go71- Pm_{10} 4-13

Figure 4.10: Isopleth Of Glc Prediction For – Go71- Pm_{25} 4-14

Figure 4.11: Isopleth Of Glc Prediction For – Combined- Pm_{10} 4-16

Figure 4.12: Isopleth Of Glc Prediction For – Combined - Pm_{25} 4-17

Figure 4.13: Water Balance Diagram 4-19

Figure 7.1: Location Of All The Leases In The Cluster 7-3

Figure 10.1: Organization Chart 10-2

Figure 12.1: Disclosure Of Consultants Engaged 12-1

LIST OF TABLES

Table 1.1: Screening Of Schedule 1(A) Projects 1-1
Table 1.2: Project Details 1-2
Table 1.3:Statutory Clearances 1-3
Table 1.4: Identification Of Project Proponents 1-4
Table 1.5: Brief Description Of Nature Of Projects 1-4
Table 1.6: Location Of The Project 1-4
Table 2.1: Features Within 500m Radius 2-9
Table 2.2: Proposed Schedule Of Implementation 2-26
Table 2.3: Yearwise Production 2-26
Table 2.4: Project Requirements 2-40
Table 3.1: Details Of Primary Schools In The Buffer Zone Rural Villages 3-10
Table 3.2: Average Annual Rainfall Data 3-17
Table 3.3: Meteorological Data 3-17
Table 3.4: Ambient Air Quality Data 3-23
Table 3.5: Summary Of Water Quality Data 3-27
Table 3.6: Ambient Noise Levels- In Db(A) 3-31
Table 3.7: Soil Quality Data 3-34
Table 3.8: Rs Satellite Image Used For The Present Study 3-35
Table 3.9: Major Land Use Units Of The Study Area 3-36
Table 3.10: Area Estimation Of Landuse Categories In Buffer Zone 3-37
Table 3.11: Land Use Pattern Of The Study Area Falling Within 10 Km Radius 3-40
Table 3.12: Village-Wise Land Use Pattern With In Buffer Zone 3-42
Table 3.13: Flora In The Buffer Zone Of Study Area. 3-47
Table 3.14: List Of Fauna 3-50
Table 3.15: Post Monsoon Water Level Of Open Wells 1 Km Radius 3-56
Table 3.16: Post Monsoon Water Level Of Borewells 1 Km Radius 3-56
Table 4.1: Emission Sources 4-3
Table 4.2: Emission Factors 4-3

Table 4.3: Emission Rate 4-4
Table 4.4: Peak Incremental Concentration 4-4
Table 4.5: Concentrations Of Pm_{10} After Project Implementation 4-15
Table 4.6: Concentrations Of $Pm_{2.5}$ After Project Implementation 4-15
Table 4.7: Emission Rate - Cumulative 4-15
Table 4.8: Peak Incremental Concentration- Cumulative 4-15
Table 4.9: Post Project Concentrations Of Pm_{10} -Cumulative 4-18
Table 4.10: Post Project Concentrations Of $Pm_{2.5}$ -Cumulative 4-18
Table 4.11: Post Project Noise Levels 4-20
Table 4.12: Land Use Table 4-21
Table 4.13: Impact On Biological Environment 4-22
Table 4.15: Details Of Transportation 4-26
Table 6.1: Environmental Monitoring Schedule 6-2
Table 6.2: Environmental Standards 6-2
Table 6.3: National Ambient Air Quality Standards 6-3
Table 6.4: Is – 10500 :2012 Standards 6-5
Table 6.5: Noise Level Standards 6-6
Table 6.6: Permissible Noise For Industrial Workers As Laid Down By Cpcb 6-6
Table 7.1 List Of Quarries Within 500 Meter Radius 7-2
Table 7.2 Salient Features Of Proposal “P1” 7-4
Table 7.3 Salient Features Of Proposal “P2” 7-5
Table 10.1: Environmental Control Cost 10-6
Table 11.1: Screening Of Schedule 1(A) Projects 11-1
Table 11.2: Salient Details Of The Project 11-2
Table 11.3: Social, Economic And Demographic Profile Of The Study Area 11-7
Table 11.4: Baseline Data 11-7
Table 11.5: Land Use In 10km Buffer Zone 11-9

LIST OF ANNEXURES

Annexure 1a:	Go Copy-43	A-1
Annexure 1b:	Go Copy-69	A-13
Annexure 1c:	Go Copy-70	A-22
Annexure 1d	Go Copy-57	A-32
Annexure 1e:	Go Copy-71	A-38
Annexure 2a:	Lease Execution – Go-43	A-45
Annexure 2b:	Lease Execution – Go-69	A-90
Annexure 2c:	Lease Execution – Go-70	A-131
Annexure 2d:	Lease Execution – Go-57	A-173
Annexure 2e:	Lease Execution – Go-71	A-217
Annexure 3a:	Mine Plan Approval Letter-Go-43	A-257
Annexure 3b:	Mine Plan Approval Letter-Go-69	A-259
Annexure 3c:	Mine Plan Approval Letter-Go-70	A-261
Annexure 3d:	Mine Plan Approval Letter-Go-57	A-263
Annexure 3e:	Mine Plan Approval Letter-Go-71	A-265
Annexure 4a:	Details Of Quarry Within 500m Radius – Go-43	A-267
Annexure 4b:	Details Of Quarry Within 500m Radius – Go-69	A-269
Annexure 4c:	Details Of Quarry Within 500m Radius – Go-70	A-271
Annexure 4d:	Details Of Quarry Within 500m Radius – Go-57	A-273
Annexure 4e:	Details Of Quarry Within 500m Radius – Go-71	A-275
Annexure 5a:	Pwd Letter – Riverways Mines & Minerals	A-277
Annexure 5b:	Pwd Letter – Ss Minerals	A-279
Annexure 6a:	Letter From Industries Deparetment – Go-43	A-281
Annexure 6b:	Letter From Industries Deparetment – Go-69	A-284
Annexure 6c:	Letter From Industries Deparetment – Go-70	A-287
Annexure 6d:	Letter From Industries Deparetment – Go-57	A-290
Annexure 6e:	Letter From Industries Deparetment – Go-71	A-293
Annexure 7:	Population Breakup And Literacy Levels In The Buffer Zone	A-296
Annexure 8:	Occupational Structure In The Buffer Zone	A-297
Annexure 9:	Educational Facilities In The Buffer Zone	A-298
Annexure 10:	Medical Facilities In The Buffer Zone	A-299

Annexure 11:	Infrastructural Facilities In The Buffer Zone	A-300
Annexure 12:	Ambient Air Quality Data	A-301
Annexure 13:	Water Quality Data	A-306
Annexure 14:	Noise Lelvel Data	A-308
Annexure 15:	Soil Quality Data	A-310

* * * * * * * *

TERMS OF REFERENCE & ITS COMPLIANCE

TERMS OF REFERENCE
GO-43

THIRU.DEEPAK S. BILGI, I.F.S.
MEMBER SECRETARY

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY-TAMILNADU
3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai - 600 015.
Phone No. 044-24359973
Fax No. 044-24359975

TERMS OF REFERENCE (ToR)

Lr No.SEIAA-TN/F.No.6507/SEAC/1(a)/ToR- 1487/2023 Dated: 22.06.2023.

To

Tvl. Riverways Mines and Minerals Limited
No. 20/4, Naveed Castle
Balakrishna Street, Mylapore
Chennai-600004.

Sir / Madam,

Sub: SEIAA, Tamil Nadu – Proposal seeking for Terms of Reference with public Hearing (ToR) for the proposed Garnet Sand Deposit Mines (G.O.No.3 (D) No.43) over an extent of 4.75.5 Ha in S.F.Nos. 390(P) of Kottathur Village, Musiri Taluk, Trichy District, Tamil Nadu by Tvl. Riverways Mines and Minerals Ltd - under project category – "B1" and Schedule S.No.1 (a) – ToR issued along with Public Hearing - preparation of EIA report – Regarding.

Ref:

1. Online proposal No.SIA/TN/MIN/21940/2018, dated: 09.02.2018.
2. Your application submitted for Terms of Reference dated: 07.03.2018.
3. Minutes of the 105th SEAC meeting held on 22.03.2018
4. Proponent reply dated: 02.04.2018.
5. Minutes of the 106th SEAC meeting held on 04.04.2018
6. Minutes of the 123rd SEAC Meeting held on 22.12.2018.
7. Proponent reply dated: 27.02.2019
8. Minutes of the 127th SEAC Meeting held on 15.03.2019.

MEMBER SECRETARY
SEIAA-TN

9. Minutes of the 342nd SEIAA Meeting held on 03.04.2019.
10. Proponent reply dated: 29.05.2019.
11. Minutes of the 347th SEIAA Meeting held on 21.06.2019.
12. Proponent reply dated: 05.04.2023.
13. Minutes of the 610th SEIAA Meeting held on 11.04.2023.
14. Minutes of the 382nd SEAC meeting held on 09.06.2023.
15. Minutes of the 632nd Authority meeting held on 21.06.2023 & 22.06.2023.

Kindly refer to your proposal submitted to the State Level Impact Assessment Authority for Terms of Reference.

The proponent, Tvl. Riverways Mines and Minerals Ltd has submitted application for Terms of Reference (ToR), for the proposed Garnet Sand Deposit Mines (G.O.No.3 (D) No.43) over an extent of 4.75.5 Ha in S.F.Nos. 390(P) of Kottathur Village, Musiri Taluk, Trichy District, Tamil Nadu.

SEAC Remarks:-

The proposal was placed in this 382nd Meeting of SEAC held on 09.06.2023. The project proponent gave detailed presentation. The details of the project furnished by the proponent are available in the website (parivesh.nic.in).

The SEAC noted the following:

1. The project proponent, Tvl. Riverways Mines and Minerals Ltd has applied for Terms of Reference for the Proposed Garnet sand over an extent of 4.75.5 Ha in S.F.Nos. 390(P) of Kottathur Village, Musiri Taluk, Trichy District, Tamil Nadu
2. The project/activity is covered under Category "B1" of Item 1(a) "Mining of Mineral Projects" of the Schedule to the EIA Notification, 2006.
3. Earlier, the proposal was placed in the **610th authority** meeting held on 11.04.2023. The Authority noted the following:
   (i) Earlier, the subject was placed in the 347th SEIAA meeting held on 21.06.2019 and the authority has observed that the proponent has not submitted the necessary clarification for non-applicability of this quarry for the order issued by Ministry of Mines dated 01.03.2019 to all the Principal Secretary at the Mining departments of all the state governments from the competent authority as requested by the Authority in the 342nd SEIAA meeting held

MEMBER SECRETARY
SEIAA-TN

on 03.04.2019. Hence the authority decided to stick with the clarification request in the 342nd SEIAA meeting that is:

The proponent shall obtain necessary clarification for non-applicability of this quarry for the letter on the order issued by Ministry of Mines vide F.No.1/1/2019-M.VI dated 01.03.2019 to all the Principal Secretary at the Mining departments of all the state governments from the competent authority.

(ii) Now, the proponent has submitted the reply to SEIAA vide letter dated 05.04.2023.

On the receipt of the reply received from the PP it was again placed in the 610th Authority meeting held on 11.04.2023. After detailed discussion, SEIAA decided to refer back this proposal on the PP's reply along with recommendation in addition to the following aspects.

a) The impact of mining on geology, land area, topography, biological, marine, resources and other environmental parameters may be examined/ studied.
b) Anticipated impact on water bodies, reservoir, river may be examined/studied.
c) Through a detailed soil profiling, the quality & mineral ingredients and analysis in the soil composition may be examined.

In view of the above, the proposal was placed in this 382nd SEAC meeting held on 09.06.2023. Based on the presentation made by the proponent, **SEAC decided to recommend the proposal for Terms of Reference (TOR) with Public Hearing subject to the following additional TORs**, in addition to the standard terms of reference for EIA study for non-coal mining projects and details issued by the MOEF & CC to be included in EIA/EMP Report:

1. The PP shall furnish a copy of the document in support of the fact that the proponent is the rightful lessee of the mine.
2. The PP shall furnish Copy of approved Mining Plan /Scheme of mining plan by the competent authority during the time of EIA appraisal.
3. The PP shall furnish an affidavit that mining plan approved by AMD used for Public Hearing and the Mining Plan approved by the Competent Authority (IBM/DGM) are the same.
4. The PP shall evaluate the environmental aspects and their possible associated impacts that would arise due to the proposed Garnet sand mining and mineral separation and to work out environmental monitoring programme to prevent, control, minimise or eliminate the adverse environmental impacts envisaged from the proposed garnet mining and mineral separation.

MEMBER SECRETARY
SEIAA-TN

5. The PP shall provide all documents including approved mine plan/ approved scheme of mining, EIA and public hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management and mining technology and should be in the name of the lessee.
6. The PP shall provide all corner coordinates of the mine lease area superimposed on a high Resolution Imagery/ toposheet. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and the buffer zone).
7. The PP shall indicate the level of Impact on local transport infrastructure due to project. Projected increase in truck traffic as a result of project in the present road network (including those outside the project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as state government) should be covered.
8. The PP shall furnish a letter from VAO stating details of structures & habitations located within 300m from the boundary of the project site.
9. The structures within the radius of (i) 100 m, (ii) 300 m, and (iii) 500 m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc.
10. The PP shall submit a report on replenishment of Garnet sand (or) its geological formation as indicated in the DSR.
11. The PP shall furnish the details of the tank, depth of desiltation, extent of the tank and Ownership of the tanks, details of cultivation, distance from the site, etc, within 1 km radius around the proposed mining area from the Govt records.
12. The PP shall furnish Copy of the NoC obtained from PWD/WRD-TN for the proposed mining activity.
13. The PP carry out the geological assessment to identify mineralization, to establish continuity, quality and quantity of mineral deposit, particularly, the presence of Atomic minerals in the Garnet sand. Hence the PP shall furnish the report through the systematic sampling in the proposed site with showing geological coordinates as per the procedures laid in accordance with the provisions of Atomic Minerals Concessional Rules, 2016 and the mineralogical analysis obtained from the laboratory of IREL (India) Limited, Research Centre, Beach Road, Kollam, Kerala.

MEMBER SECRETARY
SEIAA-TN

14. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside/inside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.
15. The study area will comprise of 10km zone around the mine lease from lease periphery and the data contained in EIA such as waste generation etc. should be for the life of the mine / lease period.
16. The PP shall indicate the land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features. Land use plan of the mine lease area should be prepared to encompass pre-operational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
17. The PP shall indicate the details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.
18. The PP shall anticipate the Occupational and health impacts of the project and accordingly the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP.
19. The PP shall evaluate the Public health implications of the project and related activities for the population in the impact zone systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
20. The PP shall provide the measures of socio-economic significance and influence to the local community. As far as possible, quantitative dimensions may be given with the time frames for implementation.
21. The PP shall disclose the details of litigation / violation case pending against the project (or) the PP pertaining to this mining proposal, if any, with the direction/order passed by any court of law against the project proposal in the past or now.
22. Proponent shall furnish the letter received from DFO concerned stating the proximity details of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.
23. Detailed study report on flora and fauna in and nearby the quarry site.
24. The Proponent shall develop greenbelt and garland drain around the boundary of the proposed quarry and the photographs indicating the same shall be shown during the EIA appraisal.

MEMBER SECRETARY
SEIAA-TN

25. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.
26. The PP shall carry out the air-quality monitoring for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of minerals. The details of the model used and the input parameters used for modelling should be provided. The air quality contours may be plotted on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.
27. The PP shall furnish the water requirement for the project, its availability and source. A detailed water balance should also be provided. Fresh water requirement for the project should be indicated.
28. The PP shall assess the impact of project on water quality, both surface and groundwater and necessary safeguard measures, if any required, should be provided.
29. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.
30. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines,
    i. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?
    ii. Quantity of minerals mined out.
    iii. Highest production achieved in any one year
    iv. Detail of approved depth of mining.
    v. Actual depth of the mining achieved earlier
    vi. Name of the person already mined in that leases area.
    vii. If EC and CTO already obtained, the copy of the same shall be submitted.
    viii. Whether the mining was carried out as per the approved mine plan (or EC if issued).
31. All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining

MEMBER SECRETARY
SEIAA-TN

lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).

32. The Proponent shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,
33. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.
34. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.
35. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act' 1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.
36. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.
37. The Proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.
38. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.
39. Rain water harvesting management with recharging details along with water balance (both

MEMBER SECRETARY
SEIAA-TN

monsoon & non-monsoon) be submitted.

40. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
41. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.
42. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
43. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.
44. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
45. Public Hearing points raised and commitments of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project and to be submitted to SEIAA/SEAC with regard to the Office Memorandum of MoEF& CC accordingly.
46. The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.
47. The Proponent shall produce/display the EIA report, Executive summery and other related information with respect to public hearing in Tamil Language also.
48. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.
49. The purpose of Greenbelt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A

MEMBER SECRETARY
SEIAA-TN

wide range of indigenous plant species should be planted as given in the Appendix-I in consultation with the DFO, & Tamil Nadu Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.

50. Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner
51. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.
52. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.
53. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
54. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
55. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
56. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
57. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
58. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions

MEMBER SECRETARY
SEIAA-TN

given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.

59. The Proponent shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.
60. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.

Appendix -I

List of Native Trees Suggested for Planting

1. ***Aeglemarmelos***–Vilvam
2. ***Adenaantherapavonina***-Manjadi
3. ***Albizialebbeck***–Vaagai
4. ***Albiziaamara***-Usil
5. ***Bauhinia purpurea*** - Mantharai
6. ***Bauhinia racemosa*** - Aathi
7. ***Bauhinia tomentosa***–Iruvathi
8. ***Buchananiaaillaris***-Kattuma
9. ***Borassusflabellifer***- Panai
10. ***Buteamonosperma*** - Murukkamaram
11. ***Bobaxceiba***– Ilavu, Sevvilavu
12. ***Calophylluminophyllum*** - Punnai
13. ***Cassia fistula***- Sarakondrai
14. ***Cassia roxburghii***- Sengondrai
15. ***Chloroxylonsweitenia*** - Purasamaram
16. ***Cochlospermumreligiosum***– Kongu, Manjalllavu
17. ***Cordiadichotoma***– Mookuchalimaram
18. ***Cretevaadansonii***–Mavalingum
19. ***Dilleniaindica***– Uva, Uzha
20. ***Dilleniapentagyna***– SiruUva, Sitruzha
21. ***Diospyrosebenum***- Karungali

MEMBER SECRETARY
SEIAA-TN

22. ***Diospyroschloroxylon***– Vaganai
23. ***Ficusamplissima*** – Kalltchi
24. ***Hibiscus tiliaceous***–Aatrupoovarasu
25. ***Hardwickiabinata***– Aacha
26. ***Holopteliaintegrifolia***-Aayili
27. ***Lanneacoromandelica*** - Odhiam
28. ***Lagerstroemia speciosa*** - Poo Marudhu
29. ***Lepisanthustetraphylla***- Neikottaimaram
30. ***Limoniaacidissima*** - Vila maram
31. ***Litseaglutinosa***–Pisinpattai
32. ***Madhucalongifolia*** - Illuppai
33. ***Manilkarahexandra***–UlakkaiPaalai
34. ***Mimusopselengi*** - Magizhamaram
35. ***Mitragynaparvifolia*** - Kadambu
36. ***Morindapubescens***–Nuna
37. ***Morindacitrifolia***– VellaiNuna
38. ***Phoenix sylvestre***-Eachai
39. **Pongamiapinnata**–Pungam
40. **Premnamollissima**– Munnai
41. **Premnaserratifolia**– Narumunnai
42. **Premnatomentosa**-PurangaiNaari, PudangaNaari
43. **Prosopiscinerea** - Vannimaram
44. **Pterocarpusmarsupium** - Vengai
45. **Pterospermumcanescens**–Vennangu, Tada
46. **Pterospermumxylocarpum** - Polavu
47. **Puthranjivaroxburghii**–Puthranjivi
48. **Salvadorapersica**– UgaaMaram
49. **Sapindusemarginatus**- Manipungan, Soapukai
50. **Saracaasoca** - Asoca
51. **Streblusasper**- Pirayamaram
52. **Strychnosnuxvomica**–Yetti

MEMBER SECRETARY
SEIAA-TN

53. **Strychnospotatorum** - TherthangKottai
54. **Syzygiumcumini** - Naval
55. **Terminaliabellerica**- Thandri
56. **Terminalia arjuna**- Venmarudhu
57. **Toona ciliate** – Sandhanavembu
58. **Thespesiapopulnea**- Puvarasu
59. **Walsuratrifoliata**–valsura
60. **Wrightiatinctoria**- Vep

SEIAA Remarks: -

The subject was placed in 632nd Authority meeting held on 22.06.2023. The authority noted that the subject was appraised in 382nd SEAC meeting held on 09.06.2023.

Based on the presentation and documents furnished by the project proponent, SEAC after detailed deliberations, decided to **recommend the proposal for the grant of Terms of Reference (ToR).**

After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant **Terms of Reference (ToR) along with Public Hearing** under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions in addition to the following conditions and the conditions mentioned in 'Annexure B' of this minutes:

1. The analysis of the minerals of Garnet to be mined out from the mining lease area shall be carried out by the competent authority before conducting EIA study and the proponent shall ensure that the threshold value 0.00% monazite in heavy minerals, irrespective of monazite grade as per the Atomic minerals concession rules 2016 issued by ministry of mines notification dated 20.02.2019.
2. The proponent shall furnish the scientific proof to ensure the non-hazardous nature of the waste generated from the mineral pre- concentrated plant since the said waste proposed to dump into the mined-out void. In this connection proponent has to detailed plan bring back the non-hazardous nature of the waste generated from the mineral pre- concentrated plant to the mined-out area.
3. The detailed mine closure plan shall be furnished.

MEMBER SECRETARY
SEIAA-TN

4. The proponent has to conduct cumulative EIA report considering the other four adjacent proposed mining quarries with Separate EMP plan for the proposed individual quarrying operations.
5. The transportation methodology for the transportation of Garnet from the mining lease to the process area shall be furnished in detail and cumulative impact on Air pollution especially Fugitive emission needs to be carried out considering all the mining areas.
6. The proponent shall furnish the detailed CER plan with budget allocation incorporating the needs of the nearby public and also points raised in the public hearing as per the Office Memorandum of MoEF & CC dated 01.05.2018.
7. A detailed study shall be included in the EIA Report by incorporating flowchart showing the process of Garnet extraction from sand. This should indicate the flow of processes and products.
8. Impact due to the transportation of garnet sand from the site to the pre-concentration plant and back to site for reclamation shall be discussed in detail in the EA Report. The distance to the pre-concentration plant from the site shall also be furnished.
9. The details of tailings and the concentrates in the tailings shall also be included in the EIA Report.
10. Impact study on climate, water use, land use, energy use, details of waste generation, CO_2& GHG emission due to proposed project activity shall be included in the EIA Report.
11. Life Cycle Assessment of Garnet including the recycle-reuse pathway for the waste generated shall be included.
12. Details of Environmental monitoring agencies to be employed in the monitoring process during the removal and recovery of garnet shall be furnished.
13. The proponent shall furnish the details on the sustainable technologies to be deployed for the separation of garnet sand.
14. Impact study on soil, groundwater, surface water, agriculture, and horticulture including the impact on the fish shall be furnished.
15. Impact of the proposed project activity on wildlife, livestock & biodiversity shall be studied in detail.
16. Detailed mine closure & reclamation plan for sustainable restoration of the site shall be furnished.

MEMBER SECRETARY
SEIAA-TN

17. The EIA Report shall cover the technologies to be adopted for the reduction of environmental burdens including eco-friendly processes to be employed for the extraction of garnet.

Annexure 'B'

Cluster Management Committee

1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.
2. The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.,
3. The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.
4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.
5. The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.
6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.
7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.
8. The committee shall furnish the Emergency Management plan within the cluster.
9. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.
10. The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.
11. The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.

Impact study of mining

12. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following

MEMBER SECRETARY
SEIAA-TN

a) Soil health & soil biological, physical land chemical features.

b) Climate change leading to Droughts, Floods etc.

c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.

d) Possibilities of water contamination and impact on aquatic ecosystem health.

e) Agriculture, Forestry & Traditional practices.

f) Hydrothermal/Geothermal effect due to destruction in the Environment.

g) Bio-geochemical processes and its foot prints including environmental stress.

h) Sediment geochemistry in the surface streams.

Agriculture & Agro-Biodiversity

13. Impact on surrounding agricultural fields around the proposed mining Area.
14. Impact on soil flora & vegetation around the project site.
15. Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.
16. The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.
17. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.
18. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.

Forests

19. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.
20. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.
21. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.
22. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.

MEMBER SECRETARY
SEIAA-TN

Water Environment

23. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.
24. Erosion Control measures.
25. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.
26. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
27. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.
28. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.
29. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.
30. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.

Energy

31. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.

Climate Change

32. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.
33. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.

MEMBER SECRETARY
SEIAA-TN

Mine Closure Plan

34. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.

EMP

35. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.
36. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.

Risk Assessment

37. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.

Disaster Management Plan

38. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.

Others

39. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.
40. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.
41. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.

A. STANDARD TERMS OF REFERENCE

i) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had

MEMBER SECRETARY
SEIAA-TN

been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.

2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.

3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.

4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).

5) Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.

6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State: land diversion for mining should have approval from State land use board or the concerned authority.

7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.

8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.

9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease

MEMBER-SECRETARY
SEIAA-TN

period.

10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.

11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.

12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.

13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.

14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.

15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.

16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.

17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.

MEMBER SECRETARY
SEIAA-TN

18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.

19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.

20) Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).

21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.

22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and

MEMBER SECRETARY
SEIAA-TN

EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.

23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.

24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.

25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.

26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.

27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.

28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.

29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.

30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.

MEMBER SECRETARY
SEIAA-TN

31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.

32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.

33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.

34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.

35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.

36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.

37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.

38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land.

MEMBER SECRETARY
SEIAA-TN

if any, occupational health impacts besides other impacts specific to the proposed Project.

39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.

40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.

41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.

42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.

43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.

44) Besides the above, the below mentioned general points are also to be followed:-

a) Executive Summary of the EIA/EMP Report

b) All documents to be properly referenced with index and continuous page numbering.

c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.

d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.

e) Where the documents provided are in a language other than English, an English translation should be provided.

f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.

g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA. II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.

h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH

MEMBER SECRETARY
SEIAA-TN

again with the revised documentation.

i) As per the circular no. J-11011/618/2010-IA. II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environment Clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.

j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

In addition to the above, the following shall be furnished:-

The Executive summary of the EIA/EMP report in about 8-10 pages should be prepared incorporating the information on following points:

1. Project name and location (Village, District, State, Industrial Estate (if applicable).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
6. A detailed study of the lithology of the mining lease area shall be furnished.
7. Details of village map, "A" register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
12. The EIA study report shall include the surrounding mining activity, if any.

MEMBER SECRETARY
SEIAA-TN

13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.
16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of is acquisition, nearby (in 2-3 km.) water body, population, with in 10km other industries, forest , eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
20. Likely impact of the project on air, water, land, flora-fauna and nearby population
21. Emergency preparedness plan in case of natural or in plant emergencies
22. Issues raised during public hearing (if applicable) and response given
23. CER plan with proposed expenditure.
24. Occupational Health Measures
25. Post project monitoring plan
26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
30. Reserve funds should be earmarked for proper closure plan.
31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics

MEMBER SECRETARY
SEIAA-TN

irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

Besides the above, the below mentioned general points should also be followed:-

a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.

b. All documents may be properly referenced with index, page numbers and continuous page numbering.

c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.

d. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF& CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.

e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J -11013/77/2004-IA-II(I) dated 2nd December, 2009, 18th March 2010, 28th May 2010, 28th June 2010, 31st December 2010 & 30th September 2011 posted on the Ministry's website http://www.moef.nic.in/ may be referred.

- After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned points, the proponent willtake further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.
- The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance.
- The TORs with public hearing prescribed shall be **valid for a period of three years** from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.

MEMBER SECRETARY
SEIAA-TN

Copy to:

1. The Additional Chief Secretary to Government, Environment & Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD Cum-Office Complex, East Arjun Nagar, New Delhi 110032.
3. The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-600 032.
4. The APCCF (C), Regional Office, MoEF& CC (SZ), 34, HEPC Building, 1st & 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai -34.
5. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC, Paryavaran Bhavan, CGO Complex, New Delhi 110003
6. The District Collector, Trichy District.
7. Stock File.

TERMS OF REFERENCE – G.O.69

THIRU. DEEPAK S. BILGI, I.F.S.
MEMBER SECRETARY

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY-TAMILNADU
3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai - 600 015.
Phone No. 044-24359973
Fax No. 044-24359975

TERMS OF REFERENCE (ToR)

Lr No.SEIAA-TN/F.No.6510/SEAC/ToR-1490/2023 Dated: 22.06.2023

To

M/s. Riverways Mines and Minerals Ltd,
No.20/4, Naveed Castle,
Balakrishna Street, Mylapore,
Chennai - 600 004.

Sir / Madam,

Sub: SEIAA, Tamil Nadu – Terms of Reference with Public Hearing (ToR) for the Proposed Garnet Sand mine lease over an extent of 4.90.0 Ha at S.F.No. 390(P) of Kottathur Village, Musiri Taluk, Tiruchirapalli District, Tamil Nadu by M/s. Riverways Mines and Minerals Ltd - under project category – "B1" and Schedule S.No.1(a) – ToR issued along with Public Hearing - preparation of EIA report – Regarding.

Ref:
1. Online proposal No. SIA/TN/MIN/21946/2018, dated 09.02.2018
2. Your application submitted for Terms of Reference dated: 07.03.2018
3. Minutes of the 105th SEAC meeting held on 22.03.2018
4. Proponent reply dated: 02.04.2018
5. Minutes of the 106th SEAC meeting held on 04.04.2018
6. Minutes of the 123rd SEAC meeting held on 22.12.2018
7. Proponent reply dated: 27.02.2019
8. Minutes of the 127th SEAC meeting held on 15.03.2019
9. Minutes of the 342nd SEIAA meeting held on 03.04.2019

MEMBER SECRETARY
SEIAA-TN

10. Proponent reply dated: 29.05.2019
11. Minutes of the 347th SEIAA meeting held on 21.06.2019
12. Proponent reply dated: 05.04.2023
13. Minutes of the 610th SEIAA meeting held on 11.04.2023
14. Minutes of the 382nd SEAC meeting held on 09.06.2023
15. Minutes of the 632nd SEIAA meeting held on 21.06.2023 & 22.06.2023

Kindly refer to your proposal submitted to the State Level Impact Assessment Authority for Terms of Reference.

The proponent, M/s. Riverways Mines and Minerals Ltd has submitted application for Terms of Reference (ToR) on 07.03.2018, in Form-I, Pre-Feasibility report for the Proposed Garnet Sand mine lease over an extent of 4.90.0 Ha at S.F.No. 390(P) of Kottathur Village, Musiri Taluk, Tiruchirapalli District, Tamil Nadu.

Discussion by SEAC and the Remarks:-

Proposed Garnet Sand mine lease over an extent of 4.90.0 Ha at S.F.No. 390(P), Kottathur Village, Musiri Taluk, Tiruchirapalli District, Tamil Nadu by M/s. Riverways Mines and Minerals Ltd – For Terms of Reference

The proposal was placed in this 382nd meeting of SEAC held on 09.06.2023. The details of the project furnished by the proponent are available in the website (parivesh.nic.in).

The SEAC noted the following

- The project proposal was placed in the 105th meeting of the SEAC held on 22.03.2018. In this regard, the SEAC learnt that the Government of Tamil Nadu has issued ban orders relating to the mining operations of Garnet, Illuminite, Rutile, etc in various parts of the state of Tamil Nadu including Tiruchirapalli vide G.O. (Ms) No.173, Industries (MMD.1) Department dated: 17.09.2013. Hence, SEAC decided that the proposal cannot be considered for appraisal.
- The above minutes was communicated to the proponent vide SEIAA letter dated: 23.03.2018. The proponent requested to re-appraise the proposal vide letter dated 02.04.2018. In content of the letter the proponent has not indicated any new grounds based on which the SEAC might re-appraise the project proposal. Hence, the SEAC decided to stick to its original decision - not to consider the proposal for appraisal.

MEMBER SECRETARY
SEIAA-TN

- In this Connection, the SEIAA was requested to the Additional Chief Secretary to Government, Industrial Department to furnish present stage of Ban Orders on the mining of major mineral vide this office letter.No.SEIAA-TN/F.No.6509/2018 dated: 21.05.2018. A reply was received from the Additional Chief Secretary to Government, Industrial Department vide letter No.6751/MMD.1/2018-2 dated: 20.07.2018, it is informed that the cases which are related to illegal mining of Beach sand Minerals in the state of Tamil Nadu from the existing mining lease and stoppage of mining operations, are still pending before the Hon'ble High Court of Madras. They are not connected to fresh grant of mining lease by the Government. In G.O.(Ms).No.112, Industries (MMD.1) Department dated: 22.09.2017 orders were issued for granting of mining leases to M/S. S.S. Minerals and Riverways Mines and Minerals based on the Court order dated: 15.03.2017.

The proposal was placed in the 123rd SEAC Meeting held on 22.12.2018. The project proponent gave a detailed presentation on the salient features of the project details as follow.

1. The Government of Tamil Nadu sanctioned the grant of fresh mining lease for Garnet sand over an extent of 4.90.0 Ha in S.F.Nos.390 (part) of Kottathur Village, Musiri Taluk, Trichy District, Tamil Nadu G.O.(3D) No.69 dated 27.12.2010 to Tvl. Riverways mines and minerals Ltd.
2. Since Garnet is a major mineral and the lease area is less than 100 Ha, this project falls under category B1 as per MOEF & CC notification.
3. Form1, Feasibility Report and ToR is prepared in line with the guidelines issued by MoEF & CC, vide their letter dated 30 December 2010 towards obtaining environmental clearance for G.O.(3D) No.69 with lease area of 4.90.0 Ha for a peak production capacity of 1776 Tonnes of Garnet ROM for obtaining TOR from SEIAA, Tamil Nadu.
4. The mining plan was submitted and approved by IBM vide letter No.TN/TCR/ MP/GNT1855.MDS dated: 28.05.2013.
5. The applied mining lease area (G.O.(3D).69 of extent - 4.90.0 Ha) is located in Kottathur village, Musiri taluk, Trichy District, Tamil Nadu. The entire mine lease is Government Eri Poramboke land with an average elevation of 121m-124m from MSL. This area falls in Survey of India Topo sheet No. 58 I/12 between latitude N 11°06.081' to 11°06.230' N and longitude E 78°39.832' to 78°40.953' E. The area is

MEMBER SECRETARY
SEIAA-TN

accessible from Kottattur to Puttanampatti road which is connected to SH-142. The nearest railway station is Trichy RS located at 33 km in S.

6. The mining lease area and the 10 km buffer zone is devoid of declared ecologically sensitive features like national parks, biospheres, sanctuaries, etc. No forest land is involved in the lease area.
7. The area also does not come under CRZ category.
8. Further, there is no perennial river or streams passing through the lease area Uppar river – 1.3 km – SE, Gundar Nadi – 9.5km - W of the lease area. The lease area is almost a flat terrain ranging with an average elevation of 121m-124m from MSL. Sattanur RF – 800 m – SW, Ragalavadi RF – 3.9 km – SW, Kottatur RF – 2.4km – NE, Pulivalam RF – 7.3 km – SW, Omandur RF – 4.2 km – S, Vellakkalpat RF – 5.5 km – SE, Edumalai RF – 7.4 km – SE, Kurichi malai RF – 4.9 km – NW, Palamalai RF – 9.0 km – N and Nakkasalem RF – 7.8km – NE are located from the lease area.
9. **The geological reserve is estimated has 40078 Tonnes and the mineable reserve is estimated to be 20736 Tonnes. The quantity of top soil expected is around 12050 Tonnes for the entire life of the mine. Top soil will be dumped all along the boundary barriers for afforestation purpose.**
10. **The proposed peak production from this lease is 1776 Tonnes of garnet ROM per annum.**
11. Based on the presentation made by the project proponent and the documents furnished for the project of Garnet Sand deposits (GO (3D) No 69) by M/s. Tvl.Riverways Mines and Minerals Ltd over an Extent of 4.90.0 Ha at S.F.No 390(P) of Kottathur village, Musiri Taluk, Trichy District, Tamil Nadu under Schedule S.No. 1(a) of Category "B" – the committee decided to defer the proposal for want of following details:

    - The proponent shall come with the presentation for conducting Cumulative EIA Study. Considering the other 4 quarries are adjacent to this quarry namely, M/S. S.S. Minerals & other 3 Riverways Mines and Minerals which are adjacent to each other in the same survey Number of S.F.No 390(P) of Kottathur village, Musiri Taluk, Trichy District, Tamil Nadu.
    - The Executive Engineer, PWD, Tiruchirapalli in his letter.No.RC V3/Ko 35/ 2002 dated 15.04.2002 has recommended to grant mining lease for a period of

MEMBER SECRETARY
SEIAA-TN

three years and further he stated that the same may be renewed periodically once in three years . Hence, the committee has directed the proponent to obtain a fresh No Objection Certificate and Technical feasibility for mining of Garnets in this tank area (i.e. water body) from the competent authority.

- The proponent shall furnish the scientific proof to ensure the non hazardous nature of the waste generated from the mineral pre- concentrated plant since the said waste proposed to dump into the mined out void.

The proponent has furnished the details on 27.02.2019 to SEIAA.

The proposal was placed in the 127th SEAC Meeting held on 15.03.2019. The project proponent gave detailed presentation on the above points. The SEAC decided to recommend that the proposal be granted standard Terms of Reference (Annexure-I) with the combined Public hearing.

The proposal was considered in 342nd SEIAA meeting held on 03.04.2019. The SEIAA decided to seek following clarification from the proponent:

1. The proponent shall obtain necessary clarification for non applicability of this quarry for the letter on the order issued by Ministry of Mines dated 01.03.2019 to all the Principal Secretary at the Mining departments of all the state governments from the competent authority.
2. The proponent shall clarify the formation of the garnet in the water bodies.

The above details were communicated to the project proponent vide letter dated 26.04.2019 and proponent furnished reply on 29.05.2019.

Again this subject was placed in the 347th SEIAA meeting held on 21.06.2019. The authority has observed that the proponent has not submitted the necessary clarification for non applicability of this quarry for the order issued by Ministry of Mines dated 01.03.2019 to all the Principal Secretary at the Mining departments of all the state governments from the competent authority as requested by the Authority in the 342nd SEIAA meeting held on 03.04.2019. Hence the authority decided to stick with the clarification request in the 342nd SEIAA meeting i.e, The proponent shall obtain necessary clarification for non applicability of this quarry for the letter on the order issued by Ministry of Mines dated 01.03.2019 to all the Principal Secretary at the Mining departments of all the state governments from the competent authority.

Now, the proponent has submitted the reply to SEIAA vide letter dated 05.04.2023.

The subject was placed in 610th Authority meeting held on 11.04.2023. After detailed discussion, SEIAA decided to refer back this proposal on the PP's reply along with recommendation in addition to the following aspects.

MEMBER SECRETARY
SEIAA-TN

1. The impact of mining on geology, land area, topography, biological, coastal, marine, resources and other environmental parameters may be examined/studied.
2. Anticipated impact on water bodies, reservoir, river may be examined/studied
3. Through a detailed soil profiling, the quality & mineral ingredients and analysis in the soil composition may be examined.

Now, this proposal again been placed in this 382nd meeting of SEAC held on 09.06.2023. Based on the presentation made by the proponent, SEAC recommended to grant of **Terms of Reference (TOR) with Public Hearing** subject to the following ToRs in addition to the standard Terms of Reference for EIA study for non-coal mining projects and details issued by the MOEF & CC to be included in EIA/EMP Report:

1. The analysis of the minerals of Garnet to be mined out from the mining lease area shall be carried out by the competent authority before conducting EIA study and the proponent shall ensure that the threshold value 0.00% monazite in heavy minerals, irrespective of monazite grade as per the Atomic minerals concession rules 2016 issued by ministry of mines notification dated 20.02.2019.
2. The proponent shall furnish the scientific proof to ensure the non hazardous nature of the waste generated from the mineral pre- concentrated plant since the said waste proposed to dump into the mined out void. In this connection proponent has to detailed plan bring back the non hazardous nature of the waste generated from the mineral pre- concentrated plant to the mined out area.
3. The detailed mine closure plan shall be furnished.
4. The proponent has to conduct cumulative EIA report considering the other four adjacent proposed mining quarries with Separate EMP plan for the proposed individual quarrying operations.
5. The transportation methodology for the transportation of Garnet from the mining lease to the process area shall be furnished in detail and cumulative impact on Air pollution especially Fugitive emission needs to be carried out considering all the mining areas.
6. The proponent shall furnish the detailed CER plan with budget allocation incorporating the needs of the nearby public and also points raised in the public hearing as per the Office Memorandum of MoEF & CC dated 01.05.2018.
7. The PP shall furnish a copy of the document in support of the fact that the proponent is the rightful lessee of the mine.

MEMBER SECRETARY
SEIAA-TN

8. The PP shall furnish Copy of approved Mining Plan /Scheme of mining plan by the competent authority during the time of EIA appraisal.
9. The PP shall furnish an affidavit that mining plan approved by AMD used for Public Hearing and the Mining Plan approved by the Competent Authority (IBM/DGM) are the same.
10. The PP shall evaluate the environmental aspects and their possible associated impacts that would arise due to the proposed Garnet sand mining and mineral separation and to work out environmental monitoring programme to prevent, control, minimise or eliminate the adverse environmental impacts envisaged from the proposed garnet mining and mineral separation.
11. The PP shall provide all documents including approved mine plan/ approved scheme of mining, EIA and public hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management and mining technology and should be in the name of the lessee.
12. The PP shall provide all corner coordinates of the mine lease area superimposed on a high Resolution Imagery/ toposheet. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and the buffer zone).
13. The PP shall indicate the level of Impact on local transport infrastructure due to project. Projected increase in truck traffic as a result of project in the present road network (including those outside the project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as state government) should be covered.
14. The PP shall furnish a letter from VAO stating details of structures & habitations located within 300m from the boundary of the project site.
15. The structures within the radius of (i) 100 m, (ii) 300 m, and (iii) 500 m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc.
16. The PP shall submit a report on replenishment of Garnet sand (or) its geological formation as indicated in the DSR.
17. The PP shall furnish the details of the tank, depth of desiltation, extent of the tank and Ownership of the tanks, details of cultivation, distance from the site, etc, within 1 km radius around the proposed mining area from the Govt records.
18. The PP shall furnish Copy of the NoC obtained from PWD/WRD-TN for the proposed mining activity.

MEMBER SECRETARY
SEIAA-TN

19. The PP carry out the geological assessment to identify mineralization, to establish continuity, quality and quantity of mineral deposit, particularly, the presence of Atomic minerals in the Garnet sand. Hence the PP shall furnish the report through the systematic sampling in the proposed site with showing geological coordinates as per the procedures laid in accordance with the provisions of Atomic Minerals Concessional Rules, 2016 and the mineralogical analysis obtained from the laboratory of IREL (India) Limited, Research Centre, Beach Road, Kollam, Kerala.
20. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside/inside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.
21. The study area will comprise of 10km zone around the mine lease from lease periphery and the data contained in EIA such as waste generation etc. should be for the life of the mine / lease period.
22. The PP shall indicate the land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features. Land use plan of the mine lease area should be prepared to encompass pre-operational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
23. The PP shall indicate the details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.
24. The PP shall anticipate the Occupational and health impacts of the project and accordingly the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP.
25. The PP shall evaluate the Public health implications of the project and related activities for the population in the impact zone systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
26. The PP shall provide the measures of socio-economic significance and influence to the local community. As far as possible, quantitative dimensions may be given with the time frames for implementation.
27. The PP shall disclose the details of litigation / violation case pending against the project (or) the PP pertaining to this mining proposal, if any, with the direction/order passed by any court

MEMBER SECRETARY
SEIAA-TN

of law against the project proposal in the past or now.

28. Proponent shall furnish the letter received from DFO concerned stating the proximity details of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.
29. Detailed study report on flora and fauna in and nearby the quarry site.
30. The Proponent shall develop greenbelt and garland drain around the boundary of the proposed quarry and the photographs indicating the same shall be shown during the EIA appraisal.
31. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.
32. The PP shall carry out the air-quality monitoring for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of minerals. The details of the model used and the input parameters used for modelling should be provided. The air quality contours may be plotted on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.
33. The PP shall furnish the water requirement for the project, its availability and source. A detailed water balance should also be provided. Fresh water requirement for the project should be indicated.
34. The PP shall assess the impact of project on water quality, both surface and groundwater and necessary safeguard measures, if any required, should be provided.
35. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.
36. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines,
    i. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?
    ii. Quantity of minerals mined out.
    iii. Highest production achieved in any one year
    iv. Detail of approved depth of mining.
    v. Actual depth of the mining achieved earlier.

MEMBER SECRETARY
SEIAA-TN

vi. Name of the person already mined in that leases area.

vii. If EC and CTO already obtained, the copy of the same shall be submitted.

viii. Whether the mining was carried out as per the approved mine plan (or EC if issued).

37. All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).

38. The Proponent shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,

39. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.

40. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.

41. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.

42. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.

43. The Proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.

44. The Proponent shall carry out the Cumulative impact study due to mining operations carried

MEMBER SECRETARY
SEIAA-TN

out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.

45. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.
46. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
47. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.
48. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
49. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.
50. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
51. Public Hearing points raised and commitments of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project and to be submitted to SEIAA/SEAC with regard to the Office Memorandum of MoEF& CC accordingly.
52. The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.
53. The Proponent shall produce/display the EIA report, Executive summary and other related information with respect to public hearing in Tamil Language also.

MEMBER SECRETARY
SEIAA-TN

54. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.
55. The purpose of Greenbelt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the Appendix-I in consultation with the DFO, & Tamil Nadu Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.
56. Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner
57. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.
58. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.
59. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
60. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
61. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
62. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.

MEMBER SECRETARY
SEIAA-TN

63. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
64. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.
65. The Proponent shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.
66. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.

Appendix

List of Native Trees Suggested for Planting

1. ***Aegle marmelos*** – Vilvam
2. ***Adenaanthera pavonina*** - Manjadi
3. ***Albizia lebbeck*** – Vaagai
4. ***Albizia amara*** - Usil
5. ***Bauhinia purpurea*** - Mantharai
6. ***Bauhinia racemosa*** - Aathi
7. ***Bauhinia tomentosa*** – Iruvathi
8. ***Buchanania axillaris*** - Kattuma
9. ***Borassus flabellifer*** - Panai
10. ***Butea monosperma*** - Murukka maram
11. ***Bobax ceiba*** – Ilavu, Sevvilavu
12. ***Calophyllum inophyllum*** - Punnai
13. ***Cassia fistula*** - Sarakondrai
14. ***Cassia roxburghii***- Sengondrai
15. ***Chloroxylon sweitenia*** - Purasa maram
16. ***Cochlospermum religiosum*** – Kongu, Manjal Ilavu
17. ***Cordia dichotoma*** – Mookuchali maram
18. ***Creteva adansonii*** – Mavalingum
19. ***Dillenia indica*** – Uva, Uzha

MEMBER SECRETARY
SEIAA-TN

20. ***Dillenia pentagyna*** – Siru Uva, Sitruzha
21. ***Diospyros ebenum*** - Karungali
22. ***Diospyros chloroxylon*** – Vaganai
23. ***Ficus amplissima*** – Kal Itchi
24. ***Hibiscus tiliaceus*** – Aatru poovarasu
25. ***Hardwickia binata*** – Aacha
26. ***Holoptelia integrifolia*** - Aayili
27. ***Lannea coromandelica*** - Odhiam
28. ***Lagerstroemia speciosa*** - Poo Marudhu
29. ***Lepisanthus tetraphylla*** - Neikottai maram
30. ***Limonia acidissima*** - Vila maram
31. ***Litsea glutinosa*** –Pisin pattai
32. ***Madhuca longifolia*** - Illuppai
33. ***Manilkara hexandra*** – Ulakkai Paalai
34. ***Mimusops elengi*** - Magizha maram
35. ***Mitragyna parvifolia*** - Kadambu
36. ***Morinda pubescens*** – Nuna
37. ***Morinda citrifolia*** – Vellai Nuna
38. ***Phoenix sylvestre*** - Eachai
39. **Pongamia pinnata** – Pungam
40. **Premna mollissima** – Munnai
41. **Premna serratifolia** – Narumunnai
42. **Premna tomentosa** - Purangai Naari, Pudanga Naari
43. **Prosopis cinerea** - Vanni maram
44. **Pterocarpus marsupium** - Vengai
45. **Pterospermum canescens** – Vennangu, Tada
46. **Pterospermum xylocarpum** - Polavu
47. **Puthranjiva roxburghii** – Puthranjivi
48. **Salvadora persica** – Ugaa Maram
49. **Sapindus emarginatus** - Manipungan, Soapu kai
50. **Saraca asoca** - Asoca
51. **Streblus asper** - Piraya maram

MEMBER SECRETARY
SEIAA-TN

52. **Strychnos nuxvomica** – Yetti
53. **Strychnos potatorum** - Therthang Kottai
54. **Syzygium cumini** - Naval
55. **Terminalia bellerica** - Thandri
56. **Terminalia arjuna** - Ven marudhu
57. **Toona ciliate** – Sandhana vembu
58. **Thespesia populnea** - Puvarasu
59. **Walsuratrifoliata** – valsura
60. **Wrightia tinctoria** – Veppalai
61. **Pithecellobium dulce** – Kodukkapuli

Discussion by SEIAA and the Remarks:-

The proposal was placed in the 632nd Authority meeting held on 21.06.2023 & 22.06.2023. The authority noted that this proposal was placed for appraisal in 382nd SEAC meeting held on 09.06.2023. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant Terms of Reference (ToR) along with Public Hearing under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions in addition to the conditions in **'Annexure B'** of this minutes.

1. A detailed study shall be included in the EIA Report by incorporating flowchart showing the process of Garnet extraction from sand. This should indicate the flow of processes and products.
2. Impact due to the transportation of garnet sand from the site to the pre-concentration plant and back to site for reclamation shall be discussed in detail in the EIA Report. The distance to the pre-concentration plant from the site shall also be furnished.
3. The details of tailings and the concentrates in the tailings shall also be included in the EIA Report.
4. Impact study on climate, water use, land use, energy use, details of waste generation, CO_2 & GHG emission due to proposed project activity shall be included in the EIA Report.
5. Life Cycle Assessment of Garnet including the recycle-reuse pathway for the waste generated shall be included.
6. Details of Environmental monitoring agencies to be employed in the monitoring process during the removal and recovery of garnet shall be furnished.

MEMBER SECRETARY
SEIAA-TN

7. The proponent shall furnish the details on the sustainable technologies to be deployed for the separation of garnet sand.
8. Impact study on soil, groundwater, surface water, agriculture, and horticulture including the impact on the fish shall be furnished.
9. Impact of the proposed project activity on wildlife, livestock & biodiversity shall be studied in detail.
10. Detailed mine closure & reclamation plan for sustainable restoration of the site shall be furnished.
11. The EIA Report shall cover the technologies to be adopted for the reduction of environmental burdens including eco-friendly processes to be employed for the extraction of garnet.

Annexure 'B'

Cluster Management Committee

1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.
2. The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.,
3. The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.
4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.
5. The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.
6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.
7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.
8. The committee shall furnish the Emergency Management plan within the cluster.

MEMBER SECRETARY
SEIAA-TN

9. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.
10. The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.
11. The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.

Impact study of mining

12. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following
    a) Soil health & soil biological, physical land chemical features .
    b) Climate change leading to Droughts, Floods etc.
    c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.
    d) Possibilities of water contamination and impact on aquatic ecosystem health.
    e) Agriculture, Forestry & Traditional practices.
    f) Hydrothermal/Geothermal effect due to destruction in the Environment.
    g) Bio-geochemical processes and its foot prints including environmental stress.
    h) Sediment geochemistry in the surface streams.

Agriculture & Agro-Biodiversity

13. Impact on surrounding agricultural fields around the proposed mining Area.
14. Impact on soil flora & vegetation around the project site.
15. Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.
16. The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.
17. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.
18. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.

MEMBER SECRETARY
SEIAA-TN

Forests

19. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.
20. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.
21. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.
22. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.

Water Environment

23. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.
24. Erosion Control measures.
25. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.
26. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
27. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.
28. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.
29. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.
30. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.

MEMBER SECRETARY
SEIAA-TN

Energy

31. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.

Climate Change

32. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.
33. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.

Mine Closure Plan

34. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.

EMP

35. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.
36. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.

Risk Assessment

37. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.

Disaster Management Plan

38. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.

Others

39. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.

MEMBER SECRETARY
SEIAA-TN

40. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.
41. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.

A. STANDARD TERMS OF REFERENCE

1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.
2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.
3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.
4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
5) Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.
6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.
7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental

MEMBER SECRETARY
SEIAA-TN

issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.

8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.

9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.

10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.

11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.

12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.

13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.

14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.

15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.

16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any

MEMBER SECRETARY
SEIAA-TN

other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.

17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.

18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.

19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.

20) Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).

21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly

MEMBER SECRETARY
SEIAA-TN

brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.

22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.

23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.

24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.

25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.

26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.

27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.

28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be

MEMBER SECRETARY
SEIAA-TN

undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.

29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.

30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.

31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.

32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.

33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.

34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.

35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.

MEMBER SECRETARY
SEIAA-TN

36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.

37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.

38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.

39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.

40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.

41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.

42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.

43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.

44) Besides the above, the below mentioned general points are also to be followed:-

a) Executive Summary of the EIA/EMP Report

b) All documents to be properly referenced with index and continuous page numbering.

c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.

d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.

e) Where the documents provided are in a language other than English, an English translation should be provided.

f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.

MEMBER SECRETARY
SEIAA-TN

g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.

h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.

i) As per the circular no. J-11011/618/2010-IA.II (I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environment Clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.

j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

In addition to the above, the following shall be furnished:-

The Executive summary of the EIA/EMP report in about 8-10 pages should be prepared incorporating the information on following points:

1. Project name and location (Village, District, State, Industrial Estate (if applicable).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
6. A detailed study of the lithology of the mining lease area shall be furnished.
7. Details of village map, "A" register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be shall be submitted along with EIA report.

MEMBER SECRETARY
SEIAA-TN

9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
12. The EIA study report shall include the surrounding mining activity, if any.
13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.
16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of is acquisition, nearby (in 2-3 km.) water body, population, with in 10km other industries, forest , eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
20. Likely impact of the project on air, water, land, flora-fauna and nearby population
21. Emergency preparedness plan in case of natural or in plant emergencies
22. Issues raised during public hearing (if applicable) and response given
23. CER plan with proposed expenditure.
24. Occupational Health Measures
25. Post project monitoring plan
26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.

MEMBER SECRETARY
SEIAA-TN

28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
30. Reserve funds should be earmarked for proper closure plan.
31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

Besides the above, the below mentioned general points should also be followed:-

a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.
b. All documents may be properly referenced with index, page numbers and continuous page numbering.
c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.
d. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF & CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.
e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J -11013/77/2004-IA-II(I) dated 2nd December, 2009, 18th March 2010, 28th May 2010, 28th June 2010, 31st December 2010 & 30th September 2011 posted on the Ministry's website http://www.moef.nic.in/ may be referred.
    - After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned points, the proponent will take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.

MEMBER SECRETARY
SEIAA-TN

- The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance.
- The TORs with public hearing prescribed shall be **valid for a period of three years** from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.

MEMBER SECRETARY
SEIAA-TN

Copy to:

1. The Additional Chief Secretary to Government, Environment, Climate Change and Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9.
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD Cum-Office Complex, East Arjun Nagar, New Delhi - 110 032.
3. The Chairman, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai - 600 032.
4. The APCCF (C), Regional Office, MoEF & CC (SZ), 34, HEPC Building, 1st & 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai - 34.
5. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC, Paryavaran Bhavan, CGO Complex, New Delhi - 110 003.
6. The District Collector, Tiruchirapalli District.
7. Stock File.

TERMS OF REFERENCE – G.O.70

THIRU.DEEPAK S.BILGI, I.F.S.,
MEMBER SECRETARY

STATE LEVEL ENVIRONMENT IMPACT
ASSESSMENT AUTHORITY – TAMIL NADU
3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai-15.
Phone No. 044-24359973
Fax No. 044-24359975

TERMS OF REFERENCE (ToR)

Lr No.SEIAA-TN/F.No.6511/SEAC/1(a)/ToR- 1478/2023 Dated:22.06.2023.

To

Tvl. Riverwaays Mines and Minerals Limited
No. 20/4, Naveed Castle
Balakrishna Street, Mylapore
Chennai-600004.

Sir / Madam,

Sub: SEIAA, Tamil Nadu – Proposal seeking for Terms of Reference with public Hearing (ToR) for the Proposed Garnet Sand Deposit Mines (G.O.No.3 (D) No.70) over an extent of 4.75.0 ha at S.F.No.390 (Part) in Kottathur Village, Musiri Taluk, Tiruchirappalli District, Tamil Nadu by M/s. Riverwaays Mines and Minerals Limited - under project category – "B1" and Schedule S.No.1 (a) – ToR issued along with Public Hearing - preparation of EIA report – Regarding.

Ref:

1. Online proposal No.SIA/TN/MIN/21942/2018, dated: 09.02.2018.
2. Your application submitted for Terms of Reference dated: 07.03.2018.
3. Minutes of the 105th SEAC meeting held on 22.03.2018
4. Proponent reply dated: 02.04.2018.
5. Minutes of the 106th SEAC meeting held on 04.04.2018
6. Minutes of the 123rd SEAC Meeting held on 22.12.2018.
7. Proponent reply dated: 27.02.2019.
8. Minutes of the 127th SEAC Meeting held on 15.03.2019.
9. Minutes of the 342nd SEIAA Meeting held on 03.04.2019.

MEMBER SECRETARY
SEIAA-TN

10. Proponent reply dated: 29.05.2019.
11. Minutes of the 347th SEIAA Meeting held on 21.06.2019.
12. Proponent reply dated: 05.04.2023.
13. Minutes of the 610th SEIAA Meeting held on 11.04.2023
14. Minutes of the 382nd SEAC meeting held on 09.06.2023
15. Minutes of the 632nd Authority meeting held on 21.06.2023 & 22.06.2023.

Kindly refer to your proposal submitted to the State Level Impact Assessment Authority for Terms of Reference.

The proponent, M/s. Riverwaays Mines and Minerals Limited has submitted application for Terms of Reference (ToR), for the proposed Garnet Sand Deposit Mines (G.O.No.3 (D) No.70) over an extent of 4.75.0 ha at S.F.No.390 (Part) in Kottathur Village, Musiri Taluk, Tiruchirappalli District, Tamil Nadu.

SEAC Remarks:-

Proposed Garnet Sand Mining over an extent of 4.75.0 ha at S.F.No.390 (Part) in Kottathur Village, Musiri Taluk, Trichy District by M/s. Riverways Mines and Minerals Ltd for Garnet sand production of 2500 Tonnes for a period of 5 years - Terms of Reference. (SIA/TN/MIN/21942/2018, dt:09.02.2018)

Earlier, the proposal was placed in 103rd, 106th, 123rd, & latest in the 127th SEAC meeting held on 15.03.2019. The details of the project furnished by the proponent & minutes of SEAC are available in the website (parivesh.nic.in).

The SEAC noted the following:

1. The Project Proponent M/s. Riverways Mines and Minerals Ltd has applied seeking Terms of Refernce for the proposed Garnet Sand Mining over an extent of 4.75.0 ha at S.F.No.390 (Part) in Kottathur Village, Musiri Taluk, Trichy District , Tamil Nadu.
2. The proposed quarry/activity of Major Mineral (Garnet Sand Mining) over an extent of 4.75.0 ha with cluster area 23.95.5 ha is covered under Category "B1" of Item 1(a) "Mining Projects" of the Schedule to the EIA Notification, 2006.
3. MoEF&CC Notification vide S.O. 1886 (E) Dt: 20.04.2022, Major Mineral upto 250 ha to be treated as "B"Category project.
4. The precise area communication was issued vide G.O.3D No.70 dated 29.12.2010.

MEMBER SECRETARY
SEIAA-TN

5. The approved mining plan was issued vide TN/TCR/MP/GNT/1857-MDS dt: 28.05.2013 for mining 29700 Tonnes of ROM (Garnet recovery (10%) - 2970 Tonnes, Mining Waste (90%) - 26730 Tonnes) & Clay Alluvium-18096 Tonnes and depth of mining upto 2m and anticipated life of mine is morethan 12 Years as reported.
6. For the 1st Five Years of Mining, 9900 Tonnes of ROM (Garnet recovery (10%) - 990 Tonnes, Mining Waste (90%) - 8910 Tonnes) & Clay Alluvium-10192 Tonnes & depth of mining 2m.
7. The mining Lease was issued on 06.04.2018 valid upto 05.04.2038.
8. GoI, Mininstry of Mines, Order F.No.1/1/2019 -M.VI Dt: 01.03.2019.
9. Show cause notice issued by Industries Dept. vide Lr. No. 13113/MMD.1/2019, Industries Department, dated 08.11.2019.
10. GoI, Mininstry of Mines, Order F.No.1/1/2019 -M.VI Dt: 20.12.2022 (Order Dt: 01.03.2019 not applicable to 11 mines in Trichirapalli District and 2 Mines in Madurai District)
11. G.O.(3D) No.08 dated 02.03.2023, withdrawl of show cause notice issued vide Lr. No. 13113/MMD.1/2019, Industries Department, dated 08.11.2019.
12. PWD NOC vide Lr. dt:18.02.2019.

****

Earlier, the proposal was placed in 103rd , 106th, 123rd, & to the latest this proposal was placed in the 127th SEAC Meeting held on 15.03.2019 and the SEAC decided to recommend that the proposal be granted standard Terms of Reference (Annexure-I) with the combined Public hearing shall be conducted with other three adjacent proposed mining quarries namely M/s. Riverways Mines and Minerals Ltd and in additional specific following terms of reference.

1. The analysis of the minerals of Garnet to be mined out from the mining lease area shall be carried out by the competent authority before conducting EIA study and the proponent shall ensure that the threshold value 0.00% monazite in heavy minerals, irrespective of monazite grade as per the Atomic minerals concession rules 2016 issued by ministry of mines notification dated 20.02.2019.
2. The proponent shall furnish the scientific proof to ensure the non hazardous nature of the waste generated from the mineral pre- concentrated plant since the said waste proposed to dump into the mined out void. In this connection proponent has to detailed plan bring back the non hazardous nature of the waste generated from the mineral pre- concentrated plant to the mined out area.

MEMBER SECRETARY
SEIAA-TN

3. The detailed mine closure plan shall be furnished.
4. The proponent has to conduct cumulative EIA report considering the other four adjacent proposed mining quarries with Separate EMP plan for the proposed individual mining.
5. The transportation methodology for the transportation of Garnet from the mining lease to the process area shall be furnished in detail and cumulative impact on Air pollution especially Fugitive emission needs to be carried out considering all the mining areas.
6. The proponent shall furnish the detailed CER plan with budget allocation incorporating the needs of the nearby public and also points raised in the public hearing as per the Office Memorandum of MoEF & CC dated 01.05.2018.

Subsequently, the proposal was placed in 342nd held on 03.04.2019 and the SEIAA decided to seek following clarification from the proponent:

1. The proponent shall obtain necessary clarification for non applicability of this quarry for the letter on the order issued by Ministry of Mines dated 01.03.2019 to all the Principle Secretary at the Mining departments of all the state governments from the competent authority.
2. The proponent shall clarify the formation of the garnet in the water bodies.

In this conection, the proposal was again placed in 347th held on 21.06.2019 and the authority has observed that the proponent has not submitted the necessary clarification for non applicability of this quarry for the order issued by Ministry of Mines dated 01.03.2019 to all the Principal Secretary at the Mining departments of all the state governments from the competent authority as requested by the Authority in the 342nd SEIAA meeting held on 03.04.2019. Hence the authority decided to stick with the clarification request in the 342nd SEIAA meeting that is:

The proponent shall obtain necessary clarification for non applicability of this quarry for the letter on the order issued by Ministry of Mines vide F.No.1/12019-M.VI dated 01.03.2019 to all the Principal Secretary at the Mining departments of all the state governments from the competent authority.

The proponent has submitted the reply to SEIAA vide their letter dated 05.04.2023. In this regard, the subject was placed in 610th Authority meeting held on 11.04.2023. After detailed discussion, **SEIAA decided to refer back** this proposal on the PP's reply along with recommendation in addition to the following aspects.

1. The impact of mining on geology, land area, topography, biological, marine, resources and other environmental parameters may be examined/studied.

MEMBER SECRETARY
SEIAA-TN

2. Anticipated impact on water bodies, reservoir, river may be examined/studied.
3. Through a detailed soil profiling, the quality & mineral ingredients and analysis in the soil composition may be examined.

In view of the above, the proposal was again placed in 382nd held on 09.06.2023 .The SEAC noted the proposal was recommended in 127th SEAC Meeting held on 15.03.2019. Based on the documents submitted and the presentation by the PP. After detailed discussion, the SEAC decided to recommend that the proposal for grant of Terms of Reference with the combined Public hearing shall be conducted with other four adjacent proposed garnet sand mining quarries subject to the following TORs, in addition to the standard terms of reference for EIA study with separate EMP plan and details issued by the MOEF & CC to be included in EIA/EMP Report.

1. The analysis of the minerals of Garnet to be mined out from the mining lease area shall be carried out by the competent authority before conducting EIA study and the proponent shall ensure that the threshold value 0.00% monazite in heavy minerals, irrespective of monazite grade as per the Atomic minerals concession rules 2016 issued by ministry of mines notification dated 20.02.2019.
2. The proponent shall furnish the scientific proof to ensure the non hazardous nature of the waste generated from the mineral pre- concentrated plant since the said waste proposed to dump into the mined out void. In this connection proponent has to detailed plan bring back the non hazardous nature of the waste generated from the mineral pre- concentrated plant to the mined out area.
3. The detailed mine closure plan shall be furnished.
4. The proponent has to conduct cumulative EIA report considering the other four adjacent proposed mining quarries with Separate EMP plan for the proposed individual quarrying operations.
5. The transportation methodology for the transportation of Garnet from the mining lease to the process area shall be furnished in detail and cumulative impact on Air pollution especially Fugitive emission needs to be carried out considering all the mining areas.
6. The proponent shall furnish the detailed CER plan with budget allocation incorporating the needs of the nearby public and also points raised in the public hearing as per the Office Memorandum of MoEF & CC dated 01.05.2018.

MEMBER SECRETARY
SEIAA-TN

7. The PP shall furnish a copy of the document in support of the fact that the proponent is the rightful lessee of the mine.
8. The PP shall furnish Copy of approved Mining Plan /Scheme of mining plan by the competent authority during the time of EIA appraisal.
9. The PP shall furnish an affidavit that mining plan approved by AMD used for Public Hearing and the Mining Plan approved by the Competent Authority (IBM/DGM) are the same.
10. The PP shall evaluate the environmental aspects and their possible associated impacts that would arise due to the proposed Garnet sand mining and mineral separation and to work out environmental monitoring programme to prevent, control, minimise or eliminate the adverse environmental impacts envisaged from the proposed garnet mining and mineral separation.
11. The PP shall provide all documents including approved mine plan/ approved scheme of mining, EIA and public hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management and mining technology and should be in the name of the lessee.
12. The PP shall provide all corner coordinates of the mine lease area superimposed on a high Resolution Imagery/ toposheet. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and the buffer zone).
13. The PP shall indicate the level of Impact on local transport infrastructure due to project. Projected increase in truck traffic as a result of project in the present road network (including those outside the project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as state government) should be covered.
14. The PP shall furnish a letter from VAO stating details of structures & habitations located within 300m from the boundary of the project site.
15. The structures within the radius of (i) 100 m, (ii) 300 m, and (iii) 500 m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc.
16. The PP shall submit a report on replenishment of Garnet sand (or) its geological formation as indicated in the DSR.
17. The PP shall furnish the details of the tank, depth of desiltation, extent of the tank and Ownership of the tanks, details of cultivation, distance from the site, etc, within 1 km radius around the proposed mining area from the Govt records.

MEMBER SECRETARY
SEIAA-TN

18. The PP shall furnish Copy of the NoC obtained from PWD/WRD-TN for the proposed mining activity.
19. The PP carry out the geological assessment to identify mineralization, to establish continuity, quality and quantity of mineral deposit, particularly, the presence of Atomic minerals in the Garnet sand. Hence the PP shall furnish the report through the systematic sampling in the proposed site with showing geological coordinates as per the procedures laid in accordance with the provisions of Atomic Minerals Concessional Rules, 2016 and the mineralogical analysis obtained from the laboratory of IREL (India) Limited, Research Centre, Beach Road, Kollam, Kerala.
20. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside/inside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.
21. The study area will comprise of 10km zone around the mine lease from lease periphery and the data contained in EIA such as waste generation etc. should be for the life of the mine / lease period.
22. The PP shall indicate the land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features. Land use plan of the mine lease area should be prepared to encompass pre-operational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
23. The PP shall indicate the details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.
24. The PP shall anticipate the Occupational and health impacts of the project and accordingly the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP.
25. The PP shall evaluate the Public health implications of the project and related activities for the population in the impact zone systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
26. The PP shall provide the measures of socio-economic significance and influence to the local community. As far as possible, quantitative dimensions may be given with the time frames for implementation.
27. The PP shall disclose the details of litigation / violation case pending against the project (or)

MEMBER SECRETARY
SEIAA-TN

the PP pertaining to this mining proposal, if any, with the direction/order passed by any court of law against the project proposal in the past or now.

28. Proponent shall furnish the letter received from DFO concerned stating the proximity details of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.
29. Detailed study report on flora and fauna in and nearby the quarry site.
30. The Proponent shall develop greenbelt and garland drain around the boundary of the proposed quarry and the photographs indicating the same shall be shown during the EIA appraisal.
31. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.
32. The PP shall carry out the air-quality monitoring for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of minerals. The details of the model used and the input parameters used for modelling should be provided. The air quality contours may be plotted on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.
33. The PP shall furnish the water requirement for the project, its availability and source. A detailed water balance should also be provided. Fresh water requirement for the project should be indicated.
34. The PP shall assess the impact of project on water quality, both surface and groundwater and necessary safeguard measures, if any required, should be provided.
35. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.
36. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines.
    i. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?
    ii. Quantity of minerals mined out.
    iii. Highest production achieved in any one year
    iv. Detail of approved depth of mining.

MEMBER SECRETARY
SEIAA-TN

v. Actual depth of the mining achieved earlier.

vi. Name of the person already mined in that leases area.

vii. If EC and CTO already obtained, the copy of the same shall be submitted.

viii. Whether the mining was carried out as per the approved mine plan (or EC if issued).

37. All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).

38. The Proponent shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,

39. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.

40. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.

41. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.

42. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.

43. The Proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.

44. The Proponent shall carry out the Cumulative impact study due to mining operations carried

MEMBER SECRETARY
SEIAA-TN

out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.

45. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.
46. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
47. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.
48. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
49. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.
50. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
51. Public Hearing points raised and commitments of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project and to be submitted to SEIAA/SEAC with regard to the Office Memorandum of MoEF& CC accordingly.
52. The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.
53. The Proponent shall produce/display the EIA report, Executive summery and other related information with respect to public hearing in Tamil Language also.
54. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA

MEMBER SECRETARY
SEIAA-TN

coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.

55. The purpose of Greenbelt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the Appendix-I in consultation with the DFO, & Tamil Nadu Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.
56. Taller one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner
57. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.
58. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.
59. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
60. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
61. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
62. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
63. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the

MEMBER SECRETARY
SEIAA-TN

Project shall clearly indicate environmental, social, economic, employment potential, etc.

64. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.
65. The Proponent shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.
66. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.

SEIAA Remarks:-

The proposal was placed in the **632nd** Authority meeting held on 21.06.2023 & 22.06.2023. The Authority noted that this proposal was placed for appraisal in this 382nd SEAC meeting held on 09.06.2023. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant **Terms of Reference (ToR) along with Public Hearing** under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions in addition to the conditions in '**Annexure B**' of this minute.

1. A detailed study shall be included in the EIA Report by incorporating flowchart showing the process of Garnet extraction from sand. This should indicate the flow of processes and products.
2. Impact due to the transportation of garnet sand from the site to the pre-concentration plant and back to site for reclamation shall be discussed in detail in the EA Report. The distance to the pre-concentration plant from the site shall also be furnished.
3. The details of tailings and the concentrates in the tailings shall also be included in the EIA Report.
4. Impact study on climate, water use, land use, energy use, details of waste generation, CO_2 & GHG emission due to proposed project activity shall be included in the EIA Report.
5. Life Cycle Assessment of Garnet including the recycle-reuse pathway for the waste generated shall be included.
6. Details of Environmental monitoring agencies to be employed in the monitoring process during the removal and recovery of garnet shall be furnished.

MEMBER SECRETARY
SEIAA-TN

7. The proponent shall furnish the details on the sustainable technologies to be deployed for the separation of garnet sand.
8. Impact study on soil, groundwater, surface water, agriculture, and horticulture including the impact on the fish shall be furnished.
9. Impact of the proposed project activity on wildlife, livestock & biodiversity shall be studied in detail.
10. Detailed mine closure & reclamation plan for sustainable restoration of the site shall be furnished.
11. The EIA Report shall cover the technologies to be adopted for the reduction of environmental burdens including eco-friendly processes to be employed for the extraction of garnet.

Annexure 'B'

Cluster Management Committee

1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.
2. The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.,
3. The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.
4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.
5. The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.
6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.
7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.
8. The committee shall furnish the Emergency Management plan within the cluster.

MEMBER SECRETARY
SEIAA-TN

9. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.
10. The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.
11. The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.

Impact study of mining

12. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following
    a) Soil health & soil biological, physical land chemical features .
    b) Climate change leading to Droughts, Floods etc.
    c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.
    d) Possibilities of water contamination and impact on aquatic ecosystem health.
    e) Agriculture, Forestry & Traditional practices.
    f) Hydrothermal/Geothermal effect due to destruction in the Environment.
    g) Bio-geochemical processes and its foot prints including environmental stress.
    h) Sediment geochemistry in the surface streams.

Agriculture & Agro-Biodiversity

13. Impact on surrounding agricultural fields around the proposed mining Area.
14. Impact on soil flora & vegetation around the project site.
15. Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.
16. The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.
17. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.

MEMBER SECRETARY
SEIAA-TN

18. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.

Forests

19. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.
20. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.
21. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.
22. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.

Water Environment

23. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.
24. Erosion Control measures.
25. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.
26. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
27. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.
28. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.
29. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.

MEMBER SECRETARY
SEIAA-TN

30. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.

Energy

31. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.

Climate Change

32. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.
33. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.

Mine Closure Plan

34. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.

EMP

35. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.
36. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.

Risk Assessment

37. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.

Disaster Management Plan

38. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.

Others

39. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.

MEMBER SECRETARY
SEIAA-TN

40. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.

41. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.

A. STANDARD TERMS OF REFERENCE

1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.

2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.

3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.

4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).

5) Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.

6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.

7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental

MEMBER SECRETARY
SEIAA-TN

issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.

8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.

9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.

10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.

11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.

12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.

13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.

14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.

15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.

16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other

MEMBER SECRETARY
SEIAA-TN

protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.

17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.

18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.

19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.

20) Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).

21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out

MEMBER SECRETARY
SEIAA-TN

whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.

22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.

23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.

24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.

25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.

26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.

27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.

28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central

MEMBER SECRETARY
SEIAA-TN

Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.

29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.

30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.

31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.

32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.

33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.

34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.

35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.

36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.

MEMBER SECRETARY
SEIAA-TN

37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.

38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.

39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.

40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.

41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.

42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.

43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.

44) Besides the above, the below mentioned general points are also to be followed:-

a) Executive Summary of the EIA/EMP Report

b) All documents to be properly referenced with index and continuous page numbering.

c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.

d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.

e) Where the documents provided are in a language other than English, an English translation should be provided.

f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.

g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA. II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.

h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I

MEMBER SECRETARY
SEIAA-TN

and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.

i) As per the circular no. J-11011/618/2010-IA. II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environment Clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.

j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

In addition to the above, the following shall be furnished:-

The Executive summary of the EIA/EMP report in about 8-10 pages should be prepared incorporating the information on following points:

1. Project name and location (Village, District, State, Industrial Estate (if applicable).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
6. A detailed study of the lithology of the mining lease area shall be furnished.
7. Details of village map, "A" register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.

MEMBER SECRETARY
SEIAA-TN

11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
12. The EIA study report shall include the surrounding mining activity, if any.
13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.
16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of is acquisition, nearby (in 2-3 km.) water body, population, with in 10km other industries, forest , eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
20. Likely impact of the project on air, water, land, flora-fauna and nearby population
21. Emergency preparedness plan in case of natural or in plant emergencies
22. Issues raised during public hearing (if applicable) and response given
23. CER plan with proposed expenditure.
24. Occupational Health Measures
25. Post project monitoring plan
26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
30. Reserve funds should be earmarked for proper closure plan.
31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should

MEMBER SECRETARY
SEIAA-TN

strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

Besides the above, the below mentioned general points should also be followed:-

a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.
b. All documents may be properly referenced with index, page numbers and continuous page numbering.
c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.
d. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF& CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.
e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J -11013/77/2004-IA-II(I) dated 2nd December, 2009, 18th March 2010, 28th May 2010, 28th June 2010, 31st December 2010 & 30th September 2011 posted on the Ministry's website http://www.moef.nic.in/ may be referred.
    - After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned points, the proponent willtake further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.
    - The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance.
    - The TORs with public hearing prescribed shall be **valid for a period of three years** from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.

MEMBER SECRETARY
SEIAA-TN

Copy to:

1. The Additional Chief Secretary to Government, Environment & Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD Cum-Office Complex, East Arjun Nagar, New Delhi 110032.
3. The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-600 032.
4. The APCCF (C), Regional Office, MoEF& CC (SZ), 34, HEPC Building, 1st & 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai -34.
5. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC, Paryavaran Bhavan, CGO Complex, New Delhi 110003
6. The District Collector, Tiruchirappalli District.
7. Stock File.

TERMS OF REFERENCE – G.O.71

THIRU.DEEPAK S. BILGI, I.F.S.
MEMBER SECRETARY

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY-TAMILNADU
3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai - 600 015.
Phone No. 044-24359973
Fax No. 044-24359975

TERMS OF REFERENCE (ToR)

Lr No.SEIAA-TN/F.No.6508/SEAC/1(a)ToR-1497/2023 Dated:22.06.2023.

To

Tvl. Riverways Mines and Minerals Ltd.
No. 20/4, Naveed Castle,
Balakrishna Street, Mylapore,
Chennai-600 004.

Sir / Madam,

Sub: SEIAA, Tamil Nadu – Proposal Seeking **Terms of Reference with public Hearing** (ToR) for the Proposed mining in Kottathur Garnet Sand Deposits (G.O.(3D) No.71) over an extent of 4.80.0 Ha at S.F.Nos. 390(P) of Kottathur Village, Musiri Taluk, Trichy District, Tamil Nadu by Tvl. Riverways Mines and Minerals Ltd- under project category – "B1" and Schedule S.No.1(a) "Mining of Minerals Projects" – ToR issued along with Public Hearing- preparation of EIA report – Regarding.

Ref:
1. Online proposal No. SIA/TN/MIN/21944/2018 dated 09.02.2018.
2. Your application submitted for Terms of Reference dated: 07.03.2018.
3. Minutes of the 105th SEAC meeting held on 22.03.2018.
4. Minutes of the 106th SEAC meeting held on 04.04.2018.
5. Minutes of the 123rd SEAC meeting held on 22.12.2018.
6. Minutes of the 127th SEAC meeting held on 15.03.2019.
7. Minutes of the 342nd SEIAA meeting held on 03.04.2019.
8. Minutes of the 347th SEIAA meeting held on 21.06.2019.

MEMBER SECRETARY
SEIAA-TN

9. Minutes of the 610th SEIAA meeting held on 11.04.2023.
10. Minutes of the 382nd SEAC meeting held on 09.06.2023.
11. Minutes of the 632nd SEIAA meeting held on 21.06.2023 & 22.06.2023.

Kindly refer to your proposal submitted to the State Level Impact Assessment Authority for Terms of Reference.

The proponent, Tvl. Riverways Mines and Minerals Ltd has submitted application for Terms of Reference (ToR) on 07.03.2018. for the Proposed Kottathur Garnet Sand Deposits (G.O.(3D) No.71) over an extent of 4.80.0 Ha at S.F.Nos. 390(P) of Kottathur Village, Musiri Taluk, Trichy District, Tamil Nadu.

Discussion by SEAC and the Remarks:-

The proposal is placed for appraisal in this 382nd SEAC meeting held on 09.06.2023. The details of the project furnished by the proponent are given in the website (parivesh.nic.in).

The SEAC noted the following:

1. The Project Proponent, Tvl. Riverways Mines and Minerals Ltd. has applied for Terms of Reference for the Proposed Kottathur Garnet Sand Deposits (G.O.(3D) No.71) over an extent of 4.80.0 Ha at S.F.Nos. 390(P) of Kottathur Village, Musiri Taluk, Trichy District, Tamilnadu.
2. The project/activity is covered under Category "B1" of Item 1(a) "Mining Projects" of the Schedule to the EIA Notification, 2006.
3. The production for 5 years not to exceed: **RoM – 14,016Ts which includes 1402Ts of Garnet (@10% recovery) & 12,614Ts of mined waste and also 14,185Ts of clay alluvium up to a depth of 2m.**
4. Earlier, the proposal was placed in the **610th authority** meeting held on 11.04.2023. The Authority noted the following:
    - Earlier, the subject was placed in the 347th SEIAA meeting held on 21.06.2019 and the authority has observed that the proponent has not submitted the necessary clarification for non applicability of this quarry for the order issued by Ministry of Mines dated 01.03.2019 to all the Principal Secretary at the Mining departments of all the state governments from the competent authority as requested by the Authority in the 342nd SEIAA meeting held on 03.04.2019. Hence the authority decided to stick with the clarification request in the 342nd SEIAA meeting that is:

MEMBER SECRETARY
SEIAA-TN

The proponent shall obtain necessary clarification for non applicability of this quarry for the letter on the order issued by Ministry of Mines vide F.No.1/1/2019-M.VI dated 01.03.2019 to all the Principal Secretary at the Mining departments of all the state governments from the competent authority.

- Now, the proponent has submitted the reply to SEIAA vide letter dated 05.04.2023.

On the receipt of the reply received from the PP it was again placed in the 610th Authority meeting held on 11.04.2023. After detailed discussion, SEIAA decided to refer back this proposal on the PP's reply along with recommendation in addition to the following aspects.

a) The impact of mining on geology, land area, topography, biological, marine, resources and other environmental parameters may be examined/studied.
b) Anticipated impact on water bodies, reservoir, river may be examined/studied.
c) Through a detailed soil profiling, the quality & mineral ingredients and analysis in the soil composition may be examined.

In view of the above, the proposal is placed in this 382nd SEAC meeting held on 09.06.2023.

Based on the presentation made by the proponent, **SEAC decided to recommend the proposal for Terms of Reference (TOR) with Public Hearing subject to the following additional TORs**, in addition to the standard terms of reference for EIA study for non-coal mining projects and details issued by the MOEF & CC to be included in EIA/EMP Report:

1. The PP shall furnish a copy of the document in support of the fact that the proponent is the rightful lessee of the mine.
2. The PP shall furnish Copy of approved Mining Plan /Scheme of mining plan by the competent authority during the time of EIA appraisal.
3. The PP shall furnish an affidavit that mining plan approved by AMD used for Public Hearing and the Mining Plan approved by the Competent Authority (IBM/DGM) are the same.
4. The PP shall evaluate the environmental aspects and their possible associated impacts that would arise due to the proposed Garnet sand mining and mineral separation and to work out environmental monitoring programme to prevent, control, minimise or eliminate the adverse environmental impacts envisaged from the proposed garnet mining and mineral separation.
5. The PP shall provide all documents including approved mine plan/ approved scheme of mining, EIA and public hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management and mining technology and should be in the name of the lessee.

MEMBER SECRETARY
SEIAA-TN

6. The PP shall provide all corner coordinates of the mine lease area superimposed on a high Resolution Imagery/ toposheet. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and the buffer zone).
7. The PP shall indicate the level of Impact on local transport infrastructure due to project. Projected increase in truck traffic as a result of project in the present road network (including those outside the project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as state government) should be covered.
8. The PP shall furnish a letter from VAO stating details of structures & habitations located within 300m from the boundary of the project site.
9. The structures within the radius of (i) 100 m, (ii) 300 m, and (iii) 500 m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc.
10. The PP shall submit a report on replenishment of Garnet sand (or) its geological formation as indicated in the DSR.
11. The PP shall furnish the details of the tank, depth of desiltation, extent of the tank and Ownership of the tanks, details of cultivation, distance from the site, etc, within 1 km radius around the proposed mining area from the Govt records.
12. The PP shall furnish Copy of the NoC obtained from PWD/WRD-TN for the proposed mining activity.
13. The PP carry out the geological assessment to identify mineralization, to establish continuity, quality and quantity of mineral deposit, particularly, the presence of Atomic minerals in the Garnet sand. Hence the PP shall furnish the report through the systematic sampling in the proposed site with showing geological coordinates as per the procedures laid in accordance with the provisions of Atomic Minerals Concessional Rules, 2016 and the mineralogical analysis obtained from the laboratory of IREL (India) Limited, Research Centre, Beach Road, Kollam, Kerala.
14. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside/inside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.
15. The study area will comprise of 10km zone around the mine lease from lease periphery and

MEMBER SECRETARY
SEIAA-TN

the data contained in EIA such as waste generation etc. should be for the life of the mine / lease period.

16. The PP shall indicate the land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features. Land use plan of the mine lease area should be prepared to encompass pre-operational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
17. The PP shall indicate the details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.
18. The PP shall anticipate the Occupational and health impacts of the project and accordingly the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP.
19. The PP shall evaluate the Public health implications of the project and related activities for the population in the impact zone systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
20. The PP shall provide the measures of socio-economic significance and influence to the local community. As far as possible, quantitative dimensions may be given with the time frames for implementation.
21. The PP shall disclose the details of litigation / violation case pending against the project (or) the PP pertaining to this mining proposal, if any, with the direction/order passed by any court of law against the project proposal in the past or now.
22. Proponent shall furnish the letter received from DFO concerned stating the proximity details of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.
23. Detailed study report on flora and fauna in and nearby the quarry site.
24. The Proponent shall develop greenbelt and garland drain around the boundary of the proposed quarry and the photographs indicating the same shall be shown during the EIA appraisal.
25. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.
26. The PP shall carry out the air-quality monitoring for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of minerals. The details of the model used and the input parameters used for

MEMBER SECRETARY
SEIAA-TN

modelling should be provided. The air quality contours may be plotted on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.

27. The PP shall furnish the water requirement for the project, its availability and source. A detailed water balance should also be provided. Fresh water requirement for the project should be indicated.
28. The PP shall assess the impact of project on water quality, both surface and groundwater and necessary safeguard measures, if any required, should be provided.
29. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.
30. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines.
    i. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?
    ii. Quantity of minerals mined out.
    iii. Highest production achieved in any one year
    iv. Detail of approved depth of mining.
    v. Actual depth of the mining achieved earlier.
    vi. Name of the person already mined in that leases area.
    vii. If EC and CTO already obtained, the copy of the same shall be submitted.
    viii. Whether the mining was carried out as per the approved mine plan (or EC if issued).
31. All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
32. The Proponent shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,
33. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.

MEMBER SECRETARY
SEIAA-TN

34. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.
35. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act' 1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.
36. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.
37. The Proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.
38. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.
39. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.
40. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
41. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required,

MEMBER SECRETARY
SEIAA-TN

clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.

42. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
43. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.
44. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
45. Public Hearing points raised and commitments of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project and to be submitted to SEIAA/SEAC with regard to the Office Memorandum of MoEF& CC accordingly.
46. The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.
47. The Proponent shall produce/display the EIA report, Executive summery and other related information with respect to public hearing in Tamil Language also.
48. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.
49. The purpose of Greenbelt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the Appendix-I in consultation with the DFO, & Tamil Nadu Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.
50. Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner

MEMBER SECRETARY
SEIAA-TN

51. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.
52. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.
53. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
54. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
55. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
56. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
57. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
58. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.
59. The Proponent shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.
60. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.

MEMBER SECRETARY
SEIAA-TN

Appendix -I
List of Native Trees Suggested for Planting

No	Scientific Name	Tamil Name	Tamil Name
1	*Aegle marmelos*	Vilvam	வில்வம்
2	*Adenaanthera pavonina*	Manjadi	மஞ்சாடி ஆனைக்குன்றுமணி
3	*Albizia lebbeck*	Vaagai	வாகை
4	*Albizia amara*	Usil	உசில்
5	*Bauhinia purpurea*	Mandharai	மந்தாரை
6	*Bauhinia racemosa*	Aathi	ஆத்தி
7	*Bauhinia tomentos*	Iruvathi	இருவாத்தி
8	*Buchanania axillaris*	Kattuma	காட்டுமா
9	*Borassus flabellifer*	Panai	பனை
10	*Butea monosperma*	Murukkamaram	முருக்கமரம்
11	*Bobax ceiba*	Ilavu, Sevvilavu	இலவு
12	*Calophyllum inophyllum*	Punnai	புன்னை
13	*Cassia fistula*	Sarakondrai	சரக்கொன்றை
14	*Cassia roxburghii*	Sengondrai	செங்கொன்றை
15	*Chloroxylon swietenia*	Purasamaram	புரசு மரம்
16	*Cochlospermum religiosum*	Kongu, Manjalllavu	கோங்கு மஞ்சள் இலவு
17	*Cordia dichotoma*	Naruvili	நருவிலி
18	*Creteva adansoni*	Mavalingum	மாவிலிங்கம்
19	*Dillenia indica*	Uva, Uzha	உசா
20	*Dillenia pentagyna*	SiruUva, Siruzha	சிறு உசா
21	*Diospyro sebenum*	Karungali	கருங்காலி
22	*Diospyro schloroxylon*	Vagarai	வாகனை
23	*Ficus amplissima*	Kalltchi	கல் இச்சி
24	*Hibiscus tiliaceou*	Aatrupoovarasu	ஆற்றுபூவரசு
25	*Harduickia binata*	Aacha	ஆச்சா
26	*Holoptelia integrifolia*	Aavila	ஆயா மரம், ஆவில்
27	*Lannea coromandelica*	Odhuam	ஓதி மரம்
28	*Lagerstroemia speciosa*	Poo Marudhu	பூ மருது
29	*Lepisanthus tetraphylla*	Neikottaimaram	நெய் கொட்டை மரம்
30	*Limonia acidissima*	Vila maram	விளா மரம்
31	*Litsea glutinos*	Pisinpattai	அரப்பா பிசின்பட்டை
32	*Madhuca longifolia*	Illuppai	இலுப்பை
33	*Manilkara hexandra*	UlakkaiPaalai	உலக்கை பாலை
34	*Mimusops elengi*	Magizhamaram	மகிழமரம்
35	*Mitragyna parvifolia*	Kadambu	கடம்பு
36	*Morinda pubescens*	Nuna	நுனா
37	*Morinda citrifolia*	Vellai Nuna	வெள்ளை நுனா
38	*Phoenix sylvestris*	Eachai	ஈச்சமரம்
39	*Pongamia pinnat*	Pungam	புங்கம்

MEMBER SECRETARY
SEIAA-TN

40	*Premna mollissima*	Munnai	முன்னை
41	*Premna serratifolia*	Narumunnai	நறு முன்னை
42	*Premna tomentosa*	Malaipoovarasu	மலை பூவரசு
43	*Prosopis cineria*	Vanni maram	வன்னி மரம்
44	*Pterocarpus marsupium*	Vengai	வேங்கை
45	*Pterospermum canescens*	Vennangu. Tada	வெண்ணாங்கு
46	*Pterospermum xylocarpum*	Polavu	பலவு
47	*Puthranjiva roxburghii*	Karipala	கரிப்பாலா
48	*Salvadora persica*	Uppu Maram	உப்பு மரம்
49	*Sapindus emarginatus*	Manupungan Soapukai	மனப்புங்கன் சோபுக்காய்
50	*Saraca asoca*	Asoca	அசோகா
51	*Strebilus asper*	Piray maram	பிரய மரம்
52	*Strychnos nuxvomica*	Yetti	எட்டி
53	*Strychnos potatorum*	Therthang Kottai	தேற்றான் கொட்டை
54	*Syzygium cumini*	Naval	நாவல்
55	*Terminalia bellerica*	Thandri	தான்றி
56	*Terminalia arjuna*	Ven marudhu	வெண் மருது
57	*Toona ciliata*	Sandhana vembu	சந்தன வேம்பு
58	*Thespesia populnea*	Puvarasu	பூவரசு
59	*Walsuratrifoliata*	valsura	வாகை
60	*Wrightia tinctoria*	Veppalai	வெப்பாலை
61	*Pithecellobium dulce*	Kodukkapuli	கொடுக்காப்புளி

Discussion by SEIAA and the Remarks:-

The subject was placed in the 632nd authority meeting held on 21.06.2023 & 22.06.2023. The authority noted that the subject was appraised in the 382nd SEAC meeting held on 09.06.2023. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant **Terms of Reference (ToR) along with Public Hearing** under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions in addition to the following conditions and the conditions mentioned in 'Annexure B' of this minutes.

1. The analysis of the minerals of Garnet to be mined out from the mining lease area shall be carried out by the competent authority before conducting EIA study and the proponent shall ensure that the threshold value 0.00% monazite in heavy minerals, irrespective of monazite grade as per the Atomic minerals concession rules 2016 issued by ministry of mines notification dated 20.02.2019.
2. The proponent shall furnish the scientific proof to ensure the non-hazardous nature of the waste generated from the mineral pre-concentrated plant since the said waste is proposed to dump into the mined-out void. In this connection, proponent has to furnish a detailed plan to bring

MEMBER SECRETARY
SEIAA-TN

back the non-hazardous waste generated from the mineral pre-concentrated plant to the mined-out area.

3. The detailed mine closure plan shall be furnished.
4. The proponent has to conduct cumulative EIA report considering the other four adjacent proposed mining quarries with Separate EMP plan for the proposed individual quarrying operations.
5. The transportation methodology for the transportation of Garnet from the mining lease to the process area shall be furnished in detail and cumulative impact on Air pollution especially Fugitive emission needs to be carried out considering all the mining areas.
6. The proponent shall furnish the detailed CER plan with budget allocation incorporating the needs of the nearby public and also points raised in the public hearing as per the Office Memorandum of MoEF & CC dated 01.05.2018.
7. A detailed study shall be included in the EIA Report by incorporating flowchart showing the process of Garnet extraction from sand. This should indicate the flow of processes and products.
8. Impact due to the transportation of garnet sand from the site to the pre-concentration plant and back to site for reclamation shall be discussed in detail in the EA Report. The distance to the pre-concentration plant from the site shall also be furnished.
9. The details of tailings and the concentrates in the tailings shall also be included in the EIA Report.
10. Impact study on climate, water use, land use, energy use, details of waste generation, CO_2 & GHG emission due to proposed project activity shall be included in the EIA Report.
11. Life Cycle Assessment of Garnet including the recycle-reuse pathway for the waste generated shall be included.
12. Details of Environmental monitoring agencies to be employed in the monitoring process during the removal and recovery of garnet shall be furnished.
13. The proponent shall furnish the details on the sustainable technologies to be deployed for the separation of garnet sand.
14. Impact study on soil, groundwater, surface water, agriculture, and horticulture including the impact on the fish shall be furnished.
15. Impact of the proposed project activity on wildlife, livestock & biodiversity shall be studied in detail.

MEMBER SECRETARY
SEIAA-TN

16. Detailed mine closure & reclamation plan for sustainable restoration of the site shall be furnished.
17. The EIA Report shall cover the technologies to be adopted for the reduction of environmental burdens including eco-friendly processes to be employed for the extraction of garnet.

Annexure 'B'

Cluster Management Committee

1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.
2. The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.,
3. The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.
4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.
5. The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.
6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.
7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.
8. The committee shall furnish the Emergency Management plan within the cluster.
9. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.
10. The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.
11. The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.

MEMBER SECRETARY
SEIAA-TN

Impact study of mining

12. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following
    a) Soil health & soil biological, physical land chemical features .
    b) Climate change leading to Droughts, Floods etc.
    c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature. & Livelihood of the local people.
    d) Possibilities of water contamination and impact on aquatic ecosystem health.
    e) Agriculture, Forestry & Traditional practices.
    f) Hydrothermal/Geothermal effect due to destruction in the Environment.
    g) Bio-geochemical processes and its foot prints including environmental stress.
    h) Sediment geochemistry in the surface streams.

Agriculture & Agro-Biodiversity

13. Impact on surrounding agricultural fields around the proposed mining Area.
14. Impact on soil flora & vegetation around the project site.
15. Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.
16. The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.
17. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.
18. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.

Forests

19. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.
20. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.

MEMBER SECRETARY
SEIAA-TN

21. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.
22. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.

Water Environment

23. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.
24. Erosion Control measures.
25. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.
26. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
27. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.
28. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.
29. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.
30. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.

Energy

31. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.

Climate Change

32. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.

MEMBER SECRETARY
SEIAA-TN

33. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.

Mine Closure Plan

34. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.

EMP

35. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.
36. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.

Risk Assessment

37. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.

Disaster Management Plan

38. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.

Others

39. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.
40. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.
41. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.

MEMBER SECRETARY
SEIAA-TN

A. STANDARD TERMS OF REFERENCE

1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.
2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.
3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.
4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
5) Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.
6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.
7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.
8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.

MEMBER SECRETARY
SEIAA-TN

9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.

10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.

11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.

12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.

13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.

14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.

15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.

16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.

17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing

MEMBER SECRETARY
SEIAA-TN

Committee of National Board of Wildlife and copy furnished.

18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.

19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.

20) Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).

21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.

22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) : December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and

MEMBER SECRETARY
SEIAA-TN

EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.

23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.

24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.

25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.

26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.

27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.

28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.

29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.

30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.

31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form

MEMBER SECRETARY
SEIAA-TN

(indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.

32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.

33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.

34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.

35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.

36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.

37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.

38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.

39) Public Hearing points raised and commitment of the Project Proponent on the same along with

MEMBER SECRETARY
SEIAA-TN

time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.

40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.

41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.

42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.

43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.

44) Besides the above, the below mentioned general points are also to be followed:-

a) Executive Summary of the EIA/EMP Report

b) All documents to be properly referenced with index and continuous page numbering.

c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.

d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.

e) Where the documents provided are in a language other than English, an English translation should be provided.

f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.

g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.

h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.

i) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environment Clearance for the

MEMBER SECRETARY
SEIAA-TN

existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.

j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area. (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

In addition to the above, the following shall be furnished:-

The Executive summary of the EIA/EMP report in about 8-10 pages should be prepared incorporating the information on following points:

1. Project name and location (Village, District, State, Industrial Estate (if applicable).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
6. A detailed study of the lithology of the mining lease area shall be furnished.
7. Details of village map, "A" register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
12. The EIA study report shall include the surrounding mining activity, if any.
13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.

MEMBER SECRETARY
SEIAA-TN

16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of is acquisition, nearby (in 2-3 km.) water body, population, with in 10km other industries, forest , eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
20. Likely impact of the project on air, water, land, flora-fauna and nearby population
21. Emergency preparedness plan in case of natural or in plant emergencies
22. Issues raised during public hearing (if applicable) and response given
23. CER plan with proposed expenditure.
24. Occupational Health Measures
25. Post project monitoring plan
26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
30. Reserve funds should be earmarked for proper closure plan.
31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

Besides the above, the below mentioned general points should also be followed:-

a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.

MEMBER SECRETARY
SEIAA-TN

b. All documents may be properly referenced with index, page numbers and continuous page numbering.

c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.

d. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF& CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.

e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J -11013/77/2004-IA-II(I) dated 2nd December, 2009, 18th March 2010, 28th May 2010, 28th June 2010, 31st December 2010 & 30th September 2011 posted on the Ministry's website http://www.moef.nic.in/ may be referred.

- After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned points, the proponent willtake further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.
- The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance.
- The TORs with public hearing prescribed shall be **valid for a period of three years** from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.

MEMBER SECRETARY
SEIAA-TN

Copy to:

1. The Additional Chief Secretary to Government, Environment & Forests Department,Govt. of Tamil Nadu, Fort St. George, Chennai - 9
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan,CBD Cum-Office Complex, East Arjun Nagar, New Delhi 110032.

3. The Member Secretary, Tamil Nadu Pollution Control Board,76, Mount Salai, Guindy, Chennai-600 032.
4. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC,Paryavaran Bhavan, CGO Complex, New Delhi 110003
5. The District Collector, Trichy District.
6. Stock File.

TERMS OF REFERENCE – G.O.57

THIRU.DEEPAK S.BILGI, I.F.S.
MEMBER SECRETARY

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY-TAMILNADU
3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai - 600 015.
Phone No. 044-24359973
Fax No. 044-24359975

TERMS OF REFERENCE (ToR)

Lr No.SEIAA-TN/F.No.6509/SEAC/1(a)/ToR- 1493/2023 Dated:22.06.2023.

To

Tvl. S.S. Minerals
No. 20/4, Naveed Castle
Balakrishna Street, Mylapore
Chennai-600004

Sir / Madam,

Sub: SEIAA, Tamil Nadu – Proposal seeking for Terms of Reference with public Hearing (ToR) for the Proposed Garnet Sand Mine (G.O.No. (3D) No.57) over an extent of 4.75.0 ha at S.F.No. 390 (Part) in Kottathur Village, Musiri Taluk, Tiruchirappalli District, Tamil Nadu by Tvl. S.S. Minerals- under project category – "B1" and Schedule S.No.1 (a) – ToR issued along with Public Hearing - preparation of EIA report – Regarding.

Ref:

1. Online proposal No.SIA/TN/MIN/21943/2018, dated: 09.02.2018.
2. Your application submitted for Terms of Reference dated: 07.03.2018.
3. Minutes of the 105th SEAC meeting held on 22.03.2018
4. Proponent reply dated: 02.04.2018.
5. Minutes of the 106th SEAC meeting held on 04.04.2018
6. Minutes of the 123rd SEAC Meeting held on 22.12.2018.
7. Proponent reply dated: 27.02.2019.
8. Minutes of the 127th SEAC Meeting held on 15.03.2019.

MEMBER SECRETARY
SEIAA-TN

9. Minutes of the 342nd SEIAA Meeting held on 03.04.2019.
10. Proponent reply dated: 29.05.2019.
11. Minutes of the 347th SEIAA Meeting held on 21.06.2019.
12. Proponent reply dated: 05.04.2023.
13. Minutes of the 610th SEIAA Meeting held on 11.04.2023
14. Minutes of the 382nd SEAC meeting held on 09.06.2023
15. Minutes of the 632nd Authority meeting held on 21.06.2023 & 22.06.2023.

Kindly refer to your proposal submitted to the State Level Impact Assessment Authority for Terms of Reference.

The proponent, Tvl. S.S. Minerals has submitted application for Terms of Reference (ToR), for the Proposed Garnet Sand Mine (G.O.No. (3D) No:57) over an extent of 4.75.0 ha at S.F.No.390 (Part) in Kottathur Village, Musiri Taluk, Tiruchirappalli District, Tamil Nadu.

SEAC Remarks:-

Proposed Garnet Sand Mine over an extent of 4.75.0 ha by M/s. S.S. Minerals Ltd, for Garnet sand production of 2450 Tonnes for a period of 5 years at S.F.No.390 (Part) in Kottathur Village, Musiri Taluk, Trichy District - Activity 1(a) – Mining of major mineral – For Terms of Reference.

(SIA/TN/MIN/ 21943/2018 dated 09.02.2018)

Earlier, the project proposal was placed in the 105th meeting of the SEAC held on 22.03.2018. In this regard, the SEAC learnt that the Government of Tamil Nadu has issued ban orders relating to the mining operations of Garnet, Illuminite, Rutile, etc in various parts of the state of Tamil Nadu including Tiruchirapalli vide G.O. (Ms) No.173, Industries (MMD.1) Department dated: 17.09.2013. Hence, SEAC decided that the proposal cannot be considered for appraisal.

The above minutes was communicated to the proponent vide SEIAA letter dated: 23.03.2018. The proponent requested to re-appraise the proposal vide letter dated 02.04.2018. In content of the letter the proponent has not indicated any new grounds based on which the SEAC might re-appraise the project proposal. Hence, the SEAC decided to stick to its original decision - not to consider the proposal for appraisal.

MEMBER SECRETARY
SEIAA-TN

In this Connection, the SEIAA was requested to the Additional Chief Secretary to Government, Industrial Department to furnish present stage of Ban Orders on the mining of major mineral vide this office letter.No.SEIAA-TN/F.No.6509/2018 dated: 21.05.2018. A reply was received from the Additional Chief Secretary to Government, Industrial Department vide letter No.6751/MMD.1/2018-2 dated: 20.07.2018, it is mformed that the cases which are related to illegal mining of Beach sand Minerals in the state of Tamil Nadu from the existing mining lease and stoppage of mining operations, are still pending before the Hon'ble High Court of Madras. They are not connected to fresh grant of mining lease by the Government. In G.O.(Ms).No.112, Industries (MMD.1) Department dated: 22.09.2017 orders were issued for granting of mining leases to M/S. S.S. Minerals and Riverways Mines and Minerals based on the Court order dated: 15.03.2017.

The proposal was again placed in the 123rd SEAC Meeting held on 22.12.2018. The project proponent gave a detailed presentation on the salient features of the project details as follow.

The Government of Tamil Nadu sanctioned the grant of fresh mining lease for Garnet sand over an extent of 4.75.0 Ha in S.F.Nos.390 (part) of Kottathur village, MusiriTaluk, Thiruchirapalli district, Tamil Nadu vide G.O.(3D) No.57 dated 03.11.2010 to Tvl.S.S.Minerals Ltd.

Since Garnet is a major mineral and the lease area is less than 50 Ha, this project falls under category B1 as per MOEF & CC notification.

Form 1, Feasibility Report and ToR is prepared in line with the guidelines issued by MoEF&CC, vide their letter dated 30 December 2010 towards obtaining for environmental clearance for GO (3D) No.57 with lease area of 4.75.0 Ha for a peak production capacity of 2450 Tonnes of Garnet ROM for obtaining TOR from SEIAA, Tamil Nadu.

The mining plan was submitted and approved by IBM vide letter No.TN/TCR/MP/GNT1858 - MDS dated: 28.05.2013.

The applied mining lease area (G.O.(3D).57 of extent - 4.75.0 Ha) is located in Kottathur Village, Musiri Tuluk, Trichy District, Tamil Nadu. The entire mine lease is Government Eri Poramboke land with an average elevation of 121m-124m from MSL. This area falls in Survey of India Toposheet No. 58 I/12 between latitude N 11°06.284' to 11°06.364' N and longitude E 78°39.862' to 78°40.059' E. The area is accessible from Kottattur to Puttanampatti road which is connected to SH-142. The nearest railway station is Trichy RS located at 33 km in S.

The mining lease area and the 10 km buffer zone is devoid of declared ecologically sensitive features like national parks, biospheres, sanctuaries, etc. No forest land is involved in the lease area.

MEMBER SECRETARY
SEIAA-TN

The area also does not come under CRZ category.

Further, there is no perennial river or streams passing through the lease area. In the buffer area, Uppar river – 1.1 km – SE, Gundar – 9.3 km – W of the lease area. The lease area is almost a flat terrain ranging with an average elevation of 121m-124m from MSL. Sattanur RF – 1.1 km – SW, Ragalavadi RF – 4.0 km – SW, Kottatur RF – 1.7 km – NE, Pulivalam RF – 7.6 km – SW, Omandur RF – 5.7 km – S, Vellakkalpat RF – 5.8 km – SE, Edumalai RF – 7.3 km – SE, Kurichimalai RF – 4.5 km – NW, Palamalai RF – 8.7 km – N and Nakkasalem RF – 7.3 km – NE are located from the lease area.

The geological reserve is estimated has 56428 Tonnes and the mineable reserve is estimated to be 36000 Tonnes. The quantity of top soil expected is around 22568 Tonnes for the entire life of the mine. Top soil will be dumped all along the boundary barriers for afforestation purpose.

On commencement of mining activity detailed exploration will be carried out which may further enhance the mineable reserves quantity. The proposed peak production from this lease is 2450 Tonnes of garnet ROM per annum. The life of the mine is anticipated to be 15 years. However, the life of the mine may increase in case of increased reserves availability, subsequent to future exploration.

The mining is proposed to carry out by open cast method. No deep hole drilling, excavation, blasting or bore holing will be carried out. The depth of mining proposed is up to 2m. The mined Garnet ROM will be directly loaded on to trucks /tippers manually or occasionally by front end loaders for transportation to the mineral pre-concentration plant.

The mined garnet rich stream sediments will be transported to the pre-concentration plant for separation of garnet sand. The waste generated from the pre-concentration plant will be backfilled in the mined out void.

The proposed lease area is 4.75 Ha. At the end of the plan period, 0.97.50 Ha will be under quarry area, 0.02 Ha will be under mine roads and 3.75.50 Ha will be left undisturbed. Ultimately, after leaving the necessary 7.5m safety distance all around the mine periphery the remaining 4.07.10 Ha will be covered with quarry area. The waste from the processing plant will be back filled in the mined out pits, 0.67.90 Ha will be left unutilized.

This is a proposed project. Common site services (for all 5 leases) like mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.

MEMBER SECRETARY
SEIAA-TN

The total water requirement for all the ML operation in the 5 leases is 6.0cu.m including 1.0cu.m for domestic purposes, 5.0cu.m for dust suppression and afforestation. All the equipment will be diesel operated. No electricity is needed for mining operation. The minimum power requirement for office, etc will be met from state grid.

The capital cost for this project is estimated to be Rs. 13.5 lakhs which includes combined departmental mining machineries, utility, infrastructure etc.

The proponent will implement good CSR activities based on the needs of the people in the locality. As per company's act, 2% of the net profit will be spent for CSR activities every year.

Based on the presentation made by the project proponent and the documents furnished for the project of Garnet Sand deposits (GO (3D) No 57) by M/s. S.S. Minerals ltd over an Extent of 4.75.0 Ha at S.F.No 390(P) of Kottathur village, Musiri Taluk, Trichy District, Tamil Nadu under Schedule S.No. 1(a) of Category "B" – the committee decided to defer the proposal for want of following details:

1. The proponent shall come with the presentation for conducting Cumulative EIA Study. Considering the other 4 quarries are adjacent to this quarry and other 4 Riverways Mines and Minerals which are adjacent to each other in the same survey Number of S.F.No 390(P) of Kottathur village, Musiri Taluk, Trichy District, Tamil Nadu.
2. The Executive Engineer, PWD, Tiruchirapalli in his letter.No.RC V3/Ko 35/ 2002 dated 15.04.2002 has recommended to grant mining lease for a period of three years and further he stated that the same may be renewed periodically once in three years . Hence, the committee has directed the proponent to obtain a fresh No Objection Certificate and Technical feasibility for mining of Garnets in this tank area (i.e. water body) from the competent authority.
3. The proponent shall furnish the scientific proof to ensure the non hazardous nature of the waste generated from the mineral pre- concentrated plant since the said waste proposed to dump into the mined out void.

The proponent has furnished the details on 27.02.2019 to SEIAA.

Then, the proposal was placed in the 127th SEAC Meeting held on 15.03.2019. The project proponent gave detailed presentation on the above points. The SEAC decided to recommend that the proposal be granted standard Terms of Reference (Annexure-I) with public Hearing in additional specific following terms of reference.

MEMBER SECRETARY
SEIAA-TN

1. The analysis of the minerals of Garnet to be mined out from the mining lease area shall be carried out by the competent authority before conducting EIA study and the proponent shall ensure that the threshold value 0.00% monazite in heavy minerals, irrespective of monazite grade as per the Atomic minerals concession rules 2016 issued by ministry of mines notification dated 20.02.2019.
2. The proponent shall furnish the scientific proof to ensure the non hazardous nature of the waste generated from the mineral pre- concentrated plant since the said waste proposed to dump into the mined out void. In this connection proponent has to detailed plan bring back the non hazardous nature of the waste generated from the mineral pre- concentrated plant to the mined out area.
3. The detailed mine closure plan shall be furnished.
4. The proponent must conduct cumulative EIA report considering the other four adjacent proposed mining quarries with Separate EMP plan for the proposed individual mining.
5. The transportation methodology for the transportation of Garnet from the mining lease to the process area shall be furnished in detail and cumulative impact on Air pollution especially Fugitive emission needs to be carried out considering all the mining areas.
6. The proponent shall furnish the detailed CER plan with budget allocation incorporating the needs of the nearby public and also points raised in the public hearing as per the Office Memorandum of MoEF & CC dated 01.05.2018.

The subject was placed in 610th Authority Meeting held on 11.04.2023. After detailed discussion, the Authority noted as follows.

1. Earlier, the subject was placed in the 347th SEIAA meeting held on 21.06.2019 and the authority has observed that the proponent has not submitted the necessary clarification for non applicability of this quarry for the order issued by Ministry of Mines dated 01.03.2019 to all the Principal Secretary at the Mining departments of all the state governments from the competent authority as requested by the Authority in the 342nd SEIAA meeting held on 03.04.2019. Hence the authority decided to stick with the clarification request in the 342nd SEIAA meeting that is:
   The proponent shall obtain necessary clarification for non applicability of this quarry for the letter on the order issued by Ministry of Mines vide F.No.1/1/2019-M.VI dated 01.03.2019 to all the Principal Secretary at the Mining departments of all the state governments from the competent authority.

MEMBER SECRETARY
SEIAA-TN

2. Now, the proponent has submitted the reply to SEIAA vide letter dated 05.04.2023.

On the receipt of the reply received from the PP it was again been placed in the Authority meeting. After detailed discussion, SEIAA decided to refer back this proposal on the PP's reply along with recommendation in addition to the following aspects.

1. The impact of mining on geology, land area, topography, biological, marine, resources and other environmental parameters may be examined/studied.
2. Anticipated impact on water bodies, reservoir, river may be examined/studied.
3. Through a detailed soil profiling, the quality & mineral ingredients and analysis in the soil composition may be examined.

Now the proposal was placed in the 382nd SEAC Meeting held on 09.06.2023.

Based on the presentation made by the proponent, **SEAC decided to recommend for grant of Terms of Reference (TOR) with Public Hearing,** subject to the following TORs, in addition to the standard terms of reference for EIA study for non-coal mining projects and details issued by the MOEF & CC to be included in EIA/EMP Report:

1. The analysis of the minerals of Garnet to be mined out from the mining lease area shall be carried out by the competent authority before conducting EIA study and the proponent shall ensure that the threshold value 0.00% monazite in heavy minerals, irrespective of monazite grade as per the Atomic minerals concession rules 2016 issued by ministry of mines notification dated 20.02.2019.
2. The proponent shall furnish the scientific proof to ensure the non hazardous nature of the waste generated from the mineral pre- concentrated plant since the said waste proposed to dump into the mined out void. In this connection proponent has to detailed plan bring back the non hazardous nature of the waste generated from the mineral pre- concentrated plant to the mined out area.
3. The detailed mine closure plan shall be furnished.
4. The proponent has to conduct cumulative EIA report considering the other four adjacent proposed mining quarries with Separate EMP plan for the proposed individual quarrying operations.
5. The transportation methodology for the transportation of Garnet from the mining lease to the process area shall be furnished in detail and cumulative impact on Air pollution especially Fugitive emission needs to be carried out considering all the mining areas.
6. The proponent shall furnish the detailed CER plan with budget allocation incorporating the needs of the nearby public and also points raised in the public hearing as per the Office Memorandum of MoEF & CC dated 01.05.2018.

MEMBER SECRETARY
SEIAA-TN

7. The PP shall furnish a copy of the document in support of the fact that the proponent is the rightful lessee of the mine.
8. The PP shall furnish Copy of approved Mining Plan /Scheme of mining plan by the competent authority during the time of EIA appraisal.
9. The PP shall furnish an affidavit that mining plan approved by AMD used for Public Hearing and the Mining Plan approved by the Competent Authority (IBM/DGM) are the same.
10. The PP shall evaluate the environmental aspects and their possible associated impacts that would arise due to the proposed Garnet sand mining and mineral separation and to work out environmental monitoring programme to prevent, control, minimise or eliminate the adverse environmental impacts envisaged from the proposed garnet mining and mineral separation.
11. The PP shall provide all documents including approved mine plan/ approved scheme of mining, EIA and public hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management and mining technology and should be in the name of the lessee.
12. The PP shall provide all corner coordinates of the mine lease area superimposed on a high Resolution Imagery/ toposheet. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and the buffer zone).
13. The PP shall indicate the level of Impact on local transport infrastructure due to project. Projected increase in truck traffic as a result of project in the present road network (including those outside the project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as state government) should be covered.
14. The PP shall furnish a letter from VAO stating details of structures & habitations located within 300m from the boundary of the project site.
15. The structures within the radius of (i) 100 m, (ii) 300 m, and (iii) 500 m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc.
16. The PP shall submit a report on replenishment of Garnet sand (or) its geological formation as indicated in the DSR.
17. The PP shall furnish the details of the tank, depth of desiltation, extent of the tank and Ownership of the tanks, details of cultivation, distance from the site, etc, within 1 km radius around the

MEMBER SECRETARY
SEIAA-TN

proposed mining area from the Govt records.

18. The PP shall furnish Copy of the NoC obtained from PWD/WRD-TN for the proposed mining activity.
19. The PP carry out the geological assessment to identify mineralization, to establish continuity, quality and quantity of mineral deposit, particularly, the presence of Atomic minerals in the Garnet sand. Hence the PP shall furnish the report through the systematic sampling in the proposed site with showing geological coordinates as per the procedures laid in accordance with the provisions of Atomic Minerals Concessional Rules, 2016 and the mineralogical analysis obtained from the laboratory of IREL (India) Limited, Research Centre, Beach Road, Kollam, Kerala.
20. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside/inside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.
21. The study area will comprise of 10km zone around the mine lease from lease periphery and the data contained in EIA such as waste generation etc. should be for the life of the mine / lease period.
22. The PP shall indicate the land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features. Land use plan of the mine lease area should be prepared to encompass pre-operational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
23. The PP shall indicate the details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.
24. The PP shall anticipate the Occupational and health impacts of the project and accordingly the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP.
25. The PP shall evaluate the Public health implications of the project and related activities for the population in the impact zone systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
26. The PP shall provide the measures of socio-economic significance and influence to the local community. As far as possible, quantitative dimensions may be given with the time frames for

MEMBER SECRETARY
SEIAA-TN

implementation.

27. The PP shall disclose the details of litigation / violation case pending against the project (or) the PP pertaining to this mining proposal, if any, with the direction/order passed by any court of law against the project proposal in the past or now.
28. Proponent shall furnish the letter received from DFO concerned stating the proximity details of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.
29. Detailed study report on flora and fauna in and nearby the quarry site.
30. The Proponent shall develop greenbelt and garland drain around the boundary of the proposed quarry and the photographs indicating the same shall be shown during the EIA appraisal.
31. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.
32. The PP shall carry out the air-quality monitoring for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of minerals. The details of the model used and the input parameters used for modelling should be provided. The air quality contours may be plotted on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.
33. The PP shall furnish the water requirement for the project, its availability and source. A detailed water balance should also be provided. Fresh water requirement for the project should be indicated.
34. The PP shall assess the impact of project on water quality, both surface and groundwater and necessary safeguard measures, if any required, should be provided.
35. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.
36. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines.
    i. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?
    ii. Quantity of minerals mined out.

MEMBER SECRETARY
SEIAA-TN

iii. Highest production achieved in any one year

iv. Detail of approved depth of mining.

v. Actual depth of the mining achieved earlier.

vi. Name of the person already mined in that leases area.

vii. If EC and CTO already obtained, the copy of the same shall be submitted.

viii. Whether the mining was carried out as per the approved mine plan (or EC if issued).

37. All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).

38. The Proponent shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,

39. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.

40. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.

41. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.

42. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.

43. The Proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.

MEMBER SECRETARY
SEIAA-TN

44. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.
45. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.
46. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
47. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.
48. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
49. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.
50. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
51. Public Hearing points raised and commitments of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project and to be submitted to SEIAA/SEAC with regard to the Office Memorandum of MoEF& CC accordingly.
52. The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.
53. The Proponent shall produce/display the EIA report, Executive summery and other related information with respect to public hearing in Tamil Language also.

MEMBER SECRETARY
SEIAA-TN

54. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.
55. The purpose of Greenbelt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the Appendix-I in consultation with the DFO, & Tamil Nadu Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.
56. Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner.
57. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.
58. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.
59. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
60. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
61. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
62. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.

MEMBER SECRETARY
SEIAA-TN

63. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
64. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.
65. The Proponent shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.
66. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.

SEIAA Remarks:-

The proposal was placed in the 632nd Authority meeting held on 21.06.2023 & 22.06.2023. The authority noted that this proposal was placed for appraisal in 382nd meeting of SEAC held on 09.06.2023, the committee has furnished its recommendations for granting ToR with Public hearing subject to the conditions stated therein. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant **Terms of Reference (ToR) along with Public Hearing** subject to the conditions as recommended by SEAC & normal conditions in addition to the following conditions:

1. A detailed study shall be included in the EIA Report by incorporating flowchart showing the process of Garnet extraction from sand. This should indicate the flow of processes and products.
2. Impact due to the transportation of garnet sand from the site to the pre-concentration plant and back to site for reclamation shall be discussed in detail in the EIA Report. The distance to the pre-concentration plant from the site shall also be furnished.
3. The details of tailings and the concentrates in the tailings shall also be included in the EIA Report.
4. Impact study on climate, water use, land use, energy use, details of waste generation, CO_2 & GHG emission due to proposed project activity shall be included in the EIA Report.

MEMBER SECRETARY
SEIAA-TN

5. Life Cycle Assessment of Garnet including the recycle-reuse pathway for the waste generated shall be included.
6. Details of Environmental monitoring agencies to be employed in the monitoring process during the removal and recovery of garnet shall be furnished.
7. The proponent shall furnish the details on the sustainable technologies to be deployed for the separation of garnet sand.
8. Impact study on soil, groundwater, surface water, agriculture, and horticulture including the impact on the fish shall be furnished.
9. Impact of the proposed project activity on wildlife, livestock & biodiversity shall be studied in detail.
10. Detailed mine closure & reclamation plan for sustainable restoration of the site shall be furnished.
11. The EIA Report shall cover the technologies to be adopted for the reduction of environmental burdens including eco-friendly processes to be employed for the extraction of garnet.

Annexure 'B'

Cluster Management Committee

1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.
2. The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.,
3. The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.
4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.
5. The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.
6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.

MEMBER SECRETARY
SEIAA-TN

7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.
8. The committee shall furnish the Emergency Management plan within the cluster.
9. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.
10. The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.
11. The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.

Impact study of mining

12. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following
    a) Soil health & soil biological, physical land chemical features .
    b) Climate change leading to Droughts, Floods etc.
    c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.
    d) Possibilities of water contamination and impact on aquatic ecosystem health.
    e) Agriculture, Forestry & Traditional practices.
    f) Hydrothermal/Geothermal effect due to destruction in the Environment.
    g) Bio-geochemical processes and its foot prints including environmental stress
    h) Sediment geochemistry in the surface streams.

Agriculture & Agro-Biodiversity

13. Impact on surrounding agricultural fields around the proposed mining Area.
14. Impact on soil flora & vegetation around the project site.
15. Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.

MEMBER SECRETARY
SEIAA-TN

16. The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.
17. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.
18. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.

Forests

19. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.
20. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.
21. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.
22. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.

Water Environment

23. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.
24. Erosion Control measures.
25. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.
26. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
27. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.

MEMBER SECRETARY
SEIAA-TN

28. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.

29. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.

30. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.

Energy

31. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.

Climate Change

32. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.

33. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.

Mine Closure Plan

34. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.

EMP

35. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.

36. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.

Risk Assessment

37. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.

Disaster Management Plan

38. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its

MEMBER SECRETARY
SEIAA-TN

related activities covering the entire mine lease period as per precise area communication order issued.

Others

39. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.
40. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.
41. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.

A. STANDARD TERMS OF REFERENCE

1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.
2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.
3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.
4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
5) Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.

MEMBER SECRETARY
SEIAA-TN

6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.

7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.

8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.

9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.

10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.

11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.

12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the

MEMBER SECRETARY
SEIAA-TN

Expert Appraisal Committees.

13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.

14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.

15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.

16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.

17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.

18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.

19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.

MEMBER SECRETARY
SEIAA-TN

20) Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating I.T.L. HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).

21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.

22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.

23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.

MEMBER SECRETARY
SEIAA-TN

24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.

25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.

26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.

27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.

28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.

29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.

30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.

31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.

MEMBER SECRETARY
SEIAA-TN

32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.

33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.

34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.

35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.

36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.

37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.

38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.

39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.

40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.

41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.

MEMBER SECRETARY
SEIAA-TN

42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.

43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.

44) Besides the above, the below mentioned general points are also to be followed:-

a) Executive Summary of the EIA/EMP Report

b) All documents to be properly referenced with index and continuous page numbering.

c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.

d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.

e) Where the documents provided are in a language other than English, an English translation should be provided.

f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.

g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA. II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.

h) Changes, if any made in the basic scope and project parameters (as submitted in Form-1 and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.

i) As per the circular no. J-11011/618/2010-IA. II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environment Clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.

MEMBER SECRETARY
SEIAA-TN

j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

In addition to the above, the following shall be furnished:-

The Executive summary of the EIA/EMP report in about 8-10 pages should be prepared incorporating the information on following points:

1. Project name and location (Village, District, State, Industrial Estate (if applicable).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
6. A detailed study of the lithology of the mining lease area shall be furnished.
7. Details of village map, "A" register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
12. The EIA study report shall include the surrounding mining activity, if any.
13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.

MEMBER SECRETARY
SEIAA-TN

16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of is acquisition, nearby (in 2-3 km.) water body, population, with in 10km other industries, forest , eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
20. Likely impact of the project on air, water, land, flora-fauna and nearby population
21. Emergency preparedness plan in case of natural or in plant emergencies
22. Issues raised during public hearing (if applicable) and response given
23. CER plan with proposed expenditure.
24. Occupational Health Measures
25. Post project monitoring plan
26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
30. Reserve funds should be earmarked for proper closure plan.
31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

MEMBER SECRETARY
SEIAA-TN

Besides the above, the below mentioned general points should also be followed:-

a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.

b. All documents may be properly referenced with index, page numbers and continuous page numbering.

c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.

d. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF& CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.

e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J-11013/77/2004-IA-II(I) dated 2nd December, 2009, 18th March 2010, 28th May 2010, 28th June 2010, 31st December 2010 & 30th September 2011 posted on the Ministry's website http://www.moef.nic.in/ may be referred.

- After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned points, the proponent willtake further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.
- The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance.
- The TORs with public hearing prescribed shall be **valid for a period of three years** from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.

MEMBER SECRETARY
SEIAA-TN

Copy to:

1. The Additional Chief Secretary to Government, Environment & Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD Cum-Office Complex, East Arjun Nagar, New Delhi 110032.
3. The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-600 032.
4. The APCCF (C), Regional Office, MoEF& CC (SZ), 34, HEPC Building, 1st & 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai -34.
5. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC, Paryavaran Bhavan, CGO Complex, New Delhi 110003
6. The District Collector,Tiruchirappalli District.
7. Stock File.

AMENDMENT TERMS OF REFERENCE – G.O.43

File No.: 11809
Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment Authority(SEIAA), TAMIL NADU)
****

Dated **07/04/2025**

To,

Thiru.BALASUBRAMANIAN K
TVL RIVERWAYS MINES AND MINERALS LTD
Tvl.Riverways mines and minerals Ltd 6/9, Kasthuri Estate, III street, Poes Garden, Chennai - 600086 , Kottathur , TIRUCHIRAPPALLI, TAMIL NADU, , 600086
ls.baskaran@gmail.com

Subject: Amendment in prior Terms of Reference (ToR) granted to the project under the provision of the EIA Notification 2006 and as amended thereof regarding.

Sir/Madam,

SEIAA-TN – Amendment to Terms of Reference (ToR) for the Proposed Garnet sand lease area over an extent of 4.75.50Ha at S.F. No.390(P), Kottathur Village Musiri Taluk, Tiruchirappalli District, Tamil Nadu by Tvl. Riverways Mines and Minerals Ltd – under Category B1" of Item 1(a) "Mining of Minerals Projects" under the EIA Notification, 2006 as amended – Amendment to Terms of Reference – Issued – Regarding

Ref:

1. Earlier, ToR issued Letter No. SEIAATN/F/No.6507/SEAC/ToR-1487/2023 dated 22.06.2023
2. Online proposal No. SIA/TN/MIN/522461/2025, Dated: 28/02/2025 for amendment
3. Proponent application for ToR Amendment dated: 07.02.2025
4. Minutes of the 538th meeting of SEAC held on 01.03.2025.
5. Minutes of the 804th Authority Meeting held on 01.04.2025

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO25B0108TN5433895A
(ii) File No.	11809
(iii) Clearance Type	Amendment in TOR
(iv) Category	B1
(v) Schedule No./ Project Activity	1(a) Mining of minerals
(vii) Name of Project	Kottathur Garnet sand deposits (G.O.(3D) No.43) of Tvl. Riverways Mines and Minerals Ltd
(ix) Location of Project (District, State)	TIRUCHIRAPPALLI, TAMIL NADU
(x) Issuing Authority	SEIAA

(xii) Applicability of General Conditions No

Terms of Reference (ToR) was accorded vide SEIAATN/F/No.6507/SEAC/ToR-1487/2023 dated 22.06.2023 to **Tvl. Riverways Mines and Minerals Ltd** for the **Proposed Garnet sand lease area over an extent of 4.75.50Ha at S.F. No.390(P), Kottathur Village Musiri Taluk, Tiruchirappalli District,** Category "B1" of Item 1(a) "Mining of Minerals Projects" under the EIA Notification, 2006 as amended

Now, the Proponent has applied Amendment to Terms of Reference (ToR) vide Online Proposal No. **SIA/TN/MIN/522461/2025, Dated: 28/02/2025**.

Remarks of SEAC

Proposed Garnet sand lease area over an extent of 4.75.50Ha at S.F. No.390(P), Kottathur Village Musiri Taluk, Tiruchirappalli District, Tamil Nadu by Tvl. Riverways Mines and Minerals Ltd - For Amendment to Terms of Reference.

(SIA/TN/MIN/522461/2025, Dated: 28/02/2025)

The proposal was placed in the 538th meeting of SEAC held on 01.03.2025. The details of the project furnished by the proponent are available in the website (parivesh.nic.in).

The SEAC noted the following:

1. The Project Proponent, **Tvl. Riverways Mines and Minerals Ltd** has applied for Terms of Reference for the proposed **garnet sand lease area over an extent of 4.75.50Ha at S.F. No.390(P), Kottathur Village Musiri Taluk, Tiruchirappalli District**, Tamil Nadu.
2. The project/activity is covered under Category "B1" of Item 1(a) "Mining of Minerals Projects" of the Schedule to the EIA Notification, 2006.
3. Earlier, ToR issued Letter No. SEIAATN/F/No.6507/SEAC/ToR-1487/2023 dated 22.06.2023.
4. PP stated that in the TOR issued vide SEIAA-TN/F/No.6507/SEAC/ToR-1487/2023, the production quantity is not specified. However, for the preparation of the Draft EIA/EMP report and for conducting the public hearing, it is required to be mentioned in the TOR.
5. Further, the PP stated that the mining operation has not been carried out to date. The proposed reserves and resources are considered for the remaining lease period. In the preparation of the RoMP for 2023-2024 to 2027-2028, there is no change in area or reserves. Considering the techno-economic viability and IBM's suggestions, the annual production capacity has been increased within the ROM.
6. The details in the approved mine Plan by the Regional Controller of Mines, IBM, vide Letter No. TN/TCR/GNT/ROMP-1761.MDS, dated 01.08.2024 (Period 2023-2024 to 2027-2028), as follows:

Particulars - G.O.M.S. No.43	As per ToR Application	(Amendment Sought)Review of mining plan for the period 2023-2024 to 2027-2028
Lease area in ha	4.75.5	4.75.5
Total mineable Reserves (T)	28800	28800
Garnet Reserves @ 10% recovery	2880	2880
Peak Production capacity ROM in Tones per annum	2400	9000
Garnet Production@ 10% recovery	240	900
Life @ targeted production 5 years	12 Years	5 Years

Based on the presentation made by the proponent, **SEAC decided to recommend the Amendment in the Terms of Reference (TOR) dated 22.06.2023 along with Public Hearing subject to the following additional TORs & ToRs in Annexure of this minutes**, in addition to the standard terms of reference for EIA study for non-coal mining projects and details issued by the MOEF & CC to be included in EIA/EMP Report:

1. The PP is requested to carry out the EIA study for the revised quantities and to prepare the EMP accordingly.
2. **A Cluster Management Committee (CMC) shall be constituted including all the mines in the cluster as Committee Members for the effective management of the mining operation in the cluster through systematic & scientific approach with appointment of required statutory personnel, appropriate environmental management, system of maintaining the haul roads and village/panchayat roads, authorized blasting operation, Monitoring system of the environmental & other statutory compliances & its reporting methodology, etc. The PP shall submit the following details in the form of an Affidavit during the EIA appraisal:**

(i) Copy of the agreement forming CMC.

(ii) The Organisation chart of the Committee with defining the role of the members

(iii) The 'Standard Operating Procedures' (SoP) executing the planned activities.

3. The PP shall ensure the installation of CCTV at the proposed quarry site and ensure its inclusion during the EIA presentation.

4. The proponent shall furnish photographs of adequate fencing, garland drainage built with siltation tank & green belt along the periphery; maintaining the safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.

5. All other conditions mentioned in the ToR dated 22.06.2023 will remain unchanged and unaltered.

Discussion of SEIAA:

The subject was placed in 804th authority meeting held on 01.04.2025. The authority noted that the subject was placed in the 538th SEAC meeting held on 01.03.2025. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant the **Amendment in the Terms of Reference (ToR) dated 22.06.2023 along with Public Hearing for the quantity of 28800T of total mineable Reserves & 2880T of Garnet Reserves @ 10% recovery upto the depth of 2m BGL** as per the approved mining plan, under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions & the conditions mentioned in Annexure of this minutes

Copy

To

1. The Additional Chief Secretary to Government, Environment, Climate Change and Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9.
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan,
CBD Cum-Office Complex, East Arjun Nagar, New Delhi - 110032.
3. The Chairperson, Tamil Nadu Pollution Control Board,
76, Mount Salai, Guindy, Chennai-600 032.
4. The APCCF (C), Regional Office, Ministry of Environment & Forest (SZ),
34, HEPC Building, 1st & 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai - 34.
5. Monitoring Cell, I A Division, Ministry of Environment & Forests,
Paryavaran Bhavan, CGO Complex, New Delhi - 110003.
6. The District Collector, TIRUCHIRAPPALLI District.
7. Stock File.

Annexure 1

Specific Terms of Reference for (Mining Of Minerals)

1. Seiaa Specific Conditions:

S. No	Terms of Reference
1.1	**Cluster Management Committee** 1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry. 2. The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc., 3. The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines. 4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network. 5. The committee shall deliberate on risk & emergency management plan, fire safety & evacuation plan and sustainable development goals pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of

S. No	Terms of Reference
	the cluster and evacuation plan. 6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the Environmental policy devised shall be given in detail in the EIA Report. 7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner. 8. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public in the vicinity. **Agriculture & Agro-Biodiversity** 9. Impact on surrounding agricultural fields around the proposed mining Area. 10. Impact on soil flora & vegetation around the project site. 11. Details of type of vegetation including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetation all along the boundary of the proposed mining area shall committed mentioned in EMP. 12. The Environmental Impact Assessment should study the agro-biodiversity, agro- forestry, horti-cultural plantations, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem. 13. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services. 14. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock. **Forests** 15. The project proponent shall detailed study on impact of mining on Reserve forests and free ranging wildlife. 16. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna. 17. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection. 18. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site. **Water Environment** 19. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period. 20. Erosion Control measures. 21. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas. 22. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir. 23. The project proponent shall study and furnish the details on potential fragmentation impact on natural Environment, by the activities. 24. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts. 25. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components. 26. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.

S. No	Terms of Reference
	27. The EIA shall include the impact of mining activity on the following: a) Hydrothermal/Geothermal effect due to destruction in the Environment. b) Bio-geochemical processes and its foot prints including Environmental stress. c) Sediment geochemistry in the surface streams. **Energy** 28. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished. **Climate Change** 29. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities. 30. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock, soil health and physical, chemical & biological soil features. 31. Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood. **Mine Closure Plan** 32. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued. **EMP** 33. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued and the scope for achieving SDGs. 34. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan. **Risk Assessment** 35. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining. **Disaster Management Plan** 36. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued. **Others** 37. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc. 38. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan. 39. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the Environment. The ecological risks and impacts of plastic & microplastics on aquatic Environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.

AMENDMENT TERMS OF REFERENCE – G.O.69

File No.: 11810
Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment Authority(SEIAA), TAMIL NADU)
***

Dated **08/04/2025**

To,

Thiru.BALASUBRAMANIAN K
TVL RIVERWAYS MINES AND MINERALS LTD
No. 20/4, Naveed Castle Balakrishna Street Mylapore Chennai-600004.
ls.baskaran@gmail.com

Subject: Amendment in prior Terms of Reference (ToR) granted to the project under the provision of the EIA Notification 2006 and as amended thereof regarding.

Sir/Madam,

SEIAA-TN – Amendment to Terms of Reference for the Proposed Garnet sand Quarry lease over an extent of 4.90.0Ha at S.F.Nos. 390(P) of Kottathur Village, Musiri Taluk, Tiruchirappalli District, Tamil Nadu by Tvl. Riverways Mines and Minerals Ltd – under Category "B1" and Schedule Sl. No. 1(a) "Mining of Minerals Projects" under the EIA Notification, 2006 as amended – Amendment to Terms of Reference– Issued – Regarding.

Ref:

1. Earlier, ToR issued vide Lr.No.SEIAA-TN/F.No.6510/SEAC/ToR-1490/2023 Dated: 22.06.2023.
2. Online proposal No. SIA/TN/MIN/522482/2025, Dated: 06.02.2025.
3. Minutes of the 538th SEIAA meeting held on 01.03.2025.
4. Minutes of the 804th SEIAA meeting held on 01.04.2025.

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO25B0108TN5161343A
(ii) File No.	11810
(iii) Clearance Type	Amendment in TOR
(iv) Category	B1
(v) Schedule No./ Project Activity	1(a) Mining of minerals
(vii) Name of Project	Kottathur Garnet Sand Deposits (G.O.(3D) No.69) over an Extent of 4.90.0 Ha of Tvl. Riverways mines and minerals ltd.
(ix) Location of Project (District, State)	TIRUCHIRAPPALLI, TAMIL NADU
(x) Issuing Authority	SEIAA

(xii) Applicability of General Conditions No

Terms of Reference was issued vide Lr.No.SEIAA-TN/F.No.6510/SEAC/ToR-1490/2023 Dated: 22.06.2023. to Tvl. Riverways Mines and Minerals Ltd for the Proposed Garnet sand Quarry lease over an extent of 4.90.0Ha at S.F.Nos. 390(P) of Kottathur Village, Musiri Taluk, Tiruchirappalli District, Tamil Nadu

Now, the Proponent has again applied Amendment to Terms of Reference vide Online proposal No. SIA/TN/MIN/522482/2025, Dated: 06.02.2025.

Discussion of SEAC:

The proposal was placed in the 538th meeting of SEAC held on 01.03.2025. The details of the project furnished by the proponent are available in the website (parivesh.nic.in).

The SEAC noted the following:

1. The Project Proponent, Tvl. Riverways Mines and Minerals Ltd has obtained Terms of Reference vide Lr.No.SEIAA-TN/F.No.6510/SEAC/ToR-1490/2023 Dated: 22.06.2023 for the proposed garnet sand quarry lease over an extent of 4.90.0Ha at S.F.Nos. 390(P) of Kottathur Village, Musiri Taluk, Tiruchirappalli District, Tamil Nadu.
2. The project/activity is covered under Category "B1" of Item 1(a) "Mining of Minerals Projects" of the Schedule to the EIA Notification, 2006.
3. The Government of Tamil Nadu sanctioned the grant of fresh mining lease for Garnet sand over an extent of 4.90.0 Ha in S.F.Nos.390 (part) of Kottathur Village, Musiri Taluk, Trichy District, Tamil Nadu G.O.(3D) No.69 dated 27.12.2010 to Tvl. Riverways mines and minerals Ltd.
4. The mining plan was submitted and approved by IBM vide letter No.TN/TCR/ MP/GNT1855.MDS dated: 28.05.2013.
5. The applied mining lease area (G.O.(3D).69 of extent - 4.90.0 Ha) is located in Kottathur village, Musiri taluk, Trichy District, Tamil Nadu. The entire mine lease is Government Eri Poramboke land with an average elevation of 121m-124m from MSL.
6. The geological reserve is estimated has 40078 Tonnes and the mineable reserve is estimated to be 20736 Tonnes. The quantity of top soil expected is around 12050 Tonnes for the entire life of the mine. Top soil will be dumped all along the boundary barriers for afforestation purpose. The proposed peak production from this lease is 1776 Tonnes of garnet ROM per annum.
7. Now, the PP has applied for the ToR amendment vide proposal SIA/TN/MIN/522482/2025, dated: 06.02.2025, wherein the PP stated as follows:

"With reference to the cited subject, we would like state following facts in respect of Proposed garnet sand mine (G.O. No. (3D) No.69) over an extent of 4.90.0 ha at S.F. No. 390 (Part) in Kottathur village, Musiri Taluk, Tiruchirappalli district, Tamilnadu by Tvl. Riverways Mines and Minerals Ltd.

Initially we had applied for TOR for a peak production capacity of 1772 Tonnes of ROM to SEIAA, Tamil Nadu based on the earlier approved mining plan as follows:

Particulars	***G.O.M.S. No.69***
Lease area in ha	*4.90.0*
Total mineable Reserves (T)	*20,736*
Garnet Reserves @ 10% recovery	*2,074*
Peak Production capacity ROM in Tones per annum	***1,772***
Garnet Production@ 10% recovery	***177***
Life of the mine	***12 years***

TOR for this proposal TOR was issued vide ToR Letter No. SEIAA-TN/F/No.6510/SEAC/ToR-1490/2023 dated 22.06.2023 referred Sl.No.16 above

· In the TOR issued in page no. 4 of 29, Sl.No: 9&10, it is mentioned as follows:

9. The geological reserve is estimated has 40078 Tonnes and the mineable reserve is estimated to be 20736 Tonnes. The quantity of top soil expected is around 12050 Tonnes for the entire life of the mine. Top soil will be dumped all along the boundary barriers for afforestation purpose.

10. The proposed peak production from this lease is 1776 Tonnes of garnet ROM per annum.

· However, in the recent review of mining plan for the period 2023 -2024 to 2027-2028 approved by IBM vide letter No TN/TCR/GNT/ROMP-1759.MDS dated 01.08.2024 Though there is no Change in area or reserves, considering the techno economic viability and IBM suggestion, the annual production capacity is revised as follows:

Particulars	***G.O.M.S. No.69***

Lease area in ha	*4.90.0*
Total mineable Reserves (T)	*20,736*
Garnet Reserves @ 10% recovery	*2,074*
Peak Production capacity ROM in Tones per annum	***6,912***
Garnet Production@ 10% recovery	***691***
Life of the mine	***5 years***

Terms of Reference (TOR) along with Public Hearing for the revised Peak annual Production capacity quantity of 6912 T ROM (691T of Garnet per annum) up to the depth of 2m BGL as per review of mining plan from IBM."

Based on the PP's request and presentation made by the proponent, SEAC recommended the **Amendment for Terms of Reference (TOR) issued** subject to the following additional condition in addition to the conditions of ToR issued vide Letter No. SEIAA-TN/F/No.6510/SEAC/ToR-1490/2023 dated 22.06.2023:

i. As per the Review of Mining Plan approved by IBM vide No. TN/TCR/GNT/ROMP-1759.MDS dated 01.08.2024, both the total production and peak production capacity (RoM of Garnet) are increased. The PP should prepare the EMP for the revised quantities.

ii. The PP is requested to carry out the EIA study for the revised quantities and to prepare the EMP accordingly.

iii. All other conditions issued vide of ToR issued vide Letter No. SEIAA-TN/F/No.6510/SEAC/ToR-1490/2023 dated 22.06.2023 remain unchanged and unaltered.

Discussion of SEIAA:

The authority noted that the subject was placed in the 538th SEAC meeting held on 01.03.2025. SEAC has furnished its recommendations for granting Amendment in Terms of Reference issued subject to the conditions stated therein.

The Authority, taking into account, the recommendations of SEAC and after detailed deliberations, decided to issue the following Amendment in the ToR dated 22.06.2023 subject to the condition that all other conditions and validity mentioned in the ToR dated 22.06.2023 shall remain unchanged and unaltered.

S. No	Particulars	As in ToR dated 22.06.2023	Amendment Recommended
1.	Peak Production capacity ROM in Tonnes per annum	1,772	6,912
2.	Garnet Production@ 10% recovery	177	691
3.	Life @ targeted production 5 years	12 years	5 years

Copy

To

1. The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
2. The Principal Secretary to Government, Environment and Forests Department, Tamil Nadu.
3. The Additional Chief Secretary to Government, Natural Resources Department, Tamil Nadu.
4. The Additional Principal Chief Conservator of Forests, Regional Office (SZ), 34, HEPC Building, 1st& 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai – 34.
5. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
6. The Chair Person, TNPC Board,76, Mount Salai, Guindy, Chennai-32
7. The District Collector, Tiruchirappalli District
8. The Commissioner of Geology and Mines, Guindy, Chennai-32
9. Assistant Director, Department of Geology & Mining, Tiruchirappalli District
10. EI Division, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
11. File Copy

AMENDMENT TERMS OF REFERENCE – G.O.70

File No.: 11811
Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment Authority(SEIAA), TAMIL NADU)
****

Dated **08/04/2025**

To,

Thiru.BALASUBRAMANIAN K
TVL RIVERWAYS MINES AND MINERALS LTD
No. 20/4, Naveed Castle Balakrishna Street Mylapore Chennai-600004.
ls.baskaran@gmail.com

Subject: Amendment in prior Terms of Reference (ToR) granted to the project under the provision of the EIA Notification 2006 and as amended thereof regarding.

Sir/Madam,

SEIAA-TN – Amendment to Terms of Reference for the Proposed Garnet sand Quarry lease over an extent of 4.75.0Ha at S.F.Nos. 390(P) of Kottathur Village, Musiri Taluk, Tiruchirappalli District, Tamil Nadu by Tvl. Riverways Mines and Minerals Ltd – under Category "B1" and Schedule Sl. No. 1(a) "Mining of Minerals Projects" under the EIA Notification, 2006 as amended – Amendment to Terms of Reference– Issued – Regarding.

Ref:

1. Earlier, ToR issued vide Letter No. SEIAA-TN/F/No.6511/SEAC/ToR-1478/2023 dated 22.06.2023.
2. Online proposal No. SIA/TN/MIN/522638/2025, Dated: 06.02.2025.
3. Minutes of the 538th SEIAA meeting held on 01.03.2025.
4. Minutes of the 804th SEIAA meeting held on 01.04.2025.

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO25B0108TN5980789A
(ii) File No.	11811
(iii) Clearance Type	Amendment in TOR
(iv) Category	B1
(v) Schedule No./ Project Activity	1(a) Mining of minerals
(vii) Name of Project	Kottathur Garnet Sand deposits (GO (3D) No 70) of Tvl. Riverways mines and minerals ltd
(ix) Location of Project (District, State)	TIRUCHIRAPPALLI, TAMIL NADU
(x) Issuing Authority	SEIAA
(xii) Applicability of General Conditions	No

Terms of Reference was issued vide Letter No. SEIAA-TN/F/No.6511/SEAC/ToR-1478/2023 dated 22.06.2023. to Tvl. Riverways Mines and Minerals Ltd for the Proposed Garnet sand Quarry lease over an extent of 4.75.0Ha at S.F.Nos. 390(P) of Kottathur Village, Musiri Taluk, Tiruchirappalli District, Tamil Nadu

Now, the Proponent has again applied Amendment to Terms of Reference vide Online proposal No. SIA/TN/MIN/522638/2025, Dated: 06.02.2025.

Discussion of SEAC:

The proposal was placed in the 538th meeting of SEAC held on 01.03.2025. The details of the project furnished by the proponent are available in the website (parivesh.nic.in).

The SEAC noted the following:

1. The Project Proponent, Tvl. Riverways Mines and Minerals Ltd has obtained Terms of Reference vide Lr.No.SEIAA-TN/F.No.6511/SEAC/1(a)/ToR-1478/2023 Dated: 22.06.2023 for the proposed garnet sand quarry lease over an extent of 4.75.0Ha at S.F.Nos. 390(P) of Kottathur Village, Musiri Taluk, Tiruchirappalli District, Tamil Nadu.
2. The proposed quarry/activity of Major Mineral (Garnet Sand Mining) over an extent of 4.75.0 ha with cluster area 23.95.5 ha is covered under Category "B1" of Item 1(a) "Mining Projects" of the Schedule to the EIA Notification, 2006.
3. The precise area communication was issued vide G.O.3D No.70 dated 29.12.2010.
4. The approved mining plan was issued vide TN/TCR/MP/GNT/1857-MDS dt: 28.05.2013 for mining 29700 Tonnes of ROM (Garnet recovery (10%) - 2970 Tonnes, Mining Waste (90%) - 26730 Tonnes) & Clay Alluvium-18096 Tonnes and depth of mining upto 2m and anticipated life of mine is morethan 12 Years as reported.
5. For the 1st Five Years of Mining, 9900 Tonnes of ROM (Garnet recovery (10%) - 990 Tonnes, Mining Waste (90%) - 8910 Tonnes) & Clay Alluvium-10192 Tonnes & depth of mining 2m.
6. The mining Lease was issued on 06.04.2018 valid upto 05.04.2038.
7. Now, the PP has applied for the ToR amendment vide proposal SIA/TN/MIN/522638/2025, dated: 06.02.2025, wherein the PP stated as follows:

"With reference to the cited subject, we would like state following facts in respect of Proposed garnet sand mine (G.O. No. (3D) No.70) over an extent of 4.75.0 ha at S.F. No. 390 (Part) in Kottathur village, Musiri Taluk, Tiruchirappalli district, Tamilnadu by Tvl. Riverways Mines and Minerals Ltd.

Initially we had applied for TOR for a peak production capacity of 2500 Tonnes of ROM to SEIAA, Tamil Nadu based on the earlier approved mining plan as follows:

Particulars	***G.O.M.S. No.70***
Lease area in ha	*4.75.0*
Total mineable Reserves (T)	*29,700*
Garnet Reserves @ 10% recovery	*2,970*
Peak Production capacity ROM in Tones per annum	***2,500***
Garnet Production@ 10% recovery	***250***
Life of the mine	***12 Years***

· TOR for this proposal TOR was issued vide ToR Letter No. SEIAA-TN/F/No.6511/SEAC/ToR-1478/2023 dated 22.06.2023 referred Sl.No.16 above

· In the TOR issued in page no. 3 of 26, Sl.No: 5, it is mentioned as follows:

5. The approved mining plan was issued vide TN/TCR/MP/GNT/1857-MDS dt: 28.05.2013 for mining 29700 Tonnes of ROM (Garnet recovery (10%) - 2970 Tonnes, Mining Waste (90%) - 26730 Tonnes) & Clay Alluvium-18096 Tonnes and depth of mining upto 2m and anticipated life of mine is morethan 12 Years as reported.

6. For the 1st Five Years of Mining, 9900 Tonnes of ROM (Garnet recovery (10%) - 990 Tonnes, Mining Waste (90%) - 8910 Tonnes) & Clay Alluvium-10192 Tonnes & depth of mining 2m.

· However, in the recent review of mining plan for the period 2023 -2024 to 2027-2028 approved by IBM vide letter No TN/TCR/GNT/ROMP-1760.MDS dated 20.08.2024 Though there is no Change in area or reserves, considering the techno economic viability and IBM suggestion, the annual production capacity is revised as follows:

Particulars	***G.O.M.S. No.70***
Lease area in ha	*4.75.0*
Total mineable Reserves (T)	*29,700*
Garnet Reserves @ 10% recovery	*2970*
Peak Production capacity ROM in Tonnes per annum	***9750***
Garnet Production@ 10% recovery	***975***

Life of the mine	***5 Years***

Terms of Reference (TOR) along with Public Hearing for the revised Peak annual Production capacity quantity of 9750 T ROM (975T of Garnet per annum) up to the depth of 2m BGL as per review of mining plan from IBM."

Based on the PP's request and presentation made by the proponent, SEAC recommended the **Amendment for Terms of Reference (TOR) issued** subject to the following additional condition in addition to the conditions of ToR issued vide Letter No. SEIAA-TN/F/No.6510/SEAC/ToR-1490/2023 dated 22.06.2023:

i. As per the Review of Mining Plan approved by IBM vide No. *No* TN/TCR/GNT/ROMP-1760.MDS dated 20.08.2024, both the total production and peak production capacity (RoM of Garnet) are increased. The PP should prepare the EMP for the revised quantities.

ii. The PP is requested to carry out the EIA study for the revised quantities and to prepare the EMP accordingly.

iii. All other conditions issued vide of ToR issued vide Letter No. SEIAA-TN/F/No.6511/SEAC/ToR-1478/2023 dated 22.06.2023 remain unchanged and unaltered.

Discussion of SEIAA:

The authority noted that the subject was placed in the 538th SEAC meeting held on 01.03.2025. SEAC has furnished its recommendations for granting Amendment in Terms of Reference issued subject to the conditions stated therein.

The Authority, taking into account, the recommendations of SEAC and after detailed deliberations, decided to issue the following Amendment in the ToR dated 22.06.2023 subject to the condition that all other conditions and validity mentioned in the ToR dated 22.06.2023 shall remain unchanged and unaltered.

S. No	Particulars	As in ToR dated 22.06.2023	Amendment Recommended
1.	Peak Production capacity ROM in Tonnes per annum	2,500	9750
2.	Garnet Production@ 10% recovery	250	975
3.	Life @ targeted production 5 years	12 years	5 years

Copy To

1. The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
2. The Principal Secretary to Government, Environment and Forests Department, Tamil Nadu.
3. The Additional Chief Secretary to Government, Natural Resources Department, Tamil Nadu.
4. The Additional Principal Chief Conservator of Forests, Regional Office (SZ), 34, HEPC Building, 1st& 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai – 34.
5. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
6. The Chair Person, TNPC Board,76, Mount Salai, Guindy, Chennai-32
7. The District Collector, Tirupathur District
8. The Commissioner of Geology and Mines, Guindy, Chennai-32
9. Assistant Director, Department of Geology & Mining, Tirupathur District
10. EI Division, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
11. File Copy

AMENDMENT TERMS OF REFERENCE – G.O.71

File No.: 11812
Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment Authority(SEIAA), TAMIL NADU)
****

Dated **07/04/2025**

To,

Thiru.BALASUBRAMANIAN K
TVL RIVERWAYS MINES AND MINERALS LTD
Tvl.Riverways mines and minerals Ltd 6/9, Kasthuri Estate, III street, Poes Garden, Chennai - 600086 , Kottathur, TIRUCHIRAPPALLI, TAMIL NADU, , 600086
ls.baskaran@gmail.com

Subject: Amendment in prior Terms of Reference (ToR) granted to the project under the provision of the EIA Notification 2006 and as amended thereof regarding.

Sir/Madam,

SEIAA-TN – Application seeking amendment in Terms of Reference issued for the Proposed garnet sand mine (G.O. No. (3D) No.71) over an extent of 4.80.0 ha at S.F. No. 390 (Part) in Kottathur Village, Musiri Taluk, Tiruchirappalli District,Tamil Nadu By Tvl. Riverways Mines and Minerals Ltd – under Category "B" and Schedule Sl No. "B1" of Item 1(a) "Mining of Minerals Projects"– Issue of Amendment Terms of Reference – Regarding.

Ref:

1. Earlier, ToR issued Letter No. SEIAA-TN/F.No/6508/SEAC/1(a)/Tor1497/2023, Dated:22.06.2023
2. Online proposal for amendment vide Proposal No. SIA/TN/MIN/522487/2025, dt: 06/02/2025.
3. Proponent application for EC Amendment at SEIAA-TN on 07.02.2025.
4. Minutes of the 538th meeting of SEAC held on 01.03.2025.
5. Minutes of the 804th Meeting of SEIAA held on 01.04.2025.

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO25B0108TN5179960A
(ii) File No.	11812
(iii) Clearance Type	Amendment in TOR
(iv) Category	B1
(v) Schedule No./ Project Activity	1(a) Mining of minerals
(vii) Name of Project	KOTTATHUR GARNET SAND DEPOSITS (G.O. 3(D). NO. 71) OVER AN EXTENT OF 4.80.0 HA OF TVL. RIVERWAYS MINES AND MINERALS LTD
(ix) Location of Project (District, State)	TIRUCHIRAPPALLI, TAMIL NADU

(x) Issuing Authority	SEIAA
(xii) Applicability of General Conditions	No

3. Terms of Reference was accorded to the Tvl. Riverways Mines and Minerals Ltd vide Letter No. SEIAA-TN/F.No/6508/SEAC/1(a)/Tor1497/2023, Dated:22.06.2023. Proposed garnet sand mine (G.O. No. (3D) No.71) over an extent of 4.80.0 ha at S.F. No. 390 (Part) in Kottathur Village, Musiri Taluk, Tiruchirappalli District, Tamil Nadu under Category "B1" of Item 1(a) "Mining of Minerals Projects".

Now, the Proponent has applied seeking an Amendment in Terms of Reference vide reference 2nd & 3rd cited.

SEAC Remarks

The proposal was placed in the 538th meeting of SEAC held on 01.03.2025. The details of the project furnished by the proponent are available in the website (parivesh.nic.in).

The SEAC noted the following:

1. The Project Proponent, Tvl. Riverways Mines and Minerals Ltd has applied for Terms of Reference for the proposed garnet sand lease area over an extent of 4.80.0Ha at S.F. No.390(P), Kottathur Village Musiri Taluk, Tiruchirappalli District, Tamil Nadu.

2. The project/activity is covered under Category "B1" of Item 1(a) "Mining of Minerals Projects" of the Schedule to the EIA Notification, 2006.

3. Earlier, ToR issued Letter No. SEIAATN/F.No/6508/SEAC/1(a)/Tor1497/2023, Dated:22.06.2023. with the production for 5 years not to exceed: RoM – 14,016Ts which includes 1402Ts of Garnet (@10% recovery) & 12,614Ts of mined waste and also 14,185Ts of clay alluvium upto a depth of 2m.

4. The PP stated that the mining operation was not carried out till date. The proposed reserves and resources are taken for the remaining lease period. In the preparation of RoMP 2023 -2024 to 2027-2028 there is no Change in area or reserves. Considering the techno economic viability and IBM suggestion, the annual production capacity has been increased within the ROM.

5. The details in the approved mine Plan by the Regional Controller of Mines, IBM, vide letter No TN/TCR/GNT/ROMP-1763.MDS dated 14.08.2024. (Period 2023 -2024 to 2027-2028) as follows:

Particulars	As per ToR Application	Amendment Sought
Lease area in ha	4.80.0	4.80.0
Total mineable Reserves (T)	42048	42048
Garnet Reserves @ 10% recovery	4205	4205
Depth of mining	2.0 m	2.0 m
Peak Production capacity ROM in Tones per annum	3552	13814
Garnet Production@ 10% recovery	355	1381
Life @ targeted production 5 years	12 Years	5 Years

Based on the presentation made by the proponent, **SEAC decided to recommend the Amendment in the Terms of Reference (TOR) along with Public Hearing subject to the following additional TORs & ToRs in Annexure of this minutes**, in addition to the standard terms of reference for EIA study for non-coal mining projects and details issued by the MOEF & CC to be included in EIA/EMP Report:

1. The PP shall prepare the EMP for the increased production quantity and carryout EIA for revised quantity.

2. **A Cluster Management Committee (CMC) shall be constituted including all the mines in the cluster as Committee Members for the effective management of the mining operation in the cluster through systematic & scientific approach with appointment of required statutory personnel, appropriate environmental management, system of maintaining the haul roads and village/panchayat roads, authorized blasting operation, Monitoring system of the environmental & other statutory compliances & its reporting methodology, etc. The PP shall submit the following details in the form of an Affidavit during the EIA appraisal:**

(i) Copy of the agreement forming CMC.

(ii) The Organisation chart of the Committee with defining the role of the members

(iii) The 'Standard Operating Procedures' (SoP) executing the planned activities.

3. The PP shall ensure the installation of CCTV at the proposed quarry site and ensure its inclusion during the EIA presentation.

4. The proponent shall furnish photographs of adequate fencing, garland drainage built with siltation tank & green belt along the periphery; maintaining the safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.

Discussion of SEIAA:

The subject was placed in the 804th Authority meeting held on 01.04.2025. The authority noted that the subject was placed in the 538th SEAC meeting held on 01.03.2025.

The Authority, taking into account, the recommendations of SEAC and after detailed deliberations, decided to issue the following amendment in the ToR dated 22.06.2023 subject to the condition that all other conditions and validity mentioned in the ToR dated 22.06.2023 shall remain unchanged and unaltered.

S.No	Particulars	As in ToR dated 22.06.2023	Amendment Recommended
1	Peak Production capacity ROM in Tones per annum	3552	13814
2	Garnet Production@ 10% recovery	355	1381
3	Life @ targeted production 5 years	12 Years	5 Years

Copy To

1. The Principal Secretary to Government, Environment, Climate Change and Forests Department, Tamil Nadu.
2. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
3. The Chairperson, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-32.
4. Monitoring Cell, I A Division, Ministry of Environment & Forests, Paryavaran Bhavan, CGO Complex, New Delhi-110003.
5. Stock File.

AMENDMENT TERMS OF REFERENCE – G.O.57

File No.: 11834
Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment Authority(SEIAA), TAMIL NADU)
***

Dated **07/04/2025**

To,

Thiru.Balasubramanian K
TVL S S MINERALS
Tvl.S.S.Minerals, 6/9 Kasthuri estate, III street, Poes Garden, Chennai - 600086 , chennai, CHENNAI, TAMIL NADU, , 600086
roshanmanaseh@gmail.com

Subject: Amendment in prior Terms of Reference (ToR) granted to the project under the provision of the EIA Notification 2006 and as amended thereof regarding.

Sir/Madam,

SEIAA-TN – Amendment to Terms of Reference (ToR) for the Proposed Garnet sand lease area over an extent of 4.75Ha at S.F.No.390(P), Kottathur Village Musiri Taluk, Tiruchirappalli District, Tamil Nadu by Tvl.S.S.Minerals – under Category B1" of Item 1(a) "Mining of Minerals Projects" under the EIA Notification, 2006 as amended – Amendment to Terms of Reference – Issued – Regarding

Ref:

1. Earlier, ToR issued Letter No. SEIAATN/F/No.6509/SEAC/ToR-1493/2023 dated 22.06.2023
2. Online proposal No. SIA/TN/MIN/523816/2025, Dated: 28/02/2025 for amendment
3. Proponent application for ToR Amendment dated: 12.02.2025
4. Minutes of the 538th meeting of SEAC held on 01.03.2025.
5. Minutes of the 804th Authority Meeting held on 01.04.2025

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO25B0108TN5581756A
(ii) File No.	11834
(iii) Clearance Type	Amendment in TOR
(iv) Category	B1
(v) Schedule No./ Project Activity	1(a) Mining of minerals
(vii) Name of Project	Kottathur Garnet Sand Deposits (G.O.Ms.No 57) over an extent of 4.75.0 Ha of Tvl. S.S. Minerals, Kottathur village, Musiri Taluk, Trichy District, Tamil Nadu
(ix) Location of Project (District, State)	TIRUCHIRAPPALLI, TAMIL NADU
(x) Issuing Authority	SEIAA

(xii) Applicability of General Conditions No

Now, the Proponent has applied Amendment to Terms of Reference (ToR) vide Online Proposal No. **SIA/TN/MIN/ 523816/2025, Dated: 28/02/2025**.

Remarks of SEAC

Proposed Garnet sand lease area over an extent of 4.75Ha at S.F.No.390(P), Kottathur Village Musiri Taluk, Tiruchirappalli District, Tamil Nadu by Tvl.S.S.Minerals - For Amendment to Terms of Reference.
(SIA/TN/MIN/523816/2025, Dated: 28/02/2025)

The proposal was placed in the 538th meeting of SEAC held on 01.03.2025. The details of the project furnished by the proponent are available in the website (parivesh.nic.in).

The SEAC noted the following:

1. The Project Proponent, **Tvl.S.S.Minerals** has applied for Terms of Reference for the proposed **garnet sand lease area over an extent of 4.75Ha at S.F.No.390(P), Kottathur Village Musiri Taluk, Tiruchirappalli District**, Tamil Nadu.
2. The project/activity is covered under Category "B1" of Item 1(a) "Mining of Minerals Projects" of the Schedule to the EIA Notification, 2006.
3. Earlier, ToR issued Letter No. SEIAATN/F/No.6509/SEAC/ToR-1493/2023 dated 22.06.2023.
4. PP requested that the TOR be amended as per the approved ROM for 2023-2024 to 2027-2028, to carry out the public hearing and proceed further towards EC as follows.

Particulars	As per ToR Application	Amendment Sought	Remarks
Lease area in ha	4.75.0	4.75.0	No change
Total mineable Reserves (T)	36000	36000	No Change
Garnet Reserves @ 10% recovery	3600	3600	No change
Depth of mining	2.0m	2.0m	No change
Peak production capacity ROM in Tones per annum	2450	10800	The PP stated that the mining operation has not been carried out to date. The proposed reserves and resources are considered for the remaining lease period. The same has been submitted to the Indian Bureau of Mines and approved by the Regional Controller of Mines, IBM, vide Letter No. TN/TCR/GNT/ROMP-1758.MDS, dated 22.08.2024.
Garnet Production@ 10% recovery	245	1080	
Life @ targeted production	15 Years	5 Years	

Based on the presentation made by the proponent, **SEAC decided to recommend the Amendment in the Terms of Reference (TOR) dated 22.06.2023 along with Public Hearing subject to the following additional TORs & ToRs in Annexure of this minutes**, in addition to the standard terms of reference for EIA study for non-coal mining projects and details issued by the MOEF & CC to be included in EIA/EMP Report:

1. The PP is requested to carry out the EIA study for the revised quantities and to prepare the EMP accordingly.
2. **A Cluster Management Committee (CMC) shall be constituted including all the mines in the cluster as Committee Members for the effective management of the mining operation in the cluster through systematic & scientific approach with appointment of required statutory personnel, appropriate environmental management, system of maintaining the haul roads and village/panchayat roads, authorized blasting operation, Monitoring system of the environmental & other statutory compliances & its reporting methodology, etc. The PP shall submit the following details in the form of an Affidavit during the EIA appraisal:**

(i) Copy of the agreement forming CMC.
(ii) The Organisation chart of the Committee with defining the role of the members
(iii) The 'Standard Operating Procedures' (SoP) executing the planned activities.

3. The PP shall ensure the installation of CCTV at the proposed quarry site and ensure its inclusion during the EIA presentation.
4. The proponent shall furnish photographs of adequate fencing, garland drainage built with siltation tank & green belt along the periphery; maintaining the safety distance between the adjacent quarries & water bodies nearby provided as per

the approved mining plan.

5. All other conditions mentioned in the ToR dated 22.06.2023 will remain unchanged and unaltered.

Discussion of SEIAA:

The subject was placed in 804th authority meeting held on 01.04.2025. The authority noted that the subject was placed in the 538th SEAC meeting held on 01.03.2025. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant the **Amendment in the Terms of Reference (ToR) dated 22.06.2023 along with Public Hearing for the quantity of 36000 T of Total mineable Reserves & 3600 T of Garnet Reserves @ 10% recovery upto the depth of 2.0m** as per the approved mining plan, under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions & the conditions mentioned in Annexure of this minutes.

Copy

To

1. The Additional Chief Secretary to Government, Environment, Climate Change and Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9.
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan,
CBD Cum-Office Complex, East Arjun Nagar, New Delhi - 110032.
3. The Chairperson, Tamil Nadu Pollution Control Board,
76, Mount Salai, Guindy, Chennai-600 032.
4. The APCCF (C), Regional Office, Ministry of Environment & Forest (SZ),
34, HEPC Building, 1st & 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai - 34.
5. Monitoring Cell, I A Division, Ministry of Environment & Forests,
Paryavaran Bhavan, CGO Complex, New Delhi - 110003.
6. The District Collector, Tiruchirappalli District.
7. Stock File.

Annexure 1

Specific Terms of Reference for (Mining Of Minerals)

1. Seiaa Standard Conditions:

S. No	Terms of Reference
1.1	**Cluster Management Committee** 1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry. 2. The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc., 3. The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines. 4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network. 5. The committee shall deliberate on risk & emergency management plan, fire safety & evacuation plan and sustainable development goals pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan. 6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the Environmental policy devised shall be given in detail in the EIA Report.

S. No	Terms of Reference
	7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner. 8. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public in the vicinity. **Agriculture & Agro-Biodiversity** 9. Impact on surrounding agricultural fields around the proposed mining Area. 10. Impact on soil flora & vegetation around the project site. 11. Details of type of vegetation including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetation all along the boundary of the proposed mining area shall committed mentioned in EMP. 12. The Environmental Impact Assessment should study the agro-biodiversity, agro- forestry, horti-cultural plantations, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem. 13. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services. 14. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock. **Forests** 15. The project proponent shall detailed study on impact of mining on Reserve forests and free ranging wildlife. 16. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna. 17. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection. 18. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site. **Water Environment** 19. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period. 20. Erosion Control measures. 21. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas. 22. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir. 23. The project proponent shall study and furnish the details on potential fragmentation impact on natural Environment, by the activities. 24. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts. 25. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components. 26. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites. 27. The EIA shall include the impact of mining activity on the following: a) Hydrothermal/Geothermal effect due to destruction in the Environment. b) Bio-geochemical processes and its foot prints including Environmental stress. c) Sediment geochemistry in the surface streams. **Energy**

S. No	Terms of Reference
	28. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished. **Climate Change** 29. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities. 30. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock, soil health and physical, chemical & biological soil features. 31. Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood. **Mine Closure Plan** 32. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued. **EMP** 33. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued and the scope for achieving SDGs. 34. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan. **Risk Assessment** 35. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining. **Disaster Management Plan** 36. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued. **Others** 37. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc. 38. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan. 39. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the Environment. The ecological risks and impacts of plastic & microplastics on aquatic Environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.

Signature Not Verified

Digitally Signed by : A R Rahul Nadh IAS
Member Secretary, SEIAA

Date: 07/04/2025

TERMS OF REFERENCE REPLY GO-43

TOR COMPLIANCE
TOR No :SEIAA-TN/F.No-6507/SEAC/1(a)/TOR-1487/2023 & TOR Amendment No - TO25B0108TN5433895A

S.No	TOR Points	Reply	Pg.No
	A. ToR in Addition to Standard ToR		
1	The PP shall furnish a copy of the document in support of the fact that the proponent is the rightful lessee of the mine.	Lease document is already executed and given in Anneuxre -2A	**A45**
2	The PP shall furnish Copy of approved Mining Plan /Scheme of mining plan by the competent authority during the time of EIA appraisal.	Review of mining plan for the period 2023 - 2024 to 2027-2028 Approved by IBM and letter given in Annexure – 3A	**A257**
3	The PP shall furnish an affidavit that mining plan approved by AMD used for Public Hearing and the Mining Plan approved by the Competent Authority (IBM/DGM) are the same.	Recently approved Review of mining plan is used for preparation of draft EIA/ EMP report. Affidavit in this regard will be submitted in the Final EIA/ EMP report	**-**
4	The PP shall evaluate the environmental aspects and their possible associated impacts that would arise due to the proposed Garnet sand mining and mineral separation and to work out environmental monitoring programme to prevent, control, minimise or eliminate the adverse environmental impacts envisaged from the proposed garnet mining and mineral separation.	Ensured	**-**
5	The PP shall provide all documents including approved mine plan/ approved scheme of mining, EIA and public hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management and mining technology and should be in the name of the lessee.	The production capacity, quantity of waste, its management and mining technology in mine plan and EIA, etc., are compatible with one another.	**-**
6	The PP shall provide all corner coordinates of the mine lease area superimposed on a high Resolution Imagery/ toposheet. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and the buffer zone).	• Project coordinates superimposed in satellite imagery and given as Figure No - 2.4 to 2.8 in Chapter – II.	**2-5**
7	The PP shall indicate the level of Impact on local transport infrastructure due to project. Projected increase in truck traffic as a result of project in the present road network (including those outside the project area) should be worked out. indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as state government) should be covered.	• Since the production is less, the overall transport from all the 5 leases in the Governement poramboke land is just 7 trips per hour only. Existing road can easily absorb this traffic. Details are provided under Para 4.9, Chapter-IV.	**4-26**
8	The PP shall furnish a letter from VAO stating details of structures & habitations located within 300m from the boundary of the project site.	VAO Letter will be submitted in Final EMP Report	**-**

9	The structures within the radius of (i) 100 m, (ii) 300 m, and (iii) 500 m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc.	The details of features within 500m radius is provided in **Table 2.4, Chapter-II.**	**2-40**
10	The PP shall submit a report on replenishment of Garnet sand (or) its geological formation as indicated in the DSR.	Geology details are given in Para 2.4, Chapter – II.	**2-11**
11	The PP shall furnish the details of the tank, depth of desiltation, extent of the tank and Ownership of the tanks, details of cultivation, distance from the site. etc. within 1 km radius around the proposed mining area from the Govt records.	Kottathur eri covers an area of 102.43 ha with the aiyacut of 94.34 ha mostly in the downstream side. Rainwater from the upstream side originating near the lease area on the north west side from pagalavadi RF and northern side during the monsoon season flows through this eri. . Due to elevation difference, this water drains immediately on the down stream south eastern side and further connected to Uppu odai . This eri acts more of a passage of rainwater.	**3-53**
12	The PP shall furnish Copy of the NoC obtained from PWD/WRD-TN for the proposed mining activity.	NOC from PWD department is obtained and given **as Annexure – 5A**	**A277**
13	The PP carry out the geological assessment to identify mineralization, to establish continuity. quality and quantity of mineral deposit, particularly, the presence of Atomic minerals in the Garnet sand. Hence the PP shall furnish the report through the systematic sampling in the proposed site with showing geological coordinates as per the procedures laid in accordance with the provisions of Atomic Minerals Concessional Rules, 2016 and the mineralogical analysis obtained from the laboratory of IREL (India) Limited. Research Centre, Reach Road. Kollam, Kerala.	Government of India, Ministry of Mines in consultation with the Department of Atomic Energy (DAE) and the Indian Bureu of Mines (IBM) has clarified the AMCR, 2016 and Government of India, Ministry of Mines Order dated 01.03.2019 are not applicable to the 11 mining leases granted for mining Garnet in Tiruchirapalli District and 2 mining leases granted for mining Garnet in Madurai District. **G**.O. obtained from Industries, Investment Promotion and Commerce (MMD.1) Department given in Annexure – 6A	**A281**
14	Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside/inside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.	Since the recovery of ROM is expected to be 10%, the balance 90% reject from the processing plant will be transported back and backfilled in the mined out area. Top soil will be spread over the backfilled area and the mined out pit will be restored back to primining condition.	**2-25**
15	The study area will comprise of 10km zone around the mine lease from lease periphery and the data contained in EIA such as waste generation etc. should be for the life of the mine / lease period.	The study area chosen for collecting existing environmental status covers 10 km radial distance from the project periphery (Figure No - 3.2). Data given in the report is for the life of the mine.	**3-3**
16	The PP shall indicate the land use of the study area delineating forest area, agricultural land,	• The land use of the study area was studied to demarcate various LULC	**3-35**

	grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features. Land use plan of the mine lease area should be prepared to encompass pre-operational. operational and post operational phases and submitted. Impact, if any, of change of land use should be given. The PP shall indicate the details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.	categories and its details are provided under section 3.4, Chapter-III. • The land use pattern at present and at the end of the quarrying period has been provided under section 4.5.1, Chapter-IV. The post mining land use has been provided in Table No. 4.12.	**4-21**
17	The PP shall indicate the details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.	This is a proposed project. Site services like mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.	**2-40**
18	The PP shall anticipate the Occupational and health impacts of the project and accordingly the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP.	Details of occupational health and safety aspects are given under the subsections of Para 4.8, Chapter-IV.	**4-25**
19	The PP shall evaluate the Public health implications of the project and related activities for the population in the impact zone systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	This being a small project with no significant impact, no health implications to the surrounding public envisaged.	**-**
20	The PP shall provide the measures of socio-economic significance and influence to the local community. As far as possible, quantitative dimensions may be given with the time frames for implementation.	Nearby villages were visited for conducting study to know about socio-economic conditions, including aspirations and requirements of the people for a better living and collected relevant data. The details are provided under section 3.2.3, Chapter-III.	**3-12**
21	The PP shall disclose the details of litigation / violation case pending against the project (or) the PP pertaining to this mining proposal, if any, with the direction/order passed by any court of law against the project proposal in the past or now.	PP informed that there is no litigation pending against the project.	**-**
22	Proponent shall furnish the letter received from DFO concerned stating the proximity details of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.	There area no Protected Areas, Sanctuaries, Tiger reserve etc with in 10 km radius	**3-4**
23	Detailed study report on flora and fauna in and nearby the quarry site.	A detailed study of flora and fauna composition in the core and buffer zone of the project has been made through primary field surveys. The details are furnished in para 3.5, Chapter III.	**3-44**
24	The Proponent shall develop greenbelt and		**2-8**

	garland drain around the boundary of the proposed quarry and the photographs indicating the same shall be shown during the EIA appraisal.	Site photographs are provided in **Photo Figure No.2.9, Chapter-II.**	
25	The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.	A detailed study of flora and fauna composition in the core and buffer zone of the project has been made through primary field surveys by NABET approved Ecologist. The details are furnished in para 3.5, Chapter III.	**3-44**
26	The PP shall carry out the air-quality monitoring for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of minerals. The details of the model used and the input parameters used for modelling should be provided. The air quality contours may be plotted on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	• Air quality modeling details are furnished in para 4.2.3 and its continuous sub paras in Chapter-IV of EIA report. • The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model developed by Lakes Environmental Software which is based on steady state Gaussian plume dispersion. • The model simulations are done for the air pollutant arising from the mining operations, namely, PM10, PM2.5. Ground Level Concentration (GLC) have been computed using hourly meteorological data both for individual lease and cumulative basis. The Isopleths of PM10, PM2.5 concentrations for with control measures scenario have also been drawn and these are given in Figure No.4.1 and 4.12.	**4-3**
27	The PP shall furnish the water requirement for the project, its availability and source. A detailed water balance should also be provided. Fresh water requirement for the project should be indicated.	Total water requirement for all the 5 leases is 8cu.m, Domestic – 2.0 cu.m, Dust suppression and Afforestation – 6.0 cu.m. Required water will be procured from outside.	**4-19**
28	The PP shall assess the impact of project on water quality, both surface and groundwater and necessary safeguard measures, if any required, should he provided.	Details are given in Para 4.3.1 & 4.3.2.	**4-19**
29	The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.	Proponent is not operating any other garnet mines in the state.	**-**
30	If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines,	This is a proposed quarry. No mining activities have been carried out in this lease area.	**-**

	i) What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines? ii) Quantity of minerals mined out. iii) Highest production achieved in any one year iv) Detail of approved depth of mining. v) Actual depth of the mining achie\ ed earlier. vi) Name of the person already mined in that leases area. vii) If EC and CTO already obtained, the copy of the same shall be submitted. viii) Whether the mining was carried out as per the approved mine plan (or EC if issued).		
31	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/Topo sheet, topographic sheet. geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	Project coordinates superimposed in satellite imagery and given as Figure No - 2.4 to 286 in Chapter – II. The 10km Radius Index plan showing buffer zone is given in Figure No.3.1 in Chapter – III.	**2-5**
32	The Proponent shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,	Agreed	**-**
33	The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	Site photographs have been provided in Chapter-II.	**2-8**
34	The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity. proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.	• The details of geological and mineable reserves are provided in para 2.6, Chapter-II. • The production schedule during the plan period is provided in Table 2.3, Chapter-II. • The working methodology is detailed under Section 2.6, Chapter-II. Anticipated impacts of mining operations on surrounding environment is provided under Chapter-IV.	**2-26**
35	The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.	The organization chart is provided as Figure No.10.1, Chapter-X.	**10-2**
36	The Project Proponent shall conduct the hydro-	Hydrogeological Study is detailed under	**3-53**

	geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.	Section 3.6, Chapter-III.	
37	The Proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.	The baseline data on micro- meteorology, ambient air quality, Water quality, noise level, soil and flora & fauna are collected during Post monsoon Season 2024 (October 2024 to December 2024) and detailed in Section 3.3 to 3.5 of Chapter-III. The details of Traffic is provided under Section 4.9, Chapter-IV.	**3-1**
38	The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health. biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	• The details of the quarries located within the 500m radius of the project is given vide Annexure-4A. • A cumulative impact study has been carried out and furnished in Para 7.3, Chapter-VII. Environmental Management Plan is provided under Chapter-X.	**A267** **7-2**
39	Rain water harvesting management with recharging details along with water balance (bothmonsoon & non-monsoon) be submitted.	• Mining in PWD eri itself is expected to augment the water holding capacity of the eri and also act as RWH measure. Additionally, clearing of other area from bushes and peripheral plantation in bunds will be carried out in consultation with authorities.	**-**
40	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies. human settlements and other ecological features should be indicated. Land use plan of the mine lease area should he prepared to encompass preoperational. operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	• The land use of the study area was studied to demarcate various LULC categories and its details are provided under section 3.4, Chapter-III. • The land use pattern at present and at the end of the quarrying period has been provided under section 4.5, Chapter-IV. The post mining land use has been provided in Table No. 4.12.	**4-21**
41	Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so	Not applicable	**-**

	required, clearance certifications from the prescribed Authorities. such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.		
42	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Replied in sl no 38 above	-
43	A tree survey study shall be carried out (nos., name of the species, age, diameter etc..) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	An ecological survey of the study area was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. Details are provided under section 3.5. Chapter-III.	**3-44**
44	A detailed mine closure plan for the proposed project shall be included in LIA/EMP report which should be site-specific.	Details of Mine Closure Plan is provided under section 7.5, Chapter-VII.	**7-7**
45	Public Hearing points raised and commitments of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project and to be submitted to SEIAA/SEAC with regard to the Office Memorandum of MoEF& CC accordingly.	This draft EIA/EMP report will be submitted for Public Hearing as per mandatory procedures through the District Collector and State Pollution Control Board officials after giving 30 days advance notice in two local newspapers about the scheduled date and time for conduct of the public hearing procedures. The opinions, concerns and objections of stakeholders will be recorded during the public hearing. All the public queries and the replies to the query by the project proponent and officials concerned will be recorded and incorporated in the Final EIA/EMP report for approval by SEIAA, Tamil Nadu.	**7-1**
46	The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.		-
47	The Proponent shall produce/display the EIA report, Executive summery and other related information with respect to public hearing in Tamil Language also.	Agreed	-
48	As a part of the study of flora and fauna around the vicinity of the proposed site. the [IA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.	An ecological survey of the study area was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. Details are provided under section 3.5.1, Chapter-III.	**3-44**
49	The purpose of Greenbelt around the project is to capture the fugitive emissions. carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the		-

	Appendix-I in consultation with the DFO. & Tamil Nadu Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.	Agreed	
50	Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner	Agreed	**-**
51	A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	The disaster management plan has been provided under section 7.4, Chapter-VII.	**7-6**
52	A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	Various risks likely to arise due to mining activities are detailed under section 7.4, Chapter-VII.	**7-6**
53	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Details of occupational health and safety aspects are given under the subsections of Para 4.8, Chapter-IV.	**4-25**
55	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	Replied in sl no 19 above	**-**
55	The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	Nearby villages were visited for conducting study to know about socio-economic conditions, including aspirations and requirements of the people for a better living and collected relevant data. The details are provided under section 3.2.3, Chapter-III	**3-12**
56	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	PP informed that there is no litigation pending against the project.	**-**
57	Benefits of the Project if the Project is	• Project benefits are given in Chapter –	**4-24**

	implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	VIII. By means of carrying out the socio-economic development activities, local community development is expected. Towards the same, the proponent has planned to allocate Rs.10 Lakhs for various activities under CER for all the 5 leases together. From the CER activities allocated for various social welfare activities, the villages near the lease area will be benefited.	
58	If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC. Regional Office, Chennai (or) the concerned DEE/TNPCB.	This is a proposed quarry. As such no mining activities have been carried out in this lease area.	-
59	The Proponent shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.	EMP is prepared for the entire life of the mine. Affidavit will be provided along with the final EIA/ EMP report.	-
60	Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.	Agreed	-
SEAC & normal conditions in addition Annexure 13" of this minutes:			
1	The analysis of the minerals of Garnet to be mined out from the mining lease area shall be carried out by the competent authority before conducting EIA study and the proponent shall ensure that the threshold value 0.00% monazite in heavy minerals, irrespective of monazite grade as per the Atomic minerals concession rules 2016 issued by ministry of mines notification dated 20.02.2019.	Government of India, Ministry of Mines in consultation with the Department of Atomic Energy (DAE) and the Indian Bureu of Mines (IBM) has clarified the AMCR, 2016 and Government of India, Ministry of Mines Order dated 01.03.2019 are not applicable to the 11 mining leases granted for mining Garnet in Tiruchirapalli District and 2 mining leases granted for mining Garnet in Madurai District. G.O. obtained from Industries, Investment Promotion and Commerce (MMD.1) Department given in Annexure – 6A.	**A281**
2	The proponent shall furnish the scientific proof to ensure the non-hazardous nature of the waste generated from the mineral pre-concentrated plant since the said waste proposed to dump into the mined-out void. In this connection proponent has to detailed plan bring back the nonhazardous nature of the waste generated from the mineral pre-	ROM Material is inert and non hazardous comprising (10% garnet and 90% silica, clay and silt). Garnet is separated by magnetic separation without any chemical process. Remaining non hazardous and inert ROM will be backfilled. As such no hazardous material is involved. Chemical anaylysis report of the material is given	**A281**

	concentrated plant to the mined-out area.	Approved Review of Mining plan.Annexure – 6A.	
3	The detailed mine closure plan shall he furnished.	Details of Mine Closure Plan is provided under section 7.5, Chapter-VII.	**7.7**
4	The proponent has to conduct cumulative EIA report considering the other four adjacent proposed mining quarries with Separate EMP plan for the proposed individual quarrying operations.	• The details of the quarries located within the 500m radius of the project is given vide Annexure-4A. • A cumulative impact study has been carried out and furnished in Para 7.3, Chapter-VII. Environmental Management Plan is provided under Chapter-X.	**A267** **7-2**
A. STANDARD TERMS OF REFERENCE			
1	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.	This is a proposed quarry. As such no mining activities have been carried out in this lease area.	**2-28**
2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	Lease document is already executed and given in Anneuxre – 2A	**A45**
3	All documents including approved mine plan. EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	The production capacity, quantity of waste, its management and mining technology in mine plan and EIA, etc., are compatible with one another.	**--**
4	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	• Project coordinates superimposed in satellite imagery and given as Figure No - 2.4 to 2.8 in Chapter – II. The 10km Radius Index plan showing buffer zone is given in Figure No.3.1 in Chapter – III.	**2-5** **3-3**
5	Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	Study area map based on Survey of India Topo sheet is given as Figure – 3.1	**--**
6	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	Not Applicable	**--**
7	It should be clearly stated whether the	• The proponent will frame a well-planned	**10-1**

	proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.	environmental policy. Its details are provided under Section 10.2.1, Chapter-X. The Mines Manager will undertake effective monitoring and implementation of various environmental control measures promptly and effectively and to oversee various environmental management schemes for air quality control, water quality status, noise level control, plantation programme, social development schemes, etc in the mine. The organizational chart for the same has been provided in Figure No.10.1, Chapter-X.	
8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	• Various risks likely to arise due to mining activities are detailed under section 7.4, Chapter-VII. This being an shallow opencast mine, subsidence is not applicable. No drilling and blasting involved.	**7-6**
9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.	The study area chosen for collecting existing environmental status covers 10 km radial distance from the project periphery (Figure No - 3.1). Data given in the report is for the life of the mine.	**3-3**
10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	• The land use of the study area was studied to demarcate various LULC categories and its details are provided under section 3.4, Chapter-III. • The land use pattern at present and at the end of the quarrying period has been provided under section 4.5, Chapter-IV. The land use during the post mining stage is provided in Table 4.12, Chapter-IV.	**3-35** **4-23**
11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.	There are no OB dumps outside the lease area.	**--**
12	Certificate from the Competent Authority in the State Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the	There is no forest land in the lease area.	**--**

	Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.		
13	Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	There is no forest land in the lease area.	**--**
14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not Applicable	**--**
15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	There are no reserved or protected forests within the buffer zone.	**3-4**
16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.	The mining lease area and the 10 km buffer zone from the periphery of the core zone is devoid of declared ecologically sensitive features like national parks, biospheres, sanctuaries, etc.	**3-4**
17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	Replied in Standard ToR point No.16	**--**
18	A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for	A detailed study of flora and fauna composition in the core and buffer zone of the project has been made through primary field surveys. The details are furnished in para 3.5, Chapter III.	**3-44**

	implementing the same should be made as part of the project cost.		
19	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable	--
20	Similarly, for coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not Applicable	--
21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmers prepared and submitted accordingly, integrating the sectoral programmers of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.	The mining activities will be carried out within the mine lease area only. The entire mine lease area is Government poramboke eri land. Hence, the question of R& R does not arise.	**7-6**
22	One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)} primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind	• The baseline data on micro- meteorology, ambient air quality, Water quality, noise level, soil and flora & fauna are collected during Post monsoon Season 2024 (October 2024 to December 2024) and detailed in Section 3.3 to 3.5 of Chapter-III. • Monitoring stations were selected taking into account, wind direction and location of sensitive receptors. Free silica composition in PM10 sample has been done and the values are found to be	**3-14** **3-36**

	direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM 10, particularly for free silica, should be given.	Below Detectable Limit (DL 0.05mg/m3) which is well within the prescribed limit of 5mg/m3.	
23	Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	• Air quality modeling details are furnished in para 4.2.3 and its continuous sub paras in Chapter-IV of EIA report. • The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model developed by Lakes Environmental Software which is based on steady state Gaussian plume dispersion. • The model simulations are done for the air pollutant arising from the mining operations, namely, PM10, PM2.5. Ground Level Concentration (GLC) have been computed using hourly meteorological data both for individual lease and cumulative basis. The Isopleths of PM10, PM2.5 concentrations for with control measures scenario have also been drawn and these are given in Figure No.4.1 and 4.12.	**4-3**
24	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.	Total water requirement for all the 5 leases is 8cu.m, Domestic – 2.0 cu.m, Dust suppression and Afforestation – 6.0 cu.m. Required water will be procured from outside.	**4-19**
25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Not Applicable	**--**
26	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Mining in PWD eri itself is expected to augment the water holding capacity of the eri and also act as RWH measure. Additionally, clearing of other area from bushes and peripheral plantation in bunds will be carried out in consultation with authorities.	**4-19**
27	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	Details are given in Para 4.3.1. chapter - IV	**4-19**
28	Based on actual monitored data. it may clearly be shown whether working will intersect groundwater. Necessary data and	Not applicable	**-**

	documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.		
29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	Replied above in Standard ToR point No.27	--
30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.	Not applicable	-
31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	Since mining operation will be carried out within the eri poramboke land , it is proposed to carryout at least 1000 nos of tree plantation in the peripheral eri bund, approach road from the eri periphery to the proposed beneficiation plant area, community plantation in the available lands in the nearby villages in consultation with the panchayat heads and Government officials. Local native species like palm, neem, pungai, vagai, puli, etc will be planted and well maintained during the lease period.	-
32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.	Since the production is less, the overall transport from all the 5 leases in the Governement poramboke land is just 7 trips per hour only. Existing road can easily absorb this traffic. Details are provided under Para 4.9, Chapter-IV.	**4-26**
33	Details of the onsite shelter and facilities to be provided to the mine workers should be	This is a proposed project. Site services like mine office, first aid room, rest shelters,	**2-40**

	included in the EIA Report.	toilets etc. will be provided as semi-permanent structures.	
34	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	Out of 2.00 m of depth of mining , since the mineral recovery is just 10% of the ROM material removed, the entire 0.50m Top clayey soil + 90% of the reject material will be used for backfilling the mined out area and ultimately the entire lease area will brough back to premining condition.	**2-25**
35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Details of occupational health and safety aspects are given under the subsections of Para 4.8, Chapter-IV.	**4-25**
36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	This being a small project with no significant impact, no health implications to the surrounding public envisaged	**4-25**
37	Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	• Nearby villages were visited for conducting study to know about socio-economic conditions, including aspirations and requirements of the people for a better living and collected relevant data. The details are provided under section 3.2.3, Chapter-III • Project benefits are given in Chapter – VIII. • By means of carrying out the socio-economic development activities, local community development is expected. Towards the same, the proponent has planned to allocate Rs.10 Lakhs for various activities under CER for all the 5 leases together. From the CER activities allocated for various social welfare activities, the villages near the lease area will be benefited.	**3-12** **4-24**
38	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.	Detailed Environmental Management plan and its implementation, etc., are furnished in Chapter X.	**10-1**

39	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	This draft EIA/EMP report will be submitted for Public Hearing as per mandatory procedures through the District Collector and State Pollution Control Board officials after giving 30 days advance notice in two local newspapers about the scheduled date and time for conduct of the public hearing procedures. The opinions, concerns and objections of stakeholders will be recorded during the public hearing. All the public queries and the replies to the query by the project proponent and officials concerned will be recorded and incorporated in the EIA/EMP report for approval by SEIAA, Tamil Nadu.	**7-1**
40	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	PP informed that there is no litigation pending against the project.	**--**
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	The details of environmental management cost has been provided in Table 10.1, Chapter-X.	**10-6**
42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	The disaster management plan has been provided under section 7.3.1, Chapter-VII.	**7-4**
43	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Project benefits are given in Chapter – VIII.	**8-1**
44	Besides the above, the below mentioned general points are also to be followed:- a) Executive Summary of the EIA/EMP Report b) All documents to be properly referenced with index and continuous page numbering. c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated. d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the Original analysis/testing reports should be available during appraisal of the Project. e) Where the documents provided are in a language other than English, an English translation should be provided. f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted. g) While preparing the EIA report, the	Noted	**-**

	instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed. h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation. i) As per the circular no. J-11011/618/2010-1A.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable. ii) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.		

TERMS OF REFERENCE REPLY GO-69

TOR COMPLIANCE
TOR No :SEIAA-TN/F.No-6510/SEAC/1(a)/TOR-1490/2023 &
TOR Amendment No - TO25B0108TN5161343A

S.No	TOR Points	Reply	Pg.No
	A. ToR in Addition to Standard ToR		
1	The analysis of the minerals of Garnet to be mined out from the mining lease area shall be carried out by the competent authority before conducting EIA study and the proponent shall ensure that the threshold value 0.00% monazite in heavy minerals, irrespective of monazite grade as per the Atomic minerals concession rules 2016 issued by ministry of mines notification dated 20.02.2019.	Government of India, Ministry of Mines in consultation with the Department of Atomic Energy (DAE) and the Indian Bureu of Mines (IBM) has clarified the AMCR, 2016 and Government of India, Ministry of Mines Order dated 01.03.2019 are not applicable to the 11 mining leases granted for mining Garnet in Tiruchirapalli District and 2 mining leases granted for mining Garnet in Madurai District. G.O. obtained from Industries, Investment Promotion and Commerce (MMD.1) Department given in Annexure – 6B.	**A284**
2	The proponent shall furnish the scientific proof to ensure the non hazardous nature of the waste generated from the mineral pre-concentrated plant since the said waste proposed to dump into the mined out void. In this connection proponent has to detailed plan bring back the non hazardous nature of the waste generated from the mineral pre-concentrated plant to the mined out area.	ROM Material is inert and non hazardous comprising (10% garnet and 90% silica, clay and silt). Garnet is separated by magnetic separation without any chemical process. Remaining non hazardous and inert ROM will be backfilled. As such no hazardous material is involved. Chemical anaylysis report of the material is given Approved Review of Mining plan. Annexure – 6B.	**A284**
3	The detailed mine closure plan shall be furnished.	Details of Mine Closure Plan is provided under section 7.5, Chapter-VII.	**7-7**
4	The proponent has to conduct cumulative EIA report considering the other four adjacent proposed mining quarries with Separate EMP plan for the proposed individual quarrying operations.	• The details of the quarries located within the 500m radius of the project is given vide Annexure-4B. • A cumulative impact study has been carried out and furnished in Para 7.3, Chapter-VII. Environmental Management Plan is provided under Chapter-X.	**7-2**
5	The transportation methodology for the transportation of Garnet from the mining lease to the process area shall be furnished in detail and cumulative impact on Air pollution especially Fugitive emission needs to be carried out considering all the mining areas.	Since the production is less, the overall transport from all the 5 leases in the Governement poramboke land is just 7 trips per hour only. Existing road can easily absorb this traffic. Details are provided under Para 4.9, Chapter-IV.	**4-26**
6	The proponent shall furnish the detailed CER plan with budget allocation incorporating the needs of the nearby public and also points raised in the public hearing as per the Office Memorandum of MoEF & CC dated 01.05.2018.	By means of carrying out the socio-economic development activities, local community development is expected. Towards the same, the proponent has planned to allocate Rs.10 Lakhs for various activities under CER for all the 5 leases together. From the CER activities allocated	4-24

		for various social welfare activities, the villages near the lease area will be benefited.	
7	The PP shall furnish a copy of the document in support of the fact that the proponent is the rightful lessee of the mine.	Lease document is already executed and given in Anneuxre -2B	**A90**
8	The PP shall furnish Copy of approved Mining Plan /Scheme of mining plan by the competent authority during the time of EIA appraisal.	Review of mining plan for the period 2023 - 2024 to 2027-2028 Approved by IBM and letter given in Annexure – 3B	**A259**
9	The PP shall furnish an affidavit that mining, plan approved by AMD used for Public Hearing and the Mining Plan approved by the Competent Authority (IBM/DGM) are the same.	Recently approved Review of mining plan is used for preparation of draft EIA/ EMP report. Affidavit in this regard will be submitted in the Final EIA/ EMP report	**-**
10	The PP shall evaluate the environmental aspects and their possible associated impacts that would arise due to the proposed Garnet sand mining and mineral separation and to work out environmental monitoring programme to prevent, control. minimise or eliminate the adverse environmental impacts envisaged from the proposed garnet mining and mineral separation.	Ensured	**-**
11	The PP shall provide all documents including approved mine plan/ approved scheme of mining, EIA and public hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management and mining technology and should be in the name of the lessee.	The production capacity, quantity of waste, its management and mining technology in mine plan and EIA, etc., are compatible with one another.	**-**
12	The PP shall provide all corner coordinates of the mine lease area superimposed on a high Resolution Imagery/ toposheet. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and the buffer zone).	• Project coordinates superimposed in satellite imagery and given as Figure No - 2.4 to 2.8 in Chapter – II.	**2-5**
13	The PP shall indicate the level of Impact on local transport infrastructure due to project. Projected increase in truck traffic as a result of project in the present road network (including those outside the project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as state government) should be covered.	• Since the production is less, the overall transport from all the 5 leases in the Governement poramboke land is just 7 trips per hour only. Existing road can easily absorb this traffic. Details are provided under Para 4.9, Chapter-IV.	**4-26**
14	The PP shall furnish a letter from VAO stating details of structures & habitations located	VAO Letter will be submitted in Final EMP Report	**-**

	within 300m from the boundary of the project site.		
15	The structures within the radius of (i) 100 m, (ii) 300 in, and (iii) 500 m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc.	The details of features within 500m radius is provided in **Table 2.4, Chapter-II.**	**2-40**
16	The PP shall submit a report on replenishment of Garnet sand (or) its geological formation as indicated in the DSR.	Geology details are given in Para 2.4, Chapter – II.	**2-11**
17	The PP shall furnish the details of the tank, depth of desiltation, extent of the tank and Ownership of the tanks, details of cultivation, distance from the site, etc, within 1 km radius around the proposed mining area from the Govt records.	Kottathur eri covers an area of 102.43 ha with the aiyacut of 94.34 ha mostly in the downstream side. Rainwater from the upstream side originating near the lease area on the north west side from pagalavadi RF and northern side during the monsoon season flows through this eri. . Due to elevation difference, this water drains immediately on the down stream south eastern side and further connected to Uppu odai . This eri acts more of a passage of rainwater.	**3-53**
18	The PP shall furnish Copy of the NoC obtained from PWD/WRD-TN for the proposed mining activity.	NOC from PWD department is obtained and given **as Annexure – 5A**	**A277**
19	The PP carry out the geological assessment to identify mineralization, to establish continuity, quality and quantity of mineral deposit. particularly, the presence of Atomic minerals in the Garnet sand. Hence the PP shall furnish the report through the systematic sampling in the proposed site with showing geological coordinates as per the procedures laid in accordance with the provisions of Atomic Minerals Concessional Rules, 2016 and the mineralogical analysis obtained from the laboratory of IREL (India) Limited, Research Centre, Beach Road. Kollam, Kerala.	Government of India, Ministry of Mines in consultation with the Department of Atomic Energy (DAE) and the Indian Bureu of Mines (IBM) has clarified the AMCR, 2016 and Government of India, Ministry of Mines Order dated 01.03.2019 are not applicable to the 11 mining leases granted for mining Garnet in Tiruchirapalli District and 2 mining leases granted for mining Garnet in Madurai District. **G**.O. obtained from Industries, Investment Promotion and Commerce (MMD.1) Department given in Annexure – 6B	**A284**
20	Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside/inside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues. if any, should be provided.	Since the recovery of ROM is expected to be 10%, the balance 90% reject from the processing plant will be transported back and backfilled in the mined out area. Top soil will be spread over the backfilled area and the mined out pit will be restored back to primining condition.	**2-25**
21	The study area will comprise of 10km zone around the mine lease from lease periphery and the data contained in EIA such as waste generation etc. should be for the life of the mine / lease period.	The study area chosen for collecting existing environmental status covers 10 km radial distance from the project periphery (Figure No - 3.2). Data given in the report is for the life of the mine.	**3-3**

22	The PP shall indicate the land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features. Land use plan of the mine lease area should be prepared to encompass pre-operational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	• The land use of the study area was studied to demarcate various LULC categories and its details are provided under section 3.4, Chapter-III. • The land use pattern at present and at the end of the quarrying period has been provided under section 4.5.1, Chapter-IV. The post mining land use has been provided in Table No. 4.12.	**3-35** **4-21**
23	The PP shall indicate the details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.	This is a proposed project. Site services like mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.	**2-40**
24	The PP shall anticipate the Occupational and health impacts of the project and accordingly the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP.	Details of occupational health and safety aspects are given under the subsections of Para 4.8, Chapter-IV.	**4-25**
25	The PP shall evaluate the Public health implications of the project and related activities for the population in the impact zone systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	This being a small project with no significant impact, no health implications to the surrounding public envisaged.	**-**
26	The PP shall provide the measures of socio-economic significance and influence to the local community. As far as possible, quantitative dimensions may be given with the time frames for implementation.	Nearby villages were visited for conducting study to know about socio-economic conditions, including aspirations and requirements of the people for a better living and collected relevant data. The details are provided under section 3.2.3, Chapter-III.	**3-12**
27	The PP shall disclose the details of litigation / violation case pending against the project (or) the PP pertaining to this mining proposal, if any, with the direction/order passed by any court of law against the project proposal in the past or now.	PP informed that there is no litigation pending against the project.	**-**
28	Proponent shall furnish the letter received from DFO concerned stating the proximity details of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.	There area no Protected Areas, Sanctuaries, Tiger reserve etc with in 10 km radius	**3-4**
29	Detailed study report on flora and fauna in and nearby the quarry site.	A detailed study of flora and fauna composition in the core and buffer zone of the project has been made through primary field surveys. The details are furnished in para 3.5, Chapter III.	**3-44**
30	The Proponent shall develop greenbelt and garland drain around the boundary of the	Site photographs are provided in **Photo**	**2-8**

	proposed quarry and the photographs indicating the same shall be shown during the EIA appraisal.	**Figure No.2.9, Chapter-II.**	
31	The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.	A detailed study of flora and fauna composition in the core and buffer zone of the project has been made through primary field surveys by NABET approved Ecologist. The details are furnished in para 3.5, Chapter III.	**3-44**
32	The PP shall carry out the air-quality monitoring for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of minerals. The details of the model used and the input parameters used for modelling should be provided. The air quality contours may be plotted on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	• Air quality modeling details are furnished in para 4.2.3 and its continuous sub paras in Chapter-IV of EIA report. • The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model developed by Lakes Environmental Software which is based on steady state Gaussian plume dispersion. • The model simulations are done for the air pollutant arising from the mining operations, namely, PM10, PM2.5. Ground Level Concentration (GLC) have been computed using hourly meteorological data both for individual lease and cumulative basis. The Isopleths of PM10, PM2.5 concentrations for with control measures scenario have also been drawn and these are given in Figure No.4.1 and 4.12.	**4-3**
33	The PP shall furnish the water requirement for the project, its availability and source. A detailed water balance should also be provided. Fresh water requirement for the project should be indicated.	Total water requirement for all the 5 leases is 8cu.m, Domestic – 2.0 cu.m, Dust suppression and Afforestation – 6.0 cu.m. Required water will be procured from outside.	**4-19**
34	The PP shall assess the impact of project on water quality, both surface and groundwater and necessary safeguard measures, if any required, should be provided.	Details are given in Para 4.3.1 & 4.3.2.	**4-19**
35	The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.	Proponent is not operating any other garnet mines in the state.	**-**
36	If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines, i) What was the period of the operation and	This is a proposed quarry. No mining activities have been carried out in this lease area.	**-**

	stoppage of the earlier mines with last work permit issued by the AD/DD mines? ii) Quantity of minerals mined out. iii) Highest production achieved in any one year iv) Detail of approved depth of mining. v) Actual depth of the mining achieved earlier. vi) Name of the person already mined in that leases area. vii) If EC and CTO already obtained, the copy of the same shall be submitted. viii) Whether the mining was carried out as per the approved mine plan (or EC if issued).		
37	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	Project coordinates superimposed in satellite imagery and given as Figure No - 2.4 to 286 in Chapter – II. The 10km Radius Index plan showing buffer zone is given in Figure No.3.1 in Chapter – III.	**2-5**
38	The Proponent shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,	Agreed	**-**
39	The proponent shall furnish photographs of adequate fencing. green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & eater bodies nearby provided as per the approved mining plan.	Site photographs have been provided in Chapter-II.	**2-8**
40	The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.	• The details of geological and mineable reserves are provided in para 2.6, Chapter-II. • The production schedule during the plan period is provided in Table 2.3, Chapter-II. • The working methodology is detailed under Section 2.6, Chapter-II. Anticipated impacts of mining operations on surrounding environment is provided under Chapter-IV.	**2-26**
41	The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.	The organization chart is provided as Figure No.10.1, Chapter-X.	**10-2**
42	The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water	Hydrogeological Study is detailed under Section 3.6, Chapter-III.	**3-53**

	bodies such as rivers, tanks, canals. ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data. it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.		
43	The Proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.	The baseline data on micro- meteorology, ambient air quality, Water quality, noise level, soil and flora & fauna are collected during Post monsoon Season 2024 (October 2024 to December 2024) and detailed in Section 3.3 to 3.5 of Chapter-III. The details of Traffic is provided under Section 4.9, Chapter-IV.	**3-1**
44	The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	• The details of the quarries located within the 500m radius of the project is given vide Annexure-4B. • A cumulative impact study has been carried out and furnished in Para 7.3, Chapter-VII. Environmental Management Plan is provided under Chapter-X.	**A269** **7-2**
45	Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	• Mining in PWD eri itself is expected to augment the water holding capacity of the eri and also act as RWH measure. Additionally, clearing of other area from bushes and peripheral plantation in bunds will be carried out in consultation with authorities.	**-**
46	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational. operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	• The land use of the study area was studied to demarcate various LULC categories and its details are provided under section 3.4, Chapter-III. • The land use pattern at present and at the end of the quarrying period has been provided under section 4.5, Chapter-IV. The post mining land use has been provided in Table No. 4.12.	**4-21**
47	Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining	Not applicable	**-**

	activities could be considered.		
48	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Replied in sl no 38 above	**-**
49	A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	An ecological survey of the study area was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. Details are provided under section 3.5. Chapter-III.	**3-44**
50	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	Details of Mine Closure Plan is provided under section 7.5, Chapter-VII.	**7-7**
51	Public Hearing points raised and commitments of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project and to be submitted to SEIAA/SEAC with regard to the Office Memorandum of MoEF& CC accordingly.	This draft EIA/EMP report will be submitted for Public Hearing as per mandatory procedures through the District Collector and State Pollution Control Board officials after giving 30 days advance notice in two local newspapers about the scheduled date and time for conduct of the public hearing procedures. The opinions, concerns and objections of stakeholders will be recorded during the public hearing. All the public queries and the replies to the query by the project proponent and officials concerned will be recorded and incorporated in the Final EIA/EMP report for approval by SEIAA, Tamil Nadu.	**7-1**
52	The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.		**-**
53	The Proponent shall produce/display the EIA report, Executive summary and other related information with respect to public hearing in Tamil Language also.	Agreed	**-**
54	As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.	An ecological survey of the study area was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. Details are provided under section 3.5.1, Chapter-III.	**3-44**
55	The purpose of Greenbelt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the Appendix-I in consultation with the DFO, & Tamil Nadu Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs	Agreed	**-**

	should be planted in a mixed manner.		
56	Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner	Agreed	**-**
57	A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	The disaster management plan has been provided under section 7.4, Chapter-VII.	**7-6**
58	A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	Various risks likely to arise due to mining activities are detailed under section 7.4, Chapter-VII.	**7-6**
59	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Details of occupational health and safety aspects are given under the subsections of Para 4.8, Chapter-IV.	**4-25**
60	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	Replied in sl no 19 above	**-**
61	The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	Nearby villages were visited for conducting study to know about socio-economic conditions, including aspirations and requirements of the people for a better living and collected relevant data. The details are provided under section 3.2.3, Chapter-III	**3-12**
62	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	PP informed that there is no litigation pending against the project.	**-**
63	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential. etc.	• Project benefits are given in Chapter – VIII. By means of carrying out the socio-economic development activities, local community development is expected. Towards the same, the proponent has	**4-24**

		planned to allocate Rs.10 Lakhs for various activities under CER for all the 5 leases together. From the CER activities allocated for various social welfare activities, the villages near the lease area will be benefited.	
64	If any quarrying operations were carried out in the proposed quarrying, site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.	This is a proposed quarry. As such no mining activities have been carried out in this lease area.	**-**
65	The Proponent shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.	EMP is prepared for the entire life of the mine. Affidavit will be provided along with the final EIA/ EMP report.	**-**
66	Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.	Agreed	**-**
A. STANDARD TERMS OF REFERENCE			
1	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.	This is a proposed quarry. As such no mining activities have been carried out in this lease area.	**2-28**
2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	Lease document is already executed and given in Anneuxre – 2A	**A45**
3	All documents including approved mine plan. EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	The production capacity, quantity of waste, its management and mining technology in mine plan and EIA, etc., are compatible with one another.	**--**
4	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	• Project coordinates superimposed in satellite imagery and given as Figure No - 2.4 to 2.8 in Chapter – II. The 10km Radius Index plan showing buffer zone is given in Figure No.3.1 in Chapter – III.	**2-5** **3-3**
5	Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of	Study area map based on Survey of India Topo sheet is given as Figure – 3.1	**--**

	land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.		
6	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	Not Applicable	--
7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.	• The proponent will frame a well-planned environmental policy. Its details are provided under Section 10.2.1, Chapter-X. The Mines Manager will undertake effective monitoring and implementation of various environmental control measures promptly and effectively and to oversee various environmental management schemes for air quality control, water quality status, noise level control, plantation programme, social development schemes, etc in the mine. The organizational chart for the same has been provided in Figure No.10.1, Chapter-X.	**10-1**
8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	• Various risks likely to arise due to mining activities are detailed under section 7.4, Chapter-VII. This being an shallow opencast mine, subsidence is not applicable. No drilling and blasting involved.	**7-6**
9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.	The study area chosen for collecting existing environmental status covers 10 km radial distance from the project periphery (Figure No - 3.1). Data given in the report is for the life of the mine.	**3-3**
10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	• The land use of the study area was studied to demarcate various LULC categories and its details are provided under section 3.4, Chapter-III. • The land use pattern at present and at the end of the quarrying period has been provided under section 4.5, Chapter-IV. The land use during the post mining stage is provided in Table 4.12, Chapter-IV.	**3-35** **4-23**
11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land	There are no OB dumps outside the lease area.	--

	area, distance from mine lease, its land use, R&R issues, if any, should be given.		
12	Certificate from the Competent Authority in the State Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	There is no forest land in the lease area.	--
13	Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	There is no forest land in the lease area.	--
14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not Applicable	--
15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	There are no reserved or protected forests within the buffer zone.	**3-4**
16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.	The mining lease area and the 10 km buffer zone from the periphery of the core zone is devoid of declared ecologically sensitive features like national parks, biospheres, sanctuaries, etc.	**3-4**
17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	Replied in Standard ToR point No.16	--
18	A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried	A detailed study of flora and fauna composition in the core and buffer zone of the project has been made through primary	**3-44**

	out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	field surveys. The details are furnished in para 3.5, Chapter III.	
19	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable	--
20	Similarly, for coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not Applicable	--
21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmers prepared and submitted accordingly, integrating the sectoral programmers of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.	The mining activities will be carried out within the mine lease area only. The entire mine lease area is Government poramboke eri land. Hence, the question of R& R does not arise.	**7-6**
22	One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter	• The baseline data on micro- meteorology, ambient air quality, Water quality, noise	

	season)} primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM 10, particularly for free silica, should be given.	level, soil and flora & fauna are collected during Post monsoon Season 2024 (October 2024 to December 2024) and detailed in Section 3.3 to 3.5 of Chapter-III. • Monitoring stations were selected taking into account, wind direction and location of sensitive receptors. Free silica composition in PM10 sample has been done and the values are found to be Below Detectable Limit (DL 0.05mg/m3) which is well within the prescribed limit of 5mg/m3.	**3-14** **3-36**
23	Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	• Air quality modeling details are furnished in para 4.2.3 and its continuous sub paras in Chapter-IV of EIA report. • The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model developed by Lakes Environmental Software which is based on steady state Gaussian plume dispersion. • The model simulations are done for the air pollutant arising from the mining operations, namely, PM10, PM2.5. Ground Level Concentration (GLC) have been computed using hourly meteorological data both for individual lease and cumulative basis. The Isopleths of PM10, PM2.5 concentrations for with control measures scenario have also been drawn and these are given in Figure No.4.1 and 4.12.	**4-3**
24	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.	Total water requirement for all the 5 leases is 8cu.m, Domestic – 2.0 cu.m, Dust suppression and Afforestation – 6.0 cu.m. Required water will be procured from outside.	**4-19**
25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Not Applicable	**--**
26	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be	Mining in PWD eri itself is expected to augment the water holding capacity of the eri and also act as RWH measure. Additionally, clearing of other area from	**4-19**

	provided.	bushes and peripheral plantation in bunds will be carried out in consultation with authorities.	
27	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	Details are given in Para 4.3.1. chapter - IV	**4-19**
28	Based on actual monitored data. it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.	Not applicable	**-**
29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	Replied above in Standard ToR point No.27	**--**
30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.	Not applicable	**-**
31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	Since mining operation will be carried out within the eri poramboke land , it is proposed to carryout at least 1000 nos of tree plantation in the peripheral eri bund, approach road from the eri periphery to the proposed beneficiation plant area, community plantation in the available lands in the nearby villages in consultation with the panchayat heads and Government officials. Local native species like palm, neem, pungai, vagai, puli, etc will be planted and well maintained during the lease period.	**-**

32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.	Since the production is less, the overall transport from all the 5 leases in the Governement poramboke land is just 7 trips per hour only. Existing road can easily absorb this traffic. Details are provided under Para 4.9, Chapter-IV.	**4-26**
33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	This is a proposed project. Site services like mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.	**2-40**
34	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	Out of 2.00 m of depth of mining , since the mineral recovery is just 10% of the ROM material removed, the entire 0.50m Top clayey soil + 90% of the reject material will be used for backfilling the mined out area and ultimately the entire lease area will brough back to premining condition.	**2-25**
35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Details of occupational health and safety aspects are given under the subsections of Para 4.8, Chapter-IV.	**4-25**
36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	This being a small project with no significant impact, no health implications to the surrounding public envisaged	**4-25**
37	Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	• Nearby villages were visited for conducting study to know about socio-economic conditions, including aspirations and requirements of the people for a better living and collected relevant data. The details are provided under section 3.2.3, Chapter-III • Project benefits are given in Chapter – VIII. • By means of carrying out the socio-economic development activities, local community development is expected. Towards the same, the	**3-12** **4-24**

		proponent has planned to allocate Rs.10 Lakhs for various activities under CER for all the 5 leases together. From the CER activities allocated for various social welfare activities, the villages near the lease area will be benefited.	
38	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.	Detailed Environmental Management plan and its implementation, etc., are furnished in Chapter X.	**10-1**
39	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	This draft EIA/EMP report will be submitted for Public Hearing as per mandatory procedures through the District Collector and State Pollution Control Board officials after giving 30 days advance notice in two local newspapers about the scheduled date and time for conduct of the public hearing procedures. The opinions, concerns and objections of stakeholders will be recorded during the public hearing. All the public queries and the replies to the query by the project proponent and officials concerned will be recorded and incorporated in the EIA/EMP report for approval by SEIAA, Tamil Nadu.	**7-1**
40	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	PP informed that there is no litigation pending against the project.	**--**
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	The details of environmental management cost has been provided in Table 10.1, Chapter-X.	**10-6**
42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	The disaster management plan has been provided under section 7.3.1, Chapter-VII.	**7-4**
43	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Project benefits are given in Chapter – VIII.	**8-1**
44	Besides the above, the below mentioned general points are also to be followed:- a) Executive Summary of the EIA/EMP Report b) All documents to be properly referenced with index and continuous page numbering. c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.	**Noted**	-

	d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the Original analysis/testing reports should be available during appraisal of the Project. e) Where the documents provided are in a language other than English, an English translation should be provided. f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted. g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed. h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation. i) As per the circular no. J-11011/618/2010-1A.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable. ii) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.		

TERMS OF REFERENCE
REPLY
GO-70

TOR COMPLIANCE
TOR No :SEIAA-TN/F.No-6511/SEAC/1(a)/TOR-1478/2023 &
TOR Amendment No - TO25B0108TN5980789A

S.No	TOR Points	Reply	Pg.No
	A. ToR in Addition to Standard ToR		
1	The analysis of the minerals of Garnet to be mined out from the mining lease area shall be carried out by the competent authority before conducting EIA study and the proponent shall ensure that the threshold value 0.00% monazite in heavy minerals, irrespective of monazite grade as per the Atomic minerals concession rules 2016 issued by ministry of mines notification dated 20.02.2019.	Government of India, Ministry of Mines in consultation with the Department of Atomic Energy (DAE) and the Indian Bureu of Mines (IBM) has clarified the AMCR, 2016 and Government of India, Ministry of Mines Order dated 01.03.2019 are not applicable to the 11 mining leases granted for mining Garnet in Tiruchirapalli District and 2 mining leases granted for mining Garnet in Madurai District. G.O. obtained from Industries, Investment Promotion and Commerce (MMD.1) Department given in Annexure – 6C.	**A287**
2	The proponent shall furnish the scientific proof to ensure the non hazardous nature of the waste generated from the mineral pre-concentrated plant since the said waste proposed to dump into the mined out void. In this connection proponent has to detailed plan bring back the non hazardous nature of the waste generated from the mineral pre-concentrated plant to the mined out area.	ROM Material is inert and non hazardous comprising (10% garnet and 90% silica, clay and silt). Garnet is separated by magnetic separation without any chemical process. Remaining non hazardous and inert ROM will be backfilled. As such no hazardous material is involved. Chemical anaylysis report of the material is given Approved Review of Mining plan. Annexure – 6C.	**A287**
3	The detailed mine closure plan shall be furnished.	Details of Mine Closure Plan is provided under section 7.5, Chapter-VII.	**7-7**
4	The proponent has to conduct cumulative EIA report considering the other four adjacent proposed mining quarries with Separate EMP plan for the proposed individual quarrying operations.	• The details of the quarries located within the 500m radius of the project is given vide Annexure-4C. • A cumulative impact study has been carried out and furnished in Para 7.6, Chapter-VII. Environmental Management Plan is provided under Chapter-X.	**A271** **7-2**
5	The transportation methodology for the transportation of Garnet from the mining lease to the process area shall be furnished in detail and cumulative impact on Air pollution especially Fugitive emission needs to be carried out considering all the mining areas.	Since the production is less, the overall transport from all the 5 leases in the Governement poramboke land is just 7 trips per hour only. Existing road can easily absorb this traffic. Details are provided under Para 4.9, Chapter-IV.	**4-26**
6	The proponent shall furnish the detailed CER plan with budget allocation incorporating the needs of the nearby public and also points raised in the public hearing as per the Office Memorandum of MoEF & CC dated 01.05.2018.	By means of carrying out the socio-economic development activities, local community development is expected. Towards the same, the proponent has planned to allocate Rs.10 Lakhs for various activities under CER for all the 5 leases together. From the CER activities allocated	4-24

		for various social welfare activities, the villages near the lease area will be benefited.	
7	The PP shall furnish a copy of the document in support of the fact that the proponent is the rightful lessee of the mine.	Lease document is already executed and given in Anneuxre -2C	**A131**
8	The PP shall furnish Copy of approved Mining Plan /Scheme of mining plan by the competent authority during the time of EIA appraisal.	Review of mining plan for the period 2023 - 2024 to 2027-2028 Approved by IBM and letter given in Annexure – 3C	**A261**
9	The PP shall furnish an affidavit that mining, plan approved by AMD used for Public Hearing and the Mining Plan approved by the Competent Authority (IBM/DGM) are the same.	Recently approved Review of mining plan is used for preparation of draft EIA/ EMP report. Affidavit in this regard will be submitted in the Final EIA/ EMP report	**-**
10	The PP shall evaluate the environmental aspects and their possible associated impacts that would arise due to the proposed Garnet sand mining and mineral separation and to work out environmental monitoring programme to prevent, control. minimise or eliminate the adverse environmental impacts envisaged from the proposed garnet mining and mineral separation.	Ensured	**-**
11	The PP shall provide all documents including approved mine plan/ approved scheme of mining, EIA and public hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management and mining technology and should be in the name of the lessee.	The production capacity, quantity of waste, its management and mining technology in mine plan and EIA, etc., are compatible with one another.	**-**
12	The PP shall provide all corner coordinates of the mine lease area superimposed on a high Resolution Imagery/ toposheet. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and the buffer zone).	• Project coordinates superimposed in satellite imagery and given as Figure No - 2.4 to 2.8 in Chapter – II.	**2-5**
13	The PP shall indicate the level of Impact on local transport infrastructure due to project. Projected increase in truck traffic as a result of project in the present road network (including those outside the project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as state government) should be covered.	• Since the production is less, the overall transport from all the 5 leases in the Governement poramboke land is just 7 trips per hour only. Existing road can easily absorb this traffic. Details are provided under Para 4.9, Chapter-IV.	**4-26**
14	The PP shall furnish a letter from VAO stating details of structures & habitations located	VAO Letter will be submitted in Final EMP Report	**-**

	within 300m from the boundary of the project site.		
15	The structures within the radius of (i) 100 m, (ii) 300 in, and (iii) 500 m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc.	The details of features within 500m radius is provided in **Table 2.4, Chapter-II.**	**2-40**
16	The PP shall submit a report on replenishment of Garnet sand (or) its geological formation as indicated in the DSR.	Geology details are given in Para 2.4, Chapter – II.	**2-11**
17	The PP shall furnish the details of the tank, depth of desiltation, extent of the tank and Ownership of the tanks, details of cultivation, distance from the site, etc, within 1 km radius around the proposed mining area from the Govt records.	Kottathur eri covers an area of 102.43 ha with the aiyacut of 94.34 ha mostly in the downstream side. Rainwater from the upstream side originating near the lease area on the north west side from pagalavadi RF and northern side during the monsoon season flows through this eri. . Due to elevation difference, this water drains immediately on the down stream south eastern side and further connected to Uppu odai . This eri acts more of a passage of rainwater.	**3-53**
18	The PP shall furnish Copy of the NoC obtained from PWD/WRD-TN for the proposed mining activity.	NOC from PWD department is obtained and given **as Annexure – 5A**	**A277**
19	The PP carry out the geological assessment to identify mineralization, to establish continuity, quality and quantity of mineral deposit. particularly, the presence of Atomic minerals in the Garnet sand. Hence the PP shall furnish the report through the systematic sampling in the proposed site with showing geological coordinates as per the procedures laid in accordance with the provisions of Atomic Minerals Concessional Rules, 2016 and the mineralogical analysis obtained from the laboratory of IREL (India) Limited, Research Centre, Beach Road. Kollam, Kerala.	Government of India, Ministry of Mines in consultation with the Department of Atomic Energy (DAE) and the Indian Bureu of Mines (IBM) has clarified the AMCR, 2016 and Government of India, Ministry of Mines Order dated 01.03.2019 are not applicable to the 11 mining leases granted for mining Garnet in Tiruchirapalli District and 2 mining leases granted for mining Garnet in Madurai District. **G**.O. obtained from Industries, Investment Promotion and Commerce (MMD.1) Department given in Annexure – 6C	**A287**
20	Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside/inside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues. if any, should be provided.	Since the recovery of ROM is expected to be 10%, the balance 90% reject from the processing plant will be transported back and backfilled in the mined out area. Top soil will be spread over the backfilled area and the mined out pit will be restored back to primining condition.	**2-25**
21	The study area will comprise of 10km zone around the mine lease from lease periphery and the data contained in EIA such as waste generation etc. should be for the life of the mine / lease period.	The study area chosen for collecting existing environmental status covers 10 km radial distance from the project periphery (Figure No - 3.2). Data given in the report is for the life of the mine.	**3-3**

22	The PP shall indicate the land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features. Land use plan of the mine lease area should be prepared to encompass pre-operational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	• The land use of the study area was studied to demarcate various LULC categories and its details are provided under section 3.4, Chapter-III. • The land use pattern at present and at the end of the quarrying period has been provided under section 4.5.1, Chapter-IV. The post mining land use has been provided in Table No. 4.12.	**3-35** **4-21**
23	The PP shall indicate the details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.	This is a proposed project. Site services like mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.	**2-40**
24	The PP shall anticipate the Occupational and health impacts of the project and accordingly the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP.	Details of occupational health and safety aspects are given under the subsections of Para 4.8, Chapter-IV.	**4-25**
25	The PP shall evaluate the Public health implications of the project and related activities for the population in the impact zone systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	This being a small project with no significant impact, no health implications to the surrounding public envisaged.	**-**
26	The PP shall provide the measures of socio-economic significance and influence to the local community. As far as possible, quantitative dimensions may be given with the time frames for implementation.	Nearby villages were visited for conducting study to know about socio-economic conditions, including aspirations and requirements of the people for a better living and collected relevant data. The details are provided under section 3.2.3, Chapter-III.	**3-12**
27	The PP shall disclose the details of litigation / violation case pending against the project (or) the PP pertaining to this mining proposal, if any, with the direction/order passed by any court of law against the project proposal in the past or now.	PP informed that there is no litigation pending against the project.	**-**
28	Proponent shall furnish the letter received from DFO concerned stating the proximity details of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.	There area no Protected Areas, Sanctuaries, Tiger reserve etc with in 10 km radius	**3-4**
29	Detailed study report on flora and fauna in and nearby the quarry site.	A detailed study of flora and fauna composition in the core and buffer zone of the project has been made through primary field surveys. The details are furnished in para 3.5, Chapter III.	**3-44**
30	The Proponent shall develop greenbelt and garland drain around the boundary of the	Site photographs are provided in **Photo**	**2-8**

	proposed quarry and the photographs indicating the same shall be shown during the EIA appraisal.	**Figure No.2.9, Chapter-II.**	
31	The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.	A detailed study of flora and fauna composition in the core and buffer zone of the project has been made through primary field surveys by NABET approved Ecologist. The details are furnished in para 3.5, Chapter III.	**3-44**
32	The PP shall carry out the air-quality monitoring for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of minerals. The details of the model used and the input parameters used for modelling should be provided. The air quality contours may be plotted on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	• Air quality modeling details are furnished in para 4.2.3 and its continuous sub paras in Chapter-IV of EIA report. • The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model developed by Lakes Environmental Software which is based on steady state Gaussian plume dispersion. • The model simulations are done for the air pollutant arising from the mining operations, namely, PM10, PM2.5. Ground Level Concentration (GLC) have been computed using hourly meteorological data both for individual lease and cumulative basis. The Isopleths of PM10, PM2.5 concentrations for with control measures scenario have also been drawn and these are given in Figure No.4.1 and 4.12.	**4-3**
33	The PP shall furnish the water requirement for the project, its availability and source. A detailed water balance should also be provided. Fresh water requirement for the project should be indicated.	Total water requirement for all the 5 leases is 8cu.m, Domestic – 2.0 cu.m, Dust suppression and Afforestation – 6.0 cu.m. Required water will be procured from outside.	**4-19**
34	The PP shall assess the impact of project on water quality, both surface and groundwater and necessary safeguard measures, if any required, should be provided.	Details are given in Para 4.3.1 & 4.3.2.	**4-19**
35	The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.	Proponent is not operating any other garnet mines in the state.	**-**
36	If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines, i) What was the period of the operation and	This is a proposed quarry. No mining activities have been carried out in this lease area.	**-**

	stoppage of the earlier mines with last work permit issued by the AD/DD mines? ii) Quantity of minerals mined out. iii) Highest production achieved in any one year iv) Detail of approved depth of mining. v) Actual depth of the mining achieved earlier. vi) Name of the person already mined in that leases area. vii) If EC and CTO already obtained, the copy of the same shall be submitted. viii) Whether the mining was carried out as per the approved mine plan (or EC if issued).		
37	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	Project coordinates superimposed in satellite imagery and given as Figure No - 2.4 to 286 in Chapter – II. The 10km Radius Index plan showing buffer zone is given in Figure No.3.1 in Chapter – III.	**2-5**
38	The Proponent shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,	Agreed	**-**
39	The proponent shall furnish photographs of adequate fencing. green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & Water bodies nearby provided as per the approved mining plan.	Site photographs have been provided in Chapter-II.	**2-8**
40	The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.	• The details of geological and mineable reserves are provided in para 2.6, Chapter-II. • The production schedule during the plan period is provided in Table 2.3, Chapter-II. • The working methodology is detailed under Section 2.6, Chapter-II. Anticipated impacts of mining operations on surrounding environment is provided under Chapter-IV.	**2-26**
41	The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.	The organization chart is provided as Figure No.10.1, Chapter-X.	**10-2**
42	The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water	Hydrogeological Study is detailed under Section 3.6, Chapter-III.	**3-53**

	bodies such as rivers, tanks, canals. ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data. it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.		
43	The Proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.	The baseline data on micro- meteorology, ambient air quality, Water quality, noise level, soil and flora & fauna are collected during Post monsoon Season 2024 (October 2024 to December 2024) and detailed in Section 3.3 to 3.5 of Chapter-III. The details of Traffic is provided under Section 4.9, Chapter-IV.	**3-1**
44	The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	• The details of the quarries located within the 500m radius of the project is given vide Annexure-4C. • A cumulative impact study has been carried out and furnished in Para 7.3, Chapter-VII. Environmental Management Plan is provided under Chapter-X.	**A271** **7-2**
45	Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	• Mining in PWD eri itself is expected to augment the water holding capacity of the eri and also act as RWH measure. Additionally, clearing of other area from bushes and peripheral plantation in bunds will be carried out in consultation with authorities.	**-**
46	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational. operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	• The land use of the study area was studied to demarcate various LULC categories and its details are provided under section 3.4, Chapter-III. • The land use pattern at present and at the end of the quarrying period has been provided under section 4.5, Chapter-IV. The post mining land use has been provided in Table No. 4.12.	**4-21**
47	Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining	Not applicable	**-**

	activities could be considered.		
48	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Replied in sl no 38 above	**-**
49	A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	An ecological survey of the study area was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. Details are provided under section 3.5. Chapter-III.	**3-44**
50	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	Details of Mine Closure Plan is provided under section 7.5, Chapter-VII.	**7-7**
51	Public Hearing points raised and commitments of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project and to be submitted to SEIAA/SEAC with regard to the Office Memorandum of MoEF& CC accordingly.	This draft EIA/EMP report will be submitted for Public Hearing as per mandatory procedures through the District Collector and State Pollution Control Board officials after giving 30 days advance notice in two local newspapers about the scheduled date and time for conduct of the public hearing procedures. The opinions, concerns and objections of stakeholders will be recorded during the public hearing. All the public queries and the replies to the query by the project proponent and officials concerned will be recorded and incorporated in the Final EIA/EMP report for approval by SEIAA, Tamil Nadu.	**7-1**
52	The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.		**-**
53	The Proponent shall produce/display the EIA report, Executive summary and other related information with respect to public hearing in Tamil Language also.	Agreed	**-**
54	As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.	An ecological survey of the study area was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. Details are provided under section 3.5.1, Chapter-III.	**3-44**
55	The purpose of Greenbelt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the Appendix-I in consultation with the DFO, & Tamil Nadu Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs	Agreed	**-**

	should be planted in a mixed manner.		
56	Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner	Agreed	**-**
57	A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	The disaster management plan has been provided under section 7.4, Chapter-VII.	**7-6**
58	A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	Various risks likely to arise due to mining activities are detailed under section 7.4, Chapter-VII.	**7-6**
59	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Details of occupational health and safety aspects are given under the subsections of Para 4.8, Chapter-IV.	**4-25**
60	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	Replied in sl no 19 above	**-**
61	The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	Nearby villages were visited for conducting study to know about socio-economic conditions, including aspirations and requirements of the people for a better living and collected relevant data. The details are provided under section 3.2.3, Chapter-III	**3-12**
62	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	PP informed that there is no litigation pending against the project.	**-**
63	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential. etc.	• Project benefits are given in Chapter – VIII. By means of carrying out the socio-economic development activities, local community development is expected. Towards the same, the proponent has	**4-24**

		planned to allocate Rs.10 Lakhs for various activities under CER for all the 5 leases together. From the CER activities allocated for various social welfare activities, the villages near the lease area will be benefited.	
64	If any quarrying operations were carried out in the proposed quarrying, site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.	This is a proposed quarry. As such no mining activities have been carried out in this lease area.	**-**
65	The Proponent shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.	EMP is prepared for the entire life of the mine. Affidavit will be provided along with the final EIA/ EMP report.	**-**
66	Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.	Agreed	**-**
A. STANDARD TERMS OF REFERENCE			
1	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.	This is a proposed quarry. As such no mining activities have been carried out in this lease area.	**2-28**
2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	Lease document is already executed and given in Anneuxre – 2A	**A45**
3	All documents including approved mine plan. EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	The production capacity, quantity of waste, its management and mining technology in mine plan and EIA, etc., are compatible with one another.	**--**
4	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	• Project coordinates superimposed in satellite imagery and given as Figure No - 2.4 to 2.8 in Chapter – II. The 10km Radius Index plan showing buffer zone is given in Figure No.3.1 in Chapter – III.	**2-5** **3-3**
5	Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of	Study area map based on Survey of India Topo sheet is given as Figure – 3.1	**--**

	land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.		
6	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	Not Applicable	--
7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.	• The proponent will frame a well-planned environmental policy. Its details are provided under Section 10.2.1, Chapter-X. The Mines Manager will undertake effective monitoring and implementation of various environmental control measures promptly and effectively and to oversee various environmental management schemes for air quality control, water quality status, noise level control, plantation programme, social development schemes, etc in the mine. The organizational chart for the same has been provided in Figure No.10.1, Chapter-X.	**10-1**
8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	• Various risks likely to arise due to mining activities are detailed under section 7.4, Chapter-VII. This being an shallow opencast mine, subsidence is not applicable. No drilling and blasting involved.	**7-6**
9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.	The study area chosen for collecting existing environmental status covers 10 km radial distance from the project periphery (Figure No - 3.1). Data given in the report is for the life of the mine.	**3-3**
10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	• The land use of the study area was studied to demarcate various LULC categories and its details are provided under section 3.4, Chapter-III. • The land use pattern at present and at the end of the quarrying period has been provided under section 4.5, Chapter-IV. The land use during the post mining stage is provided in Table 4.12, Chapter-IV.	**3-35** **4-23**
11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land	There are no OB dumps outside the lease area.	--

	area, distance from mine lease, its land use, R&R issues, if any, should be given.		
12	Certificate from the Competent Authority in the State Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	There is no forest land in the lease area.	--
13	Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	There is no forest land in the lease area.	--
14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not Applicable	--
15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	There are no reserved or protected forests within the buffer zone.	**3-4**
16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.	The mining lease area and the 10 km buffer zone from the periphery of the core zone is devoid of declared ecologically sensitive features like national parks, biospheres, sanctuaries, etc.	**3-4**
17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	Replied in Standard ToR point No.16	--
18	A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried	A detailed study of flora and fauna composition in the core and buffer zone of the project has been made through primary	**3-44**

	out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	field surveys. The details are furnished in para 3.5, Chapter III.	
19	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable	--
20	Similarly, for coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not Applicable	--
21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmers prepared and submitted accordingly, integrating the sectoral programmers of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.	The mining activities will be carried out within the mine lease area only. The entire mine lease area is Government poramboke eri land. Hence, the question of R& R does not arise.	**7-6**
22	One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter	• The baseline data on micro- meteorology, ambient air quality, Water quality, noise	

	season)} primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM 10, particularly for free silica, should be given.	level, soil and flora & fauna are collected during Post monsoon Season 2024 (October 2024 to December 2024) and detailed in Section 3.3 to 3.5 of Chapter-III. • Monitoring stations were selected taking into account, wind direction and location of sensitive receptors. Free silica composition in PM10 sample has been done and the values are found to be Below Detectable Limit (DL 0.05mg/m3) which is well within the prescribed limit of 5mg/m3.	**3-14** **3-36**
23	Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	• Air quality modeling details are furnished in para 4.2.3 and its continuous sub paras in Chapter-IV of EIA report. • The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model developed by Lakes Environmental Software which is based on steady state Gaussian plume dispersion. • The model simulations are done for the air pollutant arising from the mining operations, namely, PM10, PM2.5. Ground Level Concentration (GLC) have been computed using hourly meteorological data both for individual lease and cumulative basis. The Isopleths of PM10, PM2.5 concentrations for with control measures scenario have also been drawn and these are given in Figure No.4.1 and 4.12.	**4-3**
24	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.	Total water requirement for all the 5 leases is 8cu.m, Domestic – 2.0 cu.m, Dust suppression and Afforestation – 6.0 cu.m. Required water will be procured from outside.	**4-19**
25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Not Applicable	**--**
26	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be	Mining in PWD eri itself is expected to augment the water holding capacity of the eri and also act as RWH measure. Additionally, clearing of other area from	**4-19**

	provided.	bushes and peripheral plantation in bunds will be carried out in consultation with authorities.	
27	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	Details are given in Para 4.3.1. chapter - IV	**4-19**
28	Based on actual monitored data. it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.	Not applicable	**-**
29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	Replied above in Standard ToR point No.27	**--**
30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.	Not applicable	**-**
31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	Since mining operation will be carried out within the eri poramboke land , it is proposed to carryout at least 1000 nos of tree plantation in the peripheral eri bund, approach road from the eri periphery to the proposed beneficiation plant area, community plantation in the available lands in the nearby villages in consultation with the panchayat heads and Government officials. Local native species like palm, neem, pungai, vagai, puli, etc will be planted and well maintained during the lease period.	**-**

32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.	Since the production is less, the overall transport from all the 5 leases in the Governement poramboke land is just 7 trips per hour only. Existing road can easily absorb this traffic. Details are provided under Para 4.9, Chapter-IV.	**4-26**
33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	This is a proposed project. Site services like mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.	**2-40**
34	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	Out of 2.00 m of depth of mining , since the mineral recovery is just 10% of the ROM material removed, the entire 0.50m Top clayey soil + 90% of the reject material will be used for backfilling the mined out area and ultimately the entire lease area will brough back to premining condition.	**2-25**
35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Details of occupational health and safety aspects are given under the subsections of Para 4.8, Chapter-IV.	**4-25**
36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	This being a small project with no significant impact, no health implications to the surrounding public envisaged	**4-25**
37	Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	• Nearby villages were visited for conducting study to know about socio-economic conditions, including aspirations and requirements of the people for a better living and collected relevant data. The details are provided under section 3.2.3, Chapter-III • Project benefits are given in Chapter – VIII. • By means of carrying out the socio-economic development activities, local community development is expected. Towards the same, the	**3-12** **4-24**

		proponent has planned to allocate Rs.10 Lakhs for various activities under CER for all the 5 leases together. From the CER activities allocated for various social welfare activities, the villages near the lease area will be benefited.	
38	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.	Detailed Environmental Management plan and its implementation, etc., are furnished in Chapter X.	**10-1**
39	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	This draft EIA/EMP report will be submitted for Public Hearing as per mandatory procedures through the District Collector and State Pollution Control Board officials after giving 30 days advance notice in two local newspapers about the scheduled date and time for conduct of the public hearing procedures. The opinions, concerns and objections of stakeholders will be recorded during the public hearing. All the public queries and the replies to the query by the project proponent and officials concerned will be recorded and incorporated in the EIA/EMP report for approval by SEIAA, Tamil Nadu.	**7-1**
40	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	PP informed that there is no litigation pending against the project.	**--**
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	The details of environmental management cost has been provided in Table 10.1, Chapter-X.	**10-6**
42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	The disaster management plan has been provided under section 7.3.1, Chapter-VII.	**7-4**
43	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Project benefits are given in Chapter – VIII.	**8-1**
44	Besides the above, the below mentioned general points are also to be followed:- a) Executive Summary of the EIA/EMP Report b) All documents to be properly referenced with index and continuous page numbering. c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.	**Noted**	-

	d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the Original analysis/testing reports should be available during appraisal of the Project. e) Where the documents provided are in a language other than English, an English translation should be provided. f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted. g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed. h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation. i) As per the circular no. J-11011/618/2010-1A.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable. ii) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.		

TERMS OF REFERENCE
REPLY
GO-71

TOR COMPLIANCE
TOR No :SEIAA-TN/F.No-6508/SEAC/1(a)/TOR-1497/2023 &
TOR Amendment No - TO25B0108TN5179960A

S.No	TOR Points	Reply	Pg.No
A. ToR in Addition to Standard ToR			
1	The PP shall furnish a copy of the document in support of the fact that the proponent is the rightful lessee of the mine.	Lease document is already executed and given in Anneuxre -2D	**A173**
2	The PP shall furnish Copy of approved Mining Plan /Scheme of mining plan by the competent authority during the time of EIA appraisal.	Review of mining plan for the period 2023 - 2024 to 2027-2028 Approved by IBM and letter given in Annexure – 3D	**A263**
3	The PP shall furnish an affidavit that mining plan approved by AMD used for Public Hearing and the Mining Plan approved by the Competent Authority (IBM/DGM) are the same.	Recently approved Review of mining plan is used for preparation of draft EIA/ EMP report. Affidavit in this regard will be submitted in the Final EIA/ EMP report	**-**
4	The PP shall evaluate the environmental aspects and their possible associated impacts that would arise due to the proposed Garnet sand mining and mineral separation and to work out environmental monitoring programme to prevent, control, minimise or eliminate the adverse environmental impacts envisaged from the proposed garnet mining and mineral separation.	Ensured	**-**
5	The PP shall provide all documents including approved mine plan/ approved scheme of mining, EIA and public hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management and mining technology and shold be in the name of the lessee.	The production capacity, quantity of waste, its management and mining technology in mine plan and EIA, etc., are compatible with one another.	**-**
6	The PP shall provide all corner coordinates of the mine lease area superimposed on a high Resolution Imagery/ toposheet. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and the buffer zone).	Project coordinates superimposed in satellite imagery and given as Figure No - 2.4 to 2.8 in Chapter – II.	**2-5**
7	The PP shall indicate the level of Impact on local transport infrastructure due to project. Projected increase in truck traffic as a result of project in the present road network (including those outside the project area) should he worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure. if contemplated (including action to be taken by other agencies such as state government) should he covered.	Since the production is less, the overall transport from all the 5 leases in the Governement poramboke land is just 7 trips per hour only. Existing road can easily absorb this traffic. Details are provided under Para 4.9, Chapter-IV.	**4-26**
8	The PP shall furnish a letter from VAO stating details of structures & habitations located within	VAO Letter will be submitted in Final EMP Report	**-**

	300m from the boundary of the project site.		
9	The structures within the radius of (i) 100 m. (ii) 300 m. and (iii) 500 m shall be enumerated with details such as dwelling houses with number of occupants. whether it belongs to the owner (or) not, places of worship. industries, factories, sheds. etc.	The details of features within 500m radius is provided in **Table 2.4, Chapter-II.**	**2-40**
10	The PP shall submit a report on replenishment of Garnet sand (or) its geological formation as indicated in the DSR.	Geology details are given in Para 2.4, Chapter – II.	**2-11**
11	The PP shall furnish the details of the tank, depth of desiltation, extent of the tank and Ownership of the tanks, details of cultivation, distance from the site, etc, within 1 km radius around the proposed mining area from the Govt records.	Kottathur eri covers an area of 102.43 ha with the aiyacut of 94.34 ha mostly in the downstream side. Rainwater from the upstream side originating near the lease area on the north west side from pagalavadi RF and northern side during the monsoon season flows through this eri. . Due to elevation difference, this water drains immediately on the down stream south eastern side and further connected to Uppu odai . This eri acts more of a passage of rainwater.	**3-53**
12	The PP shall furnish Copy of the NoC obtained from PWD/WRD-TN for the proposed mining activity.	NOC from PWD department is obtained and given as **Annexure – 5A**	**A277**
13	The PP carry out the geological assessment to identify mineralization, to establish continuity, quality and quantity of mineral deposit. particularly, the presence of Atomic minerals in the Garnet sand. Hence the PP shall furnish the report through the systematic sampling in the proposed site with showing geological coordinates as per the procedures laid in accordance with the provisions of Atomic Minerals Concessional Rules, 2016 and the mineralogical analysis obtained from the laboratory of IREL (India) Limited, Research Centre, Beach Road. Kollam, Kerala.	Government of India, Ministry of Mines in consultation with the Department of Atomic Energy (DAE) and the Indian Bureu of Mines (IBM) has clarified the AMCR, 2016 and Government of India, Ministry of Mines Order dated 01.03.2019 are not applicable to the 11 mining leases granted for mining Garnet in Tiruchirapalli District and 2 mining leases granted for mining Garnet in Madurai District. **G**.O. obtained from Industries, Investment Promotion and Commerce (MMD.1) Department given in Annexure – 6D	**A290**
14	Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside/inside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues. if any, should be provided.	Since the recovery of ROM is expected to be 10%, the balance 90% reject from the processing plant will be transported back and backfilled in the mined out area. Top soil will be spread over the backfilled area and the mined out pit will be restored back to primining condition.	**2-25**
15	The study area will comprise of 10km zone around the mine lease from lease periphery and the data contained in EIA such as waste generation etc. should be for the life of the mine / lease period.	The study area chosen for collecting existing environmental status covers 10 km radial distance from the project periphery (Figure No - 3.2). Data given in the report is for the life of the mine.	**3-3**
16	The PP shall indicate the land use of the study area delineating forest area, agricultural land,	• The land use of the study area was studied to demarcate various LULC	**3-35**

	grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features. Land use plan of the mine lease area should be prepared to encompass pre-operational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	categories and its details are provided under section 3.4, Chapter-III. • The land use pattern at present and at the end of the quarrying period has been provided under section 4.5.1, Chapter-IV. The post mining land use has been provided in Table No. 4.12.	**4-21**
17	The PP shall indicate the details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.	This is a proposed project. Site services like mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.	**2-40**
18	The PP shall anticipate the Occupational and health impacts of the project and accordingly the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP.	Details of occupational health and safety aspects are given under the subsections of Para 4.8, Chapter-IV.	**4-25**
19	The PP shall evaluate the Public health implications of the project and related activities for the population in the impact zone systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	This being a small project with no significant impact, no health implications to the surrounding public envisaged.	**-**
20	The PP shall provide the measures of socio-economic significance and influence to the local community. As far as possible, quantitative dimensions may be given with the time frames for implementation.	Nearby villages were visited for conducting study to know about socio-economic conditions, including aspirations and requirements of the people for a better living and collected relevant data. The details are provided under section 3.2.3, Chapter-III.	**3-12**
21	The PP shall disclose the details of litigation / violation case pending against the project (or) the PP pertaining to this mining proposal, if any, with the direction/order passed by any court of law against the project proposal in the past or now.	PP informed that there is no litigation pending against the project.	**-**
22	Proponent shall furnish the letter received from DFO concerned stating the proximity details of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.	There area no Protected Areas, Sanctuaries, Tiger reserve etc with in 10 km radius	**3-4**
23	Detailed study report on flora and fauna in and nearby the quarry site.	A detailed study of flora and fauna composition in the core and buffer zone of the project has been made through primary field surveys. The details are furnished in para 3.5, Chapter III.	**3-44**
24	The Proponent shall develop greenbelt and garland drain around the boundary of the proposed quarry and the photographs indicating the same shall be shown during the EIA appraisal.	Site photographs are provided in **Photo Figure No.2.9, Chapter-II.**	**2-8**

25	The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.	A detailed study of flora and fauna composition in the core and buffer zone of the project has been made through primary field surveys by NABET approved Ecologist. The details are furnished in para 3.5, Chapter III.	**3-44**
26	The PP shall carry out the air-quality monitoring for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of minerals. The details of the model used and the input parameters used for modelling should be provided. The air quality contours may be plotted on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	• Air quality modeling details are furnished in para 4.2.3 and its continuous sub paras in Chapter-IV of EIA report. • The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model developed by Lakes Environmental Software which is based on steady state Gaussian plume dispersion. • The model simulations are done for the air pollutant arising from the mining operations, namely, PM10, PM2.5. Ground Level Concentration (GLC) have been computed using hourly meteorological data both for individual lease and cumulative basis. The Isopleths of PM10, PM2.5 concentrations for with control measures scenario have also been drawn and these are given in Figure No.4.1 and 4.12.	**4-3**
27	The PP shall furnish the water requirement for the project, its availability and source. A detailed water balance should also be provided. Fresh water requirement for the project should be indicated.	Total water requirement for all the 5 leases is 8cu.m, Domestic – 2.0 cu.m, Dust suppression and Afforestation – 6.0 cu.m. Required water will be procured from outside.	**4-19**
28	The PP shall assess the impact of project on water quality, both surface and groundwater and necessary safeguard measures, if any required, should be provided.	Details are given in Para 4.3.1 & 4.3.2.	**4-19**
29	The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.	Proponent is not operating any other garnet mines in the state.	**-**
30	If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines, i) What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?	This is a proposed quarry. No mining activities have been carried out in this lease area.	**-**

	ii) Quantity of minerals mined out. iii) Highest production achieved in any one year iv) Detail of approved depth of mining. v) Actual depth of the mining achieved earlier. vi) Name of the person already mined in that leases area. vii) If EC and CTO already obtained, the copy of the same shall be submitted. viii) Whether the mining was carried out as per the approved mine plan (or EC if issued).		
31	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	Project coordinates superimposed in satellite imagery and given as Figure No - 2.4 to 286 in Chapter – II. The 10km Radius Index plan showing buffer zone is given in Figure No.3.1 in Chapter – III.	**2-5**
32	The Proponent shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,	Agreed	**-**
33	The proponent shall furnish photographs of adequate fencing. green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & Water bodies nearby provided as per the approved mining plan.	Site photographs have been provided in Chapter-II.	**2-8**
34	The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.	• The details of geological and mineable reserves are provided in para 2.6, Chapter-II. • The production schedule during the plan period is provided in Table 2.3, Chapter-II. • The working methodology is detailed under Section 2.6, Chapter-II. Anticipated impacts of mining operations on surrounding environment is provided under Chapter-IV.	**2-26**
35	The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.	The organization chart is provided as Figure No.10.1, Chapter-X.	**10-2**
36	The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals. ponds etc.	Hydrogeological Study is detailed under Section 3.6, Chapter-III.	**3-53**

	within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data. it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.		
37	The Proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.	The baseline data on micro- meteorology, ambient air quality, Water quality, noise level, soil and flora & fauna are collected during Post monsoon Season 2024 (October 2024 to December 2024) and detailed in Section 3.3 to 3.5 of Chapter-III. The details of Traffic is provided under Section 4.9, Chapter-IV.	**3-1**
38	The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	• The details of the quarries located within the 500m radius of the project is given vide Annexure-4D. • A cumulative impact study has been carried out and furnished in Para 7.3, Chapter-VII. Environmental Management Plan is provided under Chapter-X.	**A290** **7-2**
39	Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	• Mining in PWD eri itself is expected to augment the water holding capacity of the eri and also act as RWH measure. Additionally, clearing of other area from bushes and peripheral plantation in bunds will be carried out in consultation with authorities.	**-**
40	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational. operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	• The land use of the study area was studied to demarcate various LULC categories and its details are provided under section 3.4, Chapter-III. • The land use pattern at present and at the end of the quarrying period has been provided under section 4.5, Chapter-IV. The post mining land use has been provided in Table No. 4.12.	**4-21**
41	Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.	Not applicable	**-**

42	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Replied in sl no 38 above	**-**
43	A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	An ecological survey of the study area was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. Details are provided under section 3.5. Chapter-III.	**3-44**
44	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	Details of Mine Closure Plan is provided under section 7.5, Chapter-VII.	**7-7**
45	Public Hearing points raised and commitments of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project and to be submitted to SEIAA/SEAC with regard to the Office Memorandum of MoEF& CC accordingly.	This draft EIA/EMP report will be submitted for Public Hearing as per mandatory procedures through the District Collector and State Pollution Control Board officials after giving 30 days advance notice in two local newspapers about the scheduled date and time for conduct of the public hearing procedures. The opinions, concerns and objections of stakeholders will be recorded during the public hearing. All the public queries and the replies to the query by the project proponent and officials concerned will be recorded and incorporated in the Final EIA/EMP report for approval by SEIAA, Tamil Nadu.	**7-1**
46	The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.		**-**
47	The Proponent shall produce/display the EIA report, Executive summary and other related information with respect to public hearing in Tamil Language also.	Agreed	**-**
48	As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.	An ecological survey of the study area was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. Details are provided under section 3.5.1, Chapter-III.	**3-44**
49	The purpose of Greenbelt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the Appendix-I in consultation with the DFO, & Tamil Nadu Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.	Agreed	**-**

50	Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner	Agreed	**-**
51	A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	The disaster management plan has been provided under section 7.4, Chapter-VII.	**7-6**
52	A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	Various risks likely to arise due to mining activities are detailed under section 7.4, Chapter-VII.	**7-6**
53	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Details of occupational health and safety aspects are given under the subsections of Para 4.8, Chapter-IV.	**4-25**
54	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	Replied in sl no 19 above	**-**
55	The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	Nearby villages were visited for conducting study to know about socio-economic conditions, including aspirations and requirements of the people for a better living and collected relevant data. The details are provided under section 3.2.3, Chapter-III	**3-12**
56	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	PP informed that there is no litigation pending against the project.	**-**
57	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential. etc.	• Project benefits are given in Chapter – VIII. By means of carrying out the socio-economic development activities, local community development is expected. Towards the same, the proponent has planned to allocate Rs.10 Lakhs for various	**4-24**

		activities under CER for all the 5 leases together. From the CER activities allocated for various social welfare activities, the villages near the lease area will be benefited.	
58	If any quarrying operations were carried out in the proposed quarrying, site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.	This is a proposed quarry. As such no mining activities have been carried out in this lease area.	-
59	The Proponent shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.	EMP is prepared for the entire life of the mine. Affidavit will be provided along with the final EIA/ EMP report.	-
60	Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.	Agreed	-
"Annexure B"			
1	The analysis of the minerals of Garnet to be mined out from the mining lease area shall be carried out by the competent authority before conducting EIA study and the proponent shall ensure that the threshold value 0.00% monazite in heavy minerals, irrespective of monazite grade as per the Atomic minerals concession rules 2016 issued by ministry of mines notification dated 20.02.2019.	Government of India, Ministry of Mines in consultation with the Department of Atomic Energy (DAE) and the Indian Bureu of Mines (IBM) has clarified the AMCR, 2016 and Government of India, Ministry of Mines Order dated 01.03.2019 are not applicable to the 11 mining leases granted for mining Garnet in Tiruchirapalli District and 2 mining leases granted for mining Garnet in Madurai District. G.O. obtained from Industries, Investment Promotion and Commerce (MMD.1) Department given in Annexure – 6D.	**A290**
2	The proponent shall furnish the scientific proof to ensure the non hazardous nature of the waste generated from the mineral pre-concentrated plant since the said waste proposed to dump into the mined out void. In this connection proponent has to detailed plan bring back the non hazardous nature of the waste generated from the mineral pre-concentrated plant to the mined out area.	ROM Material is inert and non hazardous comprising (10% garnet and 90% silica, clay and silt). Garnet is separated by magnetic separation without any chemical process. Remaining non hazardous and inert ROM will be backfilled. As such no hazardous material is involved. Chemical anaylysis report of the material is given Approved Review of Mining plan. Annexure – 6D	**A290**
3	The detailed mine closure plan shall be furnished.	Details of Mine Closure Plan is provided under section 7.5, Chapter-VII.	**7-7**
4	The proponent has to conduct cumulative EIA report considering the other four adjacent	• The details of the quarries located within the 500m radius of the project is given	**7-2**

	proposed mining quarries with Separate EMP plan for the proposed individual quarrying operations.	vide Annexure-4D. • A cumulative impact study has been carried out and furnished in Para 7.3, Chapter-VII. Environmental Management Plan is provided under Chapter-X.	**A273**
A. STANDARD TERMS OF REFERENCE			
1	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.	This is a proposed quarry. As such no mining activities have been carried out in this lease area.	**2-28**
2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	Lease document is already executed and given in Anneuxre – 2A	**A45**
3	All documents including approved mine plan. EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	The production capacity, quantity of waste, its management and mining technology in mine plan and EIA, etc., are compatible with one another.	**--**
4	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	• Project coordinates superimposed in satellite imagery and given as Figure No - 2.4 to 2.8 in Chapter – II. The 10km Radius Index plan showing buffer zone is given in Figure No.3.1 in Chapter – III.	**2-5** **3-3**
5	Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	Study area map based on Survey of India Topo sheet is given as Figure – 3.1	**--**
6	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	Not Applicable	**--**
7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions?	• The proponent will frame a well-planned environmental policy. Its details are provided under Section 10.2.1, Chapter-X. The Mines Manager will undertake effective monitoring and implementation of various	**10-1**

	The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.	environmental control measures promptly and effectively and to oversee various environmental management schemes for air quality control, water quality status, noise level control, plantation programme, social development schemes, etc in the mine. The organizational chart for the same has been provided in Figure No.10.1, Chapter-X.	
8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	• Various risks likely to arise due to mining activities are detailed under section 7.4, Chapter-VII. This being an shallow opencast mine, subsidence is not applicable. No drilling and blasting involved.	**7-6**
9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.	The study area chosen for collecting existing environmental status covers 10 km radial distance from the project periphery (Figure No - 3.1). Data given in the report is for the life of the mine.	**3-3**
10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	• The land use of the study area was studied to demarcate various LULC categories and its details are provided under section 3.4, Chapter-III. • The land use pattern at present and at the end of the quarrying period has been provided under section 4.5, Chapter-IV. The land use during the post mining stage is provided in Table 4.12, Chapter-IV.	**3-35** **4-23**
11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.	There are no OB dumps outside the lease area.	**--**
12	Certificate from the Competent Authority in the State Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	There is no forest land in the lease area.	**--**
13	Status of forestry clearance for the broken up area and virgin forestland involved in the	There is no forest land in the lease area.	**--**

	Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.		
14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not Applicable	**--**
15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	There are no reserved or protected forests within the buffer zone.	**3-4**
16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.	The mining lease area and the 10 km buffer zone from the periphery of the core zone is devoid of declared ecologically sensitive features like national parks, biospheres, sanctuaries, etc.	**3-4**
17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	Replied in Standard ToR point No.16	**--**
18	A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	A detailed study of flora and fauna composition in the core and buffer zone of the project has been made through primary field surveys. The details are furnished in para 3.5, Chapter III.	**3-44**
19	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance	Not Applicable	**--**

	certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.		
20	Similarly, for coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not Applicable	--
21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmers prepared and submitted accordingly, integrating the sectoral programmers of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.	The mining activities will be carried out within the mine lease area only. The entire mine lease area is Government poramboke eri land. Hence, the question of R& R does not arise.	**7-6**
22	One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)} primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM 10, particularly for free silica, should be given.	• The baseline data on micro- meteorology, ambient air quality, Water quality, noise level, soil and flora & fauna are collected during Post monsoon Season 2024 (October 2024 to December 2024) and detailed in Section 3.3 to 3.5 of Chapter-III. • Monitoring stations were selected taking into account, wind direction and location of sensitive receptors. Free silica composition in PM10 sample has been done and the values are found to be Below Detectable Limit (DL 0.05mg/m3) which is well within the prescribed limit of 5mg/m3.	**3-14** **3-36**
23	Air quality modeling should be carried out for prediction of impact of the project on the air	• Air quality modeling details are furnished	**4-3**

	quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	in para 4.2.3 and its continuous sub paras in Chapter-IV of EIA report. • The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model developed by Lakes Environmental Software which is based on steady state Gaussian plume dispersion. • The model simulations are done for the air pollutant arising from the mining operations, namely, PM10, PM2.5. Ground Level Concentration (GLC) have been computed using hourly meteorological data both for individual lease and cumulative basis. The Isopleths of PM10, PM2.5 concentrations for with control measures scenario have also been drawn and these are given in Figure No.4.1 and 4.12.	
24	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.	Total water requirement for all the 5 leases is 8cu.m, Domestic – 2.0 cu.m, Dust suppression and Afforestation – 6.0 cu.m. Required water will be procured from outside.	**4-19**
25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Not Applicable	**--**
26	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Mining in PWD eri itself is expected to augment the water holding capacity of the eri and also act as RWH measure. Additionally, clearing of other area from bushes and peripheral plantation in bunds will be carried out in consultation with authorities.	**4-19**
27	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	Details are given in Para 4.3.1. chapter - IV	**4-19**
28	Based on actual monitored data. it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working	Not applicable	**-**

	below ground water and for pumping of ground water should also be obtained and copy furnished.		
29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	Replied above in Standard ToR point No.27	**--**
30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.	Not applicable	**-**
31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	Since mining operation will be carried out within the eri poramboke land , it is proposed to carryout at least 1000 nos of tree plantation in the peripheral eri bund, approach road from the eri periphery to the proposed beneficiation plant area, community plantation in the available lands in the nearby villages in consultation with the panchayat heads and Government officials. Local native species like palm, neem, pungai, vagai, puli, etc will be planted and well maintained during the lease period.	**-**
32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.	Since the production is less, the overall transport from all the 5 leases in the Governement poramboke land is just 7 trips per hour only. Existing road can easily absorb this traffic. Details are provided under Para 4.9, Chapter-IV.	**4-26**
33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	This is a proposed project. Site services like mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.	**2-40**

34	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	Out of 2.00 m of depth of mining , since the mineral recovery is just 10% of the ROM material removed, the entire 0.50m Top clayey soil + 90% of the reject material will be used for backfilling the mined out area and ultimately the entire lease area will brough back to premining condition.	**2-25**
35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Details of occupational health and safety aspects are given under the subsections of Para 4.8, Chapter-IV.	**4-25**
36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	This being a small project with no significant impact, no health implications to the surrounding public envisaged	**4-25**
37	Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	• Nearby villages were visited for conducting study to know about socio-economic conditions, including aspirations and requirements of the people for a better living and collected relevant data. The details are provided under section 3.2.3, Chapter-III • Project benefits are given in Chapter – VIII. • By means of carrying out the socio-economic development activities, local community development is expected. Towards the same, the proponent has planned to allocate Rs.10 Lakhs for various activities under CER for all the 5 leases together. From the CER activities allocated for various social welfare activities, the villages near the lease area will be benefited.	**3-12** **4-24**
38	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.	Detailed Environmental Management plan and its implementation, etc., are furnished in Chapter X.	**10-1**
39	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary	This draft EIA/EMP report will be submitted for Public Hearing as per mandatory procedures through the District Collector	**7-1**

	provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	and State Pollution Control Board officials after giving 30 days advance notice in two local newspapers about the scheduled date and time for conduct of the public hearing procedures. The opinions, concerns and objections of stakeholders will be recorded during the public hearing. All the public queries and the replies to the query by the project proponent and officials concerned will be recorded and incorporated in the EIA/EMP report for approval by SEIAA, Tamil Nadu.	
40	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	PP informed that there is no litigation pending against the project.	**--**
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	The details of environmental management cost has been provided in Table 10.1, Chapter-X.	**10-6**
42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	The disaster management plan has been provided under section 7.3.1, Chapter-VII.	**7-4**
43	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Project benefits are given in Chapter – VIII.	**8-1**
44	Besides the above, the below mentioned general points are also to be followed:- a) Executive Summary of the EIA/EMP Report b) All documents to be properly referenced with index and continuous page numbering. c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated. d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the Original analysis/testing reports should be available during appraisal of the Project. e) Where the documents provided are in a language other than English, an English translation should be provided. f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted. g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-	Noted	**-**

	IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed. h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation. i) As per the circular no. J-11011/618/2010-1A.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable. ii) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.		

TERMS OF REFERENCE REPLY GO-57

TOR COMPLIANCE
TOR No :SEIAA-TN/F.No-6509/SEAC/1(a)/TOR-1493/2023 &
TOR Amendment No - TO25B0108TN5980789A

S.No	TOR Points	Reply	Pg.No
	A. ToR in Addition to Standard ToR		
1	The analysis of the minerals of Garnet to be mined out from the mining lease area shall be carried out by the competent authority before conducting EIA study and the proponent shall ensure that the threshold value 0.00% monazite in heavy minerals, irrespective of monazite grade as per the Atomic minerals concession rules 2016 issued by ministry of mines notification dated 20.02.2019.	Government of India, Ministry of Mines in consultation with the Department of Atomic Energy (DAE) and the Indian Bureu of Mines (IBM) has clarified the AMCR, 2016 and Government of India, Ministry of Mines Order dated 01.03.2019 are not applicable to the 11 mining leases granted for mining Garnet in Tiruchirapalli District and 2 mining leases granted for mining Garnet in Madurai District. G.O. obtained from Industries, Investment Promotion and Commerce (MMD.1) Department given in Annexure – 6E.	**A293**
2	The proponent shall furnish the scientific proof to ensure the non hazardous nature of the waste generated from the mineral pre-concentrated plant since the said waste proposed to dump into the mined out void. In this connection proponent has to detailed plan bring back the non hazardous nature of the waste generated from the mineral pre-concentrated plant to the mined out area.	ROM Material is inert and non hazardous comprising (10% garnet and 90% silica, clay and silt). Garnet is separated by magnetic separation without any chemical process. Remaining non hazardous and inert ROM will be backfilled. As such no hazardous material is involved. Chemical anaylysis report of the material is given Approved Review of Mining plan. Annexure – 6E.	**A293**
3	The detailed mine closure plan shall be furnished.	Details of Mine Closure Plan is provided under section 7.5, Chapter-VII.	**7-7**
4	The proponent has to conduct cumulative EIA report considering the other four adjacent proposed mining quarries with Separate EMP plan for the proposed individual quarrying operations.	• The details of the quarries located within the 500m radius of the project is given vide Annexure-4E. • A cumulative impact study has been carried out and furnished in Para 7.6, Chapter-VII. Environmental Management Plan is provided under Chapter-X.	**A275** **7-2**
5	The transportation methodology for the transportation of Garnet from the mining lease to the process area shall be furnished in detail and cumulative impact on Air pollution especially Fugitive emission needs to be carried out considering all the mining areas.	Since the production is less, the overall transport from all the 5 leases in the Governement poramboke land is just 7 trips per hour only. Existing road can easily absorb this traffic. Details are provided under Para 4.9, Chapter-IV.	**4-26**
6	The proponent shall furnish the detailed CER plan with budget allocation incorporating the needs of the nearby public and also points raised in the public hearing as per the Office Memorandum of MoEF & CC dated 01.05.2018.	By means of carrying out the socio-economic development activities, local community development is expected. Towards the same, the proponent has planned to allocate Rs.10 Lakhs for various activities under CER for all the 5 leases together. From the CER activities allocated	4-24

		for various social welfare activities, the villages near the lease area will be benefited.	
7	The PP shall furnish a copy of the document in support of the fact that the proponent is the rightful lessee of the mine.	Lease document is already executed and given in Anneuxre -2E	**A90**
8	The PP shall furnish Copy of approved Mining Plan /Scheme of mining plan by the competent authority during the time of EIA appraisal.	Review of mining plan for the period 2023 - 2024 to 2027-2028 Approved by IBM and letter given in Annexure – 3E	**A265**
9	The PP shall furnish an affidavit that mining, plan approved by AMD used for Public Hearing and the Mining Plan approved by the Competent Authority (IBM/DGM) are the same.	Recently approved Review of mining plan is used for preparation of draft EIA/ EMP report. Affidavit in this regard will be submitted in the Final EIA/ EMP report	**-**
10	The PP shall evaluate the environmental aspects and their possible associated impacts that would arise due to the proposed Garnet sand mining and mineral separation and to work out environmental monitoring programme to prevent, control. minimise or eliminate the adverse environmental impacts envisaged from the proposed garnet mining and mineral separation.	Ensured	**-**
11	The PP shall provide all documents including approved mine plan/ approved scheme of mining, EIA and public hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management and mining technology and should be in the name of the lessee.	The production capacity, quantity of waste, its management and mining technology in mine plan and EIA, etc., are compatible with one another.	**-**
12	The PP shall provide all corner coordinates of the mine lease area superimposed on a high Resolution Imagery/ toposheet. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and the buffer zone).	• Project coordinates superimposed in satellite imagery and given as Figure No - 2.4 to 2.8 in Chapter – II.	**2-5**
13	The PP shall indicate the level of Impact on local transport infrastructure due to project. Projected increase in truck traffic as a result of project in the present road network (including those outside the project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as state government) should be covered.	• Since the production is less, the overall transport from all the 5 leases in the Governement poramboke land is just 7 trips per hour only. Existing road can easily absorb this traffic. Details are provided under Para 4.9, Chapter-IV.	**4-26**
14	The PP shall furnish a letter from VAO stating details of structures & habitations located	VAO Letter will be submitted in Final EMP Report	**-**

	within 300m from the boundary of the project site.		
15	The structures within the radius of (i) 100 m, (ii) 300 in, and (iii) 500 m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc.	The details of features within 500m radius is provided in **Table 2.4, Chapter-II.**	**2-40**
16	The PP shall submit a report on replenishment of Garnet sand (or) its geological formation as indicated in the DSR.	Geology details are given in Para 2.4, Chapter – II.	**2-11**
17	The PP shall furnish the details of the tank, depth of desiltation, extent of the tank and Ownership of the tanks, details of cultivation, distance from the site, etc, within 1 km radius around the proposed mining area from the Govt records.	Kottathur eri covers an area of 102.43 ha with the aiyacut of 94.34 ha mostly in the downstream side. Rainwater from the upstream side originating near the lease area on the north west side from pagalavadi RF and northern side during the monsoon season flows through this eri. . Due to elevation difference, this water drains immediately on the down stream south eastern side and further connected to Uppu odai . This eri acts more of a passage of rainwater.	**3-53**
18	The PP shall furnish Copy of the NoC obtained from PWD/WRD-TN for the proposed mining activity.	NOC from PWD department is obtained and given **as Annexure – 5B**	**A279**
19	The PP carry out the geological assessment to identify mineralization, to establish continuity, quality and quantity of mineral deposit. particularly, the presence of Atomic minerals in the Garnet sand. Hence the PP shall furnish the report through the systematic sampling in the proposed site with showing geological coordinates as per the procedures laid in accordance with the provisions of Atomic Minerals Concessional Rules, 2016 and the mineralogical analysis obtained from the laboratory of IREL (India) Limited, Research Centre, Beach Road. Kollam, Kerala.	Government of India, Ministry of Mines in consultation with the Department of Atomic Energy (DAE) and the Indian Bureu of Mines (IBM) has clarified the AMCR, 2016 and Government of India, Ministry of Mines Order dated 01.03.2019 are not applicable to the 11 mining leases granted for mining Garnet in Tiruchirapalli District and 2 mining leases granted for mining Garnet in Madurai District. **G**.O. obtained from Industries, Investment Promotion and Commerce (MMD.1) Department given in Annexure – 6E	**A284**
20	Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside/inside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues. if any, should be provided.	Since the recovery of ROM is expected to be 10%, the balance 90% reject from the processing plant will be transported back and backfilled in the mined out area. Top soil will be spread over the backfilled area and the mined out pit will be restored back to primining condition.	**2-25**
21	The study area will comprise of 10km zone around the mine lease from lease periphery and the data contained in EIA such as waste generation etc. should be for the life of the mine / lease period.	The study area chosen for collecting existing environmental status covers 10 km radial distance from the project periphery (Figure No - 3.2). Data given in the report is for the life of the mine.	**3-3**

22	The PP shall indicate the land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features. Land use plan of the mine lease area should be prepared to encompass pre-operational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	• The land use of the study area was studied to demarcate various LULC categories and its details are provided under section 3.4, Chapter-III. • The land use pattern at present and at the end of the quarrying period has been provided under section 4.5.1, Chapter-IV. The post mining land use has been provided in Table No. 4.12.	**3-35** **4-21**
23	The PP shall indicate the details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.	This is a proposed project. Site services like mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.	**2-40**
24	The PP shall anticipate the Occupational and health impacts of the project and accordingly the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP.	Details of occupational health and safety aspects are given under the subsections of Para 4.8, Chapter-IV.	**4-25**
25	The PP shall evaluate the Public health implications of the project and related activities for the population in the impact zone systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	This being a small project with no significant impact, no health implications to the surrounding public envisaged.	**-**
26	The PP shall provide the measures of socio-economic significance and influence to the local community. As far as possible, quantitative dimensions may be given with the time frames for implementation.	Nearby villages were visited for conducting study to know about socio-economic conditions, including aspirations and requirements of the people for a better living and collected relevant data. The details are provided under section 3.2.3, Chapter-III.	**3-12**
27	The PP shall disclose the details of litigation / violation case pending against the project (or) the PP pertaining to this mining proposal, if any, with the direction/order passed by any court of law against the project proposal in the past or now.	PP informed that there is no litigation pending against the project.	**-**
28	Proponent shall furnish the letter received from DFO concerned stating the proximity details of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.	There area no Protected Areas, Sanctuaries, Tiger reserve etc with in 10 km radius	**3-4**
29	Detailed study report on flora and fauna in and nearby the quarry site.	A detailed study of flora and fauna composition in the core and buffer zone of the project has been made through primary field surveys. The details are furnished in para 3.5, Chapter III.	**3-44**
30	The Proponent shall develop greenbelt and garland drain around the boundary of the	Site photographs are provided in **Photo**	**2-8**

	proposed quarry and the photographs indicating the same shall be shown during the EIA appraisal.	**Figure No.2.9, Chapter-II.**	
31	The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.	A detailed study of flora and fauna composition in the core and buffer zone of the project has been made through primary field surveys by NABET approved Ecologist. The details are furnished in para 3.5, Chapter III.	**3-44**
32	The PP shall carry out the air-quality monitoring for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of minerals. The details of the model used and the input parameters used for modelling should be provided. The air quality contours may be plotted on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	• Air quality modeling details are furnished in para 4.2.3 and its continuous sub paras in Chapter-IV of EIA report. • The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model developed by Lakes Environmental Software which is based on steady state Gaussian plume dispersion. • The model simulations are done for the air pollutant arising from the mining operations, namely, PM10, PM2.5. Ground Level Concentration (GLC) have been computed using hourly meteorological data both for individual lease and cumulative basis. The Isopleths of PM10, PM2.5 concentrations for with control measures scenario have also been drawn and these are given in Figure No.4.1 and 4.12.	**4-3**
33	The PP shall furnish the water requirement for the project, its availability and source. A detailed water balance should also be provided. Fresh water requirement for the project should be indicated.	Total water requirement for all the 5 leases is 8cu.m, Domestic – 2.0 cu.m, Dust suppression and Afforestation – 6.0 cu.m. Required water will be procured from outside.	**4-19**
34	The PP shall assess the impact of project on water quality, both surface and groundwater and necessary safeguard measures, if any required, should be provided.	Details are given in Para 4.3.1 & 4.3.2.	**4-19**
35	The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.	Proponent is not operating any other garnet mines in the state.	**-**
36	If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines, i) What was the period of the operation and	This is a proposed quarry. No mining activities have been carried out in this lease area.	**-**

	stoppage of the earlier mines with last work permit issued by the AD/DD mines? ii) Quantity of minerals mined out. iii) Highest production achieved in any one year iv) Detail of approved depth of mining. v) Actual depth of the mining achieved earlier. vi) Name of the person already mined in that leases area. vii) If EC and CTO already obtained, the copy of the same shall be submitted. viii) Whether the mining was carried out as per the approved mine plan (or EC if issued).		
37	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	Project coordinates superimposed in satellite imagery and given as Figure No - 2.4 to 286 in Chapter – II. The 10km Radius Index plan showing buffer zone is given in Figure No.3.1 in Chapter – III.	**2-5**
38	The Proponent shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,	Agreed	**-**
39	The proponent shall furnish photographs of adequate fencing. green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	Site photographs have been provided in Chapter-II.	**2-8**
40	The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.	• The details of geological and mineable reserves are provided in para 2.6, Chapter-II. • The production schedule during the plan period is provided in Table 2.3, Chapter-II. • The working methodology is detailed under Section 2.6, Chapter-II. Anticipated impacts of mining operations on surrounding environment is provided under Chapter-IV.	**2-26**
41	The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.	The organization chart is provided as Figure No.10.1, Chapter-X.	**10-2**
42	The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water	Hydrogeological Study is detailed under Section 3.6, Chapter-III.	**3-53**

	bodies such as rivers, tanks, canals. ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data. it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.		
43	The Proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.	The baseline data on micro- meteorology, ambient air quality, Water quality, noise level, soil and flora & fauna are collected during Post monsoon Season 2024 (October 2024 to December 2024) and detailed in Section 3.3 to 3.5 of Chapter-III. The details of Traffic is provided under Section 4.9, Chapter-IV.	**3-1**
44	The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	• The details of the quarries located within the 500m radius of the project is given vide Annexure-4E. • A cumulative impact study has been carried out and furnished in Para 7.3, Chapter-VII. Environmental Management Plan is provided under Chapter-X.	**A269** **7-2**
45	Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	• Mining in PWD eri itself is expected to augment the water holding capacity of the eri and also act as RWH measure. Additionally, clearing of other area from bushes and peripheral plantation in bunds will be carried out in consultation with authorities.	**-**
46	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational. operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	• The land use of the study area was studied to demarcate various LULC categories and its details are provided under section 3.4, Chapter-III. • The land use pattern at present and at the end of the quarrying period has been provided under section 4.5, Chapter-IV. The post mining land use has been provided in Table No. 4.12.	**4-21**
47	Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining	Not applicable	**-**

	activities could be considered.		
48	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Replied in sl no 38 above	**-**
49	A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	An ecological survey of the study area was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. Details are provided under section 3.5. Chapter-III.	**3-44**
50	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	Details of Mine Closure Plan is provided under section 7.5, Chapter-VII.	**7-7**
51	Public Hearing points raised and commitments of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project and to be submitted to SEIAA/SEAC with regard to the Office Memorandum of MoEF& CC accordingly.	This draft EIA/EMP report will be submitted for Public Hearing as per mandatory procedures through the District Collector and State Pollution Control Board officials after giving 30 days advance notice in two local newspapers about the scheduled date and time for conduct of the public hearing procedures. The opinions, concerns and objections of stakeholders will be recorded during the public hearing. All the public queries and the replies to the query by the project proponent and officials concerned will be recorded and incorporated in the Final EIA/EMP report for approval by SEIAA, Tamil Nadu.	**7-1**
52	The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.		**-**
53	The Proponent shall produce/display the EIA report, Executive summary and other related information with respect to public hearing in Tamil Language also.	Agreed	**-**
54	As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.	An ecological survey of the study area was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. Details are provided under section 3.5.1, Chapter-III.	**3-44**
55	The purpose of Greenbelt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the Appendix-I in consultation with the DFO, & Tamil Nadu Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs	Agreed	**-**

	should be planted in a mixed manner.		
56	Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner	Agreed	**-**
57	A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	The disaster management plan has been provided under section 7.4, Chapter-VII.	**7-6**
58	A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	Various risks likely to arise due to mining activities are detailed under section 7.4, Chapter-VII.	**7-6**
59	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Details of occupational health and safety aspects are given under the subsections of Para 4.8, Chapter-IV.	**4-25**
60	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	Replied in sl no 19 above	**-**
61	The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	Nearby villages were visited for conducting study to know about socio-economic conditions, including aspirations and requirements of the people for a better living and collected relevant data. The details are provided under section 3.2.3, Chapter-III	**3-12**
62	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	PP informed that there is no litigation pending against the project.	**-**
63	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential. etc.	• Project benefits are given in Chapter – VIII. By means of carrying out the socio-economic development activities, local community development is expected. Towards the same, the proponent has	**4-24**

		planned to allocate Rs.10 Lakhs for various activities under CER for all the 5 leases together. From the CER activities allocated for various social welfare activities, the villages near the lease area will be benefited.	
64	If any quarrying operations were carried out in the proposed quarrying, site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.	This is a proposed quarry. As such no mining activities have been carried out in this lease area.	**-**
65	The Proponent shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.	EMP is prepared for the entire life of the mine. Affidavit will be provided along with the final EIA/ EMP report.	**-**
66	Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.	Agreed	**-**
A. STANDARD TERMS OF REFERENCE			
1	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.	This is a proposed quarry. As such no mining activities have been carried out in this lease area.	**2-28**
2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	Lease document is already executed and given in Anneuxre – 2A	**A45**
3	All documents including approved mine plan. EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	The production capacity, quantity of waste, its management and mining technology in mine plan and EIA, etc., are compatible with one another.	**--**
4	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	• Project coordinates superimposed in satellite imagery and given as Figure No - 2.4 to 2.8 in Chapter – II. The 10km Radius Index plan showing buffer zone is given in Figure No.3.1 in Chapter – III.	**2-5** **3-3**
5	Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of	Study area map based on Survey of India Topo sheet is given as Figure – 3.1	**--**

	land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.		
6	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	Not Applicable	--
7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.	• The proponent will frame a well-planned environmental policy. Its details are provided under Section 10.2.1, Chapter-X. The Mines Manager will undertake effective monitoring and implementation of various environmental control measures promptly and effectively and to oversee various environmental management schemes for air quality control, water quality status, noise level control, plantation programme, social development schemes, etc in the mine. The organizational chart for the same has been provided in Figure No.10.1, Chapter-X.	**10-1**
8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	• Various risks likely to arise due to mining activities are detailed under section 7.4, Chapter-VII. This being an shallow opencast mine, subsidence is not applicable. No drilling and blasting involved.	**7-6**
9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.	The study area chosen for collecting existing environmental status covers 10 km radial distance from the project periphery (Figure No - 3.1). Data given in the report is for the life of the mine.	**3-3**
10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	• The land use of the study area was studied to demarcate various LULC categories and its details are provided under section 3.4, Chapter-III. • The land use pattern at present and at the end of the quarrying period has been provided under section 4.5, Chapter-IV. The land use during the post mining stage is provided in Table 4.12, Chapter-IV.	**3-35** **4-23**
11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land	There are no OB dumps outside the lease area.	--

	area, distance from mine lease, its land use, R&R issues, if any, should be given.		
12	Certificate from the Competent Authority in the State Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	There is no forest land in the lease area.	--
13	Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	There is no forest land in the lease area.	--
14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not Applicable	--
15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	There are no reserved or protected forests within the buffer zone.	**3-4**
16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.	The mining lease area and the 10 km buffer zone from the periphery of the core zone is devoid of declared ecologically sensitive features like national parks, biospheres, sanctuaries, etc.	**3-4**
17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	Replied in Standard ToR point No.16	--
18	A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried	A detailed study of flora and fauna composition in the core and buffer zone of the project has been made through primary	**3-44**

	out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	field surveys. The details are furnished in para 3.5, Chapter III.	
19	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable	--
20	Similarly, for coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not Applicable	--
21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmers prepared and submitted accordingly, integrating the sectoral programmers of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.	The mining activities will be carried out within the mine lease area only. The entire mine lease area is Government poramboke eri land. Hence, the question of R& R does not arise.	**7-6**
22	One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter	• The baseline data on micro- meteorology, ambient air quality, Water quality, noise	

	season)} primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM 10, particularly for free silica, should be given.	level, soil and flora & fauna are collected during Post monsoon Season 2024 (October 2024 to December 2024) and detailed in Section 3.3 to 3.5 of Chapter-III. • Monitoring stations were selected taking into account, wind direction and location of sensitive receptors. Free silica composition in PM10 sample has been done and the values are found to be Below Detectable Limit (DL 0.05mg/m3) which is well within the prescribed limit of 5mg/m3.	**3-14** **3-36**
23	Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	• Air quality modeling details are furnished in para 4.2.3 and its continuous sub paras in Chapter-IV of EIA report. • The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model developed by Lakes Environmental Software which is based on steady state Gaussian plume dispersion. • The model simulations are done for the air pollutant arising from the mining operations, namely, PM10, PM2.5. Ground Level Concentration (GLC) have been computed using hourly meteorological data both for individual lease and cumulative basis. The Isopleths of PM10, PM2.5 concentrations for with control measures scenario have also been drawn and these are given in Figure No.4.1 and 4.12.	**4-3**
24	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.	Total water requirement for all the 5 leases is 8cu.m, Domestic – 2.0 cu.m, Dust suppression and Afforestation – 6.0 cu.m. Required water will be procured from outside.	**4-19**
25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Not Applicable	**--**
26	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be	Mining in PWD eri itself is expected to augment the water holding capacity of the eri and also act as RWH measure. Additionally, clearing of other area from	**4-19**

	provided.	bushes and peripheral plantation in bunds will be carried out in consultation with authorities.	
27	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	Details are given in Para 4.3.1. chapter - IV	**4-19**
28	Based on actual monitored data. it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.	Not applicable	**-**
29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	Replied above in Standard ToR point No.27	**--**
30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.	Not applicable	**-**
31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	Since mining operation will be carried out within the eri poramboke land , it is proposed to carryout at least 1000 nos of tree plantation in the peripheral eri bund, approach road from the eri periphery to the proposed beneficiation plant area, community plantation in the available lands in the nearby villages in consultation with the panchayat heads and Government officials. Local native species like palm, neem, pungai, vagai, puli, etc will be planted and well maintained during the lease period.	**-**

32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.	Since the production is less, the overall transport from all the 5 leases in the Governement poramboke land is just 7 trips per hour only. Existing road can easily absorb this traffic. Details are provided under Para 4.9, Chapter-IV.	**4-26**
33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	This is a proposed project. Site services like mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.	**2-40**
34	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	Out of 2.00 m of depth of mining , since the mineral recovery is just 10% of the ROM material removed, the entire 0.50m Top clayey soil + 90% of the reject material will be used for backfilling the mined out area and ultimately the entire lease area will brough back to premining condition.	**2-25**
35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Details of occupational health and safety aspects are given under the subsections of Para 4.8, Chapter-IV.	**4-25**
36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	This being a small project with no significant impact, no health implications to the surrounding public envisaged	**4-25**
37	Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	• Nearby villages were visited for conducting study to know about socio-economic conditions, including aspirations and requirements of the people for a better living and collected relevant data. The details are provided under section 3.2.3, Chapter-III • Project benefits are given in Chapter – VIII. • By means of carrying out the socio-economic development activities, local community development is expected. Towards the same, the	**3-12** **4-24**

		proponent has planned to allocate Rs.10 Lakhs for various activities under CER for all the 5 leases together. From the CER activities allocated for various social welfare activities, the villages near the lease area will be benefited.	
38	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.	Detailed Environmental Management plan and its implementation, etc., are furnished in Chapter X.	**10-1**
39	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	This draft EIA/EMP report will be submitted for Public Hearing as per mandatory procedures through the District Collector and State Pollution Control Board officials after giving 30 days advance notice in two local newspapers about the scheduled date and time for conduct of the public hearing procedures. The opinions, concerns and objections of stakeholders will be recorded during the public hearing. All the public queries and the replies to the query by the project proponent and officials concerned will be recorded and incorporated in the EIA/EMP report for approval by SEIAA, Tamil Nadu.	**7-1**
40	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	PP informed that there is no litigation pending against the project.	**--**
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	The details of environmental management cost has been provided in Table 10.1, Chapter-X.	**10-6**
42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	The disaster management plan has been provided under section 7.3.1, Chapter-VII.	**7-4**
43	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Project benefits are given in Chapter – VIII.	**8-1**
44	Besides the above, the below mentioned general points are also to be followed:- a) Executive Summary of the EIA/EMP Report b) All documents to be properly referenced with index and continuous page numbering. c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.	**Noted**	-

	d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the Original analysis/testing reports should be available during appraisal of the Project. e) Where the documents provided are in a language other than English, an English translation should be provided. f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted. g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed. h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation. i) As per the circular no. J-11011/618/2010-1A.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable. ii) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.		

CHAPTER - I

INTRODUCTION

CHAPTER 1

INTRODUCTION

1.1 PURPOSE OF THE REPORT:

The purpose of the report is to obtain environmental clearance for the proposed 5 nos of Garnet Sand Deposit Mines of Tvl.Riverways Mines and Minerals Ltd (4 nos) and Tvl.S.S.Minerals (1no) located in Musiri taluk, Trichy district, Tamil Nadu . Tvl.Riverways Mines and Minerals Ltd & Tvl.S.S.Minerals are associated companies with the same promoters & the 5 quarry leases are located within 500m radius. The leases details are given below:

S.No	Name of lease	Location	Extent	Authorized Person	Status of leases
1	GO 43	S.F.No.390(P) – Eri poramboke land, Kottathur village, Musiri taluk, Trichy district, Tamil Nadu.	4.75.5	K.Balasubramanian, Managing Director, Tvl.Riverways Mines and Minerals Ltd	Fresh lease
2	GO 69		4.90.0	K.Balasubramanian, Managing Director, Tvl.Riverways Mines and Minerals Ltd	
3	GO 70		4.75.0	K.Balasubramanian, Managing Director, Tvl.Riverways Mines and Minerals Ltd	
4	GO 71		4.80.0	K.Balasubramanian, Managing Director, Tvl.Riverways Mines and Minerals Ltd	
5	GO 57		4.75.0	N.Samuel Baskaran, Partner, Tvl.S.S.Minerals	

As per MoEF&CC notification vide S.O.1533(E) dated 14.09.2006 and its subsequent amendments, non-coal mining projects are divided into the following categories as mentioned in Table No.1.1.

Table 1.1: Screening of Schedule 1(a) Projects

MoEF&CC Notification reference	Project or Activity		Category with threshold limit		Conditions if any
			A	B	
S.O. 1886(E) dated 20.04.2022	1 (a)	Mining of Minerals	> 250 Ha of mining lease area in respect of non-coal mine lease	All mining lease area in respect of minor minerals leases and < 250 Ha mining lease area in respect of major mineral mining lease other than coal.	General condition shall apply

Source: MoEF&CC Notifications S.O.1533(E) dated 14.09.2006, S.O.3977(E) dated 14.08.2018, S.O.3194(E) dated 14.07.2022

Considering that this is a Garnet sand mining project which is a major mineral, this project falls under Sector 1(a) i.e.; Mining of Minerals under Category B1 and as per MoEF & CC notification, this proposal necessitates preparation of EIA/EMP report along with public hearing.

Since all the 5 leases belong to 2 associate companies of the same promoters and are in cluster situation within 500m radius, a common EIA report for all the leases having separate EMP Plan for individual projects has been prepared. As such this combined EIA report is prepared based on standard and additional Terms of Reference issued by SEIAA, Tamil Nadu and is in conformance of the generic structure prescribed by MOEF&CC and approved mining plan.

1.2 IDENTIFICATION OF PROJECT & PROJECT PROPONENT:

1.2.1 IDENTIFICATION OF THE PROJECT:

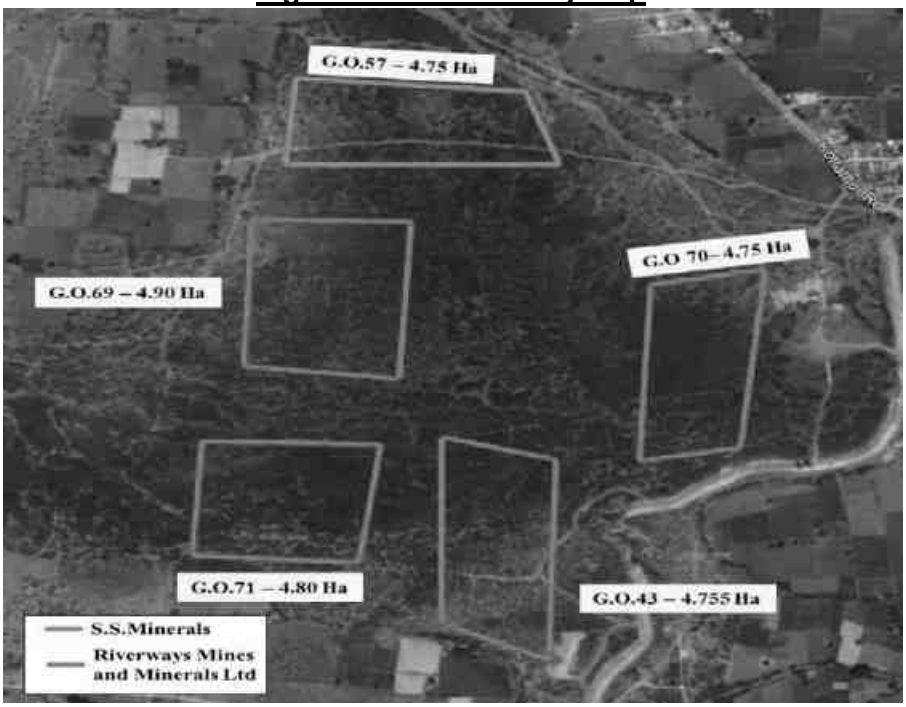
Of the 5 lease areas, four belonging to Tvl. Riverways Mines and Minerals Ltd. and one belonging to Tvl.S.S.Minerals are located in S.F.No.390(P) in Kottathur Village, Musiri Taluk, Trichy District, Tamil Nadu. The details of each of the leases are given below in Table 1.2. All the lease areas are Government Eri Poromboke Land.

Table 1.2: Project Details

G.O.No	Project Proponent	Extent (Ha)	Peak Production (TPA)	Ultimate Depth (m)
GO 43	Tvl. Riverways Mines and Minerals Ltd	4.75.5	2400	2
GO 69	Tvl. Riverways Mines and Minerals Ltd	4.90.0	1776	2
GO 70	Tvl. Riverways Mines and Minerals Ltd	4.75.0	2500	2
GO 71	Tvl. Riverways Mines and Minerals Ltd	4.80.0	3552	2
GO 57	Tvl.S.S.Minerals	4.75.0	2450	2

Site vicinity map has been described in Figure 1.1. The entire mined out material from this lease will be sent to pre-concentration plant outside the lease area.

Figure 1.1: Site Vicinity Map



Source: Google Earth

Table 1.3:Statutory Clearances

Project Name	G.O.Ms.No.43	G.O.Ms.No.69	G.O.Ms.No.70	G.O.Ms.No.57	G.O.Ms.No.71	Ref
Precise area G.O	G.O.3D No.43 dated 27.09.2010	G.O.3D No.69 dated 27.12.2010	G.O.3D No.70 dated 29.12.2010	G.O.3D No.57 dated 03.11.2010	G.O.3D No.71 dated 29.12.2010	Annexure 1A to 1E
Lease Execution	06.04.2018 valid upto 05.04.2038	06.04.2018 valid upto 05.04.2038	06.04.2018 valid upto 05.04.2038	06.04.2018 valid upto 05.04.2038	06.04.2018 valid upto 05.04.2038	Annexure 2A to E
Review of mining plan for the period 2023 -2024 to 2027-2028 Approved by IBM	vide letter No TN/TCR/GNT/ROMP-1761.MDS dated 01.08.2024	approved by IBM vide letter No TN/TCR/GNT/ROMP-1759.MDS dated 01.08.2024	approved by IBM vide letter No TN/TCR/GNT/ROMP-1760.MDS dated 20.08.2024	approved by IBM vide letter No TN/TCR/GNT/ROMP-1763.MDS dated 14.08.2024	vide letter No TN/TCR/GNT/ROMP-1758.MDS dated 22.08.2024	Annexure 3A to E
500m radius letter	Rc.No.217/2002/Mines dated 13.04.2018	Rc.No.221/2002/Mines dated 13.04.2018	Rc.No.223/2002/Mines dated 13.04.2018	Rc.No.214/2002/ Mines dated 13.04.2018	Rc.No.225/2002/ Mines dated 13.04.2018	Annexure 4A to E
Rev. PWD Letter	K.No./V.B/V-1/K-76/2019 dated 18.02.2019	K.No./V.B/V-1/K-76/2019 dated 18.02.2019	K.No./V.B/V-1/K-76/2019 dated 18.02.2019	K.No./V.B/V-1/K-76/2019 dated 18.02.2019	K.No./V.B/V-1/K-76/2019 dated 18.02.2019	Annexure 5A to B
Letter from Industries Department*	G.O.3D No.05 dated 01.03.2023	G.O.3D No.07 dated 02.03.2023	G.O.3D No.08 dated 02.03.2023	G.O.3D No.10 dated 02.03.2023	G.O.3D No.06 dated 01.03.2023	Annexure 6A to E

*Regarding non applicability of ACMR 2016

1.2.2 IDENTIFICATION OF THE PROJECT PROPONENT:

Tvl.Riverways Mines and Minerals Ltd and Tvl.S.S.Minerals are associated companies with the same promoters.

Table 1.4: Identification of Project Proponents

Name of the proponent	Tvl. Riverways Mines and Minerals Ltd	Tvl. S.S.Minerals
Address	Tvl. Riverways Mines and Minerals Ltd No 20/4, 1st floor, Naveed castle, Balakrishnan Road, Mylapore, Chennai.	Tvl. S.S.Minerals 6/9, Kasthuri Estate, III street, Poes Garden, Chennai - 600086.
E-mail ID	ls.baskaran@gmail.com	roshanmanaseh@gmail.com
Mobile No:	9841074743	9841074743

1.3 BRIEF DESCRIPTION OF NATURE, SIZE, LOCATION & PROJECT IMPORTANCE

Table 1.5: Brief Description of Nature of projects

Sector	1(a), Non-Coal Mining
Type	Greenfield Project
Category	B1
Mineral to be mined	Garnet sand
Major/Minor Mineral	Major
Mining Method	Method of mining is by mechanized open cast mining without drilling and blasting operations involving excavation & direct loading into tippers.

Table 1.6: Location of the project

Project Name	G.O.Ms.No.43	G.O.Ms.No.69	G.O.Ms.No.70	G.O.Ms.No.71	G.O.Ms.No.57
Latitude	11° 05' 52.06"N to 11° 06' 02.77"N	11° 06’ 05.43’’N to 11° 06’ 13.93’’N	11° 06' 01.10"N to 11° 06' 12.76"N	11° 05’ 54.19’’N to 11° 06’ 01.55’’N	11° 06' 14.43"N to 11° 06' 20.99"N
Longitude	78°39' 56.71"E to 78° 40' 02.72"E	78° 39’ 49.60’’E to 78° 39’ 57.51’’E	78° 40' 05.95"E to 78° 40' 11.95"E	78° 39’ 46.44’’E to 78° 39’ 54.69’’E	78° 39' 54.80"E to 78° 40' 05.89"E

Location details are elaborated in Para **2.3, Chapter-II.**

1.3.1 IMPORTANCE TO THE COUNTRY AND REGION:

Garnet is a precious mineral used for various commercial and industrial purposes. It has good indigenous and export demand. Garnet has wide range of applications, such as in production of abrasives, sand blasting, water filtration materials, abrasive blasting media and water-jet cutting.

The most important industrial use of garnet is as an abrasive. Garnet's unique grain hardness and toughness guarantees highest production efficiency in blasting. About 90% production of abrasive garnet is used for manufacturing of garnet-coated papers, clothes and discs. Garnet-coated abrasives are used in the form of belts, covers for drums, discs or as small sheets. It is used for cleaning spark plugs, paints, polishing and grinding of plate-glass. The remaining 10% output is used in the form of loose grains for surfacing and polishing soft stones (marble, slate, soapstone, etc.). Other uses are in electronic and television industry for polishing glass and TV tubes. Garnet granules are used in 'abrasive blasting' commonly called 'sand blasting' in order to smoothen, clean and remove oxidation products from metals, stone and other material.

The main application of Garnet is in water jet cutting of materials like steel and stainless steel, non-ferrous metals, granite and marble, rubber and glass. Fine garnet dust is used in the detailed finishing and polishing of optical lens, plate glass, and semiconductor materials. Because garnet is chemically stable, it is also used as a filtering medium for water purification systems or wastewater treatment plants.

Garnet grain shape of sub-angular/angular produce a greater and sharper pattern than possible with spherical or rounded shape abrasives of the same mesh size. Garnet has no free silica and hence does not cause dust and silicosis in its industrial application unlike silica sand/Quartzite.

Garnet has no toxic metals like Arsenic, Cadmium, Lead, and Mercury. It is inert. Hence, it is environmentally friendly. Garnet is a cost-effective and environment friendly alternative to other natural (mineral sands) abrasives and metallic abrasives

There is quality garnet reserves available in this lease area and major part of it can be exported after processing due to which good foreign exchange accruals will arise. The domestic sales will also bring good returns financially to state government and central government in the form of royalty, DMF, GST, etc.

Besides, garnet mining and processing plant operation in the area will provide both direct and indirect employment opportunities through allied opportunities in logistics, trading, repairing works etc good employment potential will arise in this internal area, which will provide a great fillip for raising income levels and standards of living in the area.

1.4 SCOPE OF THE STUDY:

Particulars	G.O.Ms.No.43	G.O.Ms.No.69	G.O.Ms.No.70	G.O.Ms.No.71	G.O.Ms.No.57
Proposal no	11809522461	522482	522638	522487	523816
File no	11809	11810	11811	11812	11834
Terms of Reference	SEIAATN/F/No.6507/SEAC/ToR-1487/ 2023 dt 22.06.2023.	SEIAA-TN/F/No.6508/SEAC/ToR-1497/2023 dtd 22.06.2023	SEIAA-TN/F/No.6510/SEAC/ToR-1490/2023 dt 22.06.2023	SEIAA-TN/F/No.6511/SEAC/ToR-1478/2023 dtd 22.06.2023.	SEIAA-TN/F/No.6509/SEAC/ToR-1493/2023 dt 22.06.2023.
Amendment in TOR	TO25B108TN5433895A dt.07.04.2025	TO25B108TN5433895A dt.07.04.2025	TO25B108TN5433895A dt.07.04.2025	TO25B108TN5433895A dt.07.04.2025	TO25B108TN5433895A dt.07.04.2025
Baseline Data Collection	Post monsoon season Oct-Dec-2024	Post monsoon season Oct-Dec-2024	Post monsoon season Oct-Dec-2024	Post monsoon season Oct-Dec-2024	Post monsoon season Oct-Dec-2024

Based on the terms of reference, data collection, the Environmental Impact Assessment was carried out for the project area (core zone and the buffer zone (10km radius from the core zone) and the following studies were covered:

- Collection of primary and secondary data relevant to the project.
- One-Season baseline monitoring for environmental parameters such as air, water, noise, soil, flora & fauna, etc. Analysis of parameters in in-house laboratory.
- Documentation of EIA/EMP report with inclusion of relevant studies conducted by other bodies into the EIA/EMP report.
- Identification of significant environmental parameters that are prone to get affected due to pollution. Namely, Air, Water, Noise, Soil, Biological and Land Environment.
- Evaluation and determination of suitable mitigation measures to reduce and control the said pollution.

- Prediction of post project concentration (baseline + incremental) with respect to air environment for core zone and buffer zone.
- Formulation of an Environmental Management plan including administrative aspects for proposed implementation of mitigative measures in time.

This draft EIA/EMP report will be submitted for public hearing, as per rules and procedures in this respect, as per the EIA notification 2006. The opinions, concerns and objections, if any, of the surrounding public and other stake holders connected, will be taken into consideration and compliance report thereon will be submitted to SEIAA, Tamil Nadu in the final EIA/EMP report.

1.5 LEGAL AND REGULATORY FRAMEWORK:

The Ministry of Environment, Forests & Climate Change, State and Central Pollution Control Board are the primary operational agencies/ regulation agencies in India with respect to Environment. The various environmental regulations and subsequent amendments which govern the project have been provided below:

- ❖ Environment Protection Act, 1986
- ❖ EIA Notification, 2006
- ❖ Air (Prevention and Control of Pollution) Act, 1981
- ❖ Water (Prevention and Control of Pollution) Act, 1974
- ❖ Noise Pollution (Prevention & Control) Rules, 2000
- ❖ Solid Waste Management Rules, 2016
- ❖ Hazardous Waste (Management, Handling & Transboundary Movement) Rules, 2016
- ❖ Mines-Act 1952
- ❖ Mines & Minerals (Regulation and Development) Act, 1957
- ❖ Metalliferous Mines Regulations (MMR), 1961
- ❖ Explosives Rules, 2018

1.6 STRUCTURE OF THE EIA/EMP REPORT:

Chapter-1: Introduction: This chapter provides the background information of the project, brief description of nature, size and location of proposed project, environmental setting of project, importance of project and scope of the study.

Chapter-2: Project Description: This chapter deals with the need for the project, location, project implementation, details of mining activity, other technical and design details.

Chapter-3: Description of the Environment: This chapter presents the methodology and findings of one season field study undertaken to establish the environmental baseline conditions, which is also supplemented by secondary published literature.

Chapter-4: Anticipated Environmental Impact & Mitigation Measures: This chapter cover detailed impact of the proposed project on different environmental components during operation phase of mining project. The chapter will also deal with the measures to be adopted to mitigate the adverse impact of the proposed mine development and underscores the areas of concern, which need mitigation measures.

Chapter-5: Analysis of Alternatives (Technology & Site): This chapter describes the analysis of various alternative sites and the technology considered for the mining activities.

Chapter-6: Environmental Monitoring Program: This chapter presents the environmental monitoring requirements for effective implementation of mitigatory measures during operational phase of the proposed project. The frequency and reporting of monitoring programme is also outlined in this chapter along with its cost.

Chapter-7: Additional Studies: This chapter describes various risks associated during operational stage of the project. A disaster management plan to minimise the risks or to combat the associated risks is also discussed. The public hearing details will be incorporated in this chapter in the final EIA/EMP after the successful completion of public hearing. The summary of additional studies and mine closure plan is also briefed here.

Chapter-8: Project Benefits: This chapter describes various benefits of the project to the community in the vicinity and as well as to the region on the whole.

Chapter-9: Environmental Cost Benefit Analysis: This chapter has to be carried out if specifically required as per scoping stage. As this is not specifically mentioned in scoping, accordingly detailed study in this regard is not carried out.

Chapter-10: Environment Management Plan: This chapter presents the details of institutional arrangements for environment protection and conservation and the capital and recurring cost of implementing the various mitigation measures stated in this EIA/EMP report.

Chapter-11: Summary and Conclusions: This chapter contains the summary and conclusion of the overall EIA studies.

Chapter-12: Disclosure of Consultants Engaged: This chapter contains the list of various experts engaged in preparing the EIA report along with brief description of the consultancy services.

* * * * * * * *

CHAPTER - II

PROJECT DESCRIPTION

CHAPTER 2.

PROJECT DESCRIPTION

2.1 TYPE OF PROJECT:

This proposal involves 5 separate leases for quarrying Garnet Sand Deposits of Tvl.Riverways Mines and Minerals Ltd (4 nos) and Tvl.S.S.Minerals (1no) using manual opencast method without drilling & blasting for a depth of 2m in eri poramboke land.

2.2 NEED & JUSTIFICATION FOR THE PROJECT:

Garnet is a precious & rare mineral used for various commercial and industrial purposes with limited availability in our country. It has good indigenous and export demand. Garnet has wide range of applications, such as in production of abrasives, sand blasting, water filtration materials, abrasive blasting media and water-jet cutting.

There is quality garnet reserves available in this lease area and major part of it can be exported after processing due to which good foreign exchange accruals will arise. The domestic sales will also bring good returns financially to state government and central government in the form of royalty, DMF, GST, etc.

Besides, garnet mining and processing plant operation in the area will provide both direct and indirect employment opportunities through allied opportunities in logistics, trading, repairing works etc good employment potential will arise in this internal area, which will provide a great fillip for raising income levels and standards of living in the area.

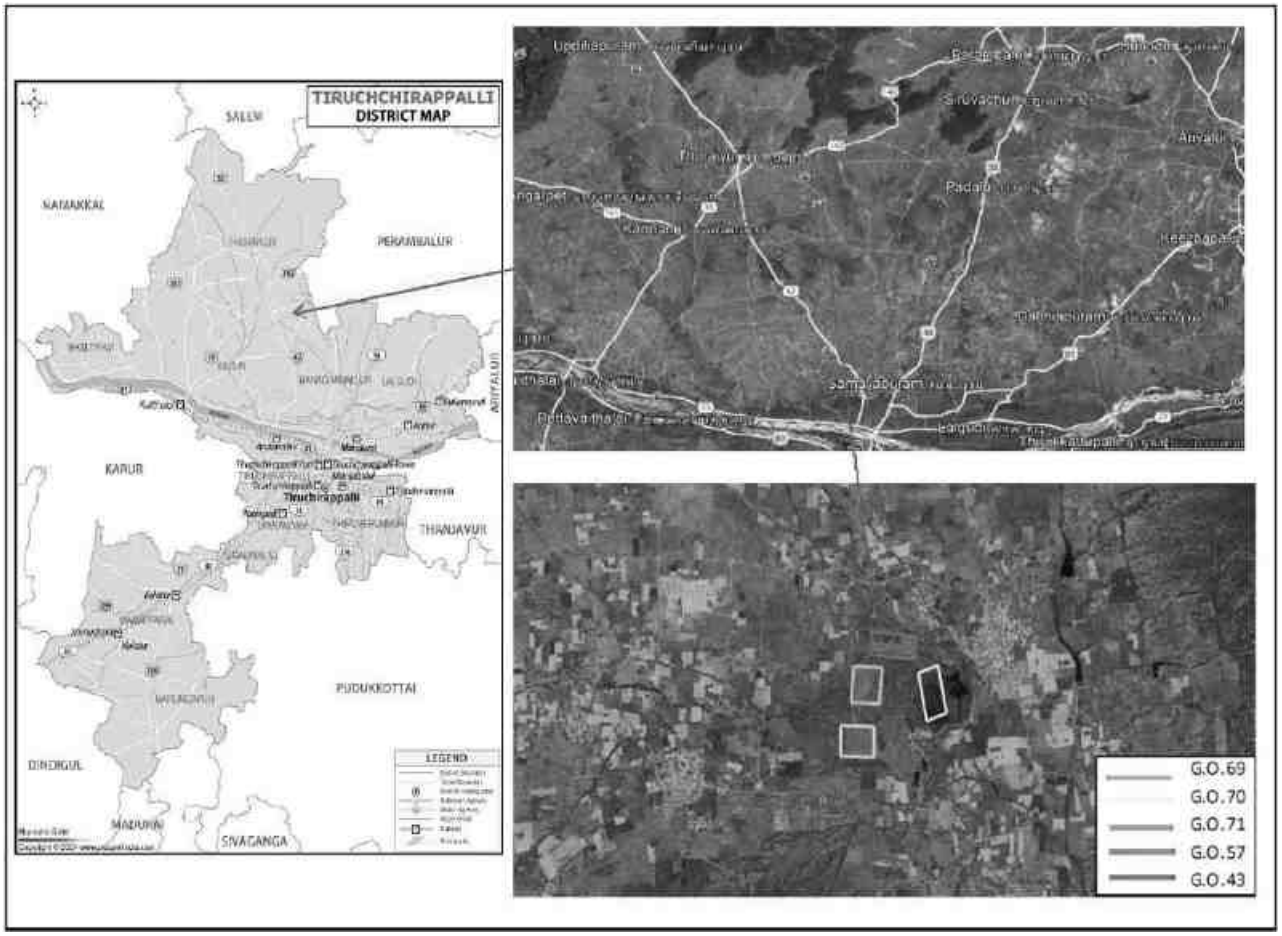
As such mining such a rare & previous mineral is imperative for the industrial application as well as regional development and it is fully justified.

2.3 LOCATION:

A. **Location of the project:**

All the five leases are located in SF.No.390(P) – Eri poramboke land, Kottathur village, Musiri taluk, Trichy district, Tamil Nadu.Location map is shown below in **Figure 2.1**.

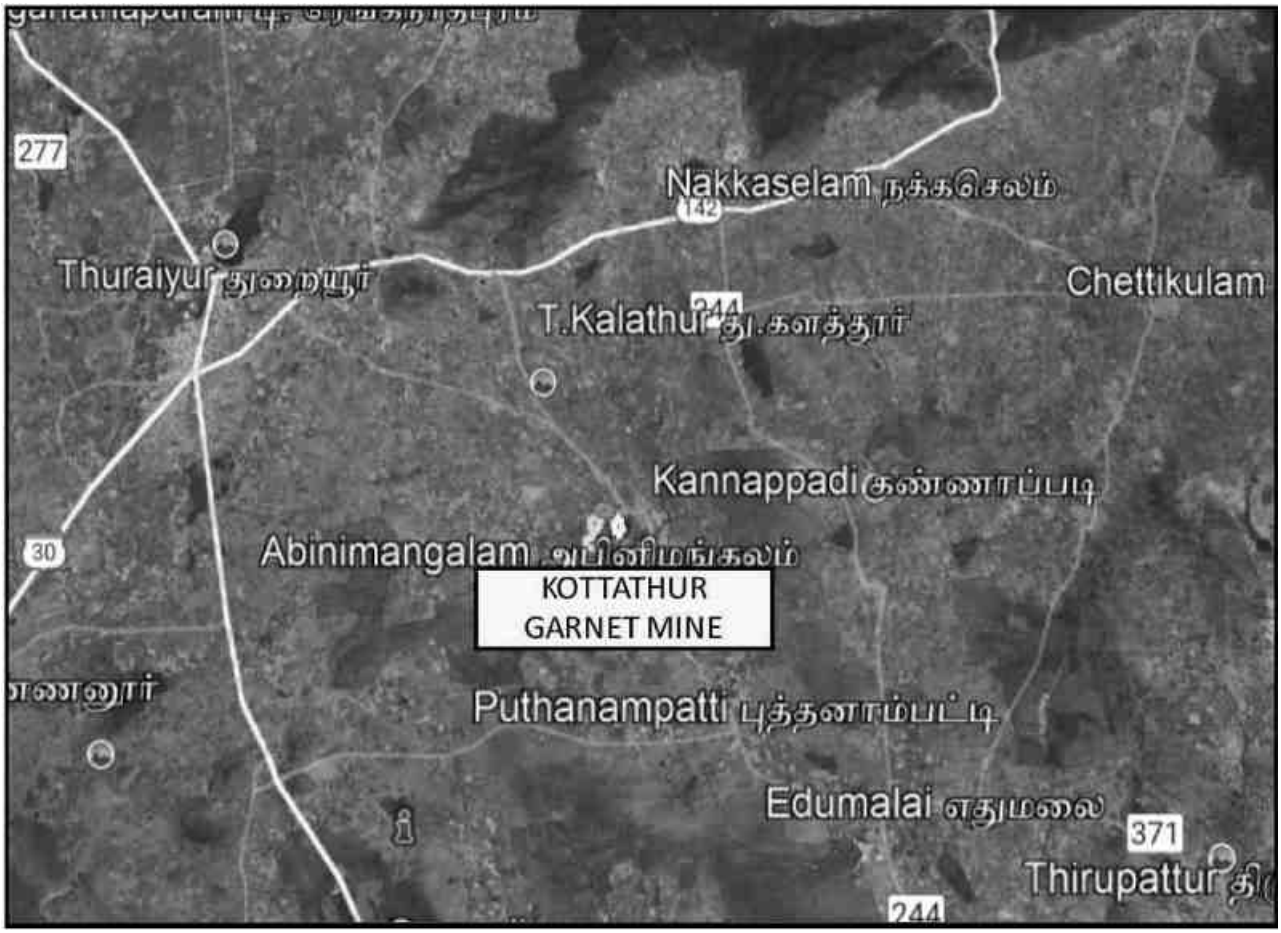
Figure 2.1: Location Map



B. Approachability to the lease area:

Leases are approachable from Kottathur to Puthanampatti road which is connected to Turaiyur – Nakkasalem road (SH-142) about 5km north of the lease area. Uthamar Kovil RS & Trichy RS are located about 25km and 34km south of the lease area respectively. Tuticorin sea port is located about 260km SE of the lease area.

Figure 2.2: Approachability Map



C. Land use details:

All the 5 leases are falling in in the same area in S.F.No.390(P) and it is eri poramboke land.

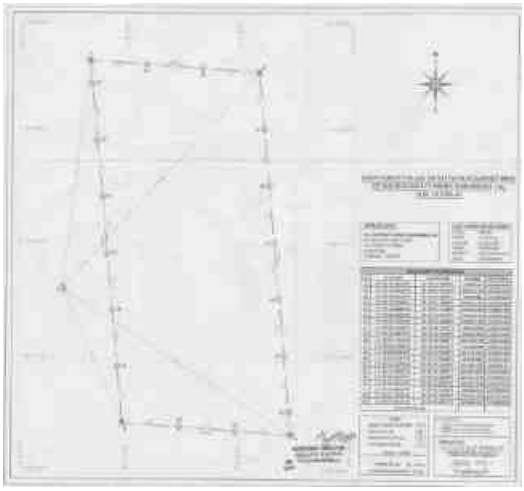
D. Co ordiantes of the lease area:

Project Name	G.O.Ms.No.43	G.O.Ms.No.69	G.O.Ms.No.70	G.O.Ms.No.71	G.O.Ms.No.57
Latitude	11° 05' 52.06"N to 11° 06' 02.77"N	11° 06’ 05.43’’N to 11° 06’ 13.93’’N	11° 06' 01.10"N to 11° 06' 12.76"N	11° 05’ 54.19’’N to 11° 06’ 01.55’’N	11° 06' 14.43"N to 11° 06' 20.99"N
Longitude	78°39' 56.71"E to 78° 40' 02.72"E	78° 39’ 49.60’’E to 78° 39’ 57.51’’E	78° 40' 05.95"E to 78° 40' 11.95"E	78° 39’ 46.44’’E to 78° 39’ 54.69’’E	78° 39' 54.80"E to 78° 40' 05.89"E

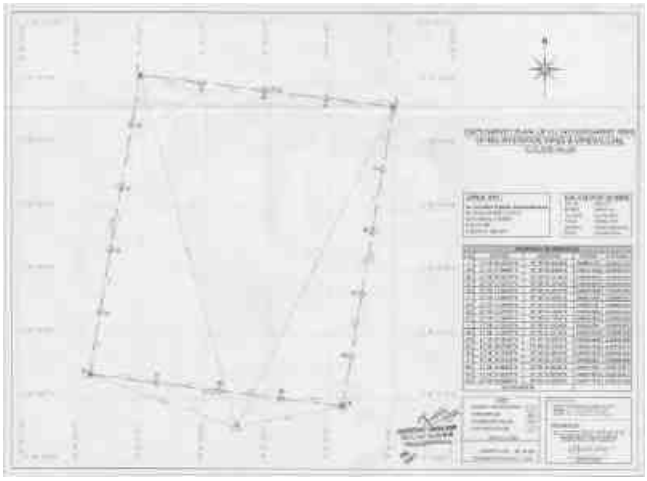
Corner co-ordinates of the lease area and satellite imagery are shown in **Figure . 2.3 & Figure 2.4 -2.8**

Figure 2.3: Lease Plan

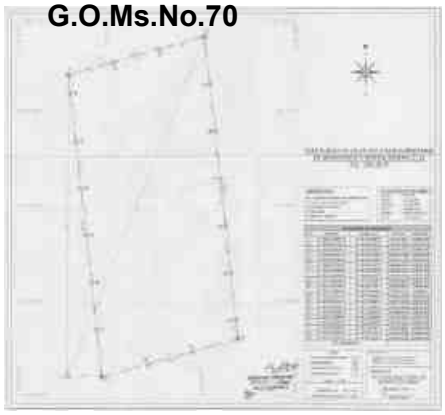
G.O.Ms.No.43



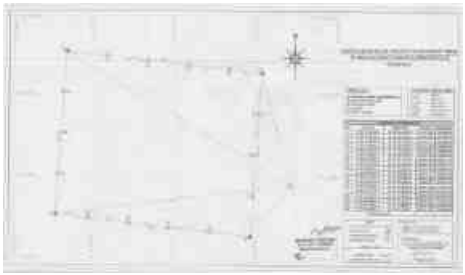
G.O.Ms.No.69



G.O.Ms.No.70



G.O.Ms.No.71



G.O.Ms.No.57

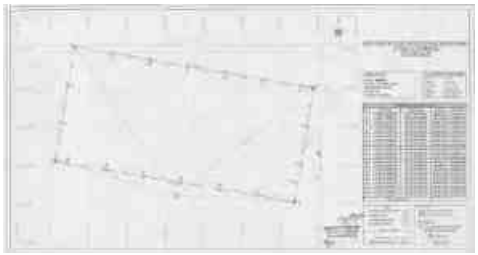


Figure 2.4: Satellite Imagery Showing Corner Co-ordinates of the leases G.O.Ms.No.43

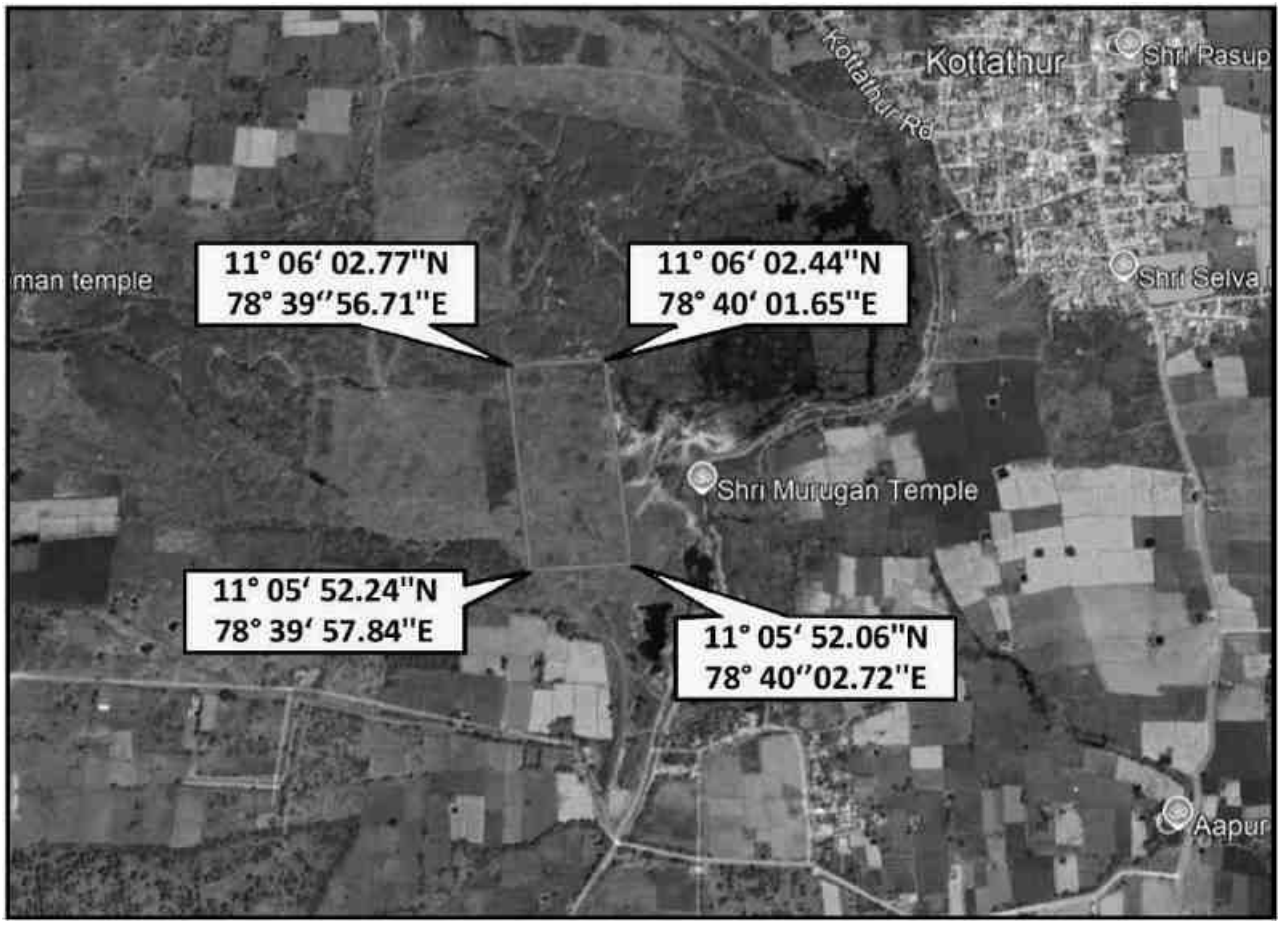


Figure 2.5: G.O.Ms.No.69

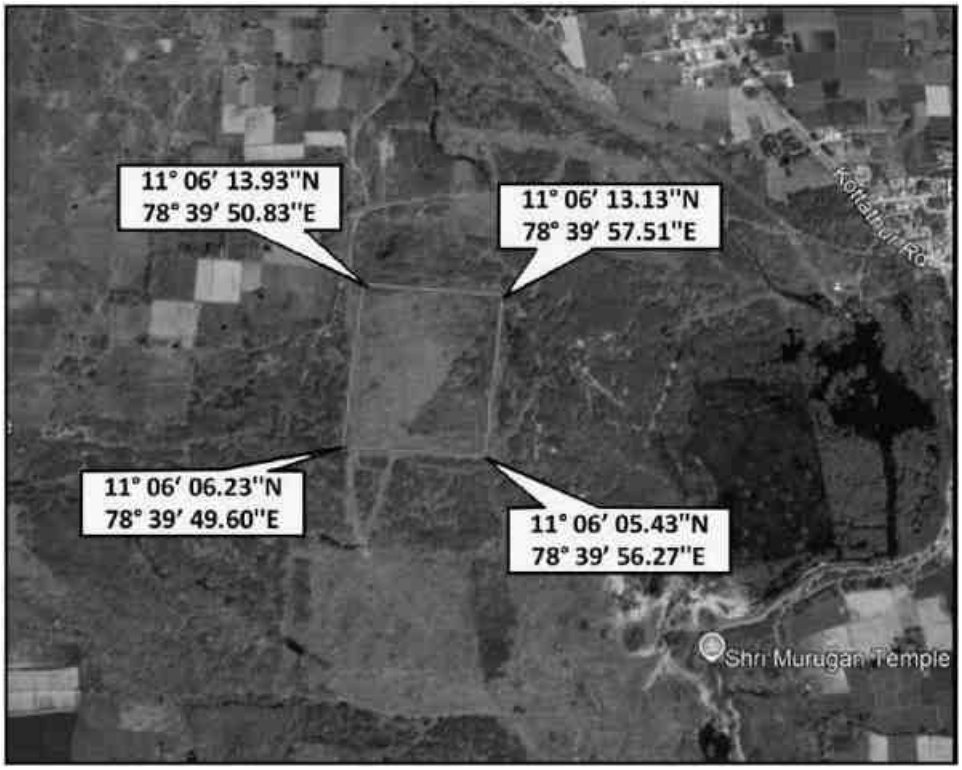


Figure 2.6: G.O.Ms.No.70

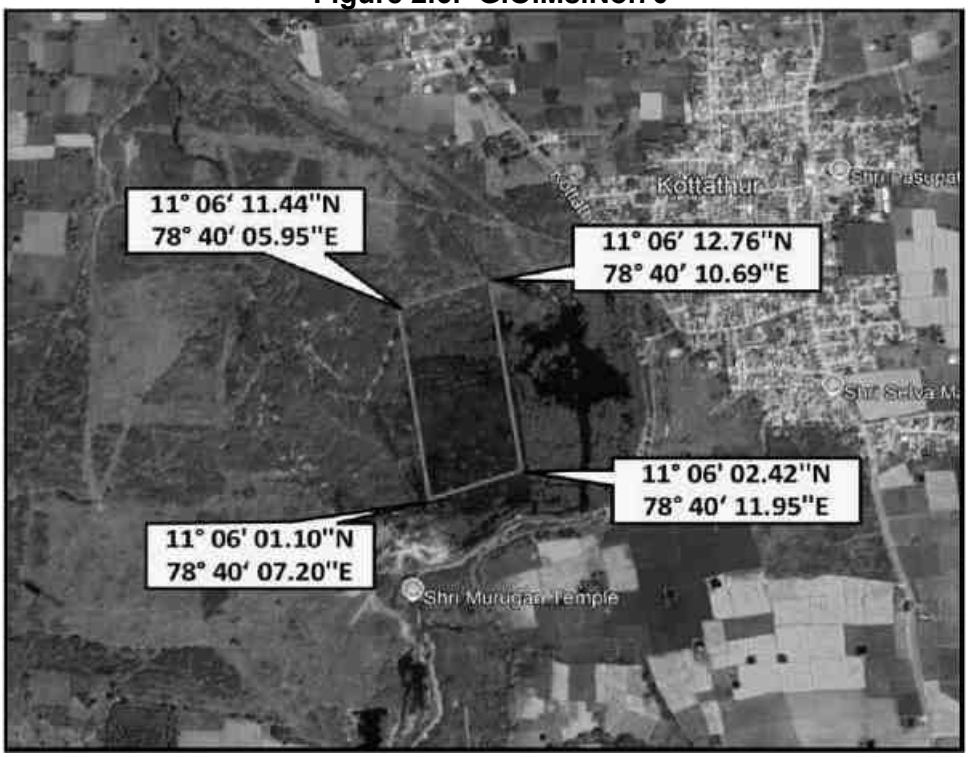


Figure 2.7: G.O.Ms.No.71

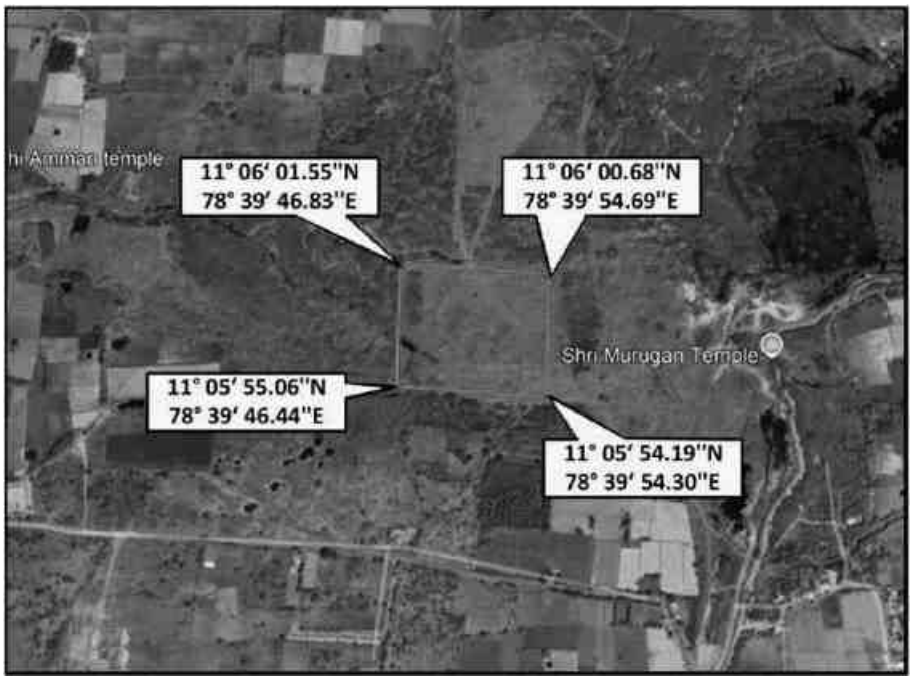


Figure 2.8: G.O.Ms.No.57

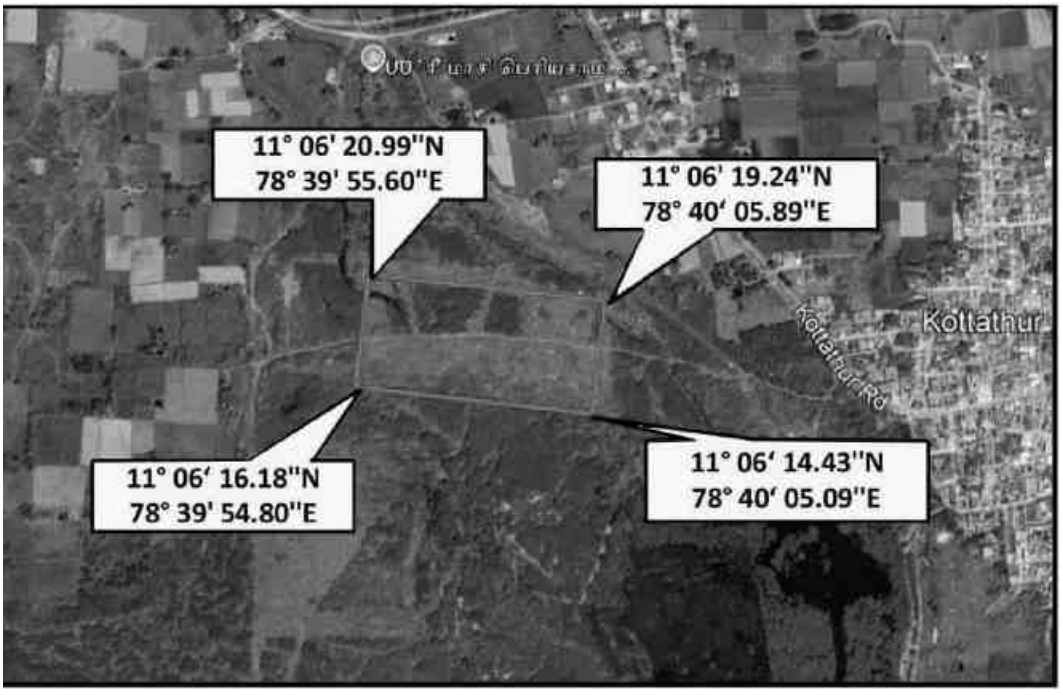


Figure 2.9: SITE PHOTOGRAPHS









E. Features within 300m radius:

As per the conditions of the Terms of Reference, the details of structures located within the 100m, 200m, 300m and 500m radius are provided below.

Table 2.1: Features within 500m radius

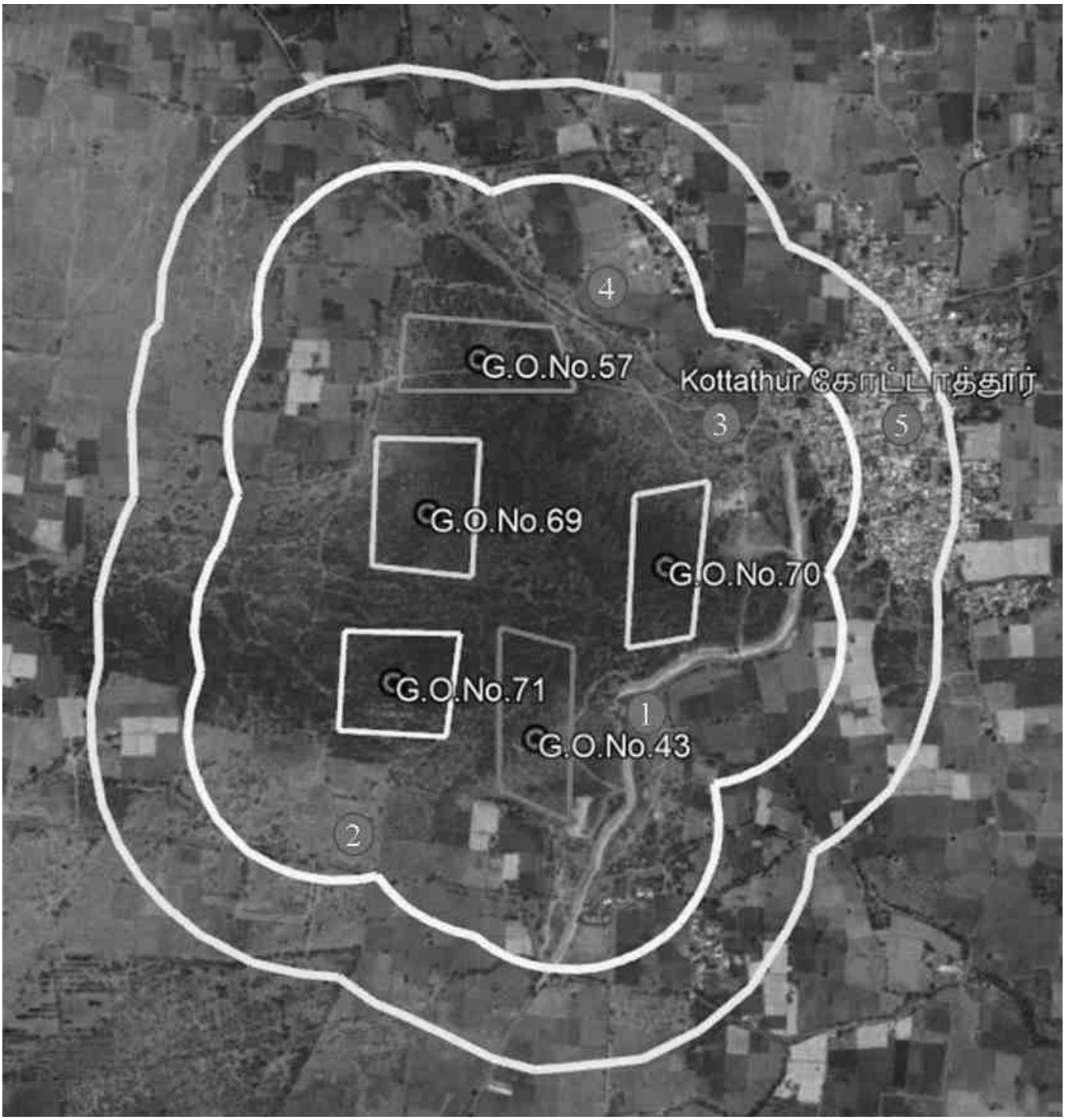
Project Name	G.O.Ms. No.43	G.O.Ms. No.71	G.O.Ms.No.69	G.O.Ms. No.70	G.O.Ms. No.57
Murugan Temple	75m-E	320m-E	380m-SE	120-S	640m-SE
Road	180m-SW	242m-S	582m-S	547m-SW	934m-S
Lake Temple	485m-NE	645m-NE	493m-E	68m-NE	325m-SW
Sri Bala Edaichi Pappathi Amman Temple	735m-S	760m-S	395m-S	460m-SE	115m-NE
Kottathur Village	650m-NE	800m-NE	580m-E	216m-E	375m-E







Figure 2.10: Details of features within 300 & 500m radius



2.4 GEOLOGY:

2.4.1 REGIONAL GEOLOGY:

The lease area is too small for description of geological history. However the major unit in which this small region is appearing can be described taking into account a wider terrain. The terrain of the lease area constitutes a part of the tectonic phase made of granulites terrain in the peninsular shield. The outcrops of garnetiferrous gneiss predominantly characterize it. Some granulites occur as linear ridges and small mounts. The best and largest outcrop of garnetiferrous pyroxene gneiss is seen in the northern foothill of kolli hills. The garnetiferrous pyroxenite is usually of coarse grained. Pyroxenites are found to occur as enclaves within the country rock of hornblende gneisses / Charnockite. The garnet sand in this region form a part of the meta sedimentary rocks of archean age correlated to bhavani super group of Dharwar group, comprising mostly of high concentrated garnetiferous gneiss. Overlain by peninsular gneiss, which is approximately aligned in North east – South west direction,. The garnetiferous gneiss is hard and compact embedded with large phenocrysts of almandine luster garnet which is in the advance stage of weathering and ready to disintegration by the impact of agents of denudation. Pyroxenite varies in their width exposure to exposure. Tremolite and actinolite rocks occur as lensoid bodies.. Pegmatite veins occur as a discordant intrusive with garnet pyroxene granulites. The important occurrences are seen in the extreme north of the lease area (i.e.) kottathur. Pegmatite represents the younger intrusive. The process of weathering results in the disintegration of rocks which in turn; enable the release of their mineral grains. When the grains like garnet, clinozoisite, amphibole, magnetite, etc., are released from the parent rocks, during the rainfall they get liberated and transported along the stream course. They get deposited in the streambed as detrital grains as and when they meet with (interface) sudden change.

2.4.2 LOCAL GEOLOGY:

The local mine geology of the area is simple and not complicated as contrast to other mineral deposits, the area is a simple sedimentary depositional sequence of alluvial sand, silt clay and some root fragments which has been carried out the streams from a longer distance and gets deposited when the velocity changes (interface). Some of the streams draining from the hills and hillocks in the Thottiyam Taluk possess large quantities of detrital garnet sand deposits on the streambed along the watercourse. The streams are seasonal. The mineral garnet is found to occur as grains admixed with sand and clay as heavy mineral concentration of alluvial

sediments in the Kottathur Eri/tank. Due to the sudden changes in the flow velocity, during the times of floods, the garnet grains subjected to sorting, segregation and deposited in the channels as heavy mineral deposit of economical importance. The streams maintain running water during the rainy days and for few days after the seasonal rain. So, most part of the year the streams are found to be dry. These streams are noticed to be extremely dynamic when heavy downpour occurs. It is indicated by the distribution of rolled down boulders and pebbles right down the midstream region FORMATIONS AGE Stream placers rich in garnet mineral Recent pegmatites younger intrusions Alluvial sand (Stream placer garnet sand) Archaean Hard consolidated garnet rich Garnetiferous gneiss and Kankar Crystalline Rocks.

symmetrical, cube-based crystals Structure. The general drainage pattern of the area is of dentritic pattern. This area was surveyed in detail by the in-house geological team of the company to prepare map in the scale of 1:1000 showing the various formations, attitude of the deposits and the resource position. In the under consideration, garnet rich stream placers are bedded and covered almost entirely in the lease area for more than 2.0mtr depth with an average of 0.5m clay/alluvium, as per the conditions imposed by the PWD only 2.0mtr are allowed to mine within the lease area. Hence the mining operation is restricted up to 2.0mtrs depth only.

The garnet sand in this region form a part of the meta sedimentary rocks of archean age correlated to bhavani super group of Dharwar group, comprising mostly of high concentrated garnetiferous gneiss. Overlain by peninsular gneiss, which is approximately aligned in North east South west direction. The garnetiferous gneiss is hard and compact embedded with large phenocrysts of almandine luster garnet which is in the advance stage of weathering. Pyroxenite varies in their width exposure to exposure. Tremolite and actinolite rocks occur as lensoid bodies. Pegmatite veins occur as a discordant intrusive with garnet pyroxene granulites. The important occurrences are seen in the extreme north of the lease area (i.e.) kottathur. Pegmatite represents the younger intrusive. The process of weathering results in the disintegration of rocks which in turn; enable the release of their mineral grains. When the grains like garnet, clinozoisite, amphibole, magnetite, etc., are released from the parent rocks, during the rainfall they get liberated and transported along the stream course. They get deposited in the streambed as detrital grains as and when they meet with (interface) sudden change in the velocity of runoff. In the mining lease area, there is no sedimentary rock present over the basement rock the streambed is mixed with silt, clay and kankar fragments in between. b. (ii)

The Geological successions are given below. FORMATIONS AGE Stream placers rich in garnet mineral Recent pegmatites younger intrusions Alluvial sand (Stream placer garnet sand)Archaean Hard consolidated garnet rich Garnetiferous gneiss and Kankar Crystalline Rocks.

The important occurrences are seen in the extreme north of the lease area (i.e.) kottathur. Pegmatite represents the younger intrusive. The process of weathering results in the disintegration of rocks which in turn; enable the release of their mineral grains. When the grains like garnet, clinozoisite, amphibole, magnetite, etc., are released from the parent rocks, during the rainfall they get liberated and transported along the stream course. They get deposited in the streambed as detrital grains as and when they meet with (interface) sudden change in the velocity of runoff. In the mining lease area, there is no sedimentary rock present over the basement rock the streambed is mixed with silt, clay and kankar fragments in between. The physical attitude of the Garnet bed is as follows: Strike Length (m): 316 Width (m): 150 Depth (m) Proved : 2.0m Strike direction : N40degreeE-S40degreeW Dip amount and direction : 10 degree towards NW Strike / Trend of the Ore Body: N40degreeE-S40degreeW Amount of dip of Ore body: 10 degree Dip Direction of the Ore Body: NW Plunge of Mineral Body (degree) (if any): 5 . The garnetiferous gneiss is hard and compact embedded with large phenocrysts of almandine luster garnet which is in the advance stage of weathering.

Geological plan and cross section of present mine working area as per present Mining plan for G.O.70, 71, 69, 57 & 43 is shown in **Figure No. 2.11 to 2.15 respectively.**

Figure 2.11: GEOLOGICAL PLAN & CROSS SECTION OF G.O.43

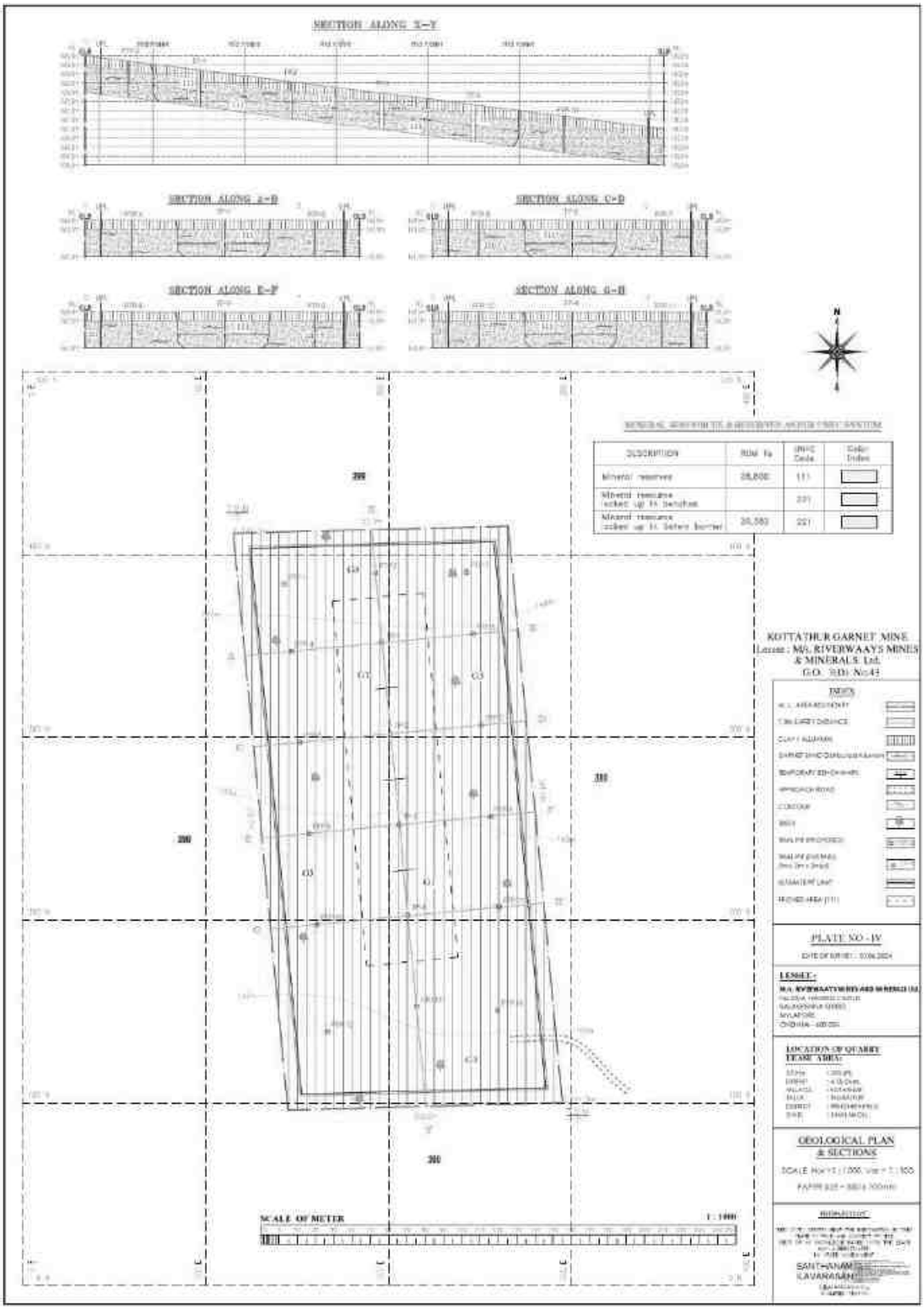


Figure 2.12: GEOLOGICAL PLAN & CROSS SECTION OF G.O.69

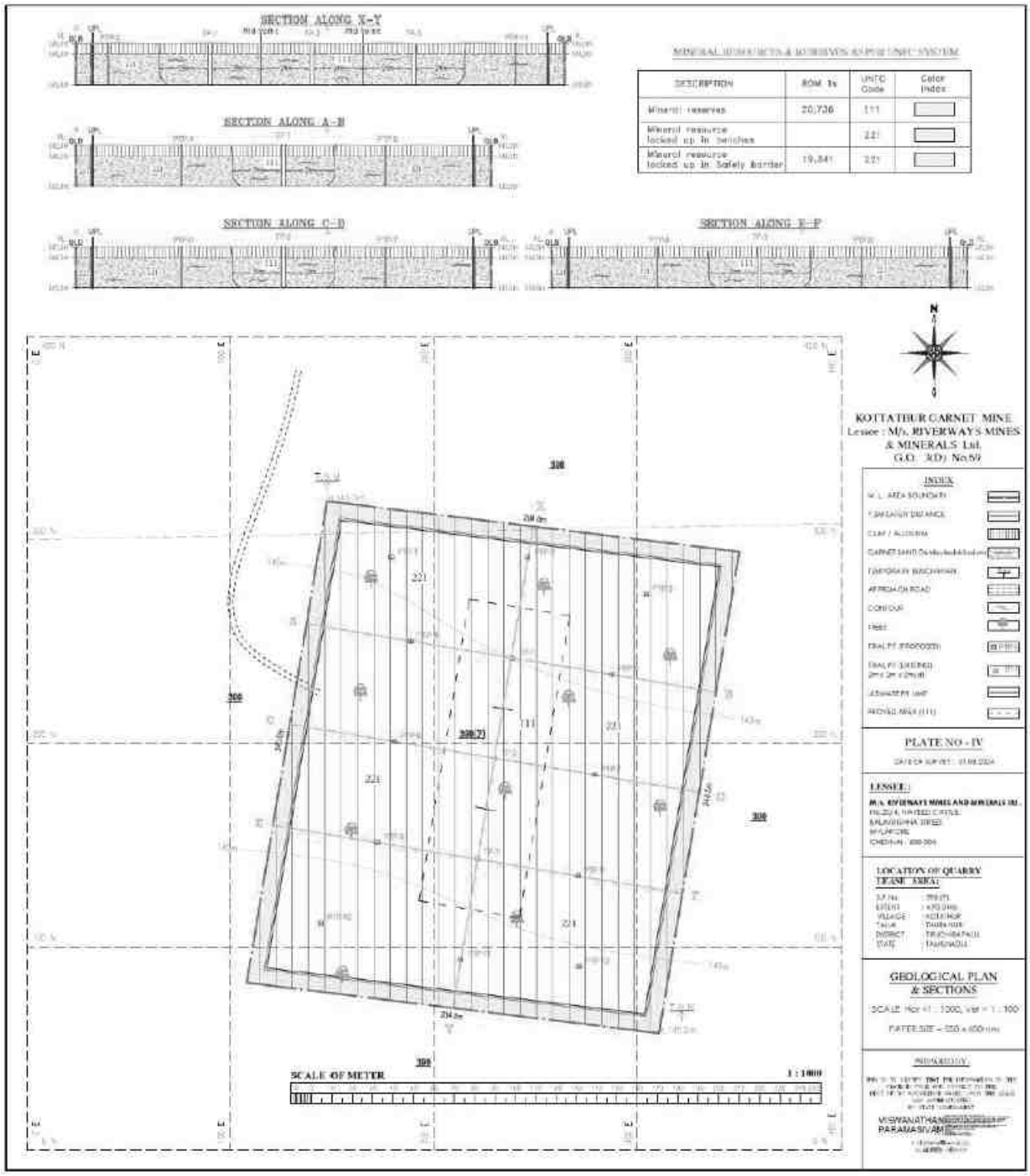


Figure 2.13: GEOLOGICAL PLAN & CROSS SECTION OF G.O.70

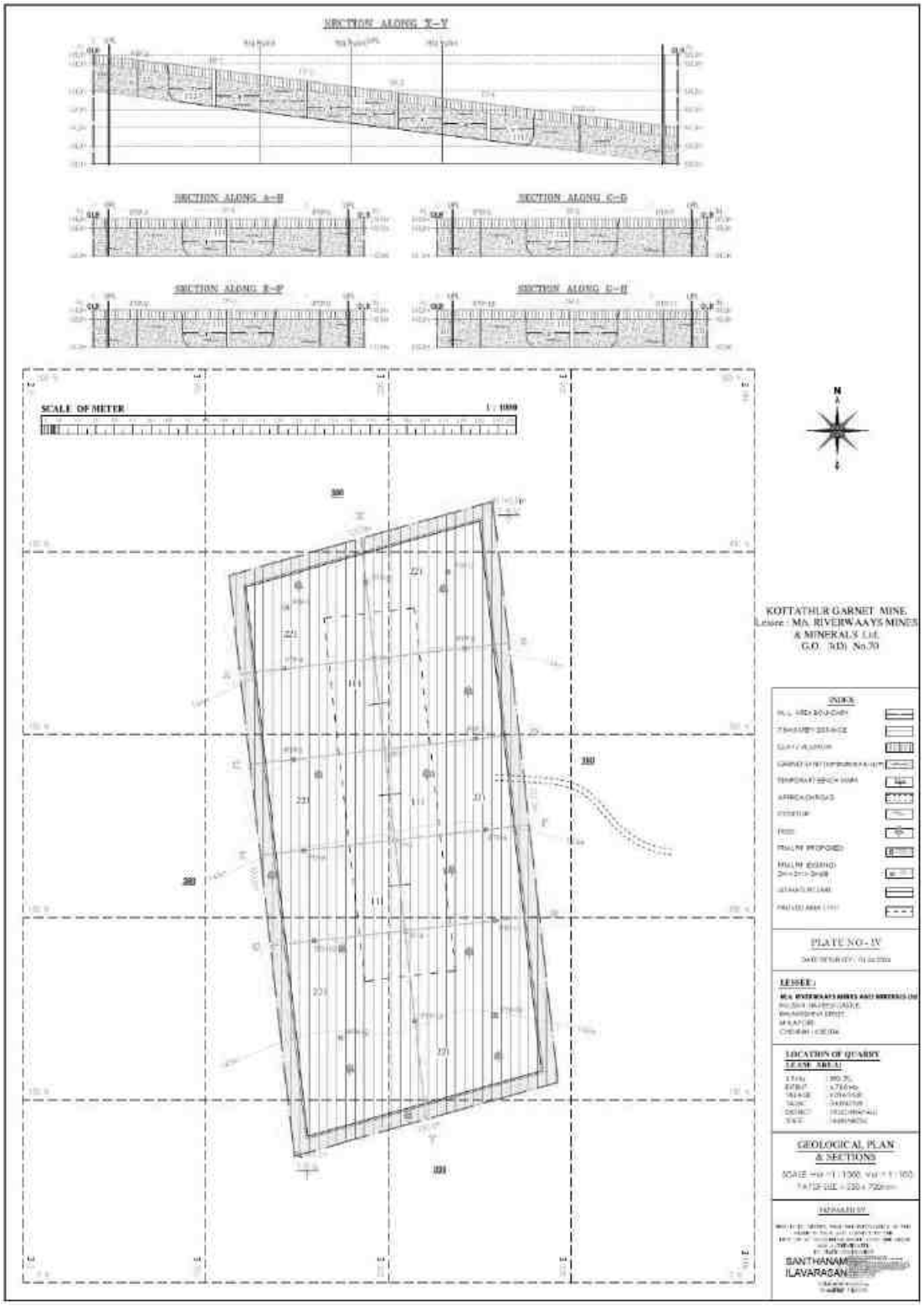


Figure 2.14: GEOLOGICAL PLAN & CROSS SECTION OF G.O.71

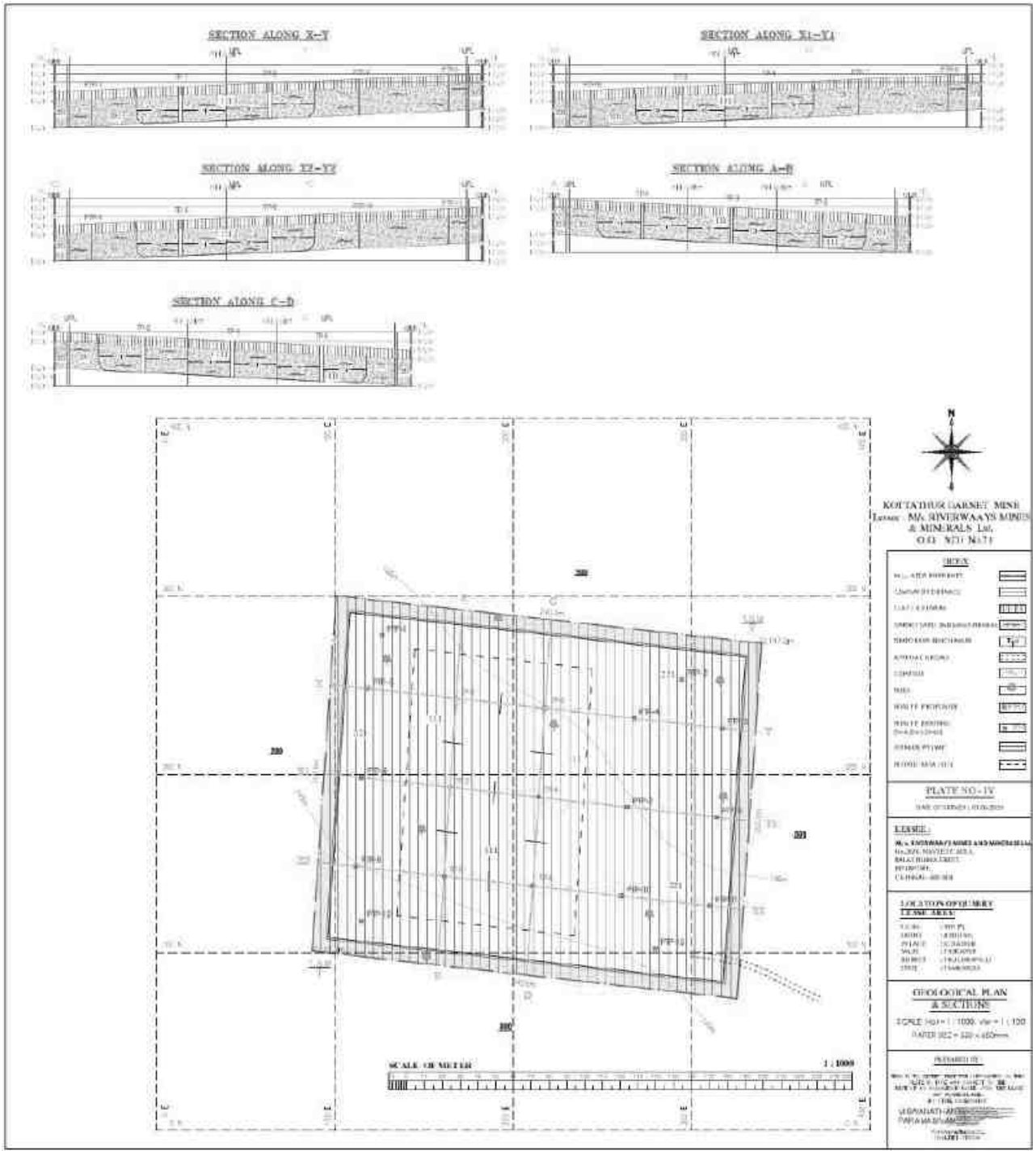


Figure 2.15: GEOLOGICAL PLAN & CROSS SECTION OF G.O.57

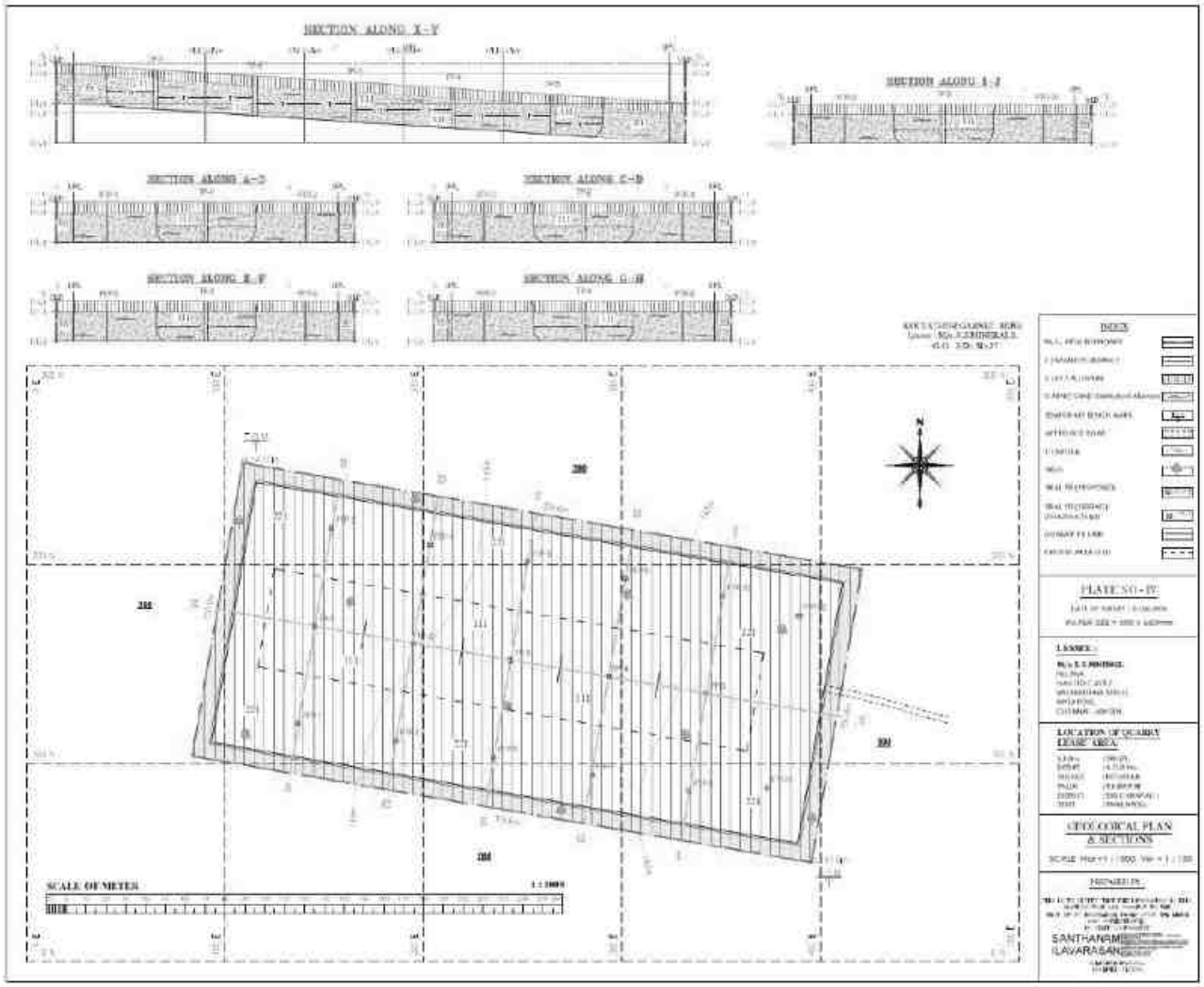


Figure 2.16: Surface Plan Of G.O.43

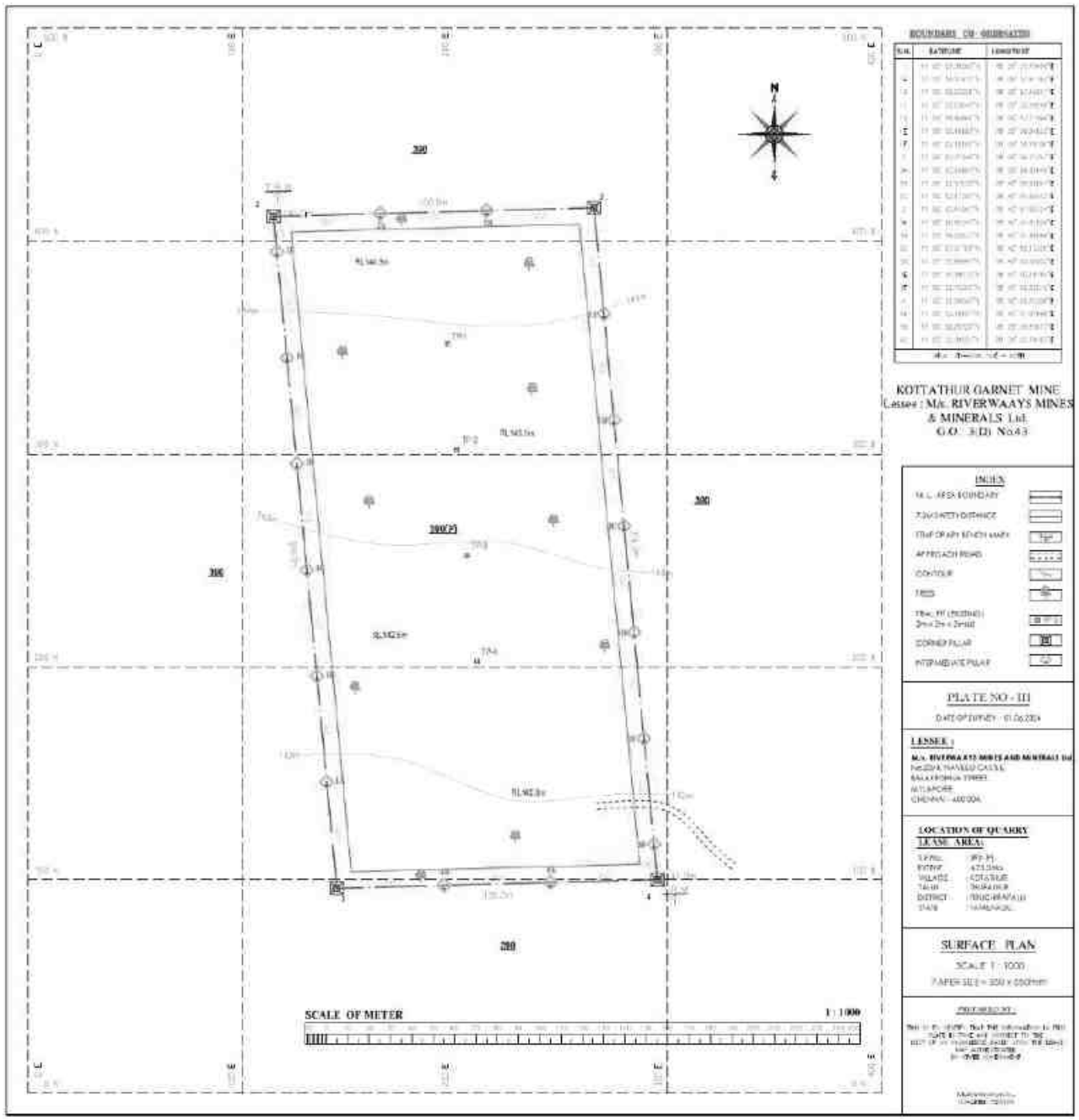


Figure 2.17: SURFACE PLAN OF G.O.69

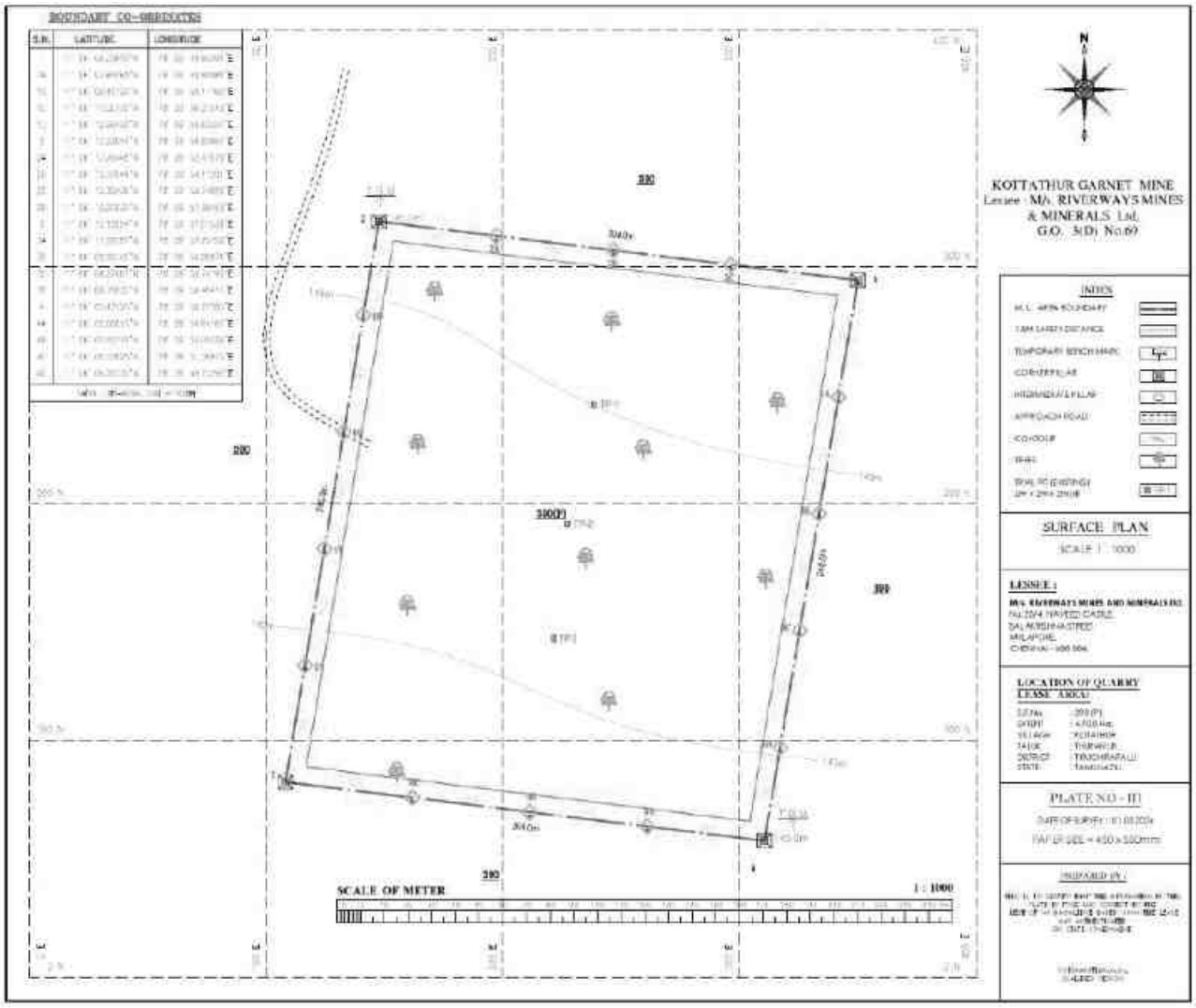


Figure 2.18: SURFACE PLAN OF G.O.70

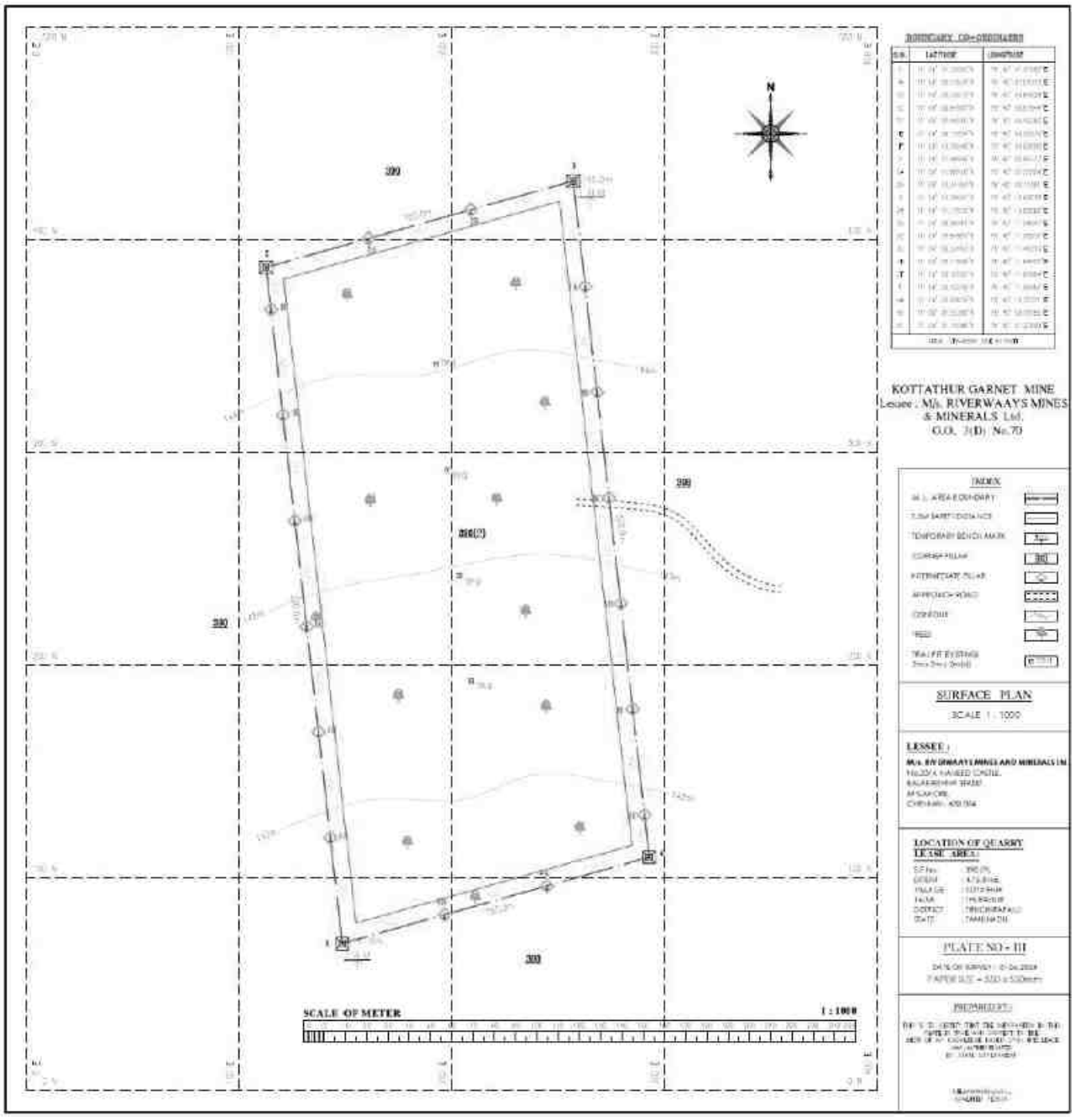


Figure 2.19: SURFACE PLAN OF G.O.71

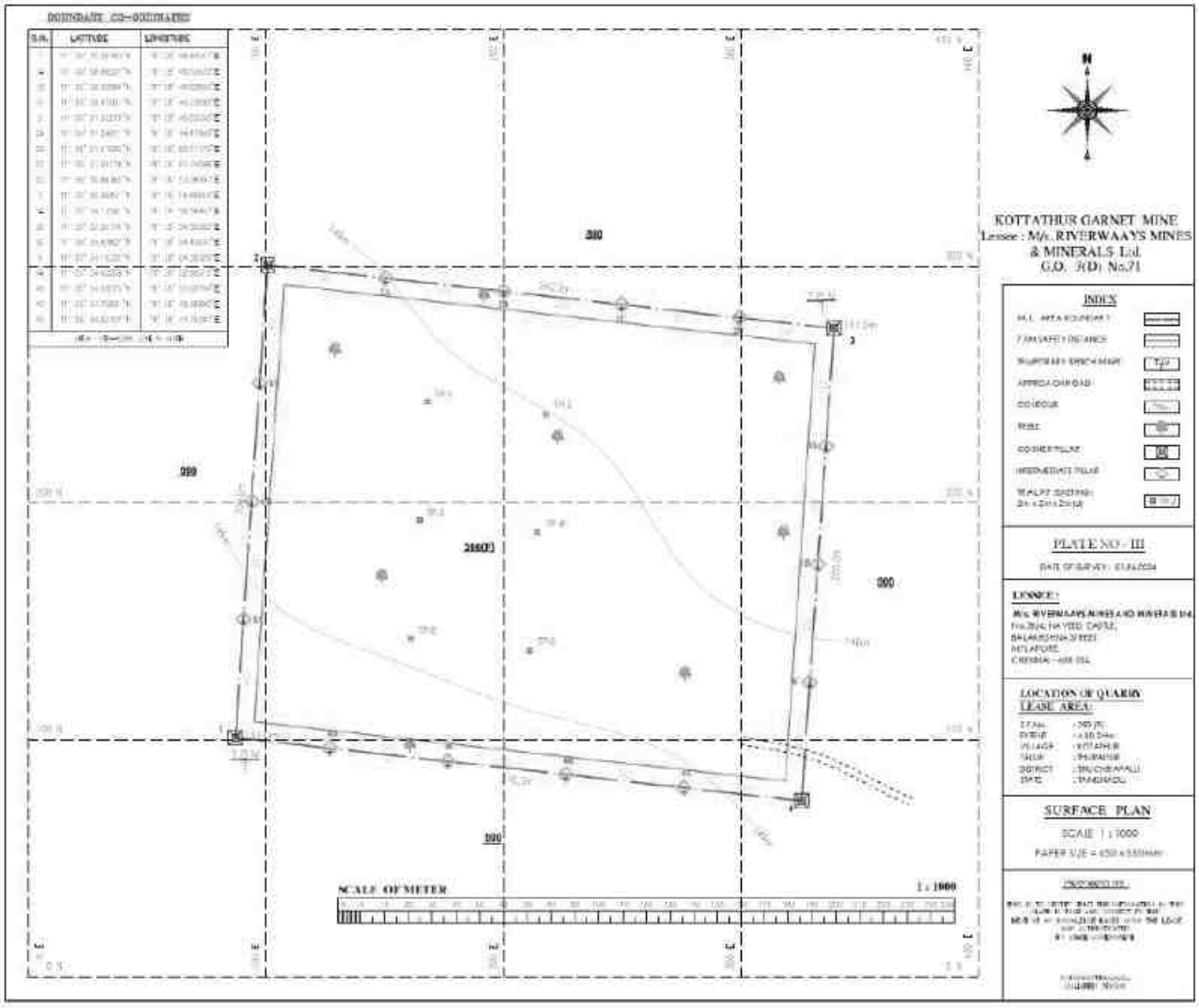
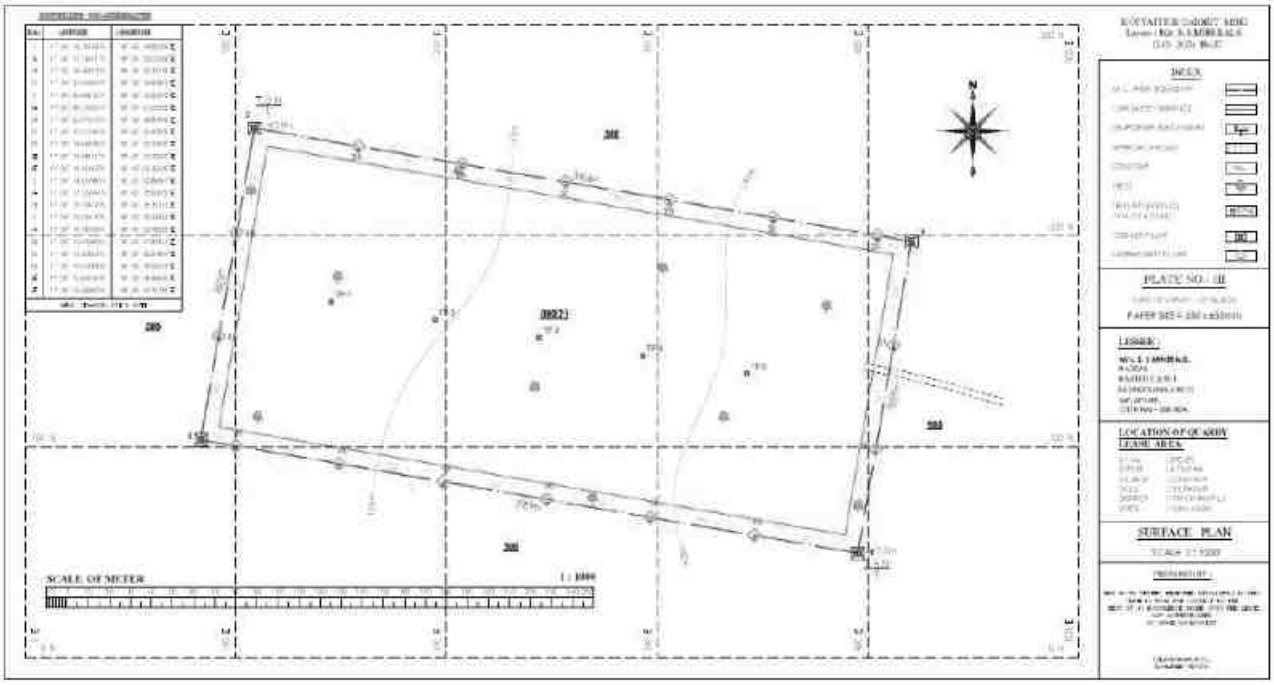


Figure 2.20: SURFACE PLAN OF G.O.57



2.5 SIZE AND MAGNITUDE OF THE OPERATION:

- Based on the present exploration, mining activities are proposed in the potentially proven mineralized area.
- Opencast manual mining method using spades axes & baskets, loading it in to trucks/tippers and transportation. No drilling and blasting involved.
- Lease deed of all the 5 leases executed on 06.04.2018 and the lease is valid upto 05.04.2038.
- Depth of mining is 2m comprising 0.5m top clay/alluvium + 1.5m ROM garnet.
- Top clayey soil will be dumped temporarily in the earmarked dump site based on the requirement and later spread over backfilled area for reclamation purposes. As such ultimately there will not be any dump within the lease area. The mined garnet rich stream sediments (ROM) will be transported to the pre-concentration plant for separation of garnet sand. The waste/mineral reject generated in the plant will be brought back and backfilled in the mined out void. Top soil will be spread over the backfilled area and the mined out pit will be restored back to pre mining condition.

2.6 TECHNICAL DETAILS:

sl no	Particulars	**G.O.43**	**G.O.69**	**G.O.70**	**G.O.71**	**G.O.57**
1	Extent in Ha	4.75.5	4.90.0	4.75.0	4.80.0	4.75.0
2	Type of land	Eri poramboke land				
3	Exploration	Based on reconnaissance survey, exposures & trial pits				
4a	Total mineable Reserves (T)	28800	20736	29700	42048	36000
4b	Garnet Reserves @ 10% recovery	2880	2074	2970	4205	3600
5a	Peak Production capacity ROM in Tonnes per annum	9000	6912	9750	13814	10800
5b	Garnet production at 10% recovery in Tonnes per annum	900	691	975	1381	1080
6	**Method of mining:** Opencast manual mining method using spades axes & baskets, loading it in to trucks/tippers and transportation. No drilling and blasting involved. Initially, top clayey soil will be removed and dumped temporarily in the earmarked dump site based					

	on the requirement and later spread over backfilled area for reclamation purposes. Mined garnet rich stream sediments (ROM) will be transported to the pre-concentration plant for separation of garnet sand. The waste/mineral reject generated in the plant will be brought back and backfilled in the mined out void. Top soil will be spread over the backfilled area and the mined out pit will be restored back to pre mining condition. After creation of sufficient floor width simultaneous production and backfilling & reclamation will be resorted to. **Removal of Top soil/ clay (0.5m)** ↓ **Loading of ROM manually in to tippers/trucks** ↓ **Transportation to mineral pre – concentration plant** ↓ **Waste from plant will be used for Backfilling the mined out**					
7	Ultimate mine depth	2m	2m	2m	2m	2m
8	Waste Generation & management	Since the recovery of ROM is expected to be 10%, the balance 90% reject from the processing plant will be transported back and backfilled in the mined out area. Top soil will be spread over the backfilled area and the mined out pit will be restored back to primining condition.				
9	Grade of Ore	SiO_2 – 34% to 38%				
10	Ore end use	Garnet is used as abrasive material in various applications.				
11	Lease period	All the 5 leases are valid upto 05.04.2038.				
12	Project cost (Rs in lakhs)	10.0 lakhs	10.0 lakhs	10.0 lakhs	10.0 lakhs	10.0 lakhs

Source: Approved Review of Mining Plan

2.7 PROPOSED SCHEDULE FOR APPROVAL AND IMPLEMENTATION:

The proponent propose to implement the production immediately after obtaining all the statutory approvals such as CTE, CTO, etc. The proponent will comply with the environmental clearance conditions during mining operations. The schedule of project implementation envisaged for this project is provided below. This is a tentative schedule subject to various factor, hence unforeseen variations may occour.

Table 2.2: Proposed Schedule of Implementation

Activities	Months					
	Zero Date	1	2	3	4	5
Obtaining Environmental Clearance						
Obtaining Consent from State Pollution Control Board						
Equipment mobilization and Commencement of Mining activity after following all the Statutory Requirements						

2.8 PROJECT DESCRIPTION:

2.8.1 PRODUCTION PLAN:

As per the approved review of mining plan, it is proposed to mine the present proved mineable reserves in the present balance plant period itself. The year wise production as per the approved mining plan is as follows:

Table 2.3: Yearwise Production

Name of the project	Year	ROM (Tonnes)	Expected Garnet 10% Recovery (Tonnes)	Waste 90% (Tonnes)	Clay alluvium /Top soil (Tonnes)
G.O.43	2023-2024	Nil			
	2024-2025	5400.00	540.00	4860	1800
	2025-2026	9000.00	900.00	8100	3000
	2026-2027	7200.00	720.00	6480	2400
	2027-2028	7200.00	720.00	6480	2400
Total		**28800.00**	**2880.00**	**25920**	**9600**
	2023-2024	Nil			
	2024-2025	3456	345.60	3110.40	1152
	2025-2026	6912	691.20	6220.80	2304

G.O.69	2026-2027	5184	518.40	4665.60	1728
	2027-2028	5184	518.40	4665.60	1728
Total		**20736**	**2073.60**	**18662.40**	**6912**
G.O.70	2023-2024	**Nil**			
	2024-2025	5250	525	4725	1750
	2025-2026	9750	975	8775	3250
	2026-2027	7350	735	6615	2450
	2027-2028	7350	735	6615	2450
Total		**29700**	**2970**	**26730**	**9900**
G.O.71	2023-2024	**Nil**			
	2024-2025	6912	691.2	6220.80	2304
	2025-2026	13824	1382.4	12441.60	4608
	2026-2027	10656	1065.6	9590.40	3552
	2027-2028	10656	1065.6	9590.40	3552
Total		**42028**	**4202.8**	**37843.20**	**14016**
G.O.57	2023-2024				
	2024-2025	7200	720.0	6480.00	2400
	2025-2026	10800	1080.0	9720.00	3600
	2026-2027	9000	900.0	8100.00	3000
	2027-2028	9000	900.0	8100.00	3000
Total		**36000**	**3600.0**	**32400.00**	**12000**

2.8.2 EXTENT OF MECHANIZATION:

Since shallow opencast manual mining method using spades, axes & baskets, loading it in to trucks/tippers is proposed in these leases no major mining equipment will be deployed for mining activities. Mineral transportation will be done by only limited no of trucks / tippers due to limited production.

The mine position and cross section at the end of present Plan period for G.O.70, 71, 69, 57 and 43 is shown in **Figure No. 2.21-2.25 respectively.**

Figure 2.21: MINE POSITION AT THE END OF PRESENT PLAN PERIOD OF G.O.43

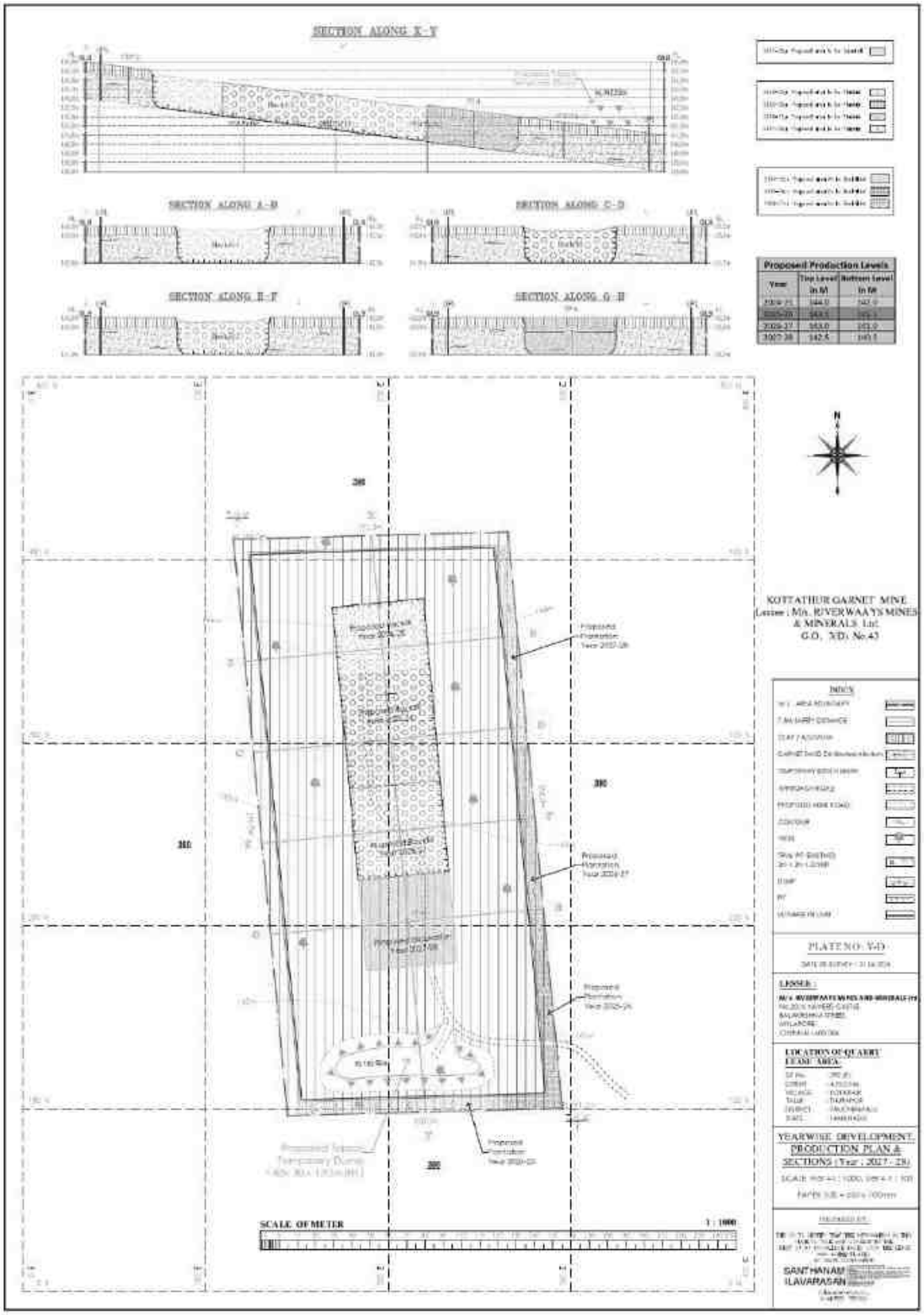


Figure 2.22: MINE POSITION AT THE END OF PRESENT PLAN PERIOD OF G.O.69

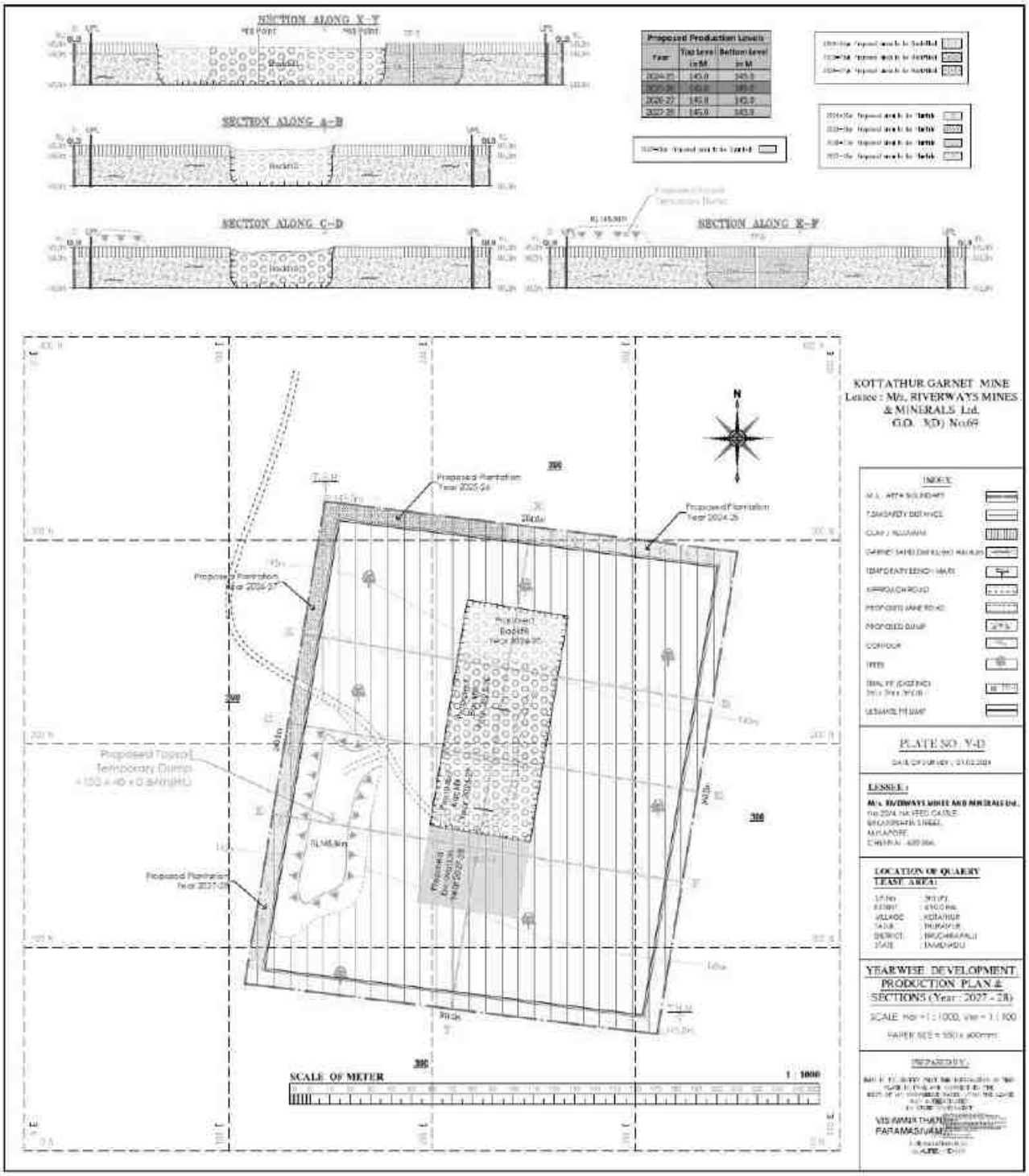


Figure 2.23: MINE POSITION AT THE END OF PRESENT PLAN PERIOD OF G.O.70

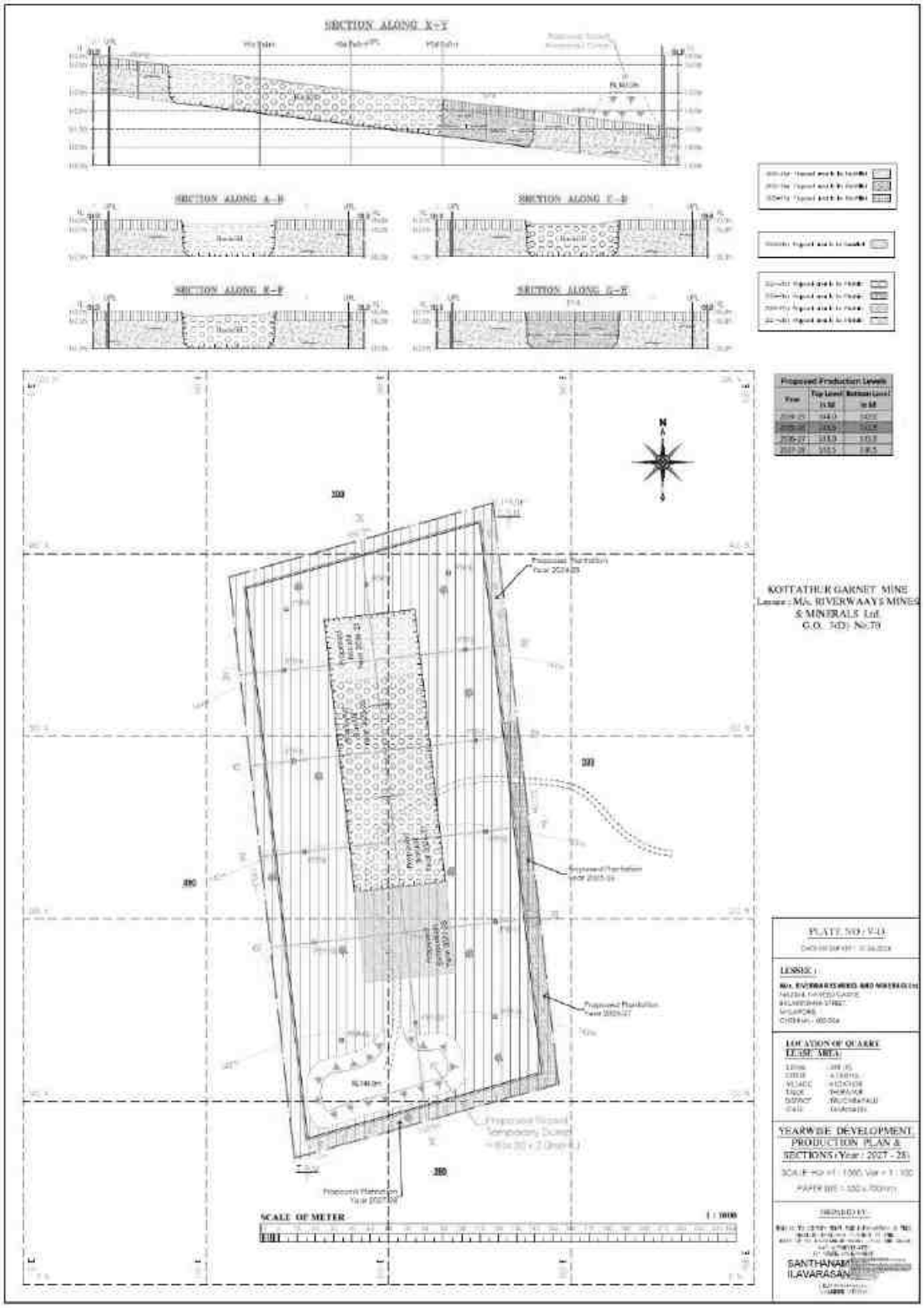


Figure 2.24: MINE POSITION AT THE END OF PRESENT PLAN PERIOD OF G.O.71

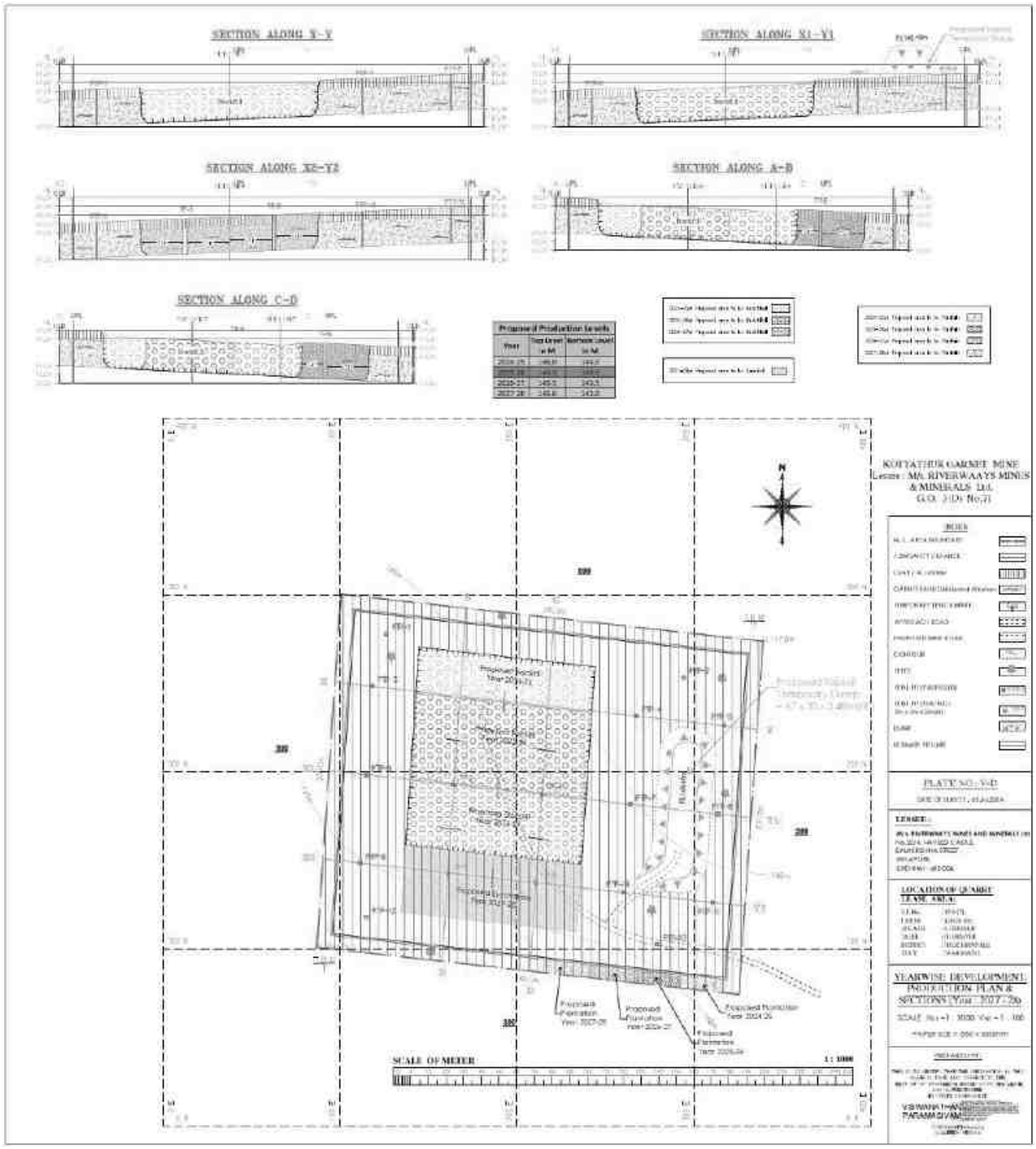
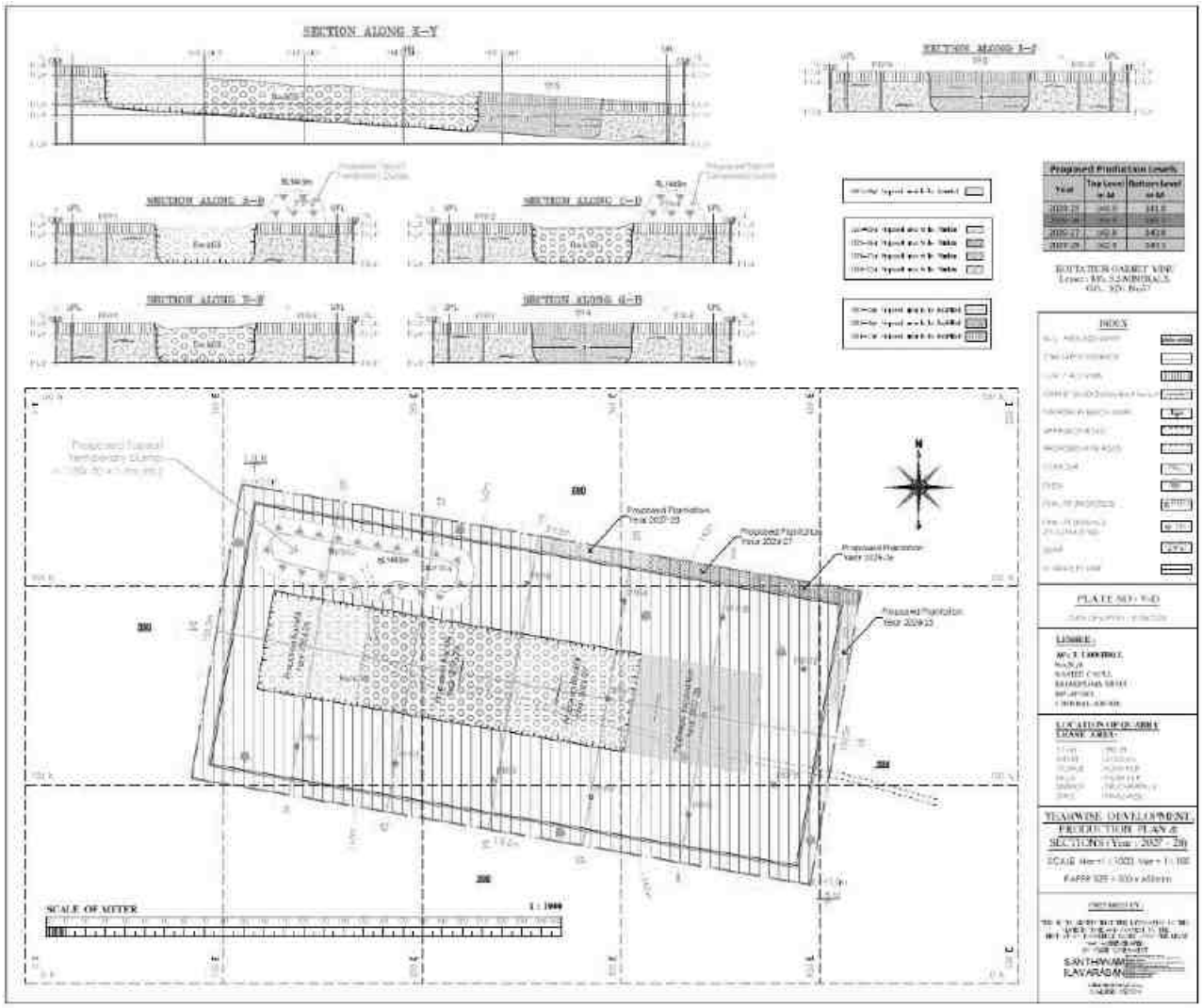


Figure 2.25: MINE POSITION AT THE END OF PRESENT PLAN PERIOD OF G.O.57



2.8.3 CONCEPTUAL PERIOD:

Based on the present exploration, mining activities are proposed in the potentially proven mineralized area only. .Ultimate depth of mining is 2m. Since it is planned to remove the present proved reserves in the plant period itself, the end of plan period itself is construed as conceptual period as of now.

The ultimate pits dimensions of the leases are given below:

Name of the project	Dimensions	Ultimate pit dimensions at the end of mine
G.O.43	Length (m)	316
	Width (m)	150
	Depth (m)	2.0
G.O.69	Length (m)	225
	Width (m)	189
	Depth (m)	2.0
G.O.70	Length (m)	300
	Width (m)	135
	Depth (m)	2.0
G.O.71	Length (m)	225
	Width (m)	185
	Depth (m)	2.0
G.O.57	Length (m)	300
	Width (m)	135
	Depth (m)	2.0

As already mentioned, waste/mineral reject generated in the plant will be brought back and backfilled in the mined out void. Top soil will be spread over the backfilled area and the mined out pit will be restored back to pre mining condition.

The conceptual plan and section for G.O.70, 71, 69, 57 and 43 are shown in **Figure No. 2.26 to 2.30 respectively.**

Figure 2.26: CONCEPTUAL PLAN AND SECTION OF G.O.43

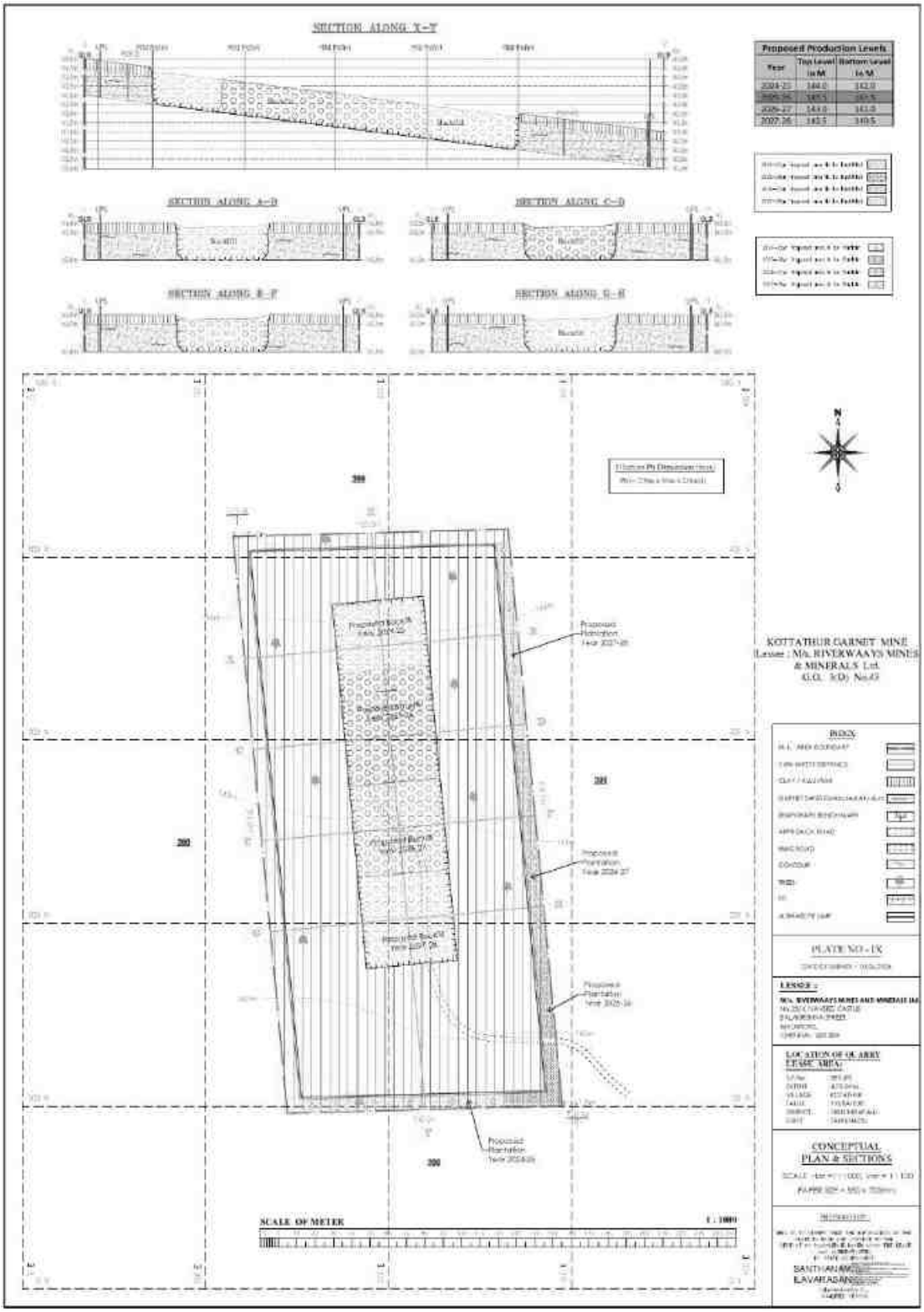


Figure 2.27: CONCEPTUAL PLAN AND SECTION OF G.O.69

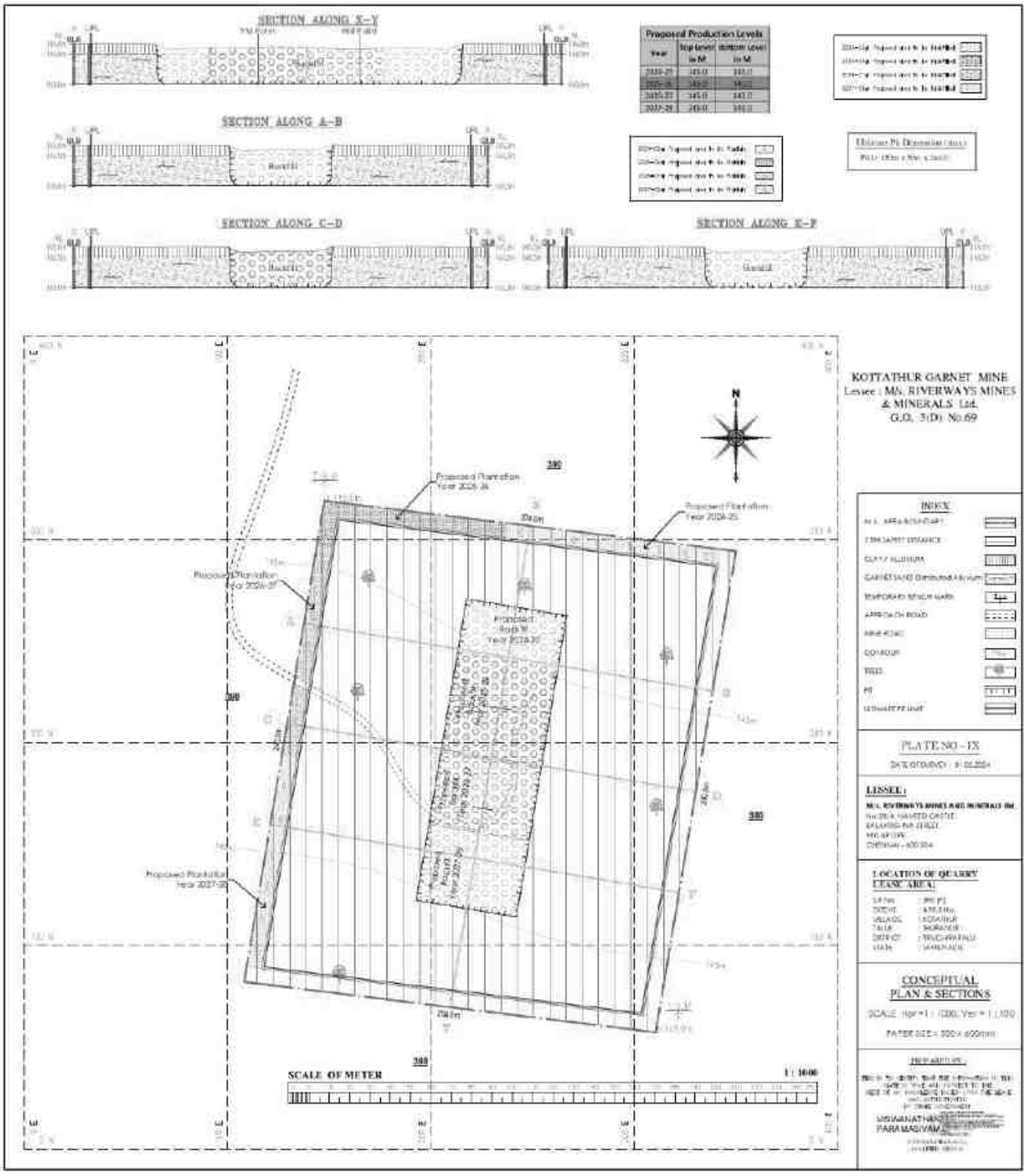


Figure 2.28: CONCEPTUAL PLAN AND SECTION OF G.O.70

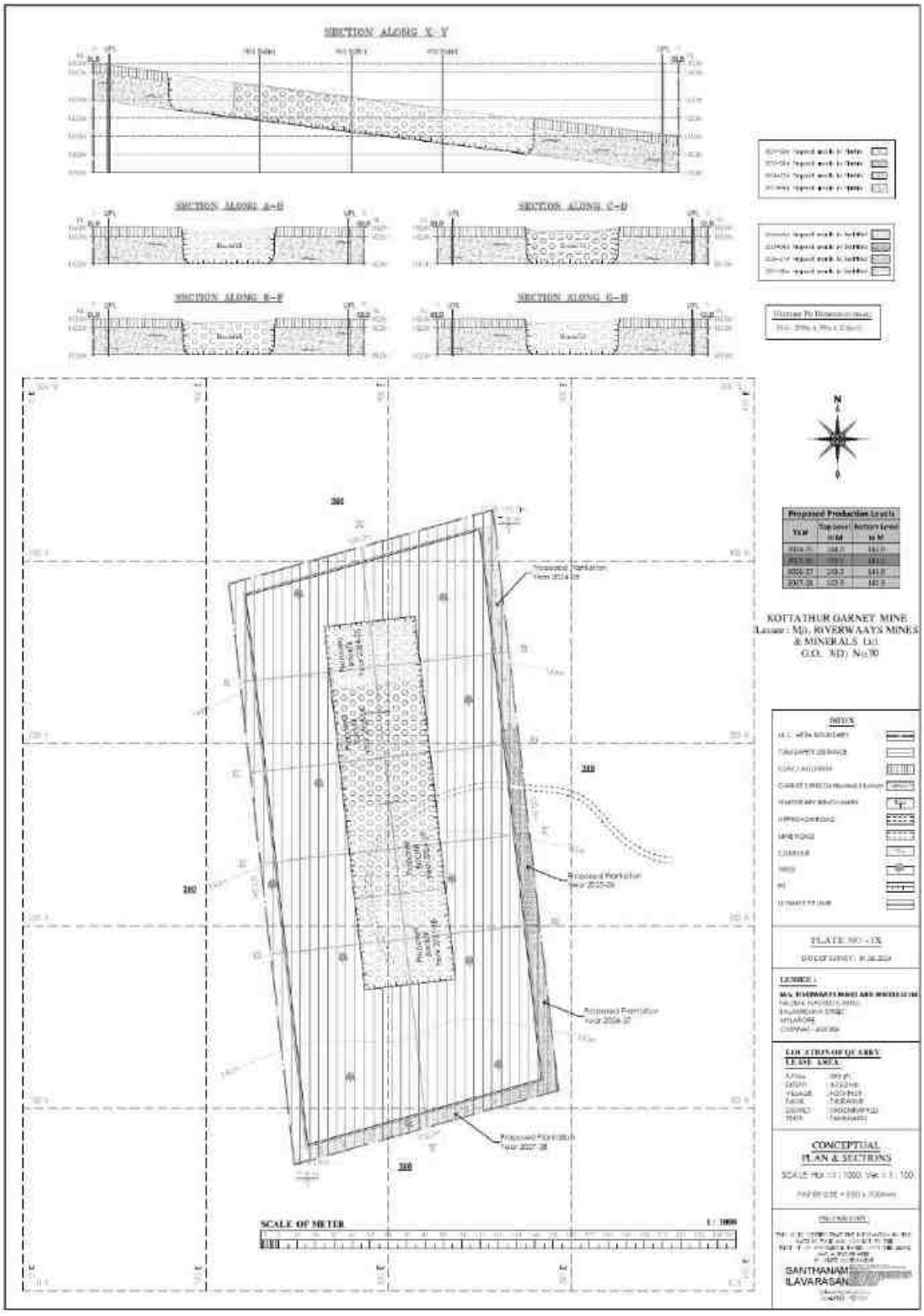


Figure 2.29: CONCEPTUAL PLAN AND SECTION OF G.O.71

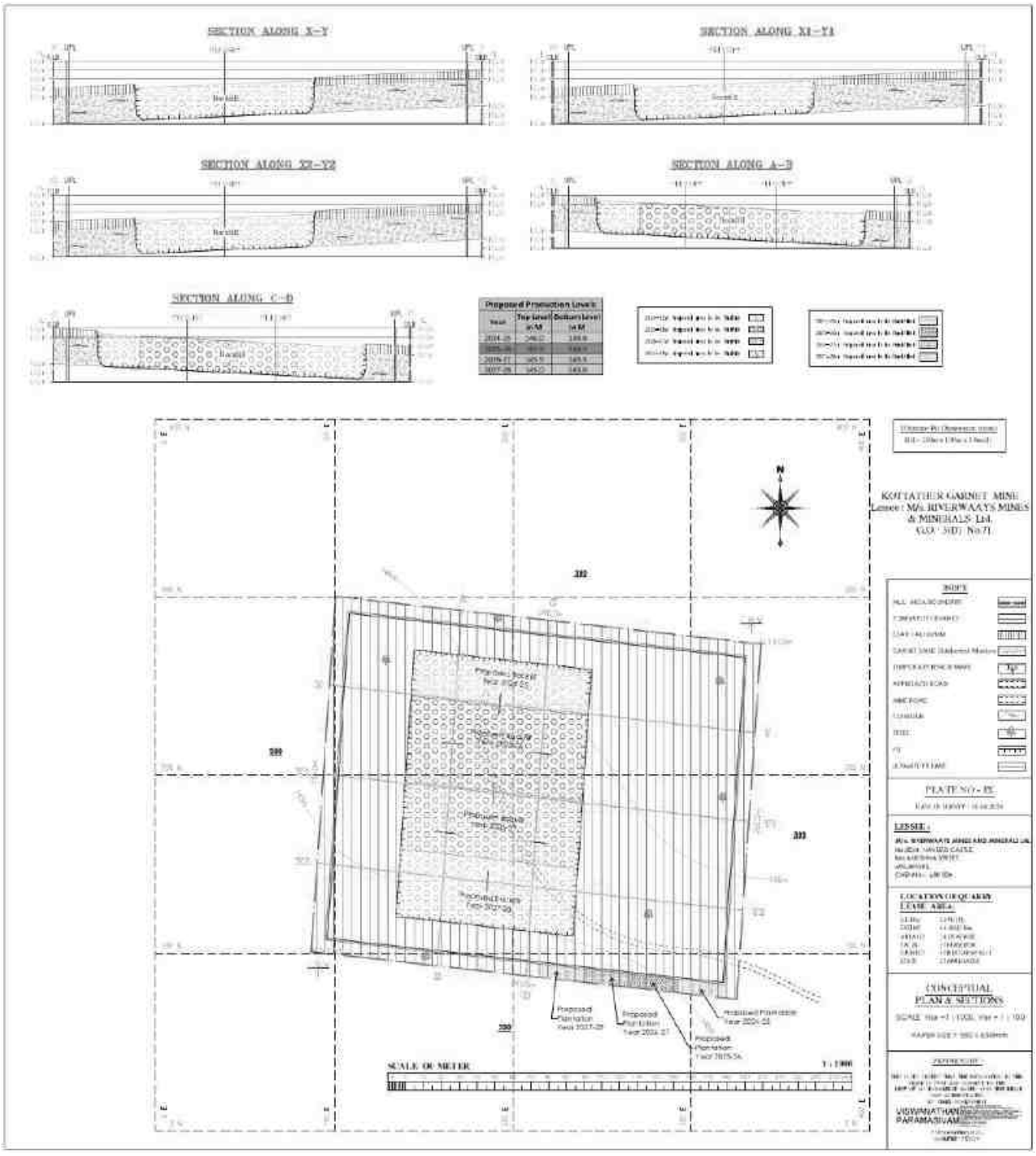
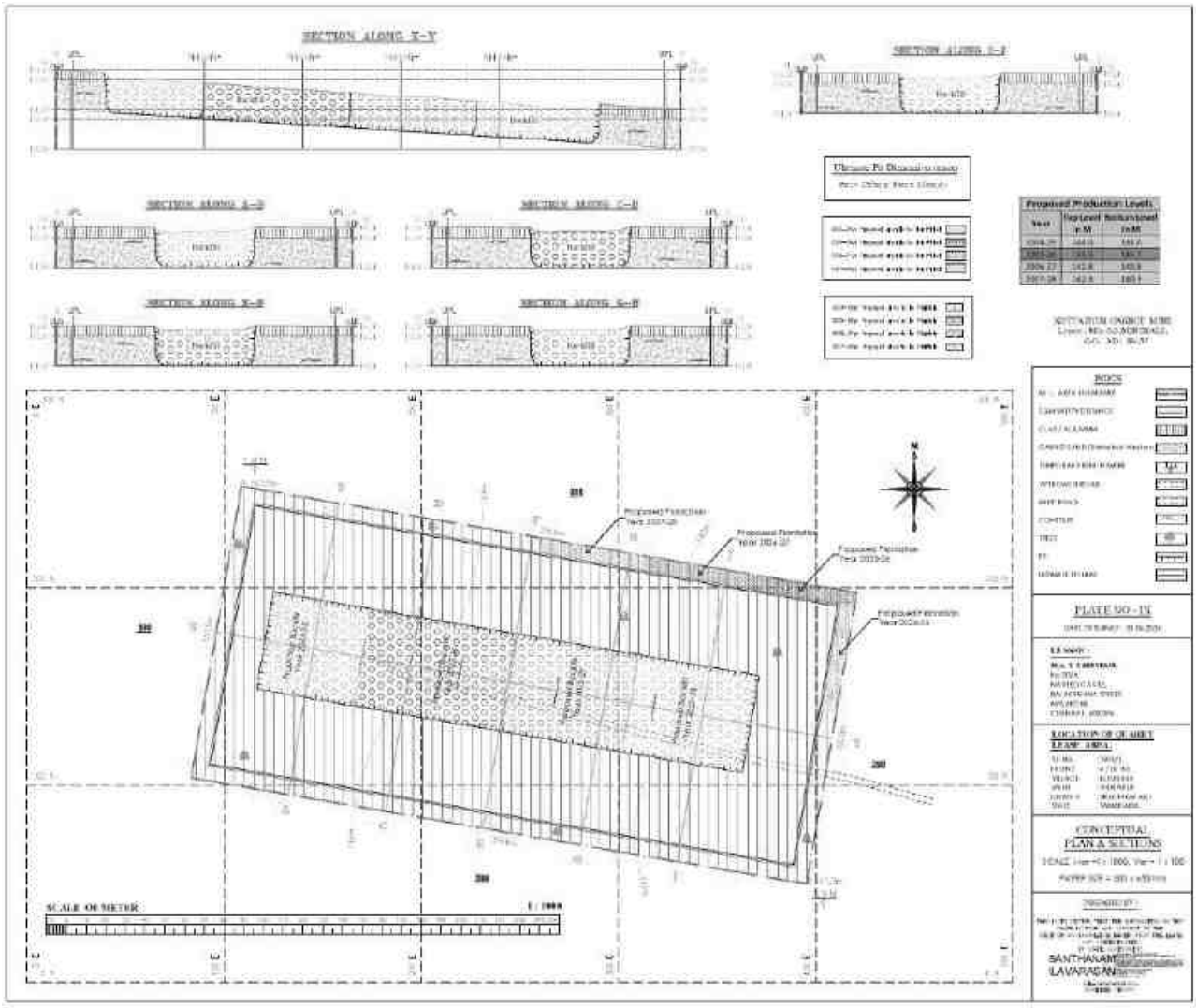


Figure 2.30: CONCEPTUAL PLAN AND SECTION OF G.O.57



2.8.4 LAND USE PATTERN:

The pre mining, end of plan period and post mining land use pattern of the 5 leases are as follows:

Name of the project	Activities	Present Land use (Ha)	Area at the end of present plan period	Land use at the end of life of mine
G.O.43	Mining (Quarry)	---	1.0000	1.0000
	Top soil stacking	---	0.2500	0.2500
	Road	---	0.0200	0.0200
	Area under plantation	---	0.3200	0.3200
	Unutilized area	4.75.50	3.1650	3.1650
	Total	**4.75.50**	**4.75.50**	**4.75.50**
G.O.69	Mining (Quarry)	---	0.75	0.75
	Top soil stacking	---	0.40	0.40
	Road	---	0.02	0.02
	Area under plantation	---	0.31	0.31
	Unutilized area	4.90.00	3.42	3.42
	Total	**4.90.00**	**4.90.00**	**4.90.00**
G.O.70	Mining (Quarry)	-	1.00	1.00
	Top soil stacking	-	0.25	0.25
	Roads	-	0.02	0.02
	Area under plantation	-	0.32	0.32
	Un utilized area	4.75.00	3.16	3.16
	Total	**4.75.00**	**4.75.00**	**4.75.00**
G.O.71	Mining (Quarry)	-	1.50	1.50
	Top soil stacking	-	0.20	0.20
	Road	-	0.02	0.02
	Area under plantation	-	0.08	0.08
	Unutilized area	4.80.00	3.08	3.08
	Total	**4.80.00**	**4.80.00**	**4.80.00**
G.O.57	Mining (Quarry)		1.25	1.25
	Top soil stacking	---	0.32	0.32
	Roads	---	0.02	0.02
	Area under plantation	---	0.16	0.16
	Un utilized area	4.75.0	3.00	3.00
	Total	**4.75.0**	**4.75.0**	**4.75.0**

Ultimately the entire lease area will brough back to premining condition by backfilling & reclamation.

2.10 PROJECT REQUIREMENTS:

Table 2.4: Project Requirements

Manpower	The total manpower for all the 5 leases will be about 50 people including common statutory manpower. Besides, scores of people will benefit through allied services like trading, logistics, casual labors or needs, plant operation etc.
Water Requirement and Source	Total water requirement for all the 5 leases – 8cu.m, Domestic – 2.0cu.m, Dust suppression and Afforestation – 6.0 cu.m. Required water will be procured from outside.
Power Requirement	No electricity needed for mining operation. The minimum power requirement for office, etc will be met from state grid.
Site Services	Common site services (for all 5 leases) like mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.

2.11 DESCRIPTION OF MITIGATION MEASURES:

Though simple , shallow manual mining will adopted in these leases , scientific and systematic mining with removal and utlisation of top soil, backfilling of mined out area and its restoration with spreading of top soil on it, strict implementation of various mitigative measures given in this report will be ensured. Elaborate analysis on impacts and mitigation measures to be adopted on implementation of this project and the same has been dealt in Chapter- IV.

2.12 ASSESSMENT OF NEW & UNTESTED TECHNOLOGY:

Manual opencast method is to be adopted to achieve the desired less project and no new or untested technology is used.

2.13 CONCLUSION:

Since simple, shallow, small magnitude opencast mining of just 2m depth with manual means will be carried out in these leases ,no adverse impact on the environmental quality is expected. With good environmental preservation measures to be carried out by the lessee, it is expected that the project activity will not have any major impact on environmental equilibrium in the area.

* * * * * * * *

CHAPTER - III

DESCRIPTION OF ENVIRONMENT

CHAPTER 3.

DESCRIPTION OF ENVIRONMENT

3.1 GENERAL:

The status of the existing environmental data for the five nearby projects of Tvl.S.S.Minerals and Tvl.Riverways Mines and Minerals Ltd (G.O.43, G.O.69 , G.O.70, G.O.71 and G.O.57) were collected in the combined study area for the following environmental parameters:

i. Socio-economic status and demographic details of the area
ii. Micro-meteorological monitoring at one location.
iii. Ambient Air Quality study at 5 different locations in the core and buffer zone.
iv. Water quality analysis at 5 different locations in the core and buffer zone.
v. Noise levels monitoring at 5 different locations in the core and buffer zone.
vi. Soil quality analysis in 3 locations in the core and buffer zone.
vii. Land use pattern study
viii. Flora & Fauna status and
ix. Hydrological study

The studies and baseline data collection have been carried out systematically and meticulously as per relevant IS codes, CPCB & MOEF&CC guidelines. The data collected during **Post monsoon Season 2024 (October 2024 to December 2024)** for the above said parameters are given in this report.

For the purpose of study, the area has been divided into two zones, namely, core and buffer zones. Core zone covers the lease area of Tvl.S.S.Minerals, G.O.57 (4.75.0 Ha) and lease area of Tvl.Riverways Mines and Minerals Ltd, G.O.69 (4.90.0 Ha), G.O.71 (4.80.0 Ha), G.O.70 (4.75.0 Ha) & G.O.43 (4.75.5 Ha).

Entire lease area of all the 5 leases of Tvl.S.S.Minerals and Tvl.Riverways Mines and Minerals ltd is a Government Eri poramboke land leased. The buffer zone study area covers an area of 10 km radius from the periphery of both ML areas. The nearest habitation, 200m, NE from the nearest core zone. (**Refer Figure No. 3.1**).

The details of villages falling in the study area and other features are given in Index Plan in **Figure No. 3.2.**

Figure 3.1:FEATURES WITHIN 500 M RADIUS

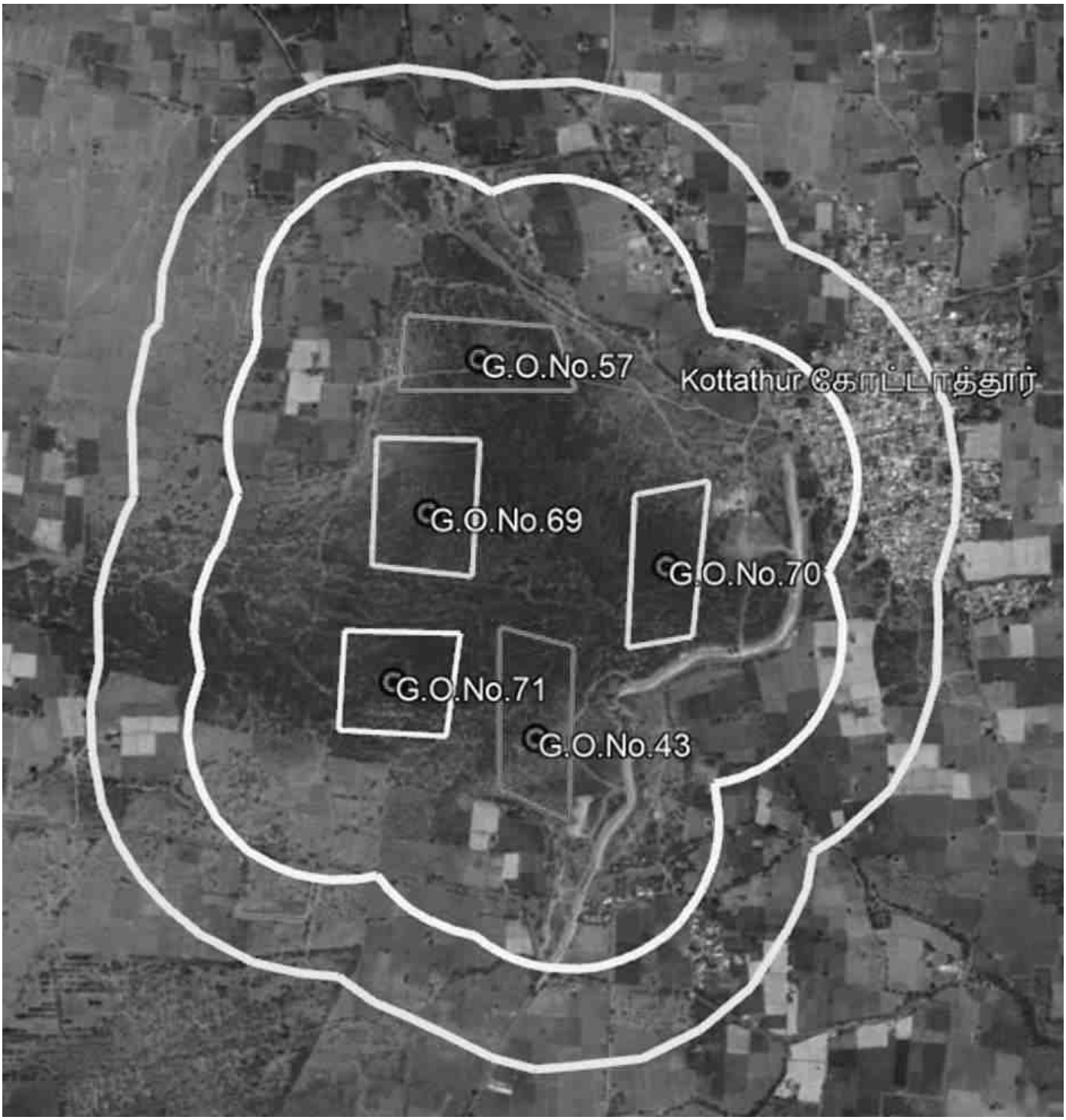
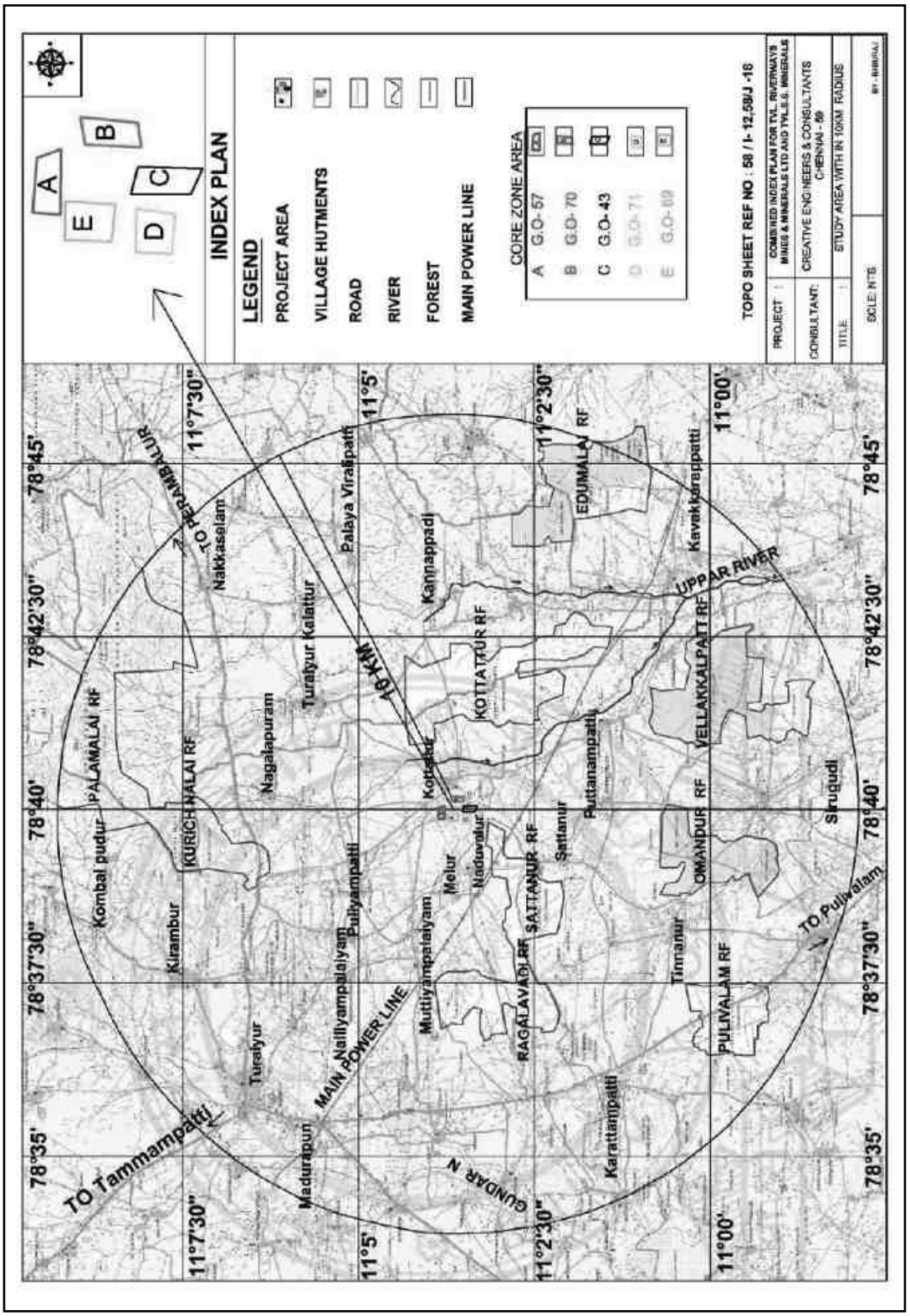


Figure 3.2:STUDY AREA WITHIN 10 KM RADIUS (INDEX PLAN)



3.1.1 ENVIRONMENT SETTING OF THE STUDY AREA – 10 KM RADIUS:

S. No	Particulars	G.O.Ms.No.43	G.O.Ms.No.69	G.O.Ms.No.70	G.O.Ms.No.71	G.O.Ms.No.57
1	**Location**					
a)	Village	Kottathur				
b)	Tehsil	Musiri				
c)	District	Trichy				
d)	State	Tamilnadu				
e)	Latitude	11° 05' 52.06"N to 11° 06' 02.77"N	11° 06' 05.43''N to 11° 06' 13.93''N	11° 06' 01.10"N to 11° 06' 12.76"N	11° 05' 54.19''N to 11° 06' 01.55''N	11° 06' 14.43"N to 11° 06' 20.99"N
f)	Longitude	78°39' 56.71"E to 78° 40' 02.72"E	78° 39' 49.60''E to 78° 39' 57.51''E	78° 40' 05.95"E to 78° 40' 11.95"E	78° 39' 46.44''E to 78° 39' 54.69''E	78° 39' 54.80"E to 78° 40' 05.89"E
2	Elevation	The lease area is almost a flat terrain ranging with an average elevation of 121m-124m from MSL. The area has gradient towards south with elevated part in north.				
3	Nearest railhead / Railway station	Trichy RS – 33km – S.				
4	Nearest airport	Trichy International Airport – 38km – S				
5	Nearest major city	Trichy – S – 34 km				
6	Defence installations	Nil within 10 km radius				
7	Notified Archaeologically important places, Monuments	Nil within 10 km radius				
8	Local Places of Historical and Tourism Interest	Nil within 10 km radius				
9	Environmental sensitive areas, Protected areas as per Wildlife Protection Act, 1972 (Tiger reserve, Elephant reserve, Biospheres, National parks, Wildlife sanctuaries, community reserves and conservation reserves)	Nil within 10 km radius				
10	Reserved/Protected forests	Sattanur RF – 1.1 km – SW, Ragalavadi RF – 4.0 km – SW, Kottatur RF – 1.7 km – NE, Pulivalam RF –	Sattanur RF – 830 M – SW, Ragalavadi RF – 4.4 km –W, Kottatur RF – 1.4 km – NE,	Sattanur RF – 450 m – SW, Ragalavadi RF – 3.8 km – SW, Kottatur RF – 2.0km – NE, Pulivalam RF –	Sattanur RF – 800 m – SW, Ragalavadi RF – 3.9 km – SW, Kottatur RF – 2.4km – NE, Pulivalam RF –	Sattanur RF – 455m – SW, Ragalavadi RF – 4.1km – SW, Kottatur RF – 1.8km – NE, Pulivalam RF –

S. No	Particulars	G.O.Ms.No.43	G.O.Ms.No.69	G.O.Ms.No.70	G.O.Ms.No.71	G.O.Ms.No.57
		7.6 km – SW, Omandur RF – 5.7 km – S, Vellakkalpat RF – 5.8 km – SE, Edumalai RF – 7.3 km – SE, Kurichi malai RF – 4.5 km – NW, Palamalai RF – 8.7 km – N and Nakkasalem RF – 7.3 km - NE	Pulivalam RF – 7.5 km – SW, Omandur RF – 5.2 km – S, Vellakkalpat RF – 5.2 km – SE, Edumalai RF – 6.7 km – SE, Kurichi malai RF – 5.1 km – NW, Palamalai RF – 8.9 km – N and Nakkasalem RF – 7.5 km - NE	7.0 km – SW, Omandur RF – 5.1 km – S, Vellakkalpat RF – 5.2 km – SE, Edumalai RF – 7.2 km – SE, Kurichi malai RF – 5.1km – NW, Palamalai RF – 9.3 km – N and Nakkasalem RF – 7.9km - NE	7.3 km – SW, Omandur RF – 4.2 km – S, Vellakkalpat RF – 5.5 km – SE, Edumalai RF – 7.4 km – SE, Kurichi malai RF – 4.9 km – NW, Palamalai RF – 9.0 km – N and Nakkasalem RF – 7.8km - NE	7.2km – SW, Omandur RF – 4.8km – S, Vellakkalpat RF – 5km – SE, Edumalai RF – 6.9km – SE, Kurichi malai RF – 5.2km – NW, Palamalai RF – 9.1km – N and Nakkasalem RF – 7.8km - NE
11	Other Industries in the study area	Other leases of Riverways mines and minerals and S.S.Minerals, Ink Factory (2km South), two stone quarries near Perumal hills, Solar power industry, Poultry farm etc are found in the buffer zone.				
12	Nearest major water bodies	Uppar river – 1.1 km – SE, Gundar – 9.3 km - W	Uppar river – 900 m – SE, Gundar – 9.7 km – W	Uppar river – 1.4km – SE, Gundar – 9.1 km - W	Uppar river – 1.3km – SE, Gundar Nadi – 9.5km - W	Uppar river – 1.4km – SE, Gundar – 9.5 km - W
13	Seismic zone	Area falls in Zone-II (Least Active)				
14	Nearest villages	Kottathur - 360m – E Puthanampatti – 4.5 km – SE Abinimangalam – 4.4 km – S Thinnanur – 8.6 km - SW	Kottathur – 200 m – E Puthanampatti – 4.2 km – SE Abinimangalam – 3.8 km – S Thinnanur – 6.4 km - SW	Kottathur - 730m – NE Puthanampatti – 4.2 km – SE Abinimangalam – 3.7 km – S Thinnanur – 6.1 km - SW	Kottathur - 580m – NE Puthanampatti – 4.5 km – SE Abinimangalam – 4.4 km – S Thinnanur – 8.6 km - SW	Kottathur - 600m – NE Puthanampatti – 3.6 km – SE Abinimangalam – 1.3 km – W Thinnanur – 6.0 km - SW

3.2 SOCIO-ECONOMIC CONFIGURATIONS OF THE AREA:

3.2.1 GENERAL:

The Socio-Economic details of the study area are collected through

- Identification of villages falling from the study area map with combined Taluk map
- Collection of primary data through sample survey, village meetings and discussion
- Collection of the demographic pattern of villages falling in the area through NIC 2011 census data
- Occupational structure of villages falling in the study area through NIC 2011 census data
- Details of the amenities available in villages falling in the study area through NIC 2011 census data

The findings of the study are illustrated below:

3.2.2 Secondary data description:

The buffer zone encompassing 10 km radius from the periphery of core zone consists of 34 rural villages from four Taluks namely Musiri Taluk, Manachanallur Taluk and Thuraiyur Taluk of Trichy district followed by Kunnam Taluk from Perambaur District. The study details based on 2011 census data are highlighted below.

Details	Population	Percentage
A. Gender-wise distribution		
Male Population	59599	49.66
Female Population	60426	50.34
Total	**120025**	**100**
B. Caste-wise population distribution		
Scheduled Caste	28870	24.05
Scheduled Tribes	500	0.42
Other	90655	75.53
Total	**120025**	**100**
C. Literate and Illiterate population		
Literate Males	44993	37.48
Literate Females	37538	31.28
Total Literate Population	**82531**	**68.76**
Others Males	14606	12.17
Others Females	22888	19.07
Others Population	**37494**	**31.24**
Total	**221595**	**100**
D. Occupational structure		
Main workers	59712	49.75
Marginal workers	6222	5.18
Total Workers	**65934**	**54.93**
Total Non-workers	**54091**	**45.07**
Total	**221595**	**100**

3.2.2.1 Population structure in the buffer zone:

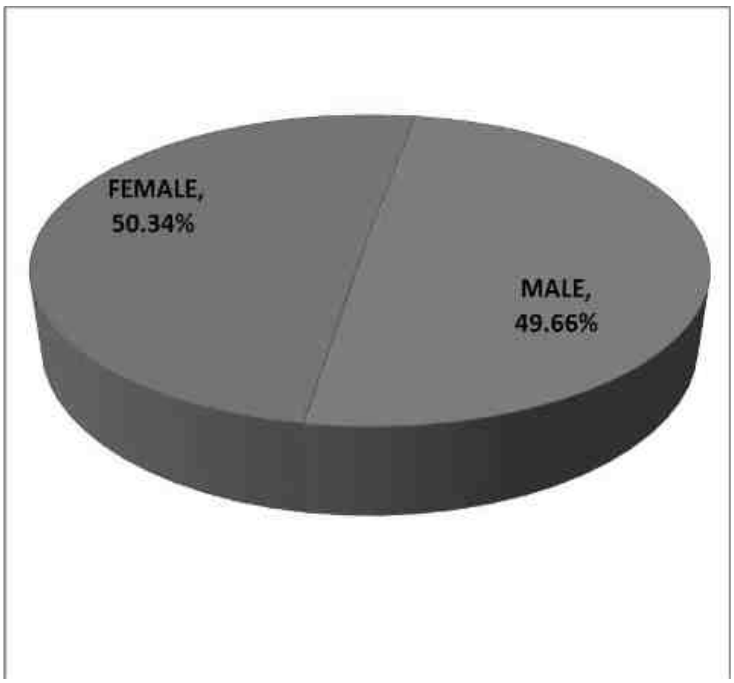
- The total population of these 34 rural villages areas is 120025 in which the male population is 59599 (49.66%) and the female population is 60426 (50.34%). This shows that the female and male population ratio is almost equal.
- Among the total population 0.42% consists of Scheduled Tribes, 24.05% are Scheduled Caste population and 75.53% people belong to other castes mainly the Most Backward Communities and Backward Communities.
- Among the total population, 68.76% of the people are literate and 31.24% of the people are illiterate.
- In total population, 37.49% males and 31.28% females are literates. This shows that the male literates are slightly more than the female literates.

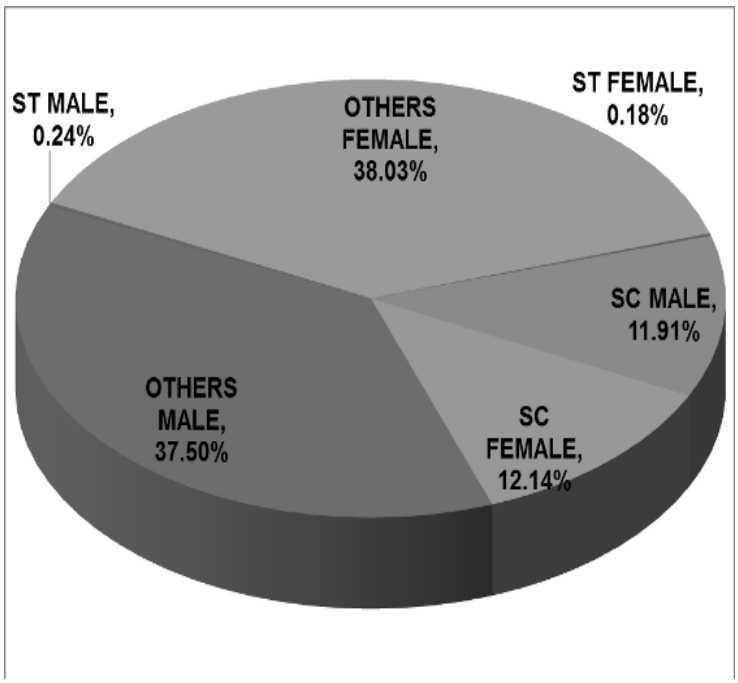
3.2.2.2 Occupational structure in the buffer zone:

- In total population main workers are 59712 (49.75%), marginal workers are 6222 (5.18%) and 54091 (45.07%) are non-workers.
- Cultivators and agricultural laborers contribute 71.28%, household workers contribute 1.73% and others contribute 26.99 % in the total main workers.

The village wise population, literacy levels and occupational structure details are given in **Annexure . 7 & 8** The demographic structure within the buffer zone is shown diagrammatically in **Figure No. 3.3**

Figure 3.3:DEMOGRAPHIC STRUCTURE WITHIN THE BUFFER ZONE





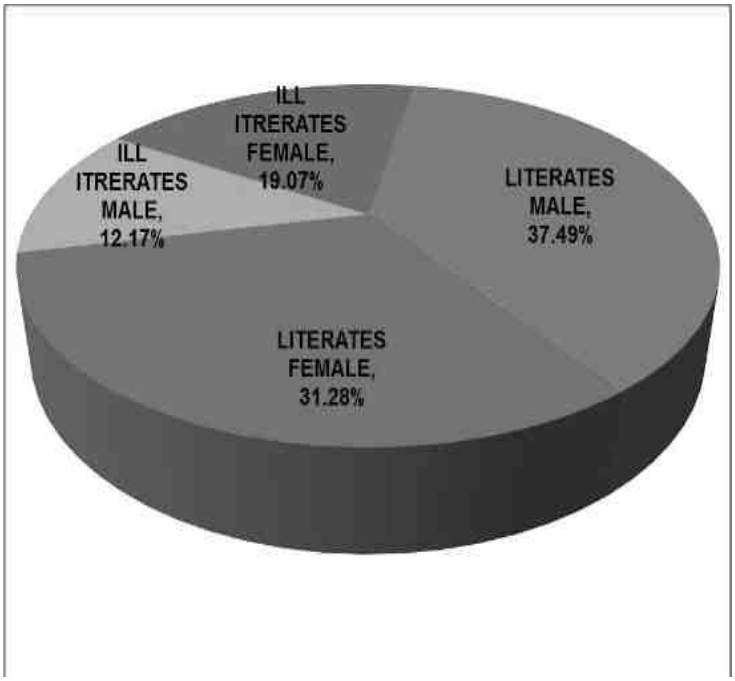
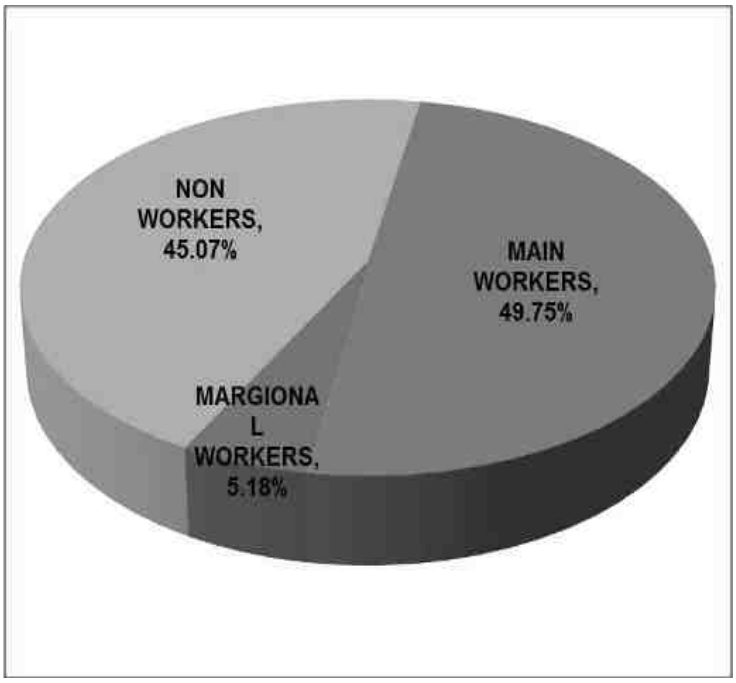
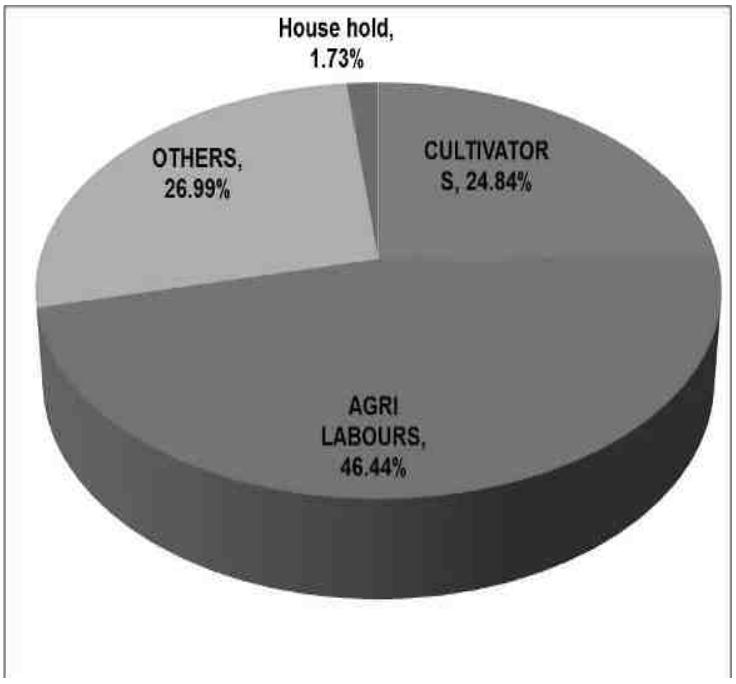


Figure No - 3.3 Contd.,





3.2.2.3 Details of Amenities:

Educational Facilities:

- Based on 2011 census data, regarding the educational facilities, all the 34 rural villages have educational facilities.
- There are totally 73 Government primary schools functioning in the villages falling in 10 km radius of study area. Among the 30 rural villages, 2 village has no schools followed by 11 villages have one primary school, 7 villages have 2 primary schools, 10 villages have 3 primary school & 4 villages have more than 3 primary schools available **(Refer Table No. 3.1)**.

Table 3.1: Details of primary schools in the buffer zone rural villages

S. No	No of rural villages	Number of primary schools	Total
1	2	0	0
2	11	1	11
3	7	2	14
4	10	3	30
5	2	4	8
6	2	5	10
Total			**73**

- Regarding the middle school facility provided by Government, among the 34 rural villages, 27 villages have this facility and 7 villages does not have this facility.
- Similarly 13 villages have secondary school facility and 6 villages have senior secondary schools which are run by the Government.

Medical facilities:

As per 2011 Census data, all villages have medical facilities provided by the Government in 10 km radius of the study area. Government Primary Health Centers are available in 5 villages namely Kottathur, Pulivalam, Varadarajapuram, Edumalai and Elandhalapatti. Primary Health Sub centers are available in 26 villages and Maternity and child care centers are available in 9 villages. Dispensaries and veterinary hospitals are available in 5 villages.

Infrastructure Facilities:

I. Water facility

Drinking water facility is available in all villages. As per the secondary data in 34 rural villages, all the villages have treated-water taps, 27 villages have covered well and 32 villages has tube well facilities followed by 31 villages have hand pumps. Springs are found in 25 villages.

II. Post office

Among the 34 rural villages, 5 villages have post office facility and 29 villages do not have this facility.

III. Telephone facilities

As per the 2011 census, 23 villages have the telephone facilities and remaining 11 villages do not have it, but the primary data collection shows all the villages have mobile phone services.

IV. Bus Facility

Public bus services are available in 24 villages.

V. Railway services

There is no railway station in any of the villages. People have to travel more than 10 km to avail rail facility.

VI. Banks

Among the 34 rural villages, 5 villages having commercial banking facilities followed by 4 villages have Co-operative Bank services and 6 villages having Agricultural Credit Societies. The details of educational, medical and infrastructural facilities are given in the **Annexure . 9,10 & 11.**

However lot of improvements have taken place now

.3.2.3 SOCIO ECONOMIC SURVEY:

Study of the area to know about socio-economic conditions, including aspirations and requirements of the people show the following:

- Lease and its surrounding environ is dominated with mixed landuse with dominant hills and intervening plains with patches of agricultural activities.
- Due to undependable rainfall, poor soil condition, absence of irrigational source or water bodies, deep ground water occurrence, little seasonal agricultural activites are carried out in the area.
- Agriculturists, land laborers, lorry transport, goat rearing are the main occupation of the locals.
- Schools up to primary level and in some villages higher school level is available. Higher & better eduction facilities are available in Puthanampatti & Thuraiyur.
- PHC level medical facilities are available locally. Better medical facilities are available in Puthanampatti & Thuraiyur
- Reasonably better amenities like approach road bus facility, electricity, mobile phone connectivity, Public Distribution System, Co operative bank. Scheduled banks etc are available.
- Bore well is the main source for drinking water. There are OHT's, Ground level tanks, public taps are available .





3.3






அரசினர் உயர்நிலைப்பள்ளி


அங்கன்வாடி மையம்
11°5'52.56586"N 78°39'9.38502"E
Abinimangalam
Tamil Nadu
Altitude:37.6m


11°7'24.29155"N 78°38'52.07608"E
Keelakunupatti
Tamil Nadu
Altitude:49.7m


11°4'33.47501"N 78°39'13.29322"E
Sathanur
Tamil Nadu
Altitude:32.4m
Speed:0.6km/h

3.3 EXISTING ENVIRONMENTAL QUALITY:

3.3.1 MICRO-METEOROLOGY:

3.3.1.1 GENERAL:

The meteorological conditions in an area regulate the dispersion of air pollutants being released into the atmosphere. The principal variables include horizontal convective transport i.e. wind speed and direction; vertical convective transport i.e. mixing height, stability class and topography of the area.

3.3.1.2 HISTORICAL METEOROLOGICAL DATA:

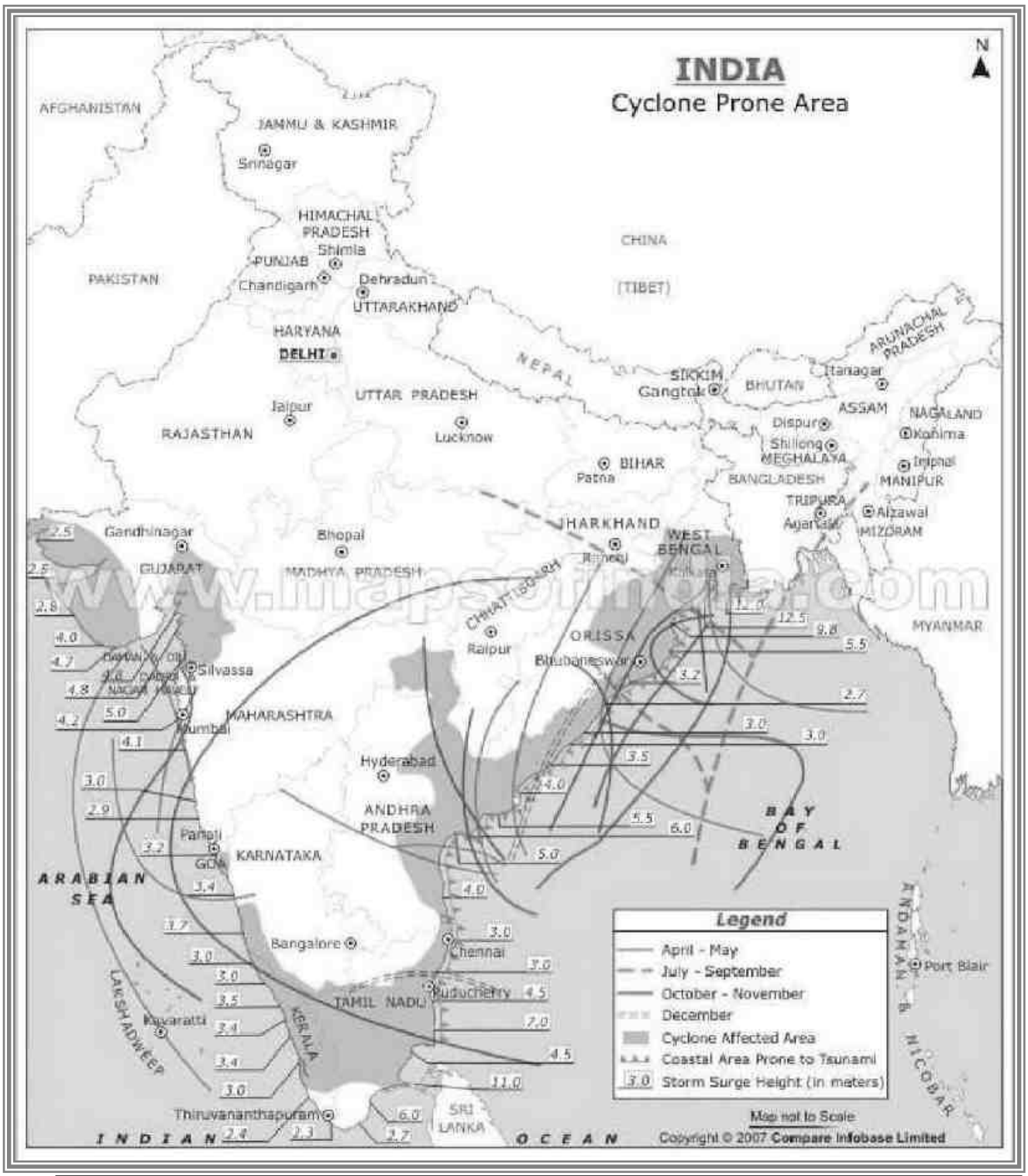
3.3.1.2.1 CYCLONES AND DEPRESSIONS:

Cyclonic storms and depressions in Bay of Bengal affect the East Coast of India. Isolated ones, forming in January to March in the South Bay of Bengal move West-North-westwards and hit Tamil Nadu coast. In April and May, cyclonic storms and depressions form in the South and adjoining Central Bay and move initially to the Northwest, then North and then recurve to the Northeast striking the Arakan coasts in April and Andhra Pradesh (AP)-Orissa-West Bengal (WB) – Bangladesh coasts in May. Most of the monsoon (June – September) storms develop in the central and in the north bay and move west – north - westwards affecting AP – Orissa – WB coasts. Post monsoon (October – December) storms form mostly in the south and central Bay, recurve between 150 and 180 N affecting Tamil Nadu – AP – Orissa – WB – Bangladesh coasts.

Figure No - 3.4 depicts the history of cyclonic storms, which have struck the Indian coast during the months of October, November and December during the last 75 years.

(Source: Vulnerability Atlas of India series, above figure accessed from www.maps of india.com). East coast is prone to cyclonic storms round the year but mostly these occur prior to SW i.e., in May and after SW monsoon i.e., in October and November.

Figure 3.4:THE HISTORY OF CYCLONIC STORMS



3.3.1.2.2 SEISMIC DATA:

From the seismic zone map of India as depicted in the **Figure No - 3.5,** it can be seen that the project site and study area falls in the Zone – II and is described as least active zone.

Figure 3.5: THE SEISMIC ZONE MAP OF INDIA



3.3.1.3 CLIMATE AND RAINFALL DATA:

The district enjoys a tropical climate. The hot weather begins early in March, the highest temperature being felt in April and May. Weather cools down progressively from about the middle of June and by December, the mean daily maximum temperature drops to 30.2°C, while the mean daily minimum drops to 19.2°C and 19.6°C in January. The weather is pleasant during the period from November to January. Mornings in general are more humid than the afternoons, with the humidity exceeding 78% on an average. In the period June to November the afternoon humidity exceeds 66% on an average. In the rest of the year the afternoons are drier, the summer afternoons being the driest. The district receives the rain under the influence of both southwest and northeast monsoons. The northeast monsoon chiefly contributes to the rainfall in the district. The southwest monsoon rainfall is highly erratic and summer rains are negligible.

TABLE 3.2: AVERAGE ANNUAL RAINFALL DATA

The average annual rainfall and the 5 years rainfall collected from twadboard, Trichy as follows:

Actual Rainfall In mm						Normal Rainfall In Mm
2019	2020	2021	2022	2023	2024(as on 30.09.24)	
635.0	748.8	1222.7	854.1	645.4	378.0	818

Source – https://www.twadboard.tn.gov.in/content/ Trichy

A. SITE SPECIFIC METEOROLOGICAL DATA:

Micrometeorology and microclimatic parameters of wind velocity, wind direction, ambient temperature, relative humidity, were collected throughout the monitoring period

B. DATA ANALYSIS:

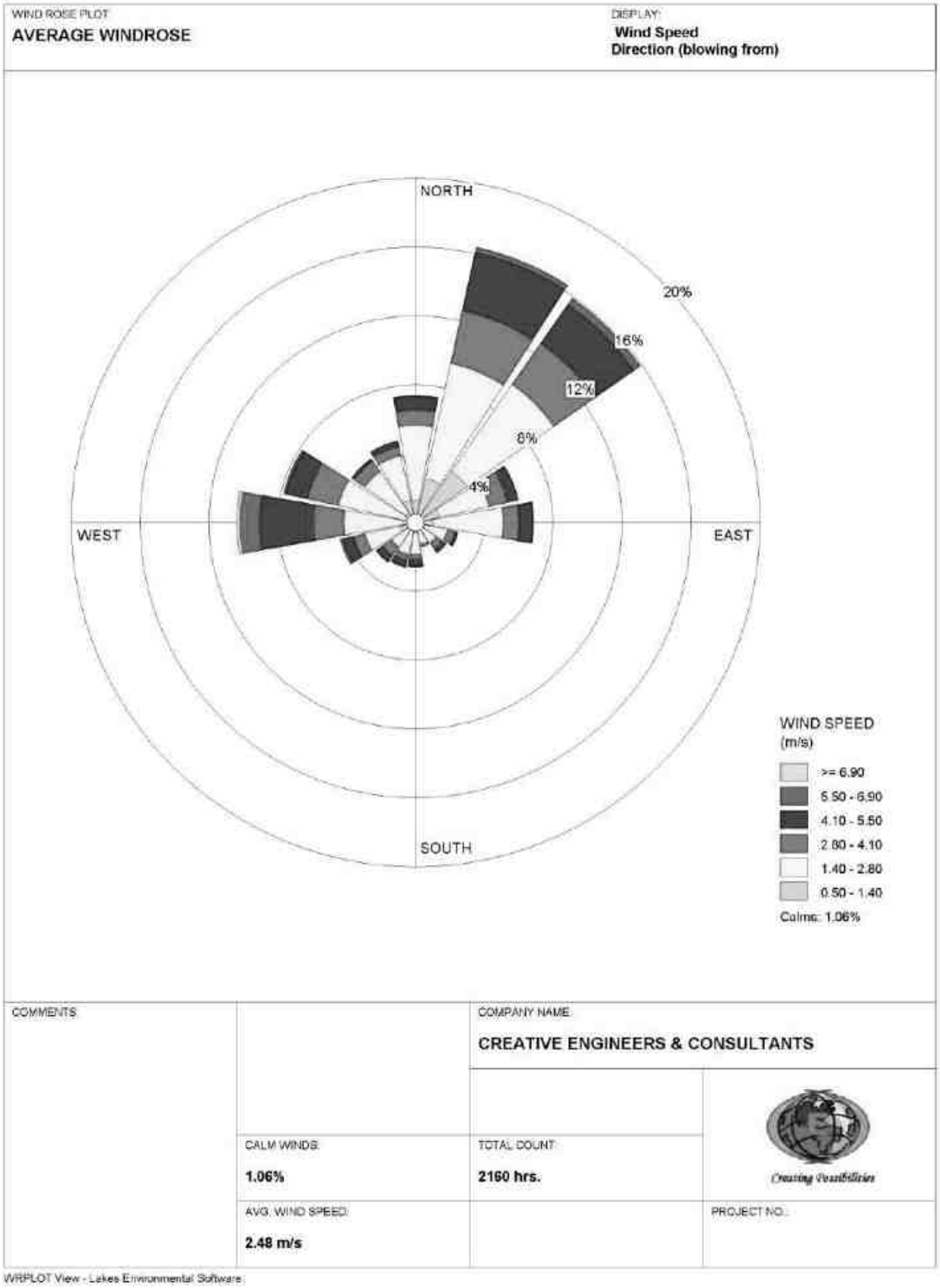
The temperature in the area during the study period ranged from 21.7 ^{o}C to 38^{o}C while the relative humidity varied between 42.3 - 99%. The wind speed during the study period ranged from <1.8 to 27.7 Km/hr. The predominant wind direction is from NE. The meteorological data are presented in **Table No. 3.3.** The average wind rose is depicted in **Figure No - 3.6**

Table 3.3: METEOROLOGICAL DATA

Post monsoon Season 2024 (October 2024 to December 2024)

SL:NO	PARAMETERS	MIN	MAX
1	Temperature In ^{0}c	21.7	38.0
2	Humidity in %	42.3	99.0
3	Wind speed in km/hr	<1.8	27.7
4	Predominant wind direction from	NE	

Figure 3.6: AVERAGE WINDROSE



3.3.2 AMBIENT AIR QUALITY (AAQ):

3.3.2.1 GENERAL:

The principal objective of the Ambient Air Quality Monitoring (AAQM) is to assess the existing levels of ambient air quality in and around the project area.

The ambient air quality depends upon the emission sources, meteorological conditions and the background concentration of specific contaminants. The study of the baseline ambient air quality data in the area is an essential and primary requirement for assessing the impact on air quality due to the mining activities and also to the potential environmental changes likely to occur due to this project.

With the above objective, the following parameters were analyzed at the selected locations established in the study area.

- Particulate Matter (PM_{10})
- Particulate Matter ($PM_{2.5}$)
- Sulphur Dioxide
- Oxides of Nitrogen
- Carbon Monoxide

Besides, the Silica content in the core zone was also evaluated.

3.3.2.2 DESIGN CRITERIA FOR AMBIENT AIR QUALITY MONITORING STUDY NETWORK:

Ambient Air quality has been assessed through a net-work of 5 ambient air quality stations. The following methodology has been considered for design of ambient air quality monitoring network in the area.

- Topography / terrain of study area.
- Populated areas within study area
- Residential /sensitive areas within study area
- Magnitude of surrounding industries
- Representation of regional background levels.

- Representation of cross sectional distribution in down wind direction
- Predominant wind direction and wind pattern

5 air sampling locations were selected for air quality study based on the above criteria.

The details of the locations are given below.

S. NO	LOCATION CODE	LOCATION	SHORTEST DISTANCE FROM CORE ZONE(KM)	DIRECTION
1	A1	Naduvalur (Near Mine Lease)	--	--
2	A2	Kilkunnuppatti Village	2.8km	NW
3	A3	Nagalapuram Village	4.4km	N
4	A4	Sathanur Village	2.7km	SW
5	A5	Kottathur Village	280m	NE

The location map, as above, for Ambient Air Quality study stations are shown in **Figure No. 3.7.**

Figure 3.7: AMBIENT AIR QUALITY STUDY STATIONS



3.3.2.3 SAMPLING METHODOLOGY:

Standard monitoring and analysis procedures were adopted for determining the Air quality parameters. The methodology adopted is briefly described here under:

Particulate Matter (PM_{10})	-Gravimetric (IS 5182: Part 23:2006)
Particulate Matter ($PM_{2.5}$)	- Gravimetric
Sulphur Dioxide	- Colorimetric (West & Geake Method) (IS 5182: Part 02: 2001)
Oxides of Nitrogen	- Colorimetric (Modified Jacob & Hocheiser Method) (IS 5182: Part 06:2006)
Carbon Monoxide	-CO Monitor
Silica	- Calorimetric (Molybdate Method)

The PM_{10}, $PM_{2.5}$, SO_2, NO_2 and CO is monitored as per prescribed guidelines/ methods. Frequency of sampling was 2 consecutive days in a week, for a month for 3 months in a season. The AAQ monitored data for all locations for above parameters are shown in **Table No. 3.4** and **Figure No - 3.8.** Ambient Air Quality data during the study period is given in **Annexure – 12.**

In the Core zone locations, it is observed that, in the ambient air, the PM_{10} values were in the range of 42.4 – 52.1 µg/m^3. $PM_{2.5}$ values were in the range of 19.5 – 24.0 µg/m^3. SO_2 levels were ranging from 4.6 – 6.9 µg/m^3. NO_2 levels were ranging from 7.5 – 9.8 µg/m^3.

In the five buffer zone locations, it is observed that, in the ambient air, the PM_{10} values were in the range of 41.1 – 60.1 µg/m^3. $PM_{2.5}$ values were in the range of 18.6 – 27.6 µg/m^3. SO_2 levels were ranging from 4.4 – 7.8 µg/m^3. NO_2 levels were ranging from 7.2 – 11.2 µg/m^3.

While comparing with the NAAQ Norms, all monitored values of PM_{10}, $PM_{2.5}$, SO_2, and NO_2 values were found to be well within the prescribed standards. The CO values in the all locations found to be below detectable limit (DL – 1144 µg/m^3). Silica values in the study area are found to be below detectable limit (DL – 0.05 mg/m^3) which is well within the prescribed limit of 5 mg/m^3.

Table 3.4: AMBIENT AIR QUALITY DATA

SEASON: Post Monsoon Season (Oct 2024 to Dec 2024)

All Value in µg/m³

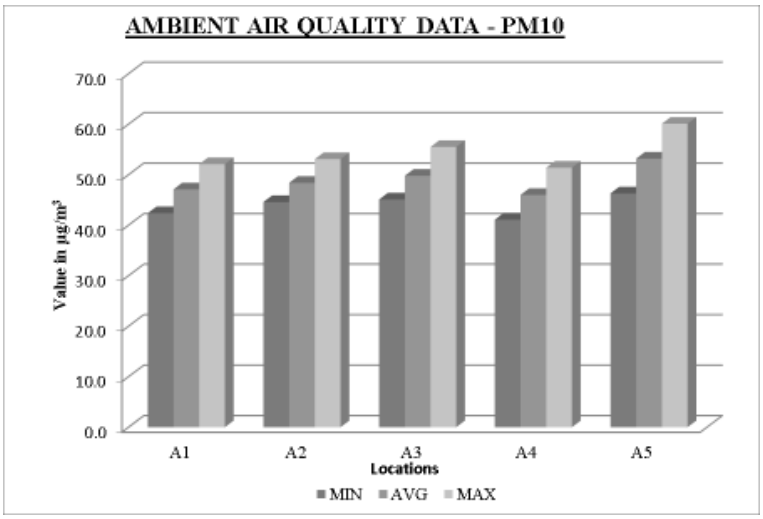
S. NO	LOCATION CODE	PARAMETERS / LOCATIONS	Cat.*	PM_{10}			$PM_{2.5}$			SO_2			NO_2		
				MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
1	A1	Naduvalur (Near Mine Lease)	R	42.4	47.1	52.1	19.5	21.7	24.0	4.6	5.8	6.9	7.5	8.7	9.8
2	A2	Kilkunnuppatti Village	R	44.6	48.4	53.1	20.7	22.5	24.6	4.7	5.9	7.2	7.3	8.6	10.1
3	A3	Nagalapuram Village	R	45.1	49.8	55.5	20.6	22.7	25.3	5.0	6.2	7.5	7.6	8.9	10.5
4	A4	Sathanur Village	R	41.1	46.0	51.4	18.6	20.8	23.2	4.4	5.6	6.7	7.2	8.4	9.6
5	A5	Kottathur Village	R	46.3	53.2	60.1	21.3	24.5	27.6	5.2	6.4	7.8	7.9	9.3	11.2
NAAQ standards as per CPCB Notification, 2009				PM_{10}			$PM_{2.5}$			SO_2			NO_2		
			*	100			60			80			80		
			**	100			60			80			80		

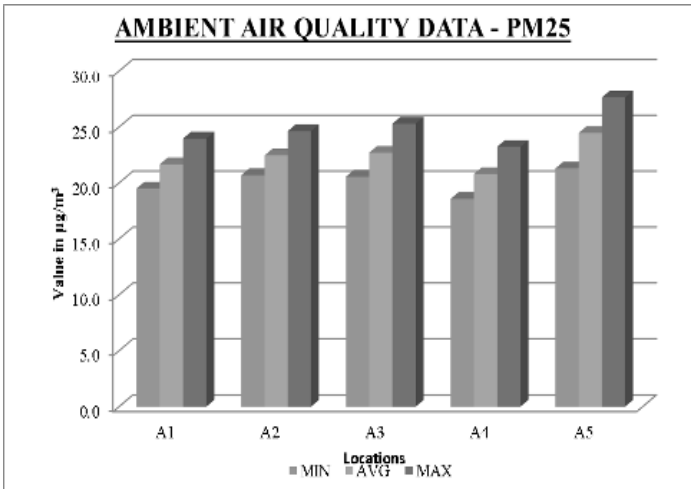
***Note: Category: * - Industrial, Residential, Rural and other area**

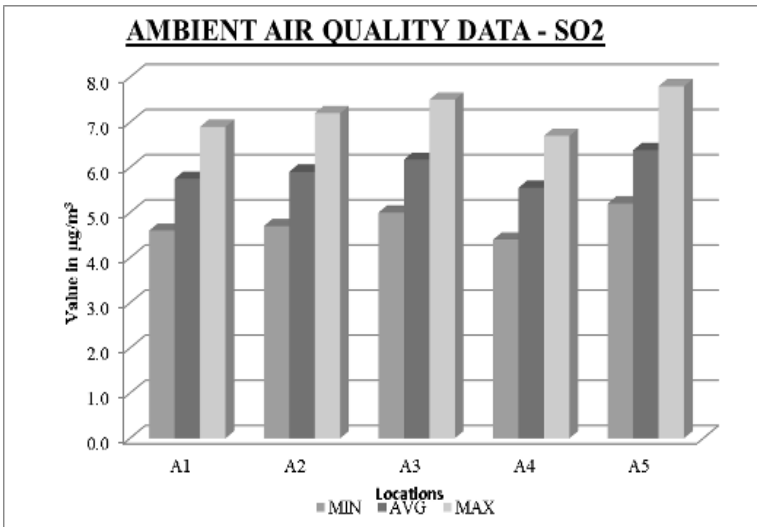
**** – Ecologically Sensitive Area (notified by Central Government)**

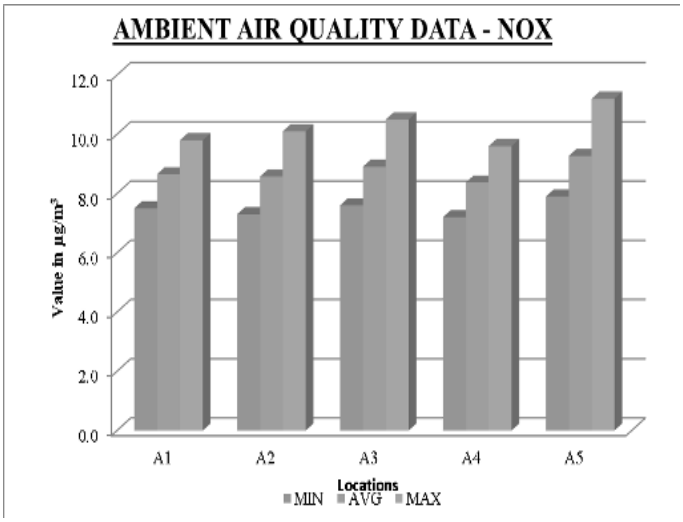
BDL- Below Detectable Limit, DL- Detectable Limit.

Figure 3.8: AMBIENT AIR QUALITY DATA









3.3.3 WATER ENVIRONMENT:

3.3.3.1 GENERAL:

Assessment of baseline data on water environment includes:

- Identification of water resources
- Collection of water samples
- Analyzing water samples collected for physico-chemical parameters as per standards.

3.3.3.2 SAMPLING STATIONS:

5 water samples (5 samples from Bore well) were collected at the following locations:

W1- Naduvalur (Near Mine Lease)

W2- Kilkunnuppatti Village

W3- Nagalapuram Village

W4- Sathanur Village

W5- Kottathur Village

The locations of the water sampling stations are shown in **Figure No - 3.9.**

3.3.3.3 SAMPLING METHODOLOGY:

Water samples were collected in 2 litre capacity fresh cans as per IS 3025 Part - I and transported to the laboratory in Ice boxes.

Figure 3.9: LOCATION OF WATER SAMPLING STATIONS



3.3.3.4 SAMPLING AND ANALYTICAL METHODOLOGY:

Table 3.5: Summary of Water Quality Data

Season	Postmonsoon Season (October to december 2024)	
Monitoring Locations	5 locations	
Parameters	**Range of values**	**Limits***
pH at 25 ˚C	6.97 - 7.58	**6.5-8.5**
Total Dissolved Solids, mg/L	440 - 930	**2000**
Chloride as Cl-, mg/L	94.5 – 415	**1000**
Total Hardness (as CaCO3), mg/L	278-582	**600**
Total Alkalinity (as CaCO3), mg/L	115-509	**600**
Sulphates as SO42-, mg/L	12.6-114	**400**
Iron as Fe, mg/L	0.04 – 0.09	**0.3**
Nitrate as NO3, mg/L	1.68 – 3.05	**45**
Fluoride as F, mg/L	0.32 – 0.56	**1.5**

The results of the water sample analysis are shown in **Table No - 3.5.** The results of the 5 water samples showed that the pH values were ranging in between 6.97 - 7.58. TDS values were in the range of 440 - 930 mg/L. Chloride values were ranging from 94.5 – 415 mg/L. Iron content was found to be in the range of 0.04 – 0.09 mg/L. Fluoride values were ranging from 0.32 - 0.56 mg/L. The water quality of ground water is found to be within the prescribed Permissible limits of IS: 10500 Norms in the absence of an alternative source as per Drinking Water Specifications. The water quality data is provided in Annexure-12.

3.3.4 NOISE ENVIRONMENT:

3.3.4.1 GENERAL:

Sound can be defined as atmospheric or air vibration perceptible to ear. Noise is usually unwanted or undesired sound. Consequently, particular sound can be noise to one person and not to others or noise at one time and not at other time. Hence sound loud enough to be harmful is called noise without regard to its characteristics. Noise is a form of pollution because it can cause hearing impairment and psychological stresses.

Operational phase of this project may lead to increase noise levels from the existing levels at least in and around the project area. As it is evident that noise level beyond permissible limits will cause adverse impacts on the environment, it has become imperative to assess the noise levels in and around the mine area.

Noise level measurements were taken at the selected locations using noise level meter both during day and night time. Noise level measurements were taken continuously for 24 hours at hourly intervals.

3.3.4.2 MONITORING LOCATIONS:

Noise measurements were carried out continuously for a day once in a Season at 5 locations. The locations are indicated below:

S. NO	LOCATION CODE	LOCATION	SHORTEST DISTANCE FROM CORE ZONE(KM)	DIRECTION
1	N1	Naduvalur (Near Mine Lease)	--	--
2	N2	Kilkunnuppatti Village	2.8km	NW
3	N3	Nagalapuram Village	4.4km	N
4	N4	Sathanur Village	2.7km	SW
5	N5	Kottathur Village	280m	NE

These Locations are shown in **Figure No - 3.10.**

Figure 3.10: LOCATION OF NOISE SAMPLING STATIONS



3.3.4.3 METHODOLOGY OF ASSESSMENT:

Noise levels were measured using sound level meter manufactured by (Model No - SL- 4001, Make - Lutron). Sound Pressure Level (SPL) measurements at all locations where ambient air quality monitored; one reading for every hour was taken for 24 hours.

3.3.4.4 DATA ANALYSIS AND INTERPRETATION:

The results of hourly background noise levels for all locations are given in **Table No. 3.6** The noise values for all above locations are shown in a comparative chart given in **Figure No - 3.11.**

In the core zone location (1 location), it is found that the Day Equivalent Noise (Leq-d) level is 47.4 dB(A) and Night Equivalent Noise (Leq-n) level is 39.4 dB(A) which are below the work zone exposure limit of 90 dB(A).

In the five buffer zone locations, it is found that the Day Equivalent Noise (Leq-d) level were ranging from 48.1 to 51.4 dB(A) and Night Equivalent Noise (Leq-n) level were ranging from 39.3 to 40.7 dB(A) for buffer zone. The monitored ambient noise levels were well within the limit while comparing with the MOEF&CC Norm of 55 dB(A) for day time and 45 dB(A) for night time in Residential areas.Noise level data is provided in Annexure - 14

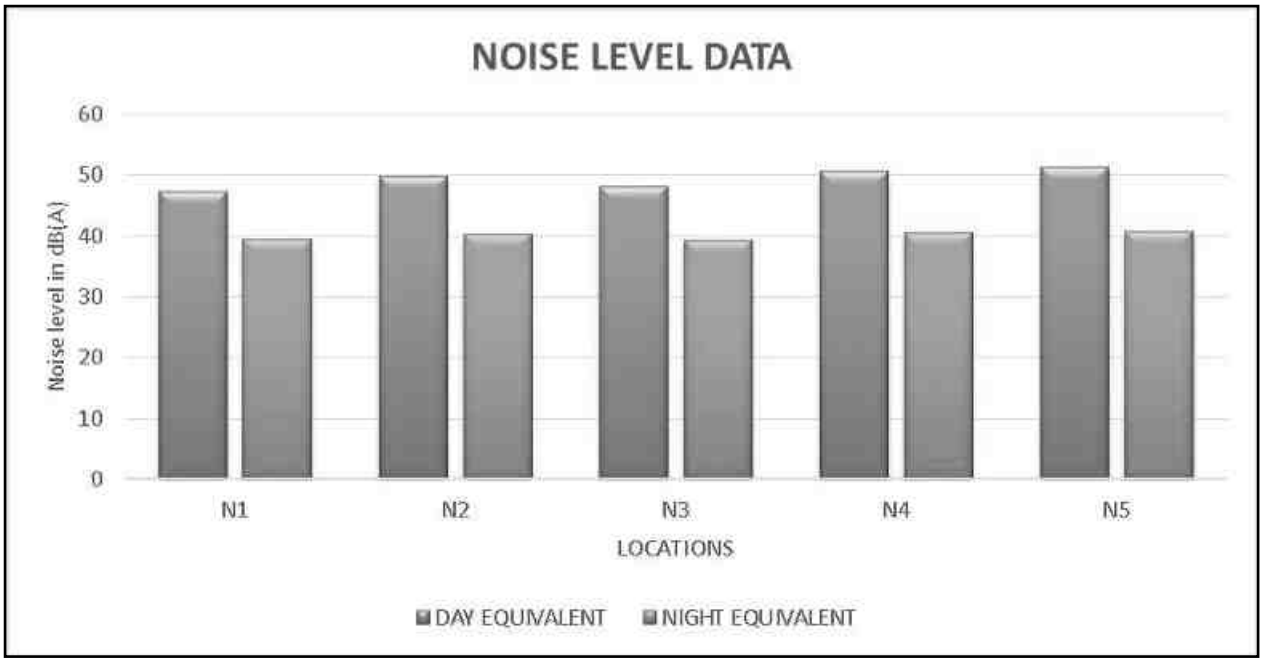
Location names:

N1 - Naduvalur (Near Mine Lease)
N2 - Kilkunnuppatti Village
N3 - Nagalapuram Village
N4 - Sathanur Village
N5 - Kottathur Village

Table 3.6: AMBIENT NOISE LEVELS- in dB(A)

Particulars	N1	N2	N3	N4	N5
Day Equivalent	47.4	49.9	48.1	50.7	51.4
Night Equivalent	39.4	40.3	39.3	40.5	40.7
Day & Night Equivalent	45.9	48.4	46.6	49.2	49.8

Figure 3.11: NOISE LEVELS FOR ALL LOCATIONS



3.3.5 SOIL CHARACTERISTICS:

3.3.5.1 GENERAL:

Soil is defined as the naturally deposited, unconsolidated material which covers the earth's surface, whose chemical, physical properties are capable of providing growth to plants. Soil itself is very complex. Soil contains mineral particles, air, water and organic matter.

Soil pH supports a number of inorganic and organic chemical reactions. Soil fertility is directly influenced by pH through the solubility of many nutrients. Soil texture has an important role in nutrient management and the size distribution of the mineral particles (sand, silt, clay). Depending on the size of the particles in the soil, it can be classified in to clay loam, loam and sandy loam.

3.3.5.2 MONITORING LOCATIONS:

Soil samples were collected from 3 locations to assess the soil quality in and around the mines. Soil samples collected using sampling augers and field capacity apparatus.

The Four locations are:

S1- Naduvalur (Near Mine Lease)

S2- Kilkunnuppatti Village

S3- Kottathur Village

The locations are shown in **Figure No – 3.12**

Figure 3.12: LOCATION OF SOIL SAMPLING STATIONS



3.3.5.3 Data Analysis:

Results of the soil samples show that the pH values were ranging between 6.65 to 7.19 and Electrical Conductivity values were ranging between 35.97 – 110.2 µmhos/cm. Soils are generally clay, silt loam, loam type. Organic matter values were ranging between 0.56 – 1.25 %.

Total Nitrogen values were ranging between 136 – 522 mg/kg. Phosphorus values were ranging between 0.86 – 1.12 µg/g. Potassium values were ranging between 715 – 1172 mg/kg. Sodium values were ranging between 860 – 1032 mg/kg. Sulphur values were observed to be BDL (D.L - 0.02).

The soil quality data for the 3 samples collected and analyzed are provided in **Table No. 3.7 &** Soil Quality data is provided in Annexure- 15

Table 3.7: SOIL QUALITY DATA

S. No	Parameters	Unit	S1	S2	S3
1	pH at 25 °C	-	7.19	6.65	6.92
2	Electrical Conductivity	(µmhos/cm)	35.97	110.2	70.43
3	Dry matter content	%	97.65	98.65	98.32
4	Water Content	%	2.35	1.35	1.68
5	Organic Matter	%	0.56	1.25	0.64
6	Soil texture	-	CLAY	LOAM	SILT LOAM
7	Grain Size Distribution i. Sand	%	13.03	44.05	26.31
8	ii. Silt	%	37.33	44.53	54.58
9	iii. Clay	%	49.64	11.42	19.11
10	Phosphorous	µg/g	1.12	0.86	0.98
11	Sodium	mg/kg	872	860	1032
12	Potassium	mg/kg	760	1172	715
13	Total Nitrogen	mg/kg	136	522	176
14	Total Sulphur	%	BDL(D.L - 0.02)	BDL(D.L - 0.02)	BDL(D.L - 0.02)

3.4 LAND ENVIRONMENT:

3.4.1 LAND USE PATTERN BASED ON SATELLITE IMAGERY STUDIES:

For preparing an impact statement, aspects of the land conditions are covered under land use. An industrial project / mine can cause changes in land use, soil process in different intensities depending upon the size of the project and distance involved between the industries and the area. Here, land use status for a radius of 10 km has been studied.

3.4.1 DATA USED AND METHODOLOGY

For the present study on land use pattern of buffer area around the proposed garnet sand quarry, an archived historical data of Landsat 8 data shas been used as base data (Figure No.3.13) has been used to generate the require landuse map showing their spatial pattern within the buffer area. The table showing data used for generation of information on landuse and subsequent GIS analysis is given below.

Table 3.8: RS satellite image used for the present study

S.No	Type of Data	Date	Generated Map
1.	Landsat 8	DEC-2024	Landuse (LU) Map showing 10 Km buffer zone

Interpretation of satellite image requires understanding of relationship between image elements and their respective terrain elements. Since, in the present study, the landuse information is obtained using visual interpretation, an interpretation key is generated. The image elements such as color, tone, texture, size, shape and associated elements have been used to delineate various landuse categories. The landuse categorization and nomenclature used in the present study is based on the national level landuse classification system, which is adopted for the entire country as recommended by NationaL Remote Sensing Centre (NRSC), Department of Space, Government of India.

Figure 3.13 : **Landsat 8 Satellite Data of the Study Area**

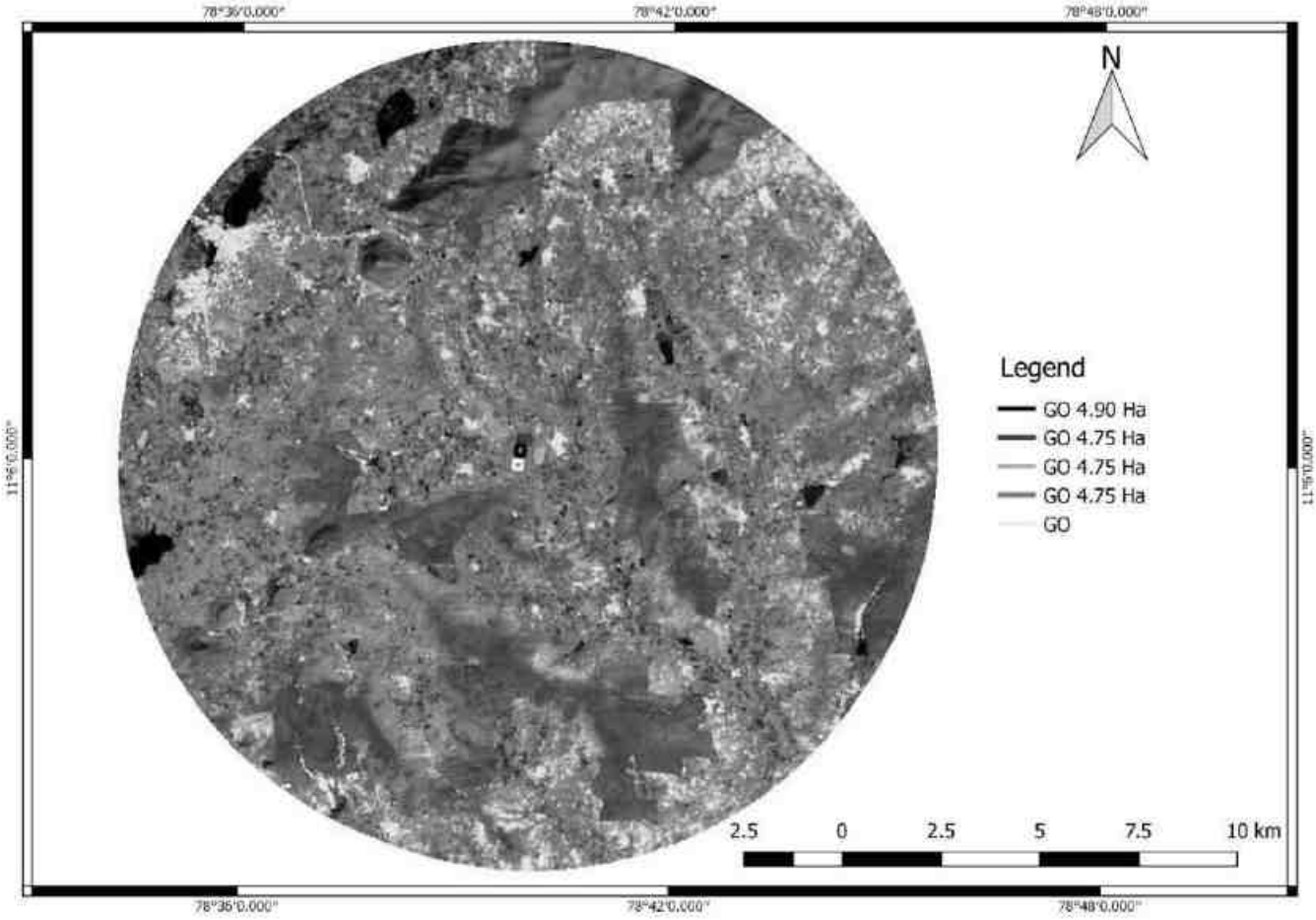


Table 3.9: Major Land use Units of the Study Area

S.No	Major Category	Land use unit
1	Built-Up Land	Village, Town, Industrial / Vacant Area
2	Agricultural Land	Crop Land Fallow Land Plantation Farm Land
3	Forest Land	Open Scrub Forest
4	Waste Land Mining Area	Land With Scrub/ Land Without Scrub Barren Rocky/ Stony Waste Quarries / Abandoned Quarries
5	Waterbodies	Tanks/ Rivers / Streams

Such LandUse and Land cover (LULC) categories have been verified using field check and identified sample sites within the buffer area, verified on field and transferred into gis geo-coordinates using observation coordinates received from hand held GPS (global positioning system) instrument. Thus, an interpreted final landuse map has been

generated (Figure No. 3.14) using above such elaborate procedure and transformed into GIS environment for its spatial distribution and area estimation. Spatial nature and extent of various landuse categories within the buffer area is discussed is given below:

Figure 3.14: Map Showing Land Use Categories around 10km Buffer

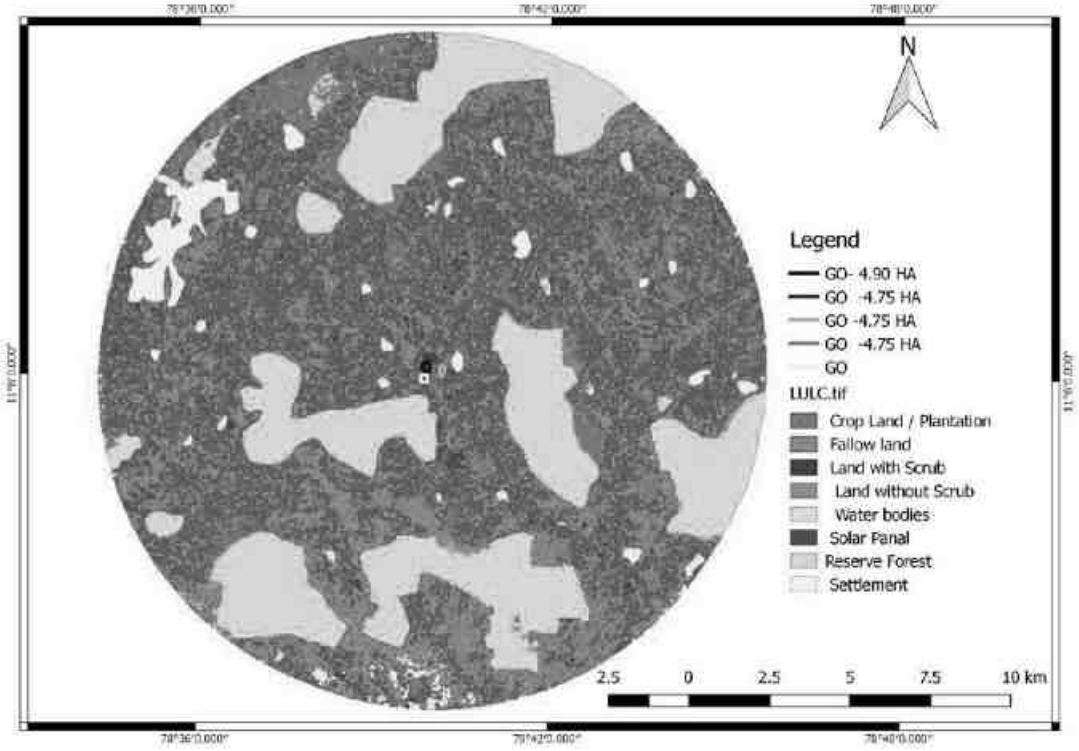


Table 3.10: Area Estimation of Landuse Categories in Buffer Zone

S.No	Land use Feature	Area (Sq.Km)	Percentage
1	Agriculture/ Plantation	114.13	34.14
2	Fallow Land	128.69	37.45
3	Land Without Scrub	17.59	5.12
4	Water bodies	2.63	0.77
5	Solar panel / infrastructure	0.77	0.22
6	Reserve Forest & Land With Scrub	69.33	19.25
7	Settlement / infrastructure	10.51	3.06
	Total	343.64	100

From the above table it is seen that 34.14 % of the buffer area is classified under the Agriculture/ Plantation followed by 34.4 % of fallow land, 0.9 % constitutes land with scrub forest, 5.6 % constitutes land with out scrub, 22.7 % constitutes scrub forest and the balance 4.1 % falls under other land use categories. Land alongside the river are primarily under Agriculture category.

Photograph showing Land use In Buffer Zone













3.4.8 LAND USE BASED ON REVENUE RECORDS:

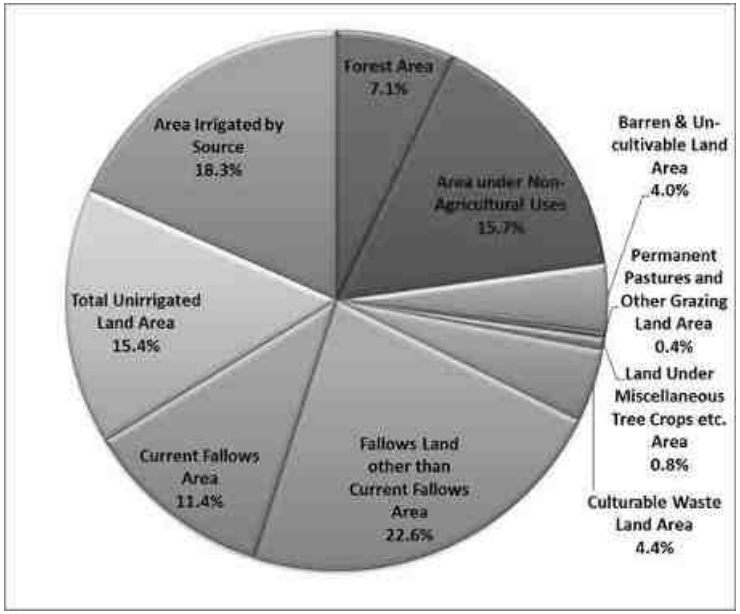
The study area encompasses 10 km radius from the periphery of core zone consists of 34 rural villages from four Taluks namely Musiri Taluk, Manachanallur Taluk and Thuraiyur Taluk of Trichy district followed by Kunnam Taluk from Perambaur District.

The study area for the land use pattern (10 km radius) has been divided into three zones viz. Zone-I (0-2 km), Zone-II (2-5 km) and Zone-III (5-10 km) respectively. The land use pattern of the study area falling within 10 km radius around the project area is presented in **Table No - 3.11.**

TABLE 3.11: LAND USE PATTERN OF THE STUDY AREA FALLING WITHIN 10 KM RADIUS

(in Hectares)

	Total Geographical Area	Forest Area	Area under Non-Agricultural Uses	Barren & Un-cultivable Land Area	Permanent Pastures and Other Grazing Land Area	Land Under Miscellaneous Tree Crops etc. Area	Culturable Waste Land Area	Fallows Land other than Current Fallows Area	Current Fallows Area	Total Unirrigated Land Area	Area Irrigated by Source
0-2 Km	7733.33	841.55	549.8	454.2	13.01	32.42	514.63	3065.05	394.66	492.47	1375.54
2-5 Km	12511.77	921.5	2175.33	812.22	31.39	103.05	579.84	2029.96	1818.4	2213.38	1826.7
5-10 Km	20390.38	1119.13	3665.94	366.87	103.64	171.17	685.42	4086.75	2399.17	3548.03	4244.26
0-10 Km	40635.48	2882.18	6391.07	1633.29	148.04	306.64	1779.89	9181.76	4612.23	6253.88	7446.5



Forest Land

A total of about 2882.18ha of land in 10 km radius is under forest land use. This accounts to about 7.1 % of the total geographical area.

Area under Non-Agricultural Uses

A total of about 6391.07ha of land in 10 km radius is under "Area under Non-Agricultural Uses" use. This accounts to about 15.7 % of the total geographical area.

Land under Cultivation

Altogether about 13700.38 ha of land (irrigated and un-irrigated) is put to agriculture and this works out to about 33.7 % of the land in 10 km radius of the study area. The land, which is irrigated by source, works out to about 18.3 % of total geographical land.

Waste Land

This land includes the land, which was cultivated sometime back and left vacant during the past 5 years in succession. Such lands may either be fallow or covered with shrubs, which are not put to any use and all grazing lands and village common lands are also included in this category. The study area comprises of about 1779.89Ha (4.4%) of wasteland.

Barren & Un-cultivable Land

A total of about 1633.29Ha of land in 10 km radius is under Barren & Un cultivable land. This accounts to about 4.0 % of the total geographical area.

Permanent Pastures and Other Grazing Land Area

A total of about 148.04ha of land in 10 km radius are under Permanent Pastures and Other Grazing Land Area use. This accounts to about 0.4 % of the total geographical area.

Land under Miscellaneous Tree Crops etc.

A total of about 306.64 ha of land in 10 km radius are under this category. This accounts to about 0.8 % of the total geographical area.

Fallows Land other than Current Fallows

A total of about 9181.76ha of land in 10 km radius is comes under Fallows Land other than Current Fallows. This accounts to about 22.6 % of the total geographical area.

Current Fallows Area

A total of about 4612.23ha of land in 10 km radius is under Current Fallows Area use. This accounts to about 11.4% of the total geographical area.

The village-wise land use pattern is presented in **Table No – 3.12**.

Table 3.12: VILLAGE-WISE LAND USE PATTERN WITH IN BUFFER ZONE

Area in (Ha)

Sl.No	Gram Panchayat Name	Total Geographical Area	Forest Area	Area under Non-Agricultural Uses	Barren & Un-cultivable Land Area	Permanent Pastures and Other Grazing Land Area	Land Under Miscellaneous Tree Crops etc. Area	Culturable Waste Land Area	Fallows Land other than Current Fallows Area	Current Fallows Area	Net Area Sown	Total Unirrigated Land Area	Area Irrigated by Source
0-2 Km, Musiri Taluk, Trichy District													
1	Kottathur	1843.21	172.39	79.68	0.28	0.61	1.41	16.57	662.8	83.27	826.2	76.88	749.32
2	Naduvalur	982.39	90.11	85.85	199.77	0.85	8.61	82.49	193.3	115.12	206.29	133.45	72.84
Thuraiyur Taluk, Trichy District													
3	Thinnanur, Sathanur	2307.27	0	107.91	95.41	0	0.01	230.96	1452.19	195.17	225.62	175.25	50.37
4	Vellakkalpatti, Puthanampatti	1699.99	579.05	152.32	152.64	11.55	20.36	172.55	274.5	0.05	336.97	55.63	281.34
5	Abinimangalam	900.47	0	124.04	6.1	0	2.03	12.06	482.26	1.05	272.93	51.26	221.67
2-5 Km, Musiri Taluk, Trichy District													
6	Sorathur, Kunnupatti	1488.29	0	773.67	153.46	0.54	3.79	12.27	54.84	105.34	384.38	164.82	219.56
7	Nagalapuram, Kunnupatti	1505.48	0	247.8	195.79	1.84	2.5	28	207.74	3.99	817.82	415.44	402.38
8	Sorathur, Muthiampalayam	1340.71	0	183.11	113.77	0	0.5	94	268.81	356.42	324.1	116.7	207.4
9	Pagalavadi	1238.67	0	283.69	30.29	8.61	38.98	75.51	187.98	441.89	171.72	40.8	130.92
Thuraiyur Taluk, Trichy District													
10	T.Kalathur	1446.56	268.01	221.71	1.46	0	8.97	0.24	79.44	345.36	521.37	357.55	163.82
11	Thenur	1259.42	400.06	263.9	0.38	0	28.83	21.16	22	63.33	459.76	137.38	322.38
Kunnam Taluk, Perambaur District													
12	Karattampatti	868.38	0	31.79	225.02	2.01	13.31	1.1	236.31	189.91	168.93	59.28	109.65
13	Pulivalam	1926.22	253.43	101.1	75.69	0	5.33	325.41	534.99	239.82	390.45	283.15	107.3
14	Manparai	1438.04	0	68.56	16.36	18.39	0.84	22.15	437.85	72.34	801.55	638.26	163.29
5-10 Km, Musiri Taluk, Trichy District													
15	Maruvathur,	1258.54	0	291.96	98.01	0	2.78	0	48.09	99.95	717.75	157.93	559.82

Sl.No	Gram Panchayat Name	Total Geographical Area	Forest Area	Area under Non-Agricultural Uses	Barren & Un-cultivable Land Area	Permanent Pastures and Other Grazing Land Area	Land Under Miscellaneous Tree Crops etc. Area	Culturable Waste Land Area	Fallows Land other than Current Fallows Area	Current Fallows Area	Net Area Sown	Total Unirrigated Land Area	Area Irrigated by Source
	Sellipalayam												
16	Varadarajapuram	817.97	0	182.38	0	0	25.36	0	92.11	100.28	417.84	47.46	370.38
17	Keerambur	1336.67	0	244.12	4.49	0	62.7	13	170.23	237.74	604.39	237.06	367.33
18	Govindapuram, Murugur	1353.15	0	296.25	0	2.12	4.62	6.27	302.61	158.97	582.31	398.9	183.41
19	Venkatesapuram, Madurapuri	561.8	0	95.01	0	0	10.43	40.73	69.85	154.51	191.27	102.01	89.26
20	Ammapatti	455.15	0	107.7	2.17	0.97	3.12	102.14	45.35	75	118.7	74.32	44.38
21	Singalandapuram	942.06	0	340.97	48.39	0	20.7	80.02	135.32	167.95	148.71	73.83	74.88
22	Kollapatti	678.35	0	67.52	0	0	1	42.8	66.26	240.1	260.67	198.83	61.84
23	Kannanur	1305.51	0	247.81	100.47	52.69	9.84	150.4	131.27	170.74	442.29	225.93	216.36
24	Adanur	863.61	0	257.92	0.27	10.05	3.65	19.45	124.35	218.71	229.21	2.49	226.72
Thuraiyur Taluk, Trichy District													
25	Edumalai	1656.9	480.37	88.32	38.08	0	3.84	0	556.34	4.12	485.83	323.83	162
26	Omandur	1269.01	183.76	160.71	0	0	0	3.06	763.21	2.75	155.52	48.94	106.58
27	Sirugudi	1000.47	184.65	103.82	2.75	0	1.01	0	449.75	16.82	241.67	163.31	78.36
28	Valaiyur, Thaluthalapatti	1148.46	80.53	119.5	3.64	0	0	0	310.48	116.97	517.34	377.04	140.3
29	Palaiyur	883.13	0	160.38	0.14	0	0	1.05	354.56	2.25	364.75	230.1	134.65
Manachanallur Taluk, Trichy District													
30	Siruvayalur , Kurur	1719.61	82	196.95	25.13	9.01	2.59	134.69	130.05	314.86	824.33	241.4	582.93
31	Elandhalapatti	1393.38	71.73	340.49	2.15	5.25	2.97	51.09	190.26	31.86	697.58	295.12	402.46
32	Nakkaselam	311.39	0	46.44	0	0	0.29	0	20.12	44.18	200.36	71.66	128.7
33	Kannapady	888.15	36.09	240.22	5.06	10.13	16.27	27.47	72.84	221.32	258.75	137.75	121
34	Mavilingai	547.07	0	77.47	36.12	13.42	0	13.25	53.7	20.09	333.02	140.12	192.9

3.5 BIOLOGICAL ENVIRONMENT:

Study of the biological environment of any area comprises of well-planned ecological survey for the floristic and faunal composition of the areas through various scientifically planned techniques.

3.5.1 FLORA:

An ecological survey of the study area was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. The objective of the survey is as follows:

- Generate existing data from field observations of various terrestrial floristic occurrences.
- Collect secondary data from Government records as well as through discussion with Forest officials, knowledgeable public etc.,
- Compare the data with authentic past records to identify changes, if any.
- Identify the impact of project operations on the biological aspects.

To accomplish the above objectives, a general ecological survey covering an area of 10 km radius was conducted. The locations were identified for phyto-sociological aspects to assess the current status.

A.CORE ZONE:

The lease area is a Eri poramboke land with thorny bush (Prosophis juliflora), grasses and shrubs only.





BUFFER ZONE:

There are 120 different species identified in the buffer zone. Among the identified, floral (120) species were 45 trees, 29 herbs, 22 shrubs, 11 climbers, 5 Creepers, 8 grasses, and Cactus 2. The detailed list of plants found in the Bufferzone. There are no Rare, Endangered, and Threatened Flora species in the mining area and their surrounding study area.

Agricultural activities are carried out along the streams / ponds and wherever irrigational facilities area available. Pulses are primarily grown as rain-fed crops. Banana, Paddy, Coconut, Sugar cane, brinjal, cotton, agathileerai and black gram are also carried out in patches.

There are RFs in the study area. It is mostly of scrubby type. Plantation under social forestry scheme with Dalbergia Sp, Neem is developed by Forest Department in most of the RF. Besides, Agave, Accacia Sp., Prosophis, and shrubs are present in these RF.

The floral composition along with the common name, and family name of the study area is listed below in Table No: 3.13.





PHOTOGRAPH OF RESERVE FOREST IN THE STUDY AREA









Table 3.13: Flora in the Buffer zone of study area.

S.No	English Name	Vernacular Name	Scientific Name	Family Name
Trees				
1.	Neem or Indian lilac	Vembu	*Azadirachta indica*	Meliaceae
2.	Acacia Nilotica	Karuvelam maram	*Vachellia nilotica*	Fabaceae
3.	Asian Palmyra palm	Panai maram	*Borassus flabellifer*	Arecaceae
4.	Tamarind	Puliyamaram	*Tamarindus indica*	Legumes
5.	Millettia Pinnata	Pongam oiltree	*Pongamia pinnata*	Fabaceae
6.	Gooseberry	Arai nelli	*Phyllanthus acidus*	Euphorbiaceae
7.	Gum arabic tree	Karuvelam	*Acacia nilotica*	Mimosaceae
8.	Indian plum	Elanthai maram	*Ziziphus mauritiana*	Rhamnaceae
9.	Coconut	Thennai maram	*Cocos nucifera*	Arecaceae
10.	Lemon	Ezhumuchaipalam	*Citrus lemon*	Rutaceae
11.	Indian Mulberry	Manjanati	*Morinda coreia*	Rubiaceae
12.	Drumstick tree	Karimurungai	*Moringa olefera*	Moraginaceae
13.	Banana tree	Vazhaimaram	*Musa*	Musaceae
14.	Senna siamea	Manjal Konnai	*Sennasiamea*	Fabaceae
15.	Creamy Peacock Flower	Vadanarayani	*Delonix elata*	Fabaceae
16.	Beauty leaf	Punnai	*Calophyllu inophyllum*	Calophyllaceae
17.	Mango	Manga	*Mangifera indica*	Anacardiaceae
18.	Indian fig tree	Athi	*Ficus recemosa*	Moraceae
19.	Jujube	Ilanthai	*Ziziphus jujubha*	Rhamnaceae
20.	Oil cake tree	Arappu	*Albizia amara*	Mimosaceae
21.	Woman's tongue	Vagai	*Albizia lebbeck*	Mimosaceae
22.	Banyan tree	Alamaram	*Ficus benghalensis*	Moraceae
23.	Rain Tree	Thoongu moonji	*Albizia saman*	Mimosaceae
24.	Muntingia calabura	Singapore cherry	*Muntingiacalabura*	Malvaceae
25.	Chinesh cheery	Thenpazham	*Muntingia calabura*	Tiliaceae
26.	Indian bael	Vilvam	*Aegle marmelos*	Rutaceae
27.	Umbrella thorn	Kodaivelam	*Acacia planifrons*	Mimosaceae
28.	Henna	Marudaani	*Lawsonia inermis*	Lythraceae
29.	Eucalyptus	Eucalyptus	*Eucalyptus globules*	Myrtaceae
30.	Black plum	Navalmaram	*Sygygium cumini*	Myrtaceae
31.	Jack fruit	Palamaram	*Artocarpus heterophyllus*	Moraceae
32.	Curry tree	Karivembu	*Murraya kentia*	Rubiaceae
33.	Robber-thorn tree	Anaimullu	*Acacia horrida*	Mimosaceae
34.	Teak	Thekku	*Tectona grandis*	Verbenaceae
35.	Indian gooseberry	Nelli	*Emblica officinalis*	Phyllanthaceae
36.	Chinese chaste tree	Nochi	*Vote negundo*	Verbenaceae
37.	Madras Thorn	Kuduka puli	*Pithecellobium dulce*	Mimosaceae
38.	Cutch tree	Karungali	*Acacia sundra*	Legumes
39.	Noni	Nuna maram	*Morinda citrifolia*	Rubiaceae
40.	Five leaf chastera	Nochi	*Vitex negundo*	Lamiaceae
41.	Papaya	Pappali maram	*Carica papaya L*	Caricaceae
42.	Peepal	Arasanmaram	*Ficus religiosa*	Moraceae
43.	Monoon longifolium	Nettilingam	*Polyalthia longifolia*	Annonaceae

44.	Bamboo	Moonghil	*Bambusa bambo*	Poaceae
45.	Indian rose wood	-	***Dalbergia latifolia***	*Fabaceae*
46.	Karuvelam	Semukaruvalam	***Prosophis juliflora***	Fabaceae
47.				
Shrubs				
1.	Milk Weed	Erukku	*Calotropis gigantea*	Apocynaceae
2.	Shoe flower	Chemparuthi	*Hibiscu rosa-sinensis*	Malvaceae
3.	Avaram	Avarai	*Senna auriculata*	Fabaceae
4.	Touch-me-not	Thottalchinungi	*Mimosa pudica*	Mimosaceae
5.	Rosy Periwinkle	Nithyakalyani	*Cathranthus roseus*	Apocynaceae
6.	Chrozophora tinctoria	Puramuttai	*Chrozophora rottleri*	Euphorbiaceae
7.	Puriging nut	Kattamanakku	*Jatropha curcas*	Euphorbiaceae
8.	Triangular spruge	Chaturakalli	*Euphorbia antiquorum*	Euphorbiaceae
9.	Jackal jujube	Surai Ilantai	*Ziziphus oenoplia*	Rhamnaceae
10.	Plumeria alba	Malaiarali	*Plumeria alba*	Appocynaceae
11.	Senna alata	Seemaiagaththi	*Cassia alata*	Caesalpinaceae
12.	Indian Oleander	Arali	*Nerium indicum*	Apocynaceae
13.	Giant reed	Naanal	*Arunudo donax*	Poaceae
14.	Malabar nut	Adathodai	*Justicia adhatoda*	Acanthaceae
15.	Ipomoea cornea	Neivelikattamanaku	*Ipomoea carnea*	Convolvulaceae
16.	Indian mallow	Thuthi	*Abutilon indicum*	Meliaceae
17.	Solanum pubescens	Malaisundai	*Solanum pubescens Willd*	Solanaceae
18.	Hygrophila spinosa	Neermulli	*Hydrophila auriculata*	Acanthaceae
19.	Datura metel	Uumaththai	*Datura metel*	Solanaceae
20.	Night shade plan	Sundaika	*Solanum torvum*	Solanaceae
21.	Ceylon Date Palm	Icham	*Phoenix pusilla*	Arecaceae
22.	Agave	kattraazhai	*Agave americana*	Asparagaceae
Herbs				
1.	Gotu kola	Vallarai	*Centella asiatica*	Apiaceae
2.	Common leucas	Thumbai	*Leucas aspera*	Lamiaceae
3.	Holy basil	Thulasi	*Ocimum tenuiflorum*	Lamiaceae
4.	Sessile joyweed	Ponnanganni	*Alternanthera sessilis*	Amaranthaceae
5.	Cyperus difformis	Kudai koori	*Cyperus difformis*	Cyperaceae
6.	Cat's claw	Thael Kodukku	*Martynia annua*	Pedaliaceae
7.	Poor land flatsedg	Kunnakora	*Cyperus compressus*	Cyperaceae
8.	Goatweed	Pumpillu	*Ageratum conyzoides*	Asteraceae
9.	Mexican prickly poppy	Eli-yotti	*Argemone mexicana*	Papaveraceae
10.	Indian doab	Arugampul	*Cynodon dactylon*	Poaceae
11.	Chinese Spinach	Thandukeerai	*Amaranthus tricolor*	Amaranthaceae
12.	Tridax daisy	Veetukaayapoondu	*Tridax procumbens*	Asteraceae
13.	Digeria muricata	Thoiya keerai	*Digeria muricata*	Amarantheceae
14.	Indian Copperleaf	Kuppaimeni	*Acalypha indica*	Euphorbiaceae
15.	Chocolate weed	Punnakku poondu	*Melochia corchorifolia*	Sterculiaceae
16.	Riceweeds	Seruppadai	*Coldenia procumbens*	Boraginaceae
17.	Goatweed	Kallurukki	*Scoparia dulcis*	Plantaginaceae

18.	East Indian globe thistle	kottai-k-karantai	*Sphaeranthus indicus*	Asteraceae
19.	False daisy	Karisilanganni	*Eclipta prostata*	Asteraceae
20.	Carrot grass	Parttiniyam	*Parthenium hysterophorus*	Asteraceae
21.	Black Mustard Seed	Kaduku	*Brassica juncea*	Brassaceae
22.	Slender amaranth	Sirukeerai	Amaranthus polygonoides	Amaranthaceae
23.	European black nightshade	Manathakkali	Solanumnigrum	Solanaceae
24.	Cleome viscosa	Nai kadugu	*Celome viscosa*	Capparidaceae
25.	Prickly chaff flower	Nayuruv	*Achyranthes aspera*	Amaranthaceae
26.	Punarnava	Mukkirattai	*Boerhaavia diffusa*	Nyctaginaceae
27.	Prickly amaranth	Mullukkeerai	*Amaranthus spinosus*	Amaranthaceae
28.	Porcupine flower	Kundan	*Barleria prionitis*	Acanthaceae
29.	Billygoat weed	Pumpillu	*Ageratum conyzoides*	Asteraceae
Climbers				
1.	Butterfly-pea	Sangupoo	*Clitoriaternatia*	Fabaceae
2.	Ivy gourd	Kovai	*Coccinia grandis*	Cucurbitaceae
3.	Balloon vine	Mudakkotan	*Cardiospermum helicacabum*	Sapindaceae
4.	Rosary pea	Kuntumani	*Abrus precatorius L*	Fabaceae
5.	Pointed gourd	Kovakkai	*Trichosanthes dioica*	Cucurbitaceae
6.	Indian sarsparilla	Nannari	*Hemidesmus indicus*	Asclepiadaceae
7.	Coral vine	Kodi rose	*Antigonon leptopus*	Polygonaceae
8.	Stemmed vine	Perandai	*Cissus quadrangularis*	Vitaceae
9.	Wild jasmine	Malli	*Jasminum augustifolium*	Oleaceae
10.	Bottle Guard	Sorakkai	*Lagenaria siceraria*	Cucurbitaceae
11.	Bitter gourd	Pavakkai	*Momordica charantia*	Cucurbitaceae
Creepers				
1.	Ground Spurge	Sithrapaalavi	*Euphorbia prostrata*	Euphorbiaceae
2.	Ipomoea reniformis chois	Elikkathilai	*Merremia gangetica*	Convolvulaceae
3.	Bitter Apple	Thumattikai	*Cucumis callosus*	Cucurbitaceae
4.	Merremia	Muthiyar koontha	*Merremia tridentata*	Convolvulaceae
5.	Frog fruit	Poduthalai	*Phyla nodifolia*	Verbenaceae
Grasses				
1.	Apluda	Kattu kanchippul	*Apluda mutica*	Poaceae
2.	Finger grass	Kuruthupillu	*Chloris dolichostachya*	Poaceae
3.	Nut grass	Korai	*Cyperus rotandus*	Poaceae
4.	Marvel grass	Marvel grass	*Dichanthium annulatum*	Poaceae
5.	Jungle rice	Kuthirai vaal Kattu arusi	*Echinochloa colona*	Poaceae
6.	Windmill grass	Chevvarakupul	*Chloris barbata*	Amaranthaceae
7.	Eragrostis	Pullu	*Eragrostis ferruginea*	Poaceae

8.	Umbrella-sedge	Vattakorai	*Cyperus difformis*	Cyperaceae
Cactus				
1.	Prickly pear	Nagathali	*Opuntia*	Cactaceae
2.	Triangular spruge	Chaturakalli	*Euphorbia antiquorum*	Euphorbiaceae

3.5.2 FAUNA

3.5.2.1 Fauna Composition in the Core Zone

Since the lease area is Government poramboke eri and it remains dry for most of the year, generally other than few reptiles and insects no major faunal species are reported.

3.5.2.2 Fauna Composition in the Buffer Zone

There are no Sanctuaries, National Parks, Tiger Reserve or Biosphere Reserve or Elephant Corridor or other protected areas within 10 km radius from the core area. It is evident from the available records, reports, and circumstantial evidence that the entire study area including the core and buffer areas were free from any endangered animals. No wild mammalian species was directly sighted during the field survey. Taxonomically a total of 74 species were identified from the project site. Based on habitat classification the majority of species were Insects 5, followed by birds 33, Reptiles 8, Mammals 4, Amphibians 4, and Butterflies 20. A total of 33 species of bird were sighted in the study area. There is no Schedule I animals in the buffer zone area. The list of fauna within the study area is given in Table No – 3.14.

Table 3.14: List of Fauna

Sl. No	Scientific Name	Common Name	IUCN Conservation Status
Mammals			
1.	*Funambulus palmarum*	Indian palm squirrel	LC
2.	*Mus booduga*	Indian Field Mouse	LC
3.	*Herpestes javanicus*	Asian Small Mongoose	LC
4.	*Rattus norwegicus*	Brown rat	LC
Birds			
1.	*Orthotomus sutorius*	Tailor Bird	IV
2.	*Passer domesticus*	House Sparrow	LC
3.	*Bubulcus ibis*	Cattle Egret	LC
4.	*Saxicoloidesfulicata*	Indian Robin	LC
5.	*Anthus rufulus*	Paddy field pipit	LC
6.	*Columba livia*	Blue rock pigeon	IV

7.	*Streptopeliachinensis*	Spotted Dove	LC
8.	*Accipiter badius*	Shikra	LC
9.	*Corvus macrorhynchos*	Jungle Crow	LC
10.	*Alcedo atthis*	Small blue kingfisher	LC
11.	*Turdoides caudatus*	Common babbler	LC
12.	*Cuculus micropterus*	Indian cuckoo	LC
13.	*Nectarinia minima*	Small Sunbird	LC
14.	*Acridotherestristis*	Common Myna	LC
15.	*Apus affinis*	House swift	LC
16.	*Centropus sinensis*	Southern Coucal	LC
17.	*Dicrurusmacrocercus*	Black Drongo	LC
18.	*Cinnyris asiaticus*	Purple Sunbird	IV
19.	*Ardeola grayii*	Pond Heron	LC
20.	*Passer domesticus*	House sparrow	LC
21.	*Nycticorax nycticorax*	Night Heron	IV
22.	*Turdoides affinis*	White headed Babbler	LC
23.	*Corvussplendens*	House Crow	LC
24.	*Eudynamys*	Koel	LC
25.	*Psittacula krameni*	Rose ringed parakeet	LC
26.	*Dicrurus macrocercus*	Black drongo	LC
27.	*Corvus splendens*	House crow	LC
28.	*Alcedo atthis*	Small blue kingfisher	LC
29.	*Cuculus canorus*	Common Cukoo	LC
30.	*Pycnonotus cafer*	Red vented Bulbul	LC
31.	*Milvus migrans*	Black kite	LC
32.	*Meropsorientalis*	Small Bee-eater	LC
33.	*Halcyon smyrnensis*	White-breasted Kingfisher	LC
Reptiles			
1.	*Mabuya carinatus*	Common skink	LC
2.	*Calotes versicolor*	Oriental garden lizard	LC
3.	*Ptyas mucosa*	Rat snake	NA
4.	*Ahaetulla nasuta*	Green vine snake	LC
5.	*Bungarus caeruleus*	Common krait	LC
6.	*Nerodiapiscator*	Freshwater snake	NA
7.	*Hemidactylus flaviviridis*	House lizards	NL
8.	*Naja naja*	Indian cobra	LC
insects			
1.	*Brachythemis contaminata*	Ditch jewe	LC
2.	*Diplocodes trivialis*	Ground skimmer	LC
3.	*Trithemis aurora*	Crimson marsh glider	LC
4.	*Apis cerana*	Indian honey bee	
5.	*Trithemis pallidinervis*	Long legged marsh skimmer	-
Butterflies			
1.	Danaus genutia	Striped Tiger	LC
2.	Danaus chrysippuschrysippus	Plain Tiger	LC

3.	Acraea terpsicore	Tawny Coster	LC
4.	Papiliopolytespolytes	Common Mormon	LC
5.	Papiliopolytesromulus	Common Mormon	LC
6.	Papiliodemoleusdemoleus	Lime Butterfly	LC
7.	Hypolimnasmisippus	DanaidEggfly	LC
8.	Junoniahierta	Yellow Pansy	LC
9.	Junonialemonias	Lemon Pansy	LC
10.	Hypolimnasmisippus	DanaidEggfly	LC
11.	Phalantaphalantha	Common Leopard	LC
12.	Zizulahylax	Tiny Grass Blue	LC
13.	Catochrysopsstrabo	Forget-Me-Not	LC
14.	Euchrysopscnejus	Gram Blue	LC
15.	Lampidesboeticus	Pea Blue	LC
16.	Euploea core	Common Crow	LC
17.	Melanitisledaleda	Common Evening Brown	LC
18.	Jamidescelenoceleno	Common Cerulean	LC
19.	Evereslacturnus	Indian Cupid	LC
20.	Pachlioptaaristolochiae	Common Rose	LC

3.6 HYDROGEOLOGICAL STATUS:

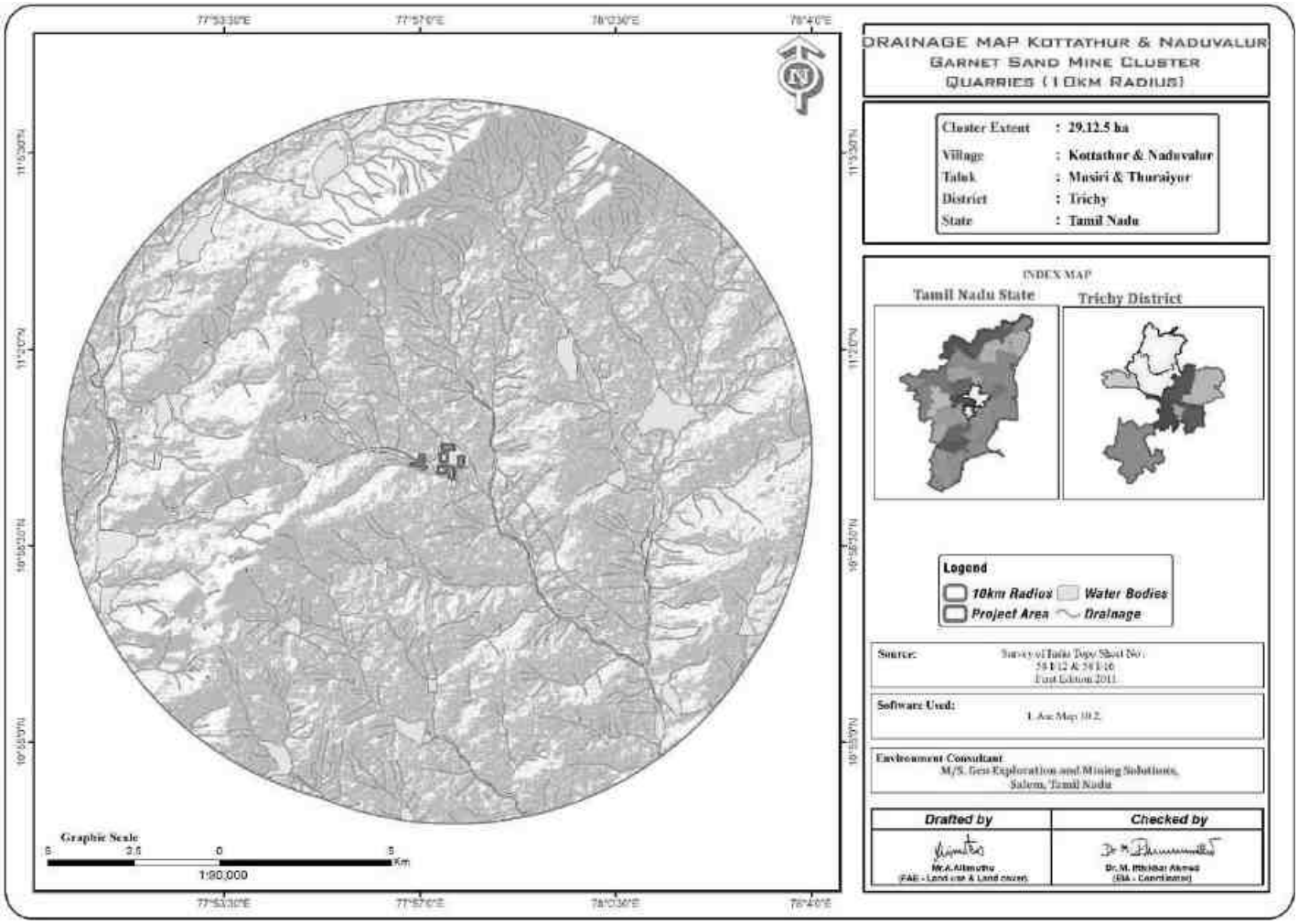
Hydrology and Hydrogeological studies

As already mentioned, the leases are situated in Government Eri poramboke land (SF no 390(P)). This Kottathur eri covers an area of 102.43 ha with the aiyacut of 94.34 ha mostly in the downstream side. Rainwater from the upstream side originating near the lease area on the north west side from pagalavadi RF and northern side during the monsoon season flows through this eri. Due to elevation difference, this water drains immediately on the down stream south eastern side and further connected to Uppuodai . This eri acts more of a passage of rainwater. Besides, due to less water holding nature and good soil impermeability this eri remains dry for most of the year. Since only shall depth of manual mining will be carried out during non monsoon days, with proper runoff management measures, the drainage of the down stream side can be ensured. Its details are given in Chapter – IV.

Drainage map of the study area and ground water prospects map are given in Figure 3.15 & 3.16 respectively. From the map it is seen that the drainage of the area is of dentric pattern flowing from North, North west to SE. The prospects of water near the streams and ponds are of shall nature ,wheras at away places it is lower.

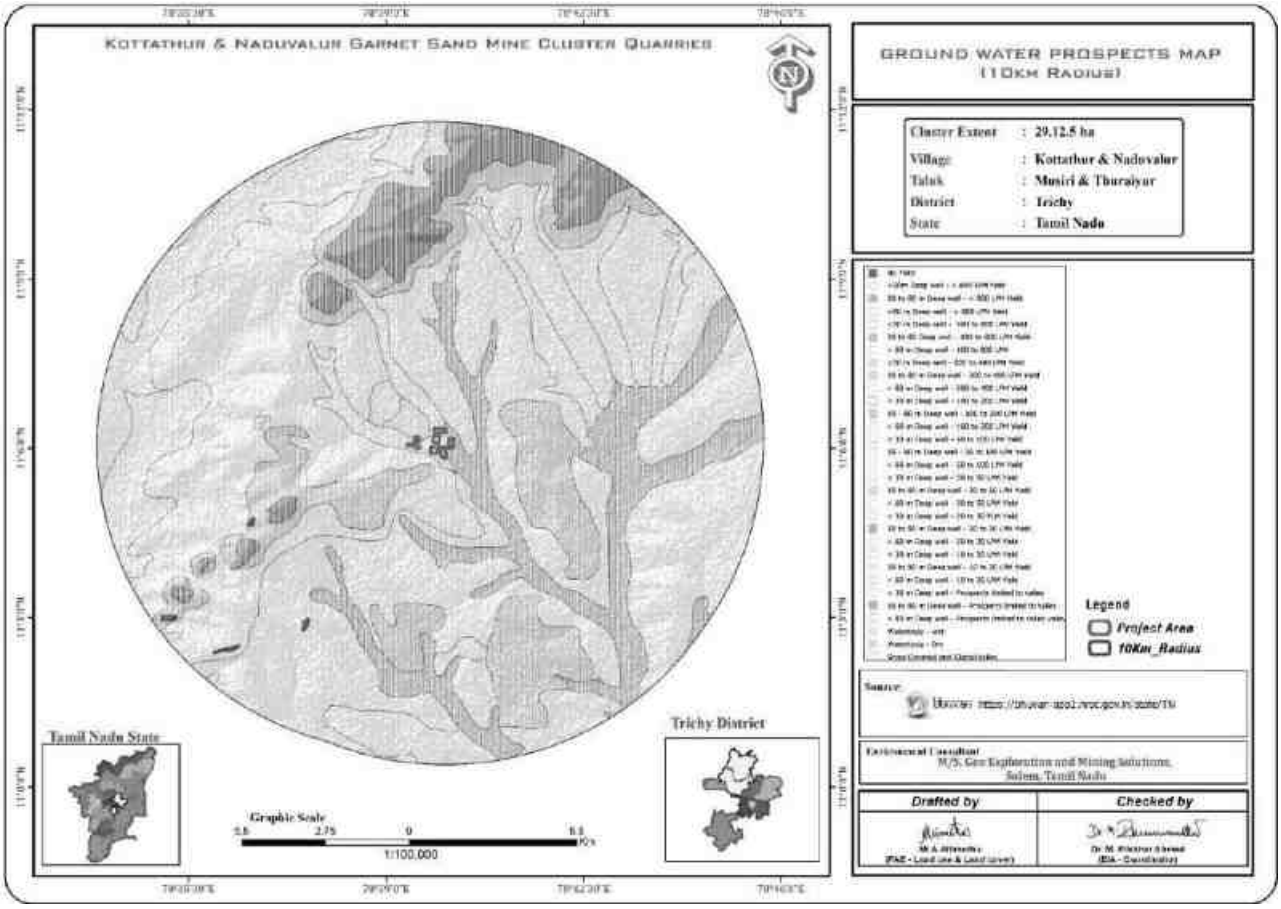
Well & Borewell inventory carried out the area is given in Table 3.15 to 3.16 & contour map intrepreted from this is given in Figure3.17to 3.22. From the study it is seen that the wells in the area are of around 30ft deep and borewells are around 125 to 150feet deep.

Figure 3.15 : DRAINAGE MAP AROUND 10 KM RADIUS FROM PROJECT SITE



SOURCE : GEMS, SALEM

Figure 3.16 : GROUND WATER PROSPECT MAP



SOURCE : GEMS, SALEM

Table 3.15: POST MONSOON WATER LEVEL OF OPEN WELLS 1 KM RADIUS

Station Code	Water Level in Meters bgl			Latitude	Longitude
	Oct 2024	Nov 2024	Dec 2024		
OW1	10.9	11.3	11.9	11° 06' 14.8022" N	78° 39' 26.8704" E
OW2	10.6	11	11.6	11° 06' 17.3965" N	78° 39' 01.0905" E
OW3	10.4	10.8	11.4	11° 06' 41.2692" N	78° 39' 55.7614" E
OW5	11.2	11.6	12.2	11° 06' 55.2328" N	78° 39' 40.6608" E
OW4	11.1	11.5	12.1	11° 06' 30.2408" N	78° 40' 18.9897" E
OW6	11.4	11.8	12.4	11° 06' 44.6122" N	78° 40' 27.7512" E
OW7	11.6	12	12.6	11° 06' 08.6452" N	78° 40' 33.7970" E
OW8	11.5	11.9	12.5	11° 05' 55.4792" N	78° 40' 44.2492" E
OW9	11.9	12.3	12.9	11° 05' 41.0270" N	78° 39' 53.8866" E
OW10	11.3	11.7	12.3	11° 05' 20.8232" N	78° 39' 52.7276" E
OW11	11.7	12.1	12.7	11° 05' 57.2746" N	78° 38' 54.3593" E

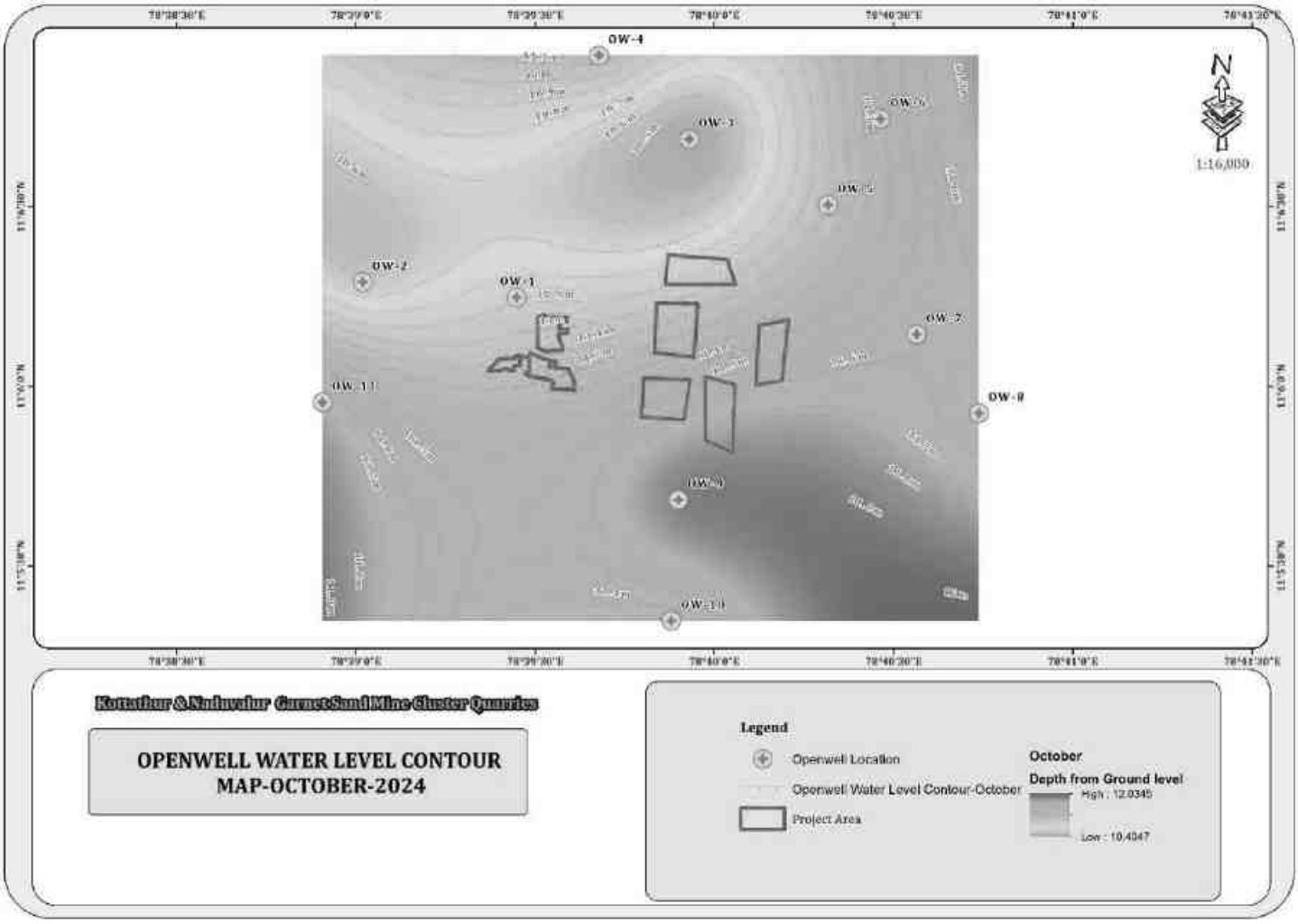
Source: Onsite monitoring data

Table 3.16: POST MONSOON WATER LEVEL OF BOREWELLS 1 KM RADIUS

Station Code	Water Level in Meters bgl			Latitude	Longitude
	Oct 2024	Nov 2024	Dec 2024		
BW1	54.6	55.2	55.8	11° 05' 58.5704" N	78° 39' 11.7677" E
BW2	55	55.6	56.2	11° 06' 23.9186" N	78° 38' 59.2547" E
BW3	54.2	54.8	55.4	11° 06' 27.5819" N	78° 40' 00.9694" E
BW4	55.1	55.7	56.3	11° 06' 52.8309" N	78° 39' 52.4884" E
BW5	55.9	56.5	57.1	11° 06' 23.4087" N	78° 40' 10.2845" E
BW6	55.8	56.4	57	11° 05' 49.0566" N	78° 40' 43.7006" E
BW7	54.7	55.3	55.9	11° 05' 42.9289" N	78° 40' 11.4488" E
BW8	54.2	54.8	55.4	11° 05' 19.5394" N	78° 39' 50.1259" E
BW9	55.5	56.1	56.7	11° 06' 03.7186" N	78° 38' 47.2867" E

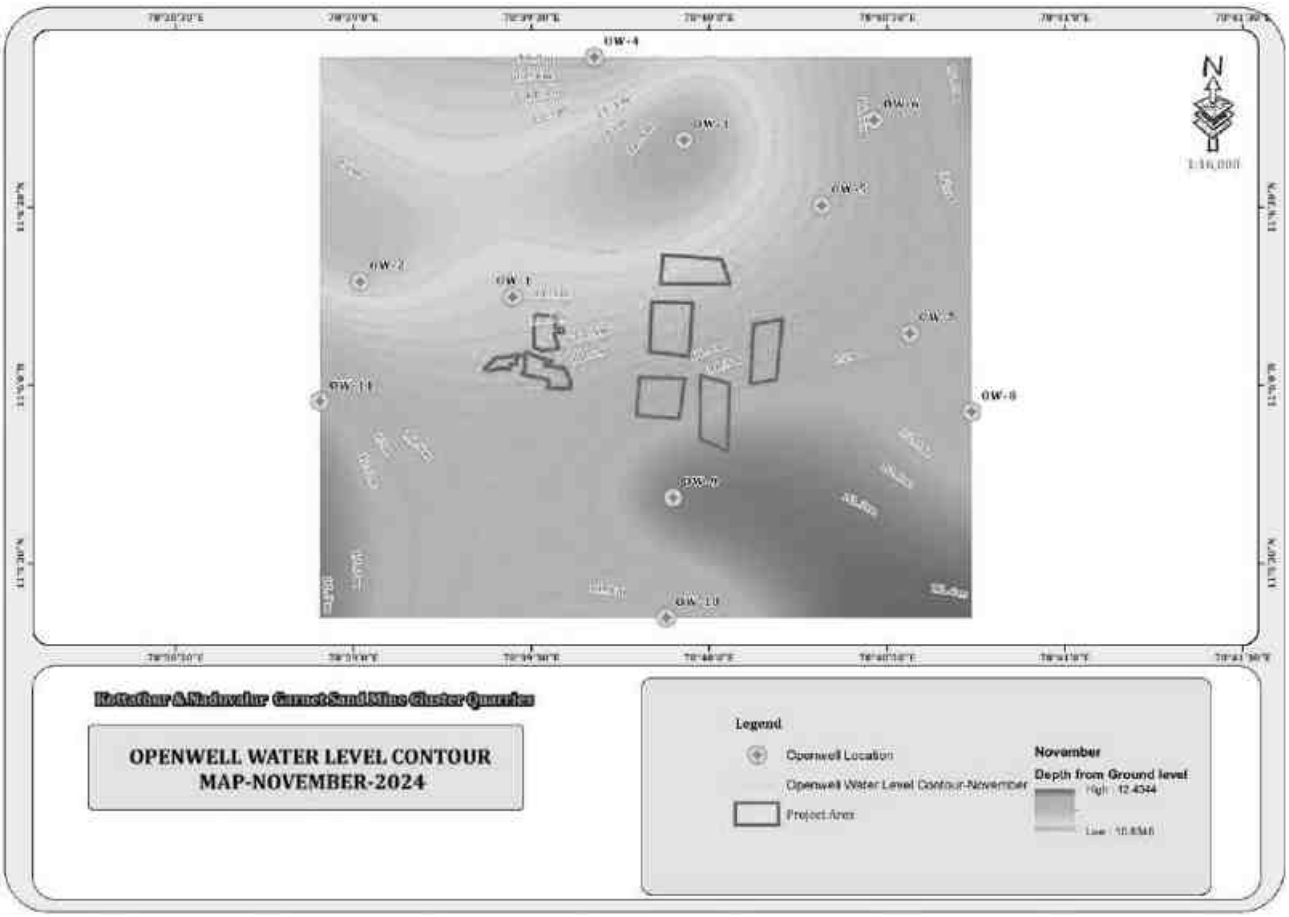
Source: Onsite monitoring data OF GEMS, SALEM

Figure 3.17 : OPEN WELL CONTOUR MAP – OCTOBER 2024



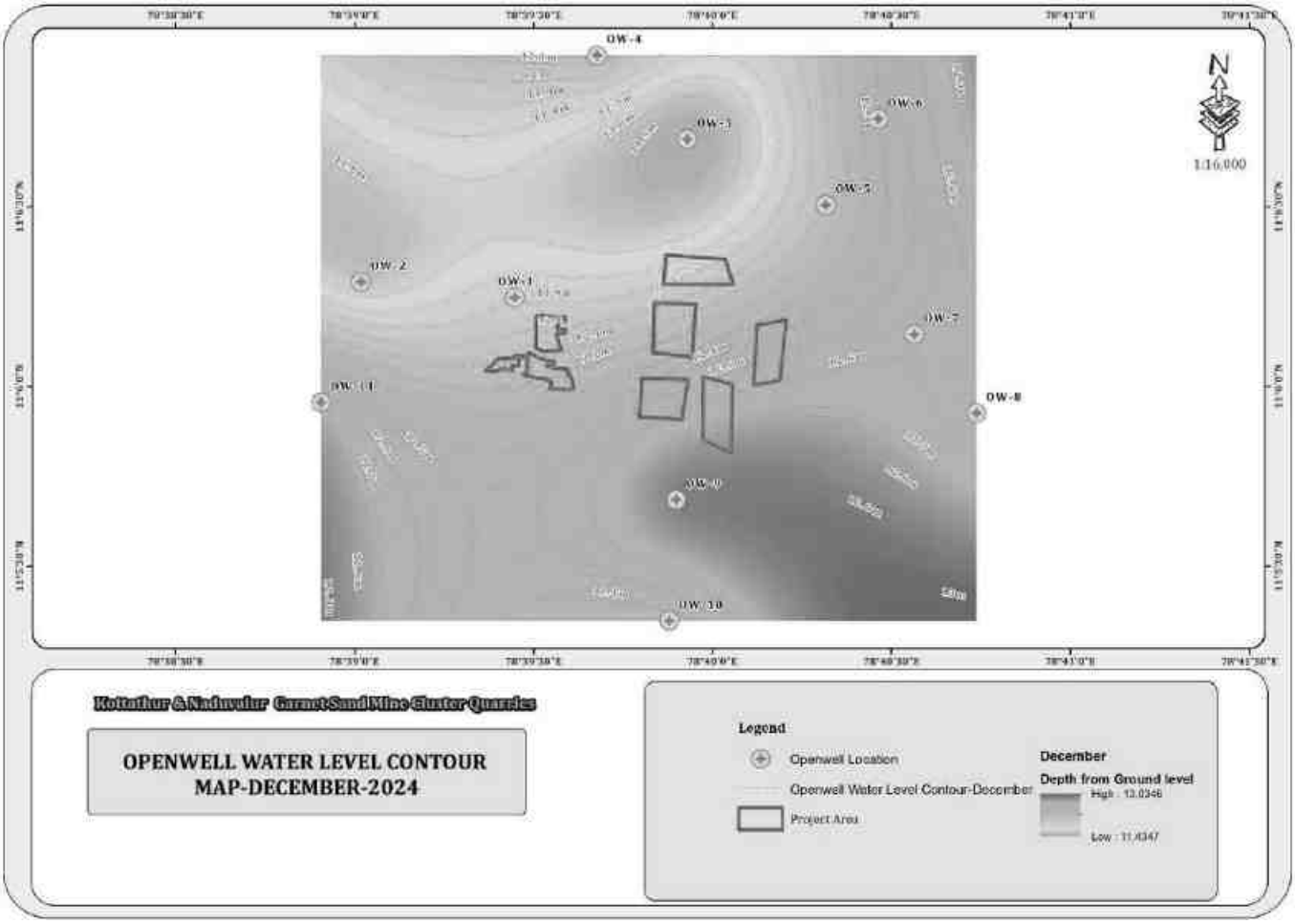
SOURCE : GEMS, SALEM

Figure 3.18 : OPEN WELL CONTOUR MAP – NOVEMBER 2024



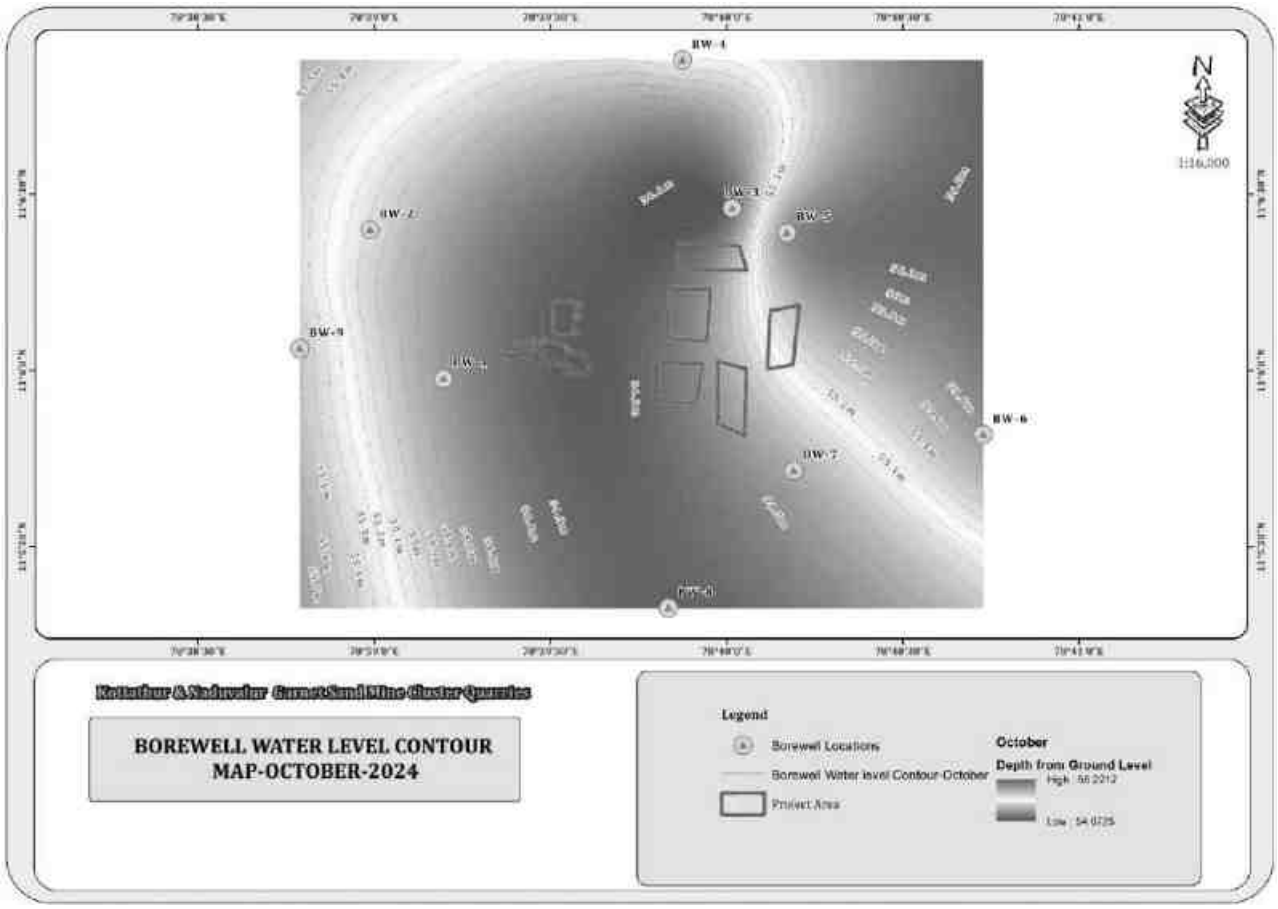
SOURCE : GEMS, SALEM

Figure 3.19 : **OPEN WELL CONTOUR MAP – DECEMBER 2024**



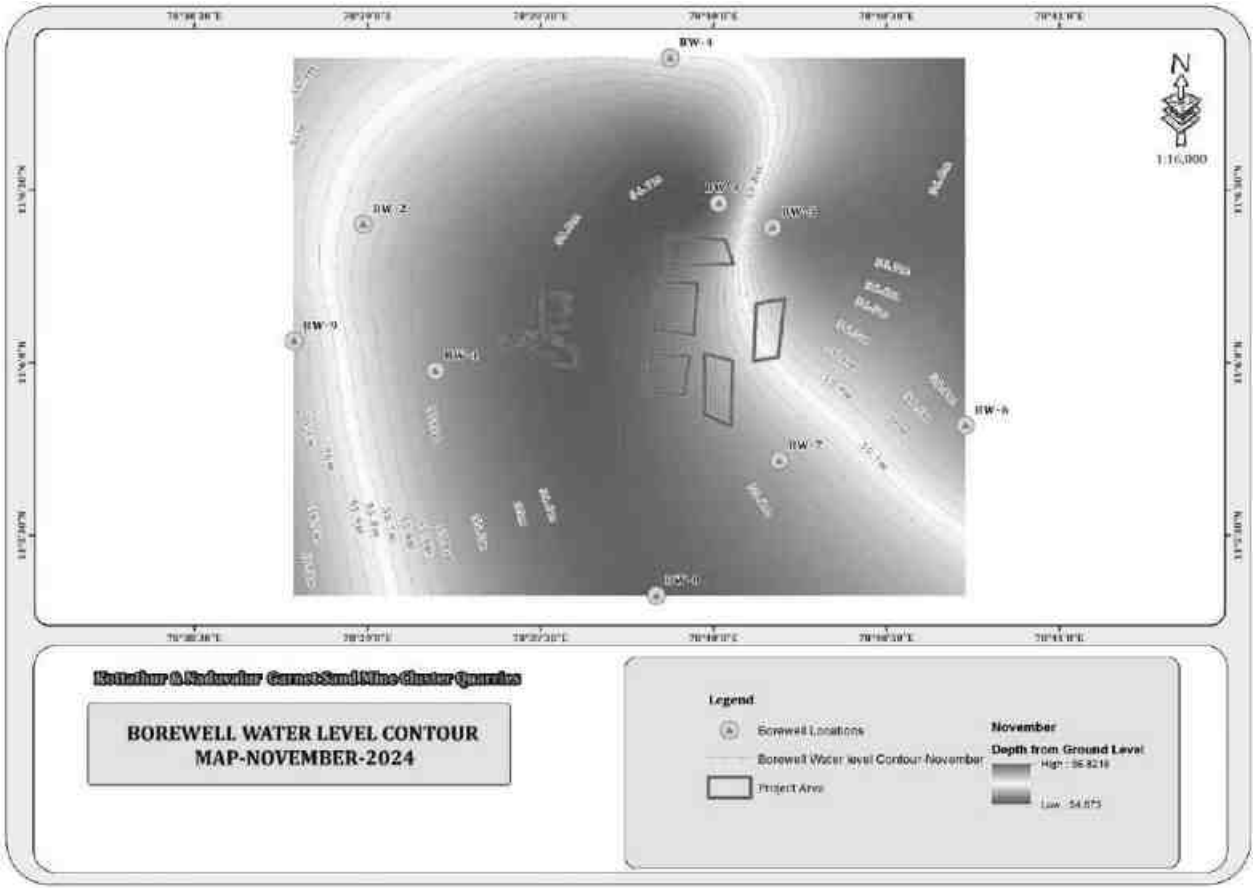
SOURCE : GEMS, SALEM

Figure 3.20 : **BOREWELL CONTOUR MAP – OCTOBER 2024**



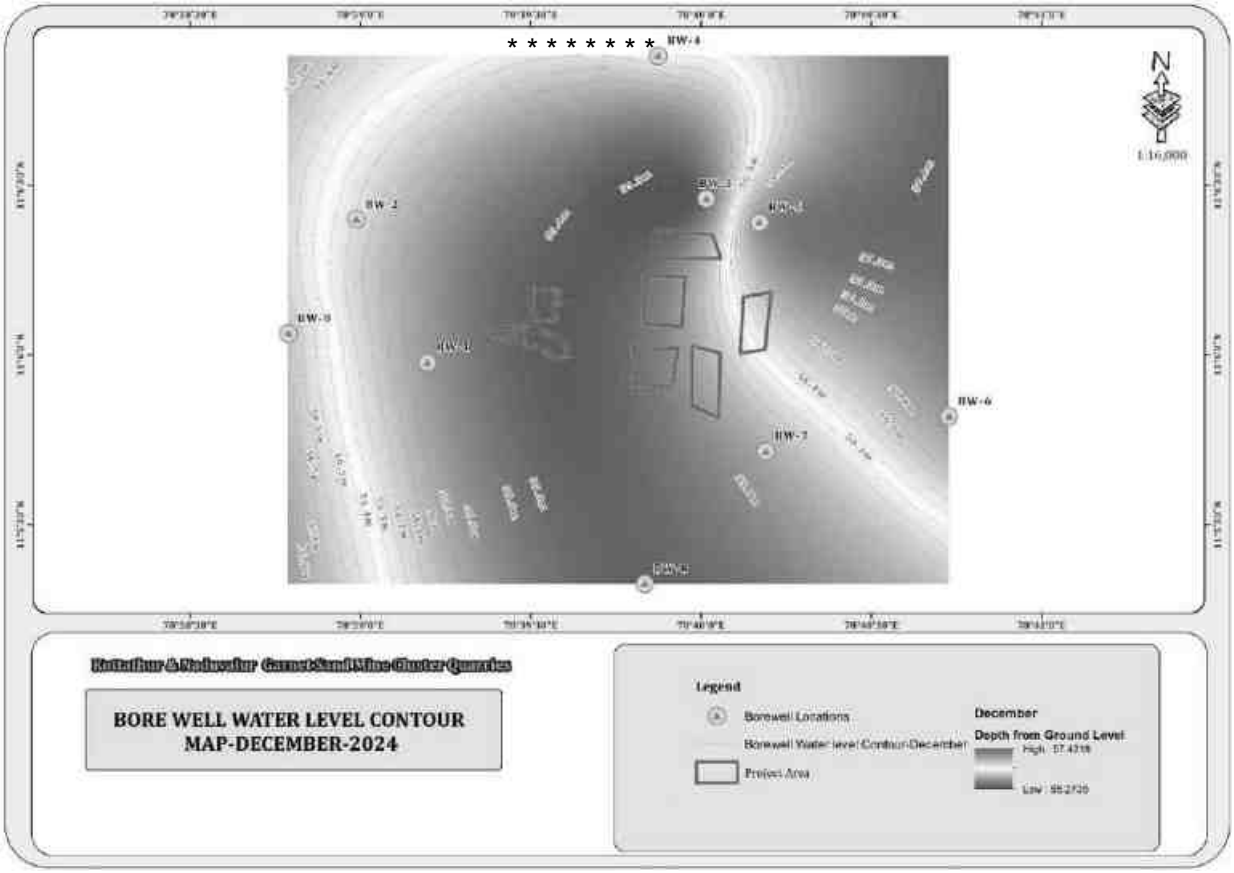
SOURCE : GEMS, SALEM

Figure 3.21 : **BOREWELL CONTOUR MAP – NOVEMBER 2024**



SOURCE : GEMS, SALEM

Figure 3.22 : **BOREWELL CONTOUR MAP – DECEMBER 2024**



SOURCE : GEMS, SALEM

CHAPTER - IV

ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

CHAPTER 4
ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 GENERAL

In the 5 leases under cluster situation, the entire top clayey layer will be removed for exposing the bottom ROM Garnet sand. The ROM garnet in this area is soft and can be excavated directly without any drilling and blasting. The maximum depth of working is limited only up to 2.00 m only (0.50m Top clayey soil + 1.50m ROM Garnet). The deposit will be mined by a simple manual system using using spades axes & baskets, loading it in to trucks/tippers and transportation. Besides, the production is also less. As such, there will not be much impact on environment due to mining activity. Most of the facilities , method of workings are on cluster basis.

However, due to proposed mining activities in the area there may be some additional impacts on various environmental attributes. As such, detailed impact assessment studies and planning of appropriate control measures have been undertaken for the proposed projects individually as well as on cluster basis. The study details are elaborately described below:

4.2 AIR ENVIRONMENT:

4.2.1 IMPACTS DUE TO PROJECT OPERATION:

The existing ambient air quality in the area has been described in Chapter-III. The proposed mining and allied operations may cause deterioration of air quality due to pollution arising from the project operation if prompt care is not taken. The principal sources of air pollution in general due to mining and allied activities will be:

- Excavation of material.
- Movement of HEMM such as Excavators, tippers etc.
- Loading and unloading operation
- Transportation

Besides, Gas emission will occur as a result of operation of diesel driven mining equipment, compressors, transporting vehicles, etc.

Particulate matter smaller than 10 microns, referred to as PM_{10}, can settle in the bronchi and lungs and cause health problems like Bronchitis, Emphysema, Bronchial Asthma, Irritation of

mucus membranes of eyes, etc. Particles smaller than 2.5 micrometers ($PM_{2.5}$), tend to penetrate into the lungs and very small particles (<100 nanometers) may pass through the lungs to affect other organs.

Besides the above mentioned fugitive dust emissions, atmospheric pollution can occur as a result of emission of SO_2, NO_x, CO etc., from diesel driven mining equipment, generator sets, etc. Larger suspended particles are generally filtered in the nose and throat and do not cause problems. Higher concentration of SO2, NOx, CO may cause some health effect on the human beings exposed to it.

In case of these mines , the dust or gaseous emission and subsequent impact on air quality is expected to be insignificant due to the following reasons:

- Depth of mining is 2.00 m only (0.50m Top clayey soil + 1.50m ROM Garnet)
- Material is soft and as such no drilling & blasting is involved
- Simple manual system of mining using spades axes & baskets will be the excavation method.
- Total production from all the 5 leases is very less and as such there will be hardly 7 trips /hour of ROM material transportation to the processing plant is involved . The waste material from the plant after recovery of garnet will be transported back in the same vehicle avoiding additional transportation.
- The waste material will be simultaneously re-casted back into the mined out void
- Gaseous emissions like SO2, NOx & CO are controlled from the source itself by using very low sulphur content fuel, using advanced diesel engines to abate NOx & CO emission from the machinery. Besides, due to adoption of manual mining and less production Less fleet of equipment's only is involved.

4.2.2 MITIGATION MEASURES:

Even for controlling the small scale pollution due to road transportation , the following mitigative measures will be ensured:

- ✓ Regular wetting of transport road using mobile water tanker
- ✓ Proper maintenance of haul road and transport road
- ✓ Avoiding overloading of vehicles
- ✓ Covering of loaded vehicles with tarpaulins to avoid spillage during transportation

- ✓ Proper maintenance of transport vehicles to keep the gas emission under check

From the above it could be seen that there may not be adverse impact on air quality due to mining operations in this lease due to small scale subdued activity in the area.

This is amply corroborated by the prediction of impact on air quality due to fugitive emissions estimated based on the computer model AERMOD View Gaussian Plume Air Dispersion Model developed by Lakes Environmental Software. Details of the modeling study / estimation including the modeling technique and post project air quality values are elaborated in the following paras.

4.2.3 AIR QUALITY IMPACT PREDICTION:

The model simulations are done for the air pollutant arising from the mining operations, namely, PM_{10}, $PM_{2.5}$. **Ground Level Concentration** (GLC) have been computed using hourly meteorological data.

Table 4.1: Emission Sources

ACTIVITY	SOURCE TYPE
A. Mining operations	Open pit
B. Transportation	Line

4.2.3.1 Emission Factors

Quantification of particulate emissions has been carried out by the emission factor technique. Emission factor is a statistical average of the rate at which a pollutant is released during an activity. This factor when multiplied by the level of that activity in a given situation will give the overall effect. Fugitive emissions have been predicted by using standard equations given and suggested by AP-42, USEPA(1998), Coal S&T Project and for mining & allied activities and other factors. The modeling is done for the peak production to know the worst case scenario on individual basis as well as cumulative basis. Modelling for transportation which is the only source is carried out and its details are provided below:

Table 4.2: Emission Factors

S.No	Activity	PM10	PM2.5	Unit
1	Hauling inside lease area	0.19	0.019	g/VKT

4.2.3.2 Emission Rates:

Based on the emission factors, after adopting necessary control measures like dust suppression, Proper maintenance of HEMM, using better quality diesel, using latest equipment, proper maintenance of roads, etc. the expected peak emission rate due to various operations in this project is calculated and is given below:

Table 4.3: Emission Rate

	ACTIVITIES/POLLUTANTS	Hauling inside lease area				
S.No	Parameters	GO43	GO57	GO69	GO70	GO71
1	PM_{10} (g/sec)	0.01	0.01	0.01	0.01	0.01
2	$PM_{2.5}$ (g/sec)	0.002	0.002	0.002	0.002	0.002

A. ***Emission Source Coordinates:*** The center of mine was assumed (0, 0) in the mathematical modeling.

B. ***Meteorological Conditions Used In Predictions:*** The hourly meteorological data has been generated for the monitoring period and the same has been used in the predictions.

4.2.3.3 Results and Discussions

Table 4.4: Peak Incremental Concentration

		Peak incremental concentration µg/m^3 – Individual basis				
S.No	Parameters	GO43	GO57	GO69	GO70	GO71
1	PM_{10}	0.39	0.52	0.24	0.44	0.57
2	$PM_{2.5}$	0.17	0.18	0.09	0.14	0.20

It is observed that the peak incremental concentration for PM_{10}, $PM_{2.5}$ occurring very near the source. At away from the source the values are getting reduced due to dispersion effects. The Isopleths of PM_{10}, $PM_{2.5}$ concentrations with control measures scenario have also been drawn and these are given in **Figure No.4.1 and 4.2.** The incremental and predicted concentrations at the locations of ambient air quality have been discussed in the following section.

Figure 4.1: Isopleth of GLC Prediction for – GO43- PM_{10}

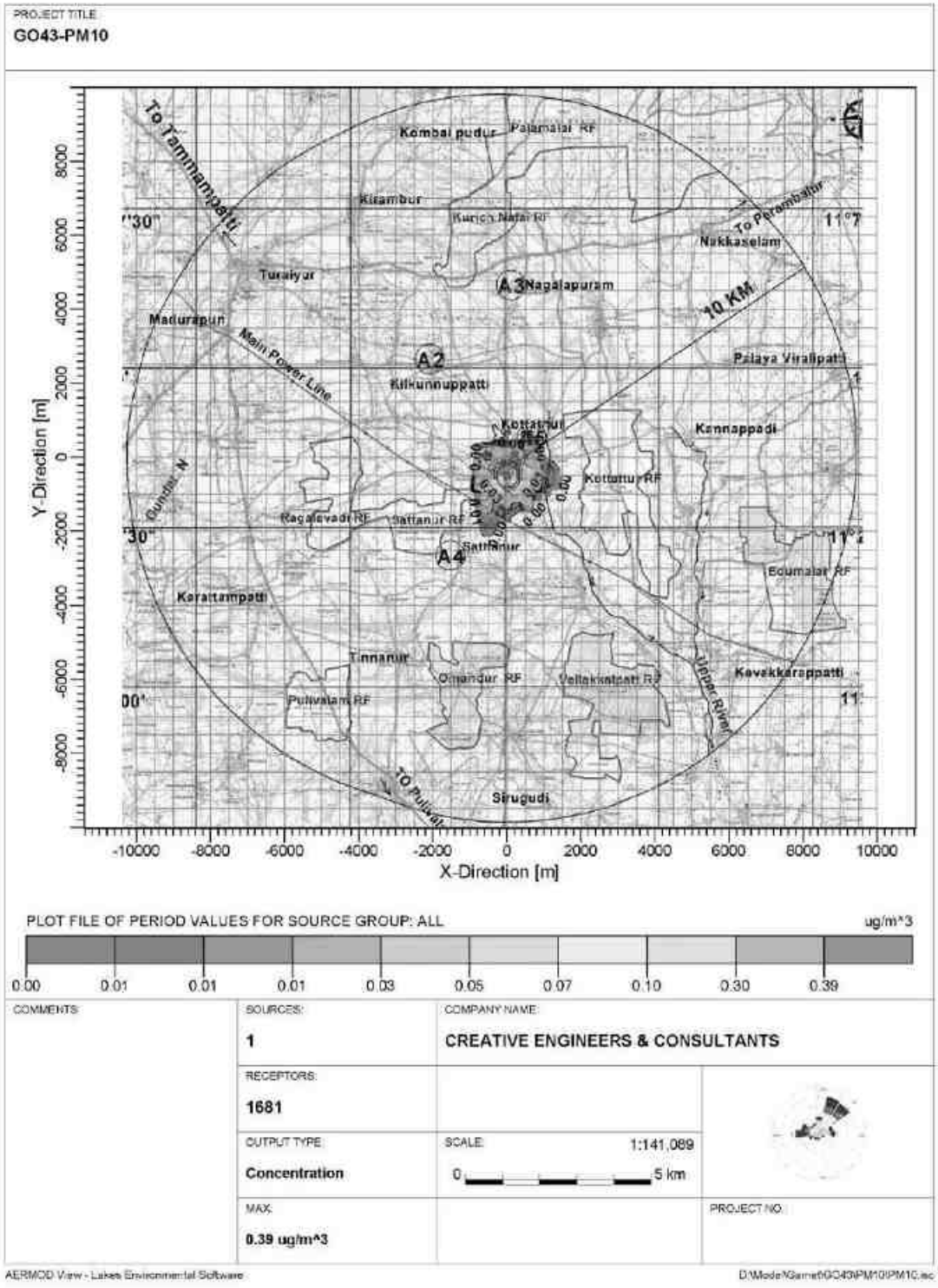


Figure 4.2: Isopleth of GLC Prediction for – GO43- $PM_{2.5}$

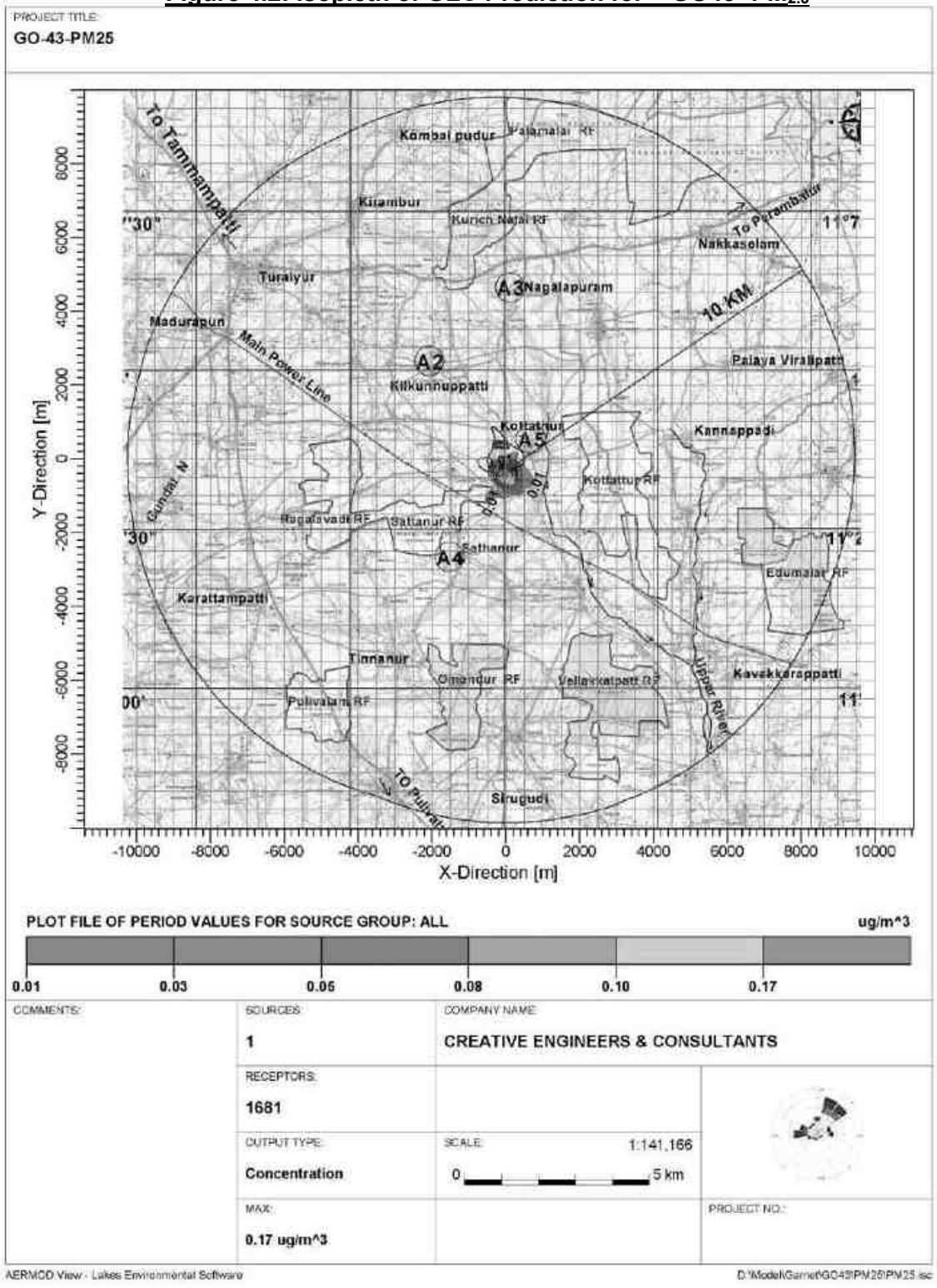


Figure 4.3: Isopleth of GLC Prediction for – GO57-PM_{10}

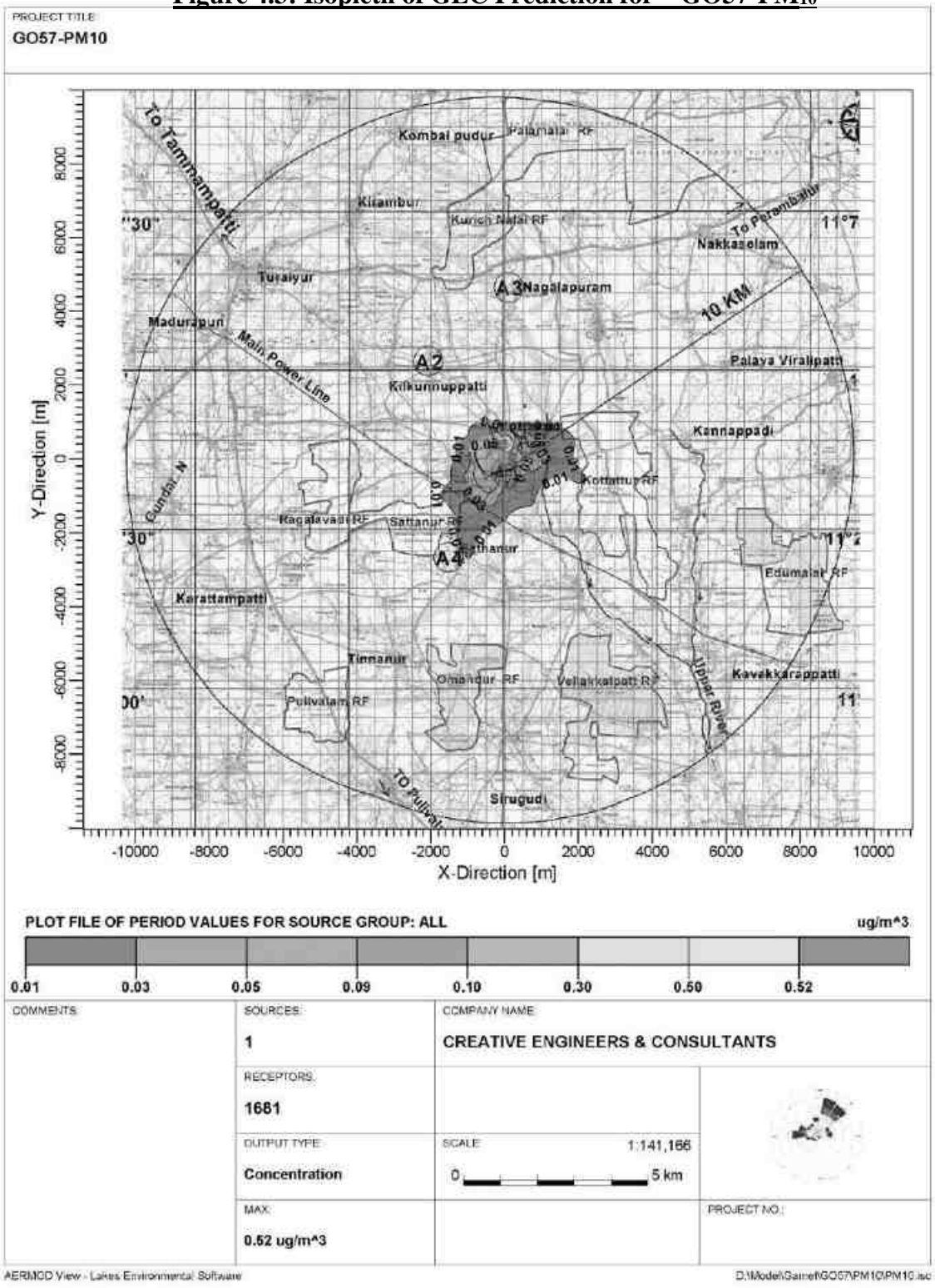


Figure 4.4: Isopleth of GLC Prediction for – GO57 - PM_{25}

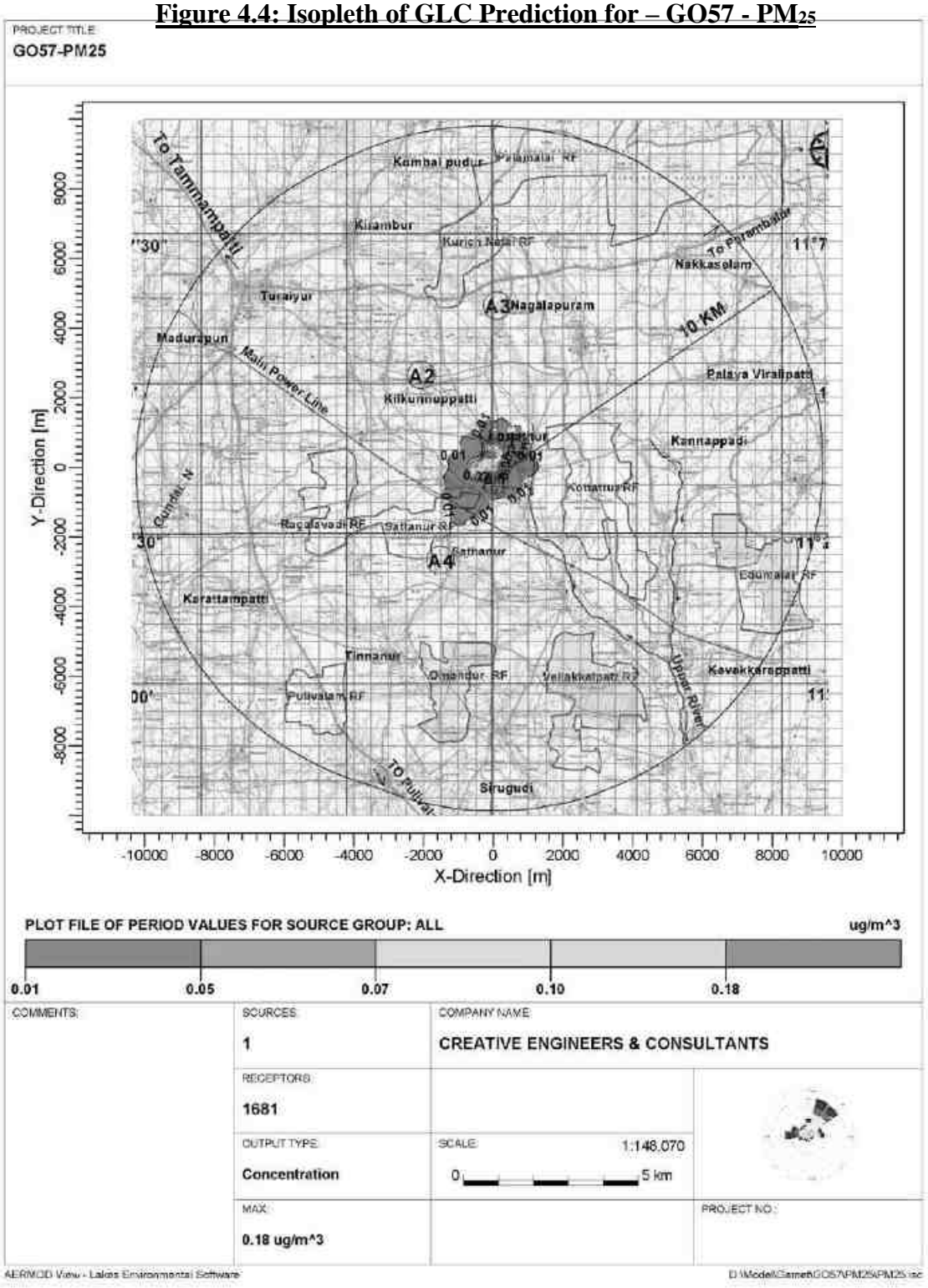


Figure 4.5: Isopleth of GLC Prediction for – GO69-PM_{10}

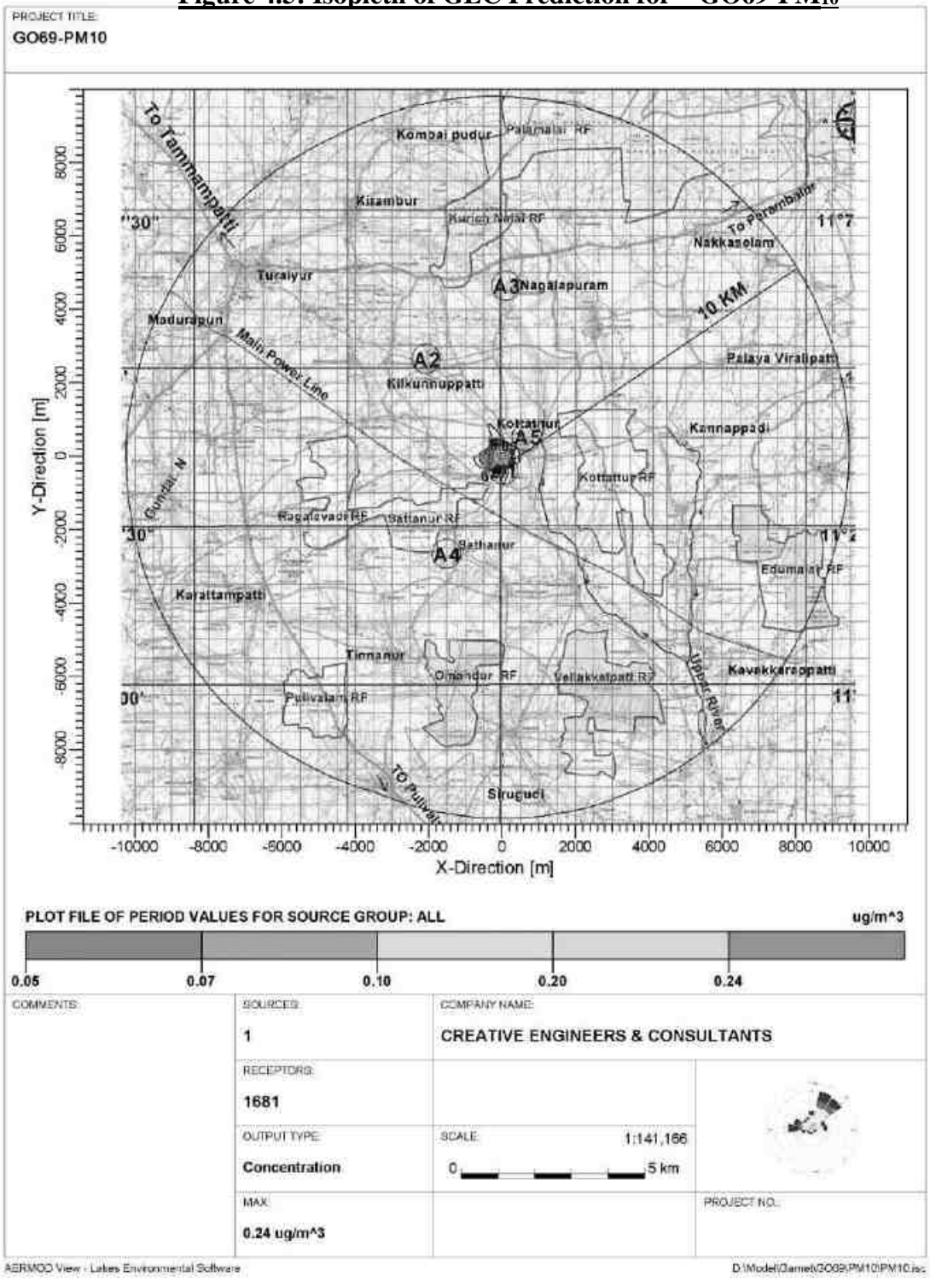


Figure 4.6: Isopleth of GLC Prediction for – GO69 - PM_{25}

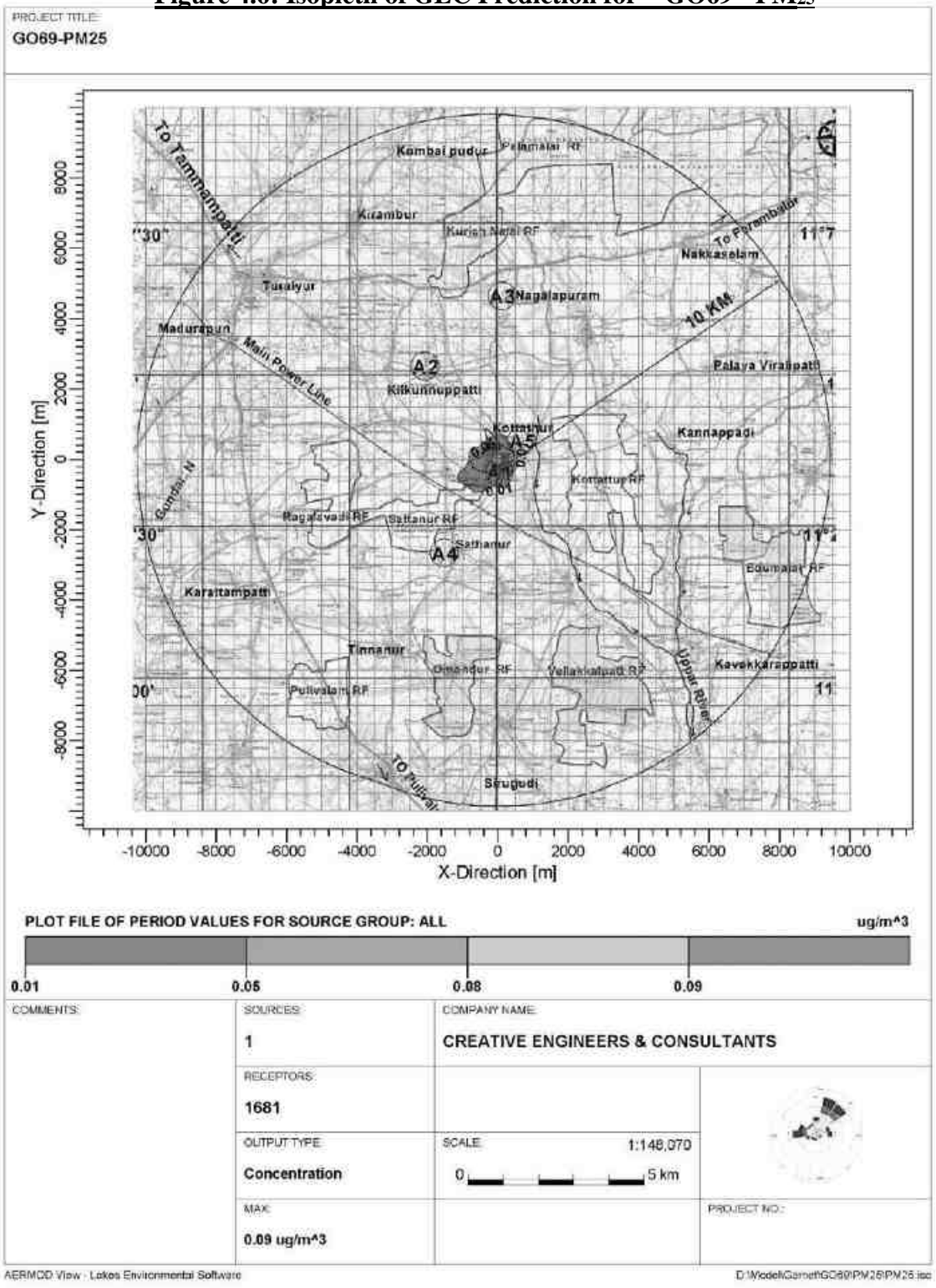


Figure 4.7: Isopleth of GLC Prediction for – GO70-PM_{10}

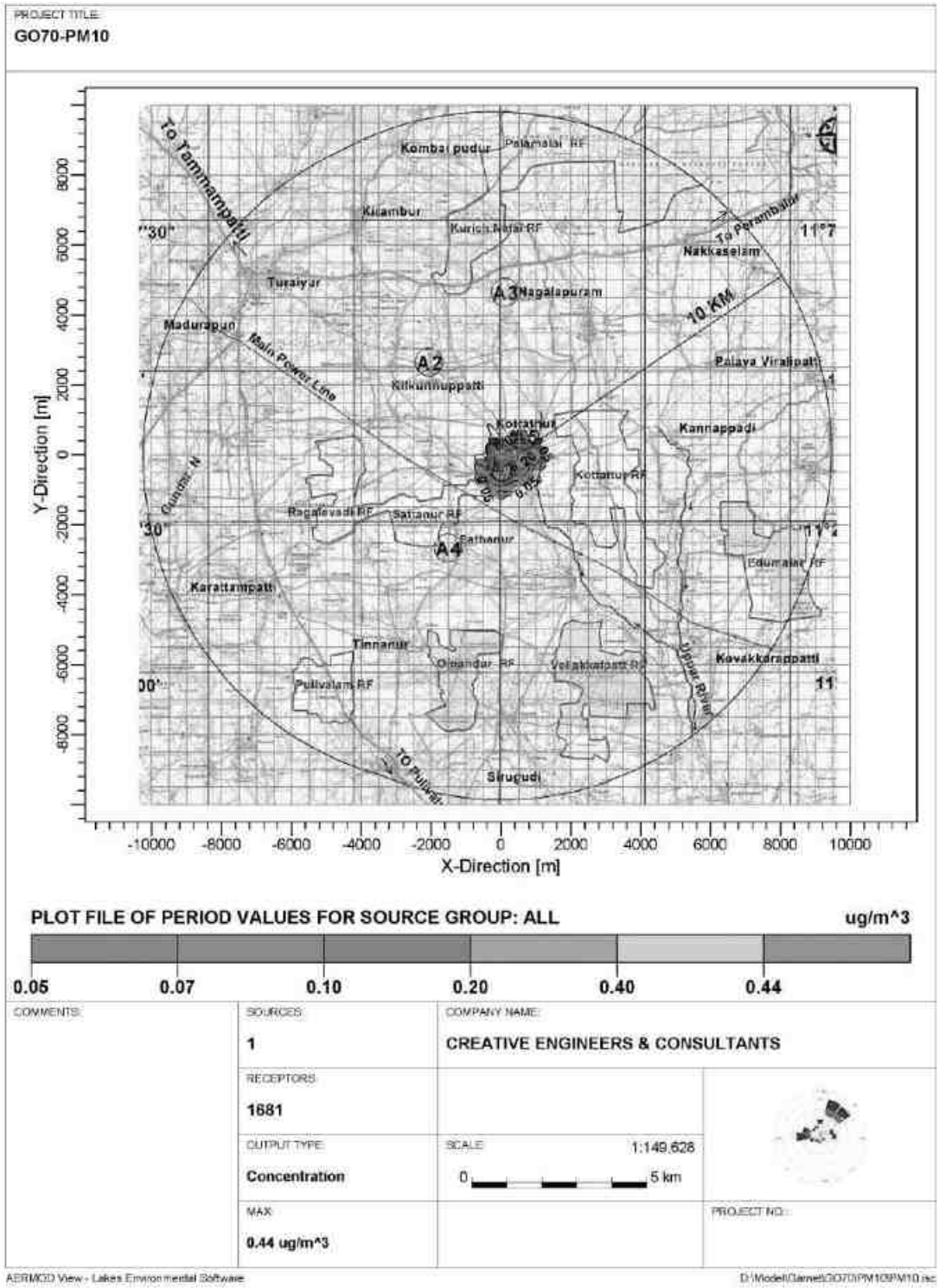


Figure 4.8: Isopleth of GLC Prediction for – GO70- PM_{25}

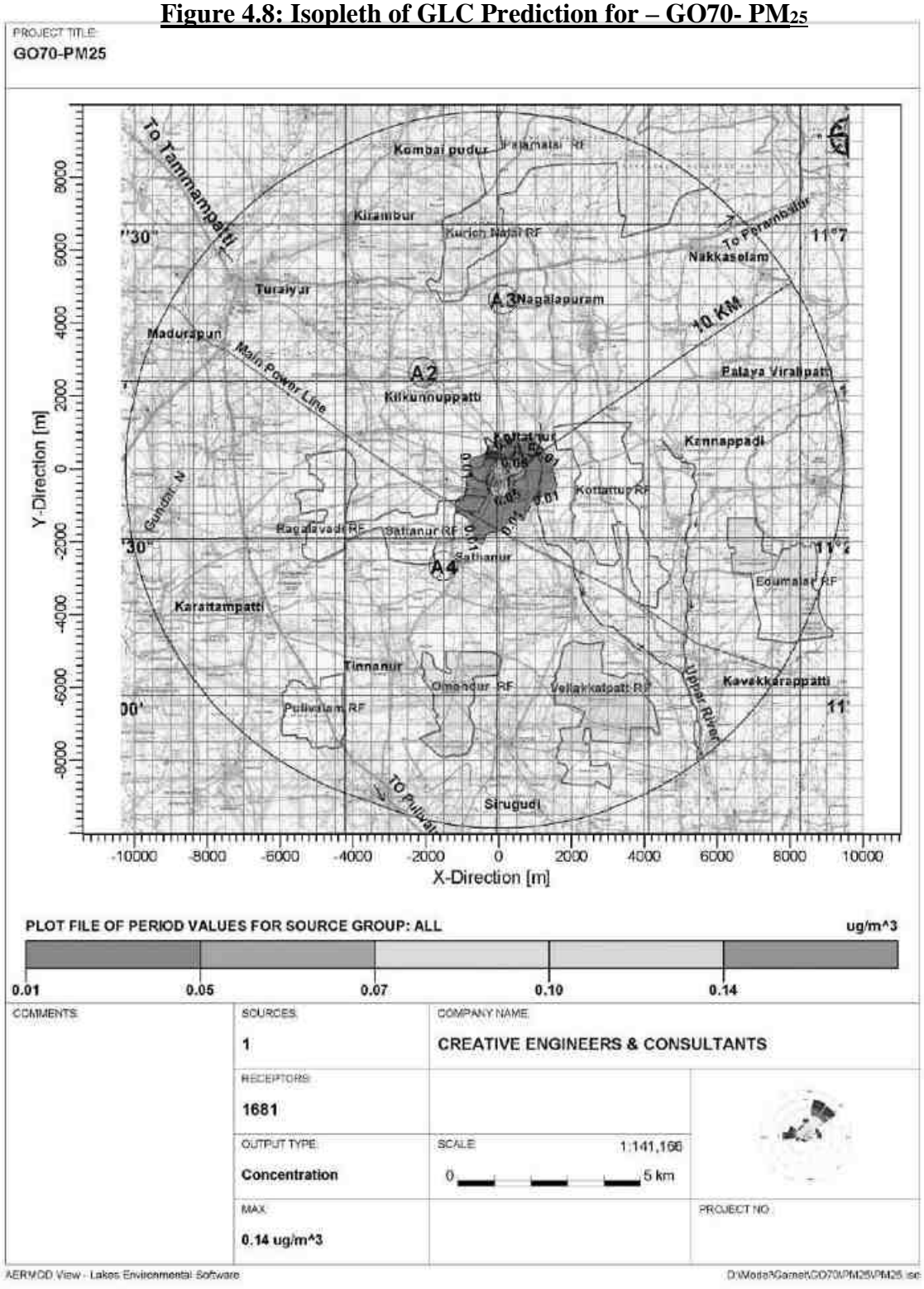


Figure 4.9: Isopleth of GLC Prediction for – GO71- PM_{10}

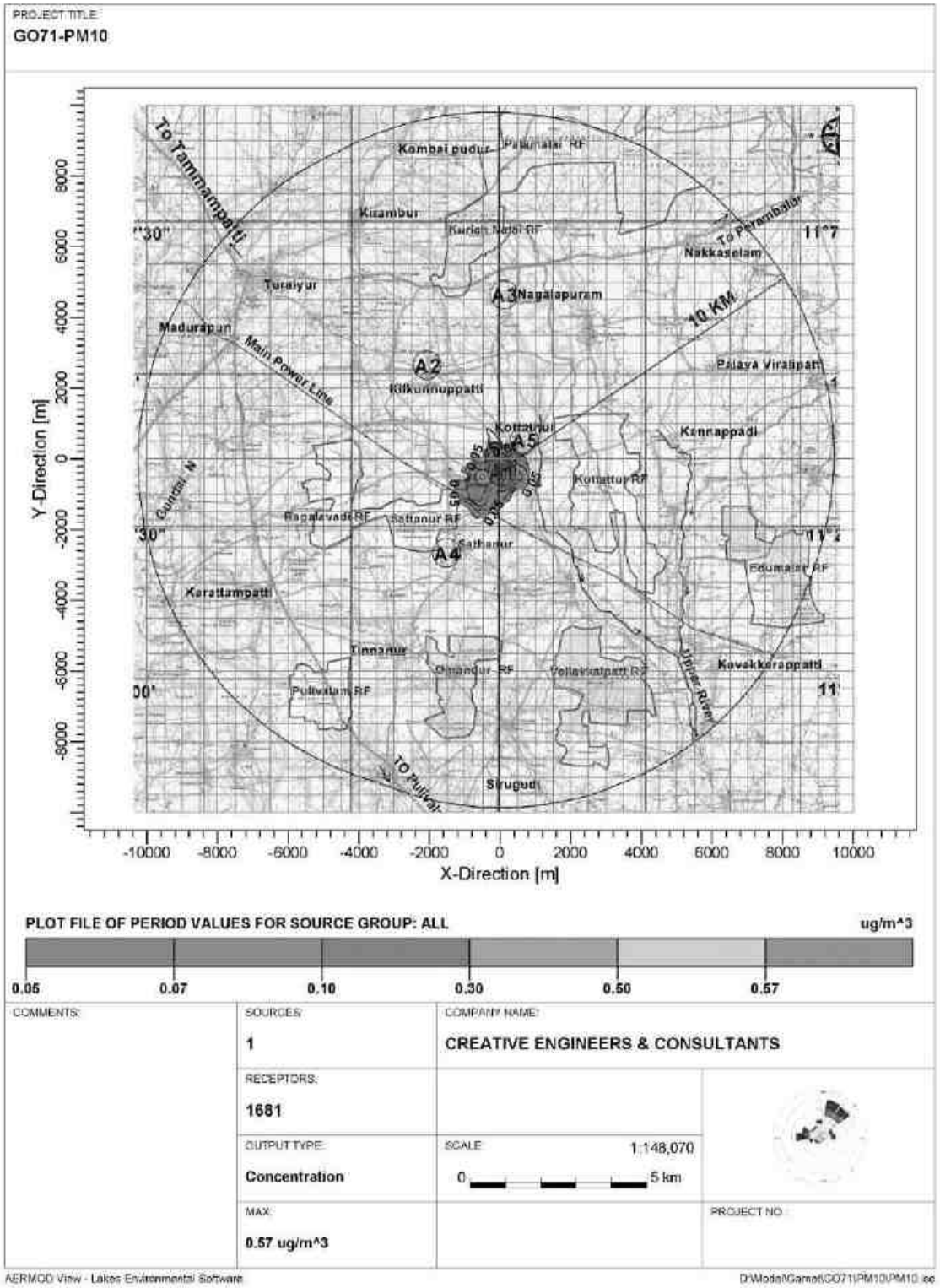
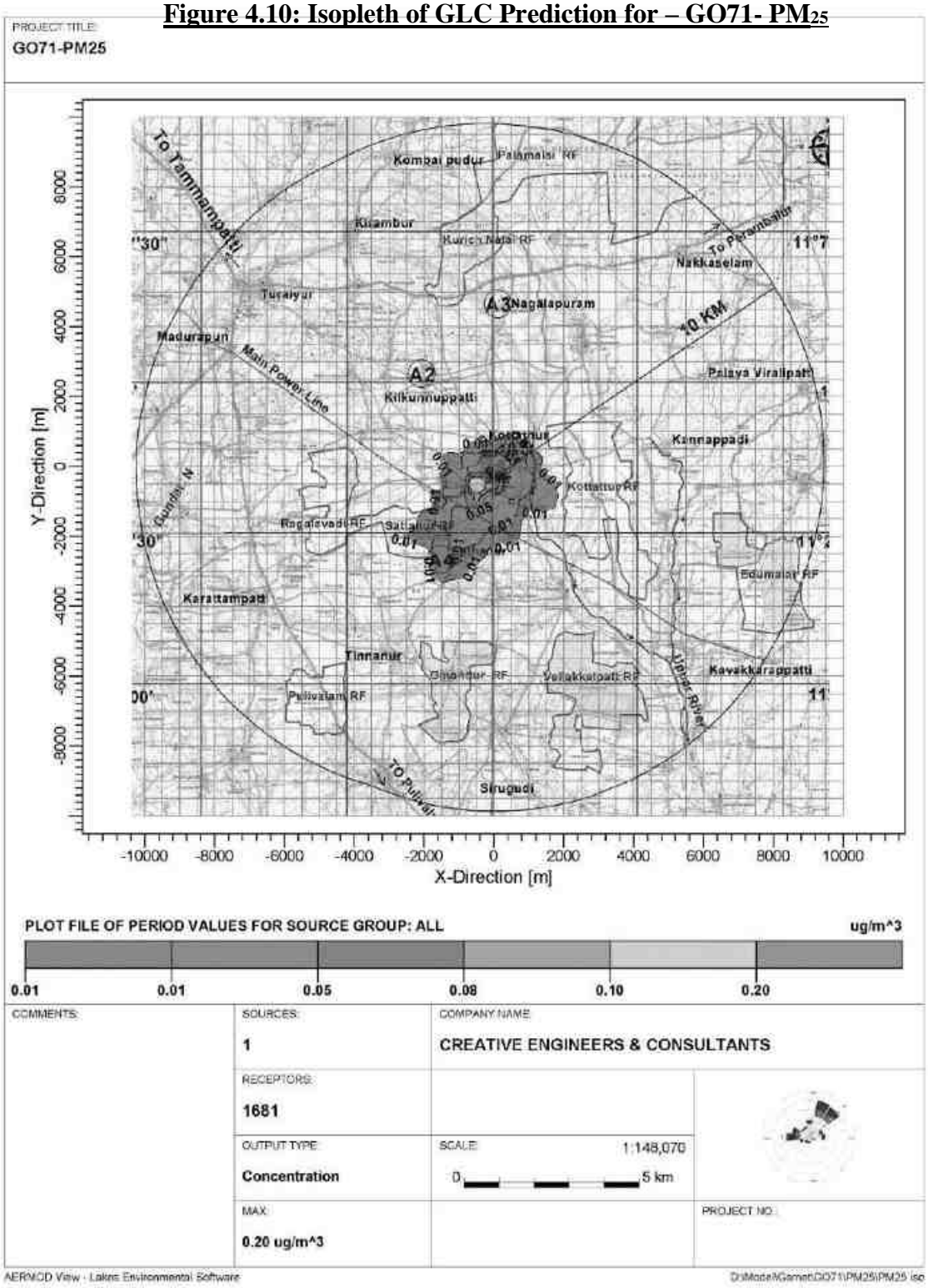


Figure 4.10: Isopleth of GLC Prediction for – GO71- PM_{25}



Predicted Ambient Air Quality:

The post project Concentrations of PM10, PM2.5, (GLC) (base line + incremental) after adopting necessary control measures is given in Table No - 4.6 to 4.7.

Table 4.5: Concentrations Of PM_{10} after Project Implementation

Values in μg/m³

S. No	Location	Background Concentration	Predicted Incremental Concentration					Post Project Concentration	Statutory Limits
			GO-43	GO-57	GO-69	GO-70	GO-71		
1	Naduvalur (Near Mine Lease)	52.1	<1.0	<1.0	<1.0	<1.0	<1.0	53.1	-
2	Kilkunnuppatti Village	53.1	<1.0	<1.0	<1.0	<1.0	<1.0	54.1	100
3	Nagalapuram Village	55.5	<1.0	<1.0	<1.0	<1.0	<1.0	56.5	
4	Sathanur Village	51.4	<1.0	<1.0	<1.0	<1.0	<1.0	52.4	
5	Kottathur Village	60.1	<1.0	<1.0	<1.0	<1.0	<1.0	61.1	

Table 4.6: Concentrations Of $PM_{2.5}$ after Project Implementation

Values in μg/m³

S. No	Location	Background Concentration	Predicted Incremental Concentration					Post Project Concentration	Statutory Limits
			GO-43	GO-57	GO-69	GO-70	GO-71		
1	Naduvalur (Near Mine Lease)	24.0	<1.0	<1.0	<1.0	<1.0	<1.0	25.0	-
2	Kilkunnuppatti Village	24.6	<1.0	<1.0	<1.0	<1.0	<1.0	25.6	60
3	Nagalapuram Village	25.3	<1.0	<1.0	<1.0	<1.0	<1.0	26.3	
4	Sathanur Village	23.2	<1.0	<1.0	<1.0	<1.0	<1.0	24.2	
5	Kottathur Village	27.6	<1.0	<1.0	<1.0	<1.0	<1.0	28.6	

It can be seen that the resultant added concentrations with baseline figures even at worst scenario, show that the values of ambient air quality with respect to PM10 are in the range of 52.4μg/m3 to 61.1μg/m3 and with respect to PM2.5 are in the range of 24.2μg/m3 to 28.6 μg/m3 which are within the statutory limits in each case. For preservation of environment in this mine strict enforcement of management schemes and regular air quality monitoring will be undertaken for taking corrective actions, as needed. By adopting the effective implementation of all the mitigative measures, no adverse impact on Air quality due to the mining operation in this lease area is expected.

Additionally, cumulative impact due working of 5 projects on ambient quality is assessed, and the details regarding the same has been provided below:

Table 4.7: Emission Rate - Cumulative

ACTIVITIES/POLLUTANTS	PM_{10} (g/sec)	$PM_{2.5}$(g/sec)
Hauling inside lease area	0.05	0.01
Total	**0.05**	**0.01**

Table 4.8: Peak Incremental Concentration- Cumulative

Parameters	Peak incremental concentration μg/m³
PM_{10}	2.01
$PM_{2.5}$	0.87

Figure 4.11: Isopleth of GLC Prediction for – COMBINED- PM_{10}

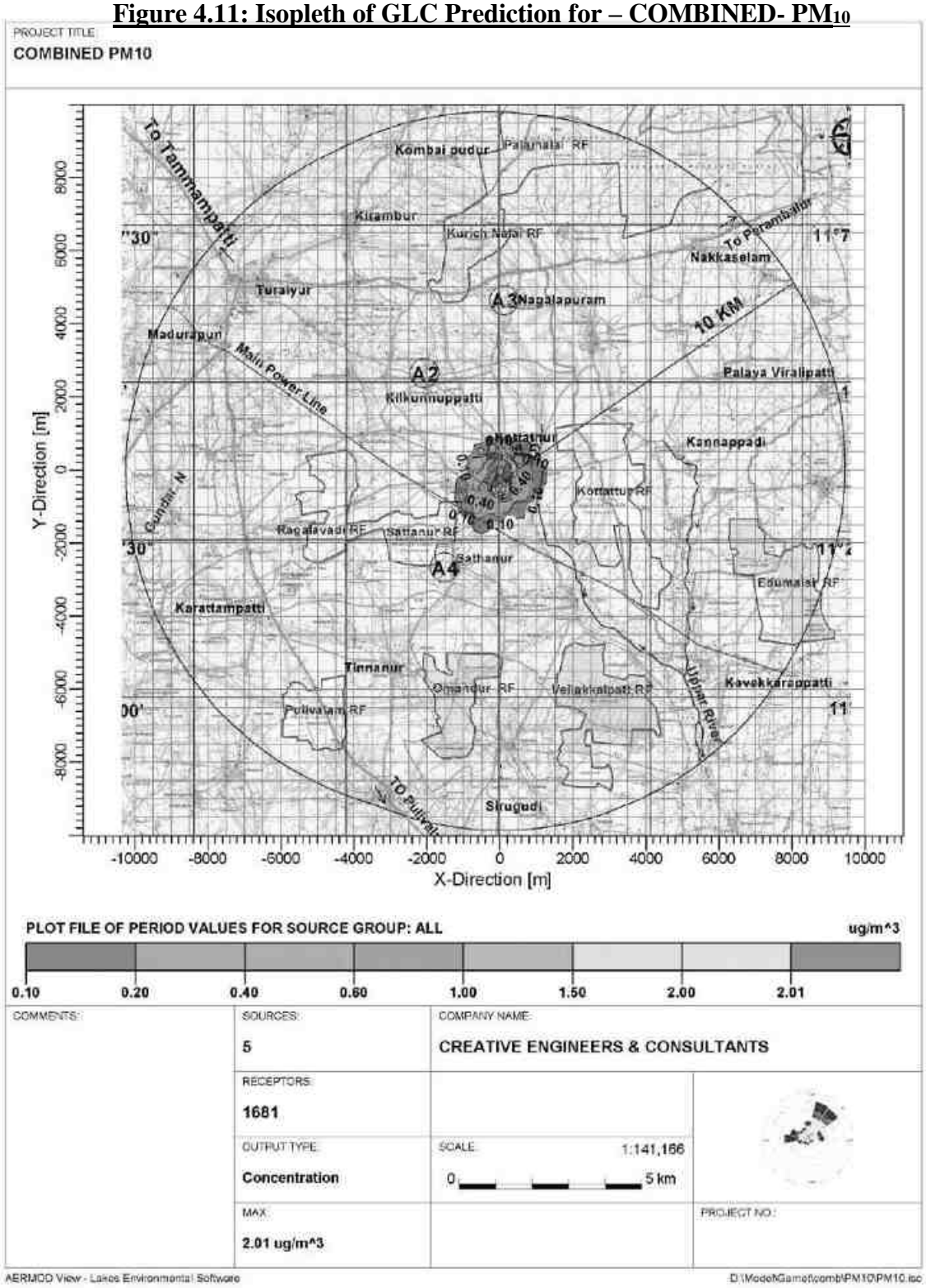
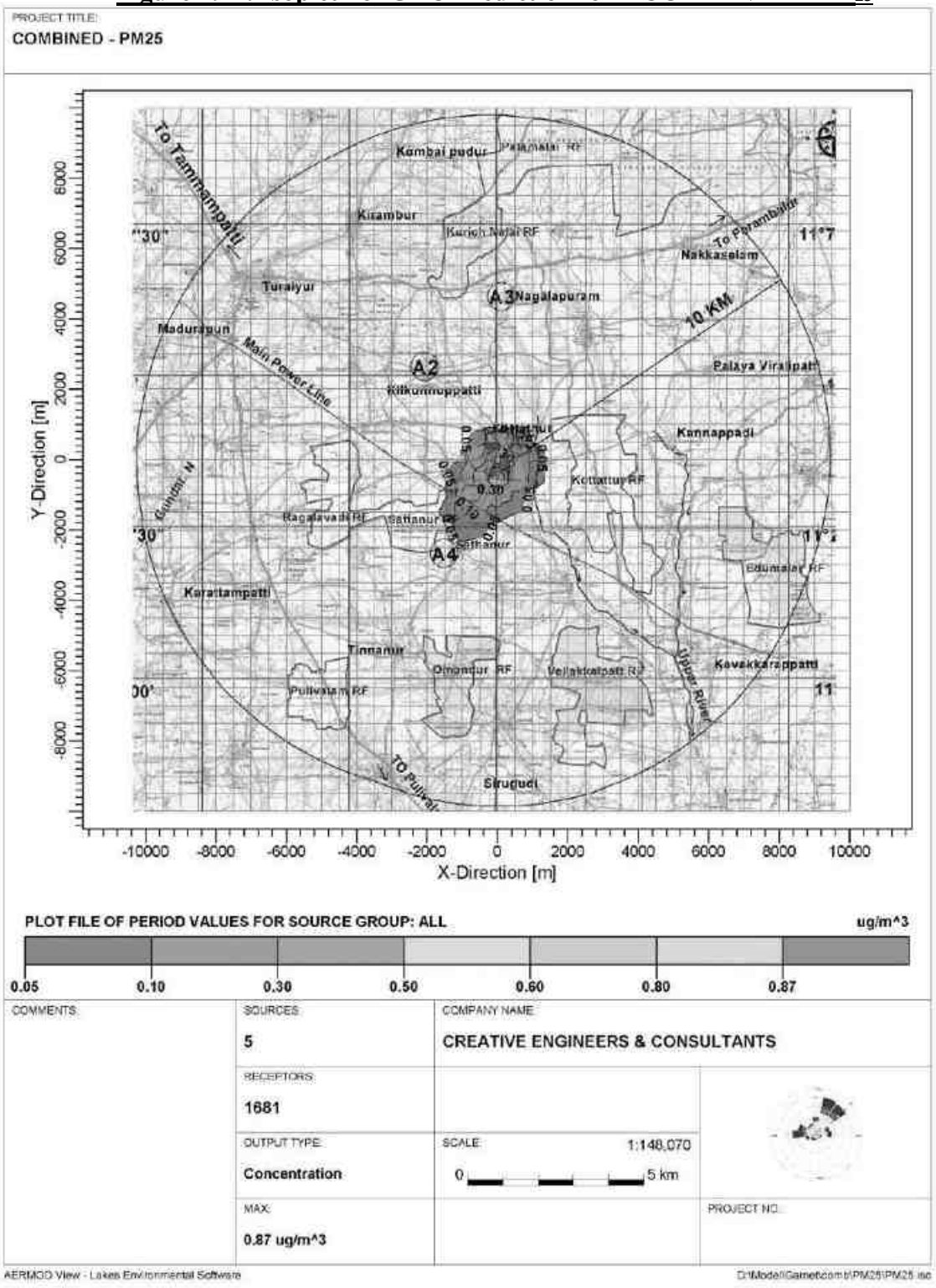


Figure 4.12: Isopleth of GLC Prediction for – COMBINED - PM_{25}



The post project concentrations of PM10, PM2.5, (GLC) (base line + incremental) after adopting necessary control measures is provided below:

Table 4.9: Post Project Concentrations Of PM_{10} -Cumulative

Values in μg/m³

S. No	Location	Background Concentration	Incremental Conc	Post Project Conc	Statutory Limits
1	Naduvalur (Near Mine Lease)	52.1	2.0	54.0	-
2	Kilkunnuppatti Village	53.1	<1.0	54.1	100
3	Nagalapuram Village	55.5	<1.0	56.5	
4	Sathanur Village	51.4	<1.0	52.4	
5	Kottathur Village	60.1	<1.0	61.1	

Table 4.10: Post Project Concentrations Of $PM_{2.5}$ -Cumulative

Values in μg/m³

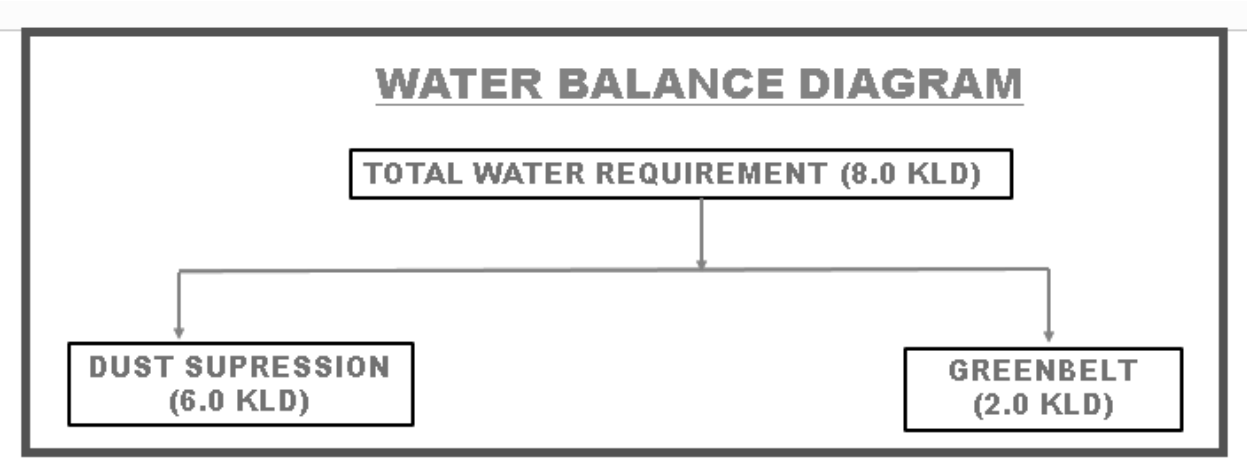
S. No	Location	Background Concentration	Incremental Conc	Post Project Conc	Statutory Limits
1	Naduvalur (Near Mine Lease)	24.0	<1.0	25.0	-
2	Kilkunnuppatti Village	24.6	<1.0	25.6	60
3	Nagalapuram Village	25.3	<1.0	26.3	
4	Sathanur Village	23.2	<1.0	24.2	
5	Kottathur Village	27.6	<1.0	28.6	

The cumulative post project concentration with respect to PM10 is in the range of 52.4 μg/m3 to 61.1 μg/m3 and with respect to PM2.5 are in the range of 24.2μg/m3 to 28.6 μg/m3 which are within the statutory limits in each case. For preservation of environment in this mine strict enforcement of management schemes and regular air quality monitoring will be undertaken for taking corrective actions, as needed. By adopting the effective implementation of all the mitigative measures, no adverse impact on Air quality due to the mining operation in these leases are expected.

4.3 WATER ENVIRONMENT:

Total water requirement for all the 5 leases is 8cu.m, Domestic – 2.0 cu.m, Dust suppression and Afforestation – 6.0 cu.m. Required water will be procured from outside. The water balance diagram for the same is shown in **Figure No 4.3.**

Figure 4.13: Water Balance Diagram



4.3.1 IMPACTS DUE TO PROJECT OPERATION:

The existing water environment showing water quality at different sampling stations in the area has been described in Chapter-III.

This being a manual mining in Eri poramboke land for a depth of 2m only in non monsoon dry period, the activity will be more of a desilting work and there will not be any significant impact on the water environment.There will not be any effluent generation or alteration in drainage course or intersection of ground water table or affecting of ground water regime.

4.3.2 MITIGATION MEASURES:

Although there will not be any generation of discharge of effluents in to the lease area or drawl of water from it and impact on water environment, Planting vegetation, including trees, along water body edges/bunds and in surrounding areas will be carried out for stabilization of soil, reduce erosion, and provide natural filtration. Though mining will be carried out in non monsoon days and no water is expected to be present in the area, it is proposed to construct peripheral drain in the overall lease area on the north west, north side to SE corner to ensure free flow of water if any for the downstream users. By this way no impact on the surface water flow is

expected. Mining in this eri will be more of desilting work and it is expected to augment the water holding capacity of the tank further. Besides, periodical Water Quality Monitoring of eri water during water available period monsoon season to ensure that there is no impact on water environment.

4.4 NOISE AND VIBRATION:

4.4.1 IMPACT DUE TO PROJECT OPERATION:

Since manual mining of mineral without drilling & blasting is proposed in these leases, apart from movement of few mineral transport vehicles , there are no noise generating source or activity is involved. As such no major noise generation is envisaged. Besides, since the mining operations will be carried out in isolated leases, due to natural attenuation effects, no impact on noise will be felt by the faraway community.

Computation of cumulative noise levels at the nearby villages is made based on the assumption that there are no attenuation paths between the source and the boundary.

Noise modeling is carried out using the following formula:

Lp2 = Lp1 – 20 log R2/R1, Where, Lp1 and Lp2 are sound pressure levels at points located at distances R1 and R2 respectively from the source. The study results are as follows:

Table 4.11: Post Project Noise Levels

Sl.No	Location	Baseline Day Eq.in dB(A)	Post project noise Eq in dB(A)	Limit dB(A) as per MoEF&CC
1	Kilkunnuppatti Village	49.9	50.2	55
2	Nagalapuram Village	48.1	48.4	55
3	Sathanur Village	50.7	50.9	55
4	Kottathur Village	51.4	51.7	55

From the studies, it is found that the predicted Noise Levels due to mining operations at the periphery of the eri itself will be less even without considering any attenuation factor. However, practically there will be attenuation due to vegetation etc., and as such there will not be any adverse noise propagation outside the lease boundary. Since the habitations are also away the effect of noise due to mining operations will not be felt at all in the surrounding villages.

4.4.2 CONTROL MEASURES FOR NOISE ENVIRONMENT:

Hence, by following mitigative measures for noise control, the impact on noise levels will be insignificant:

- Planting rows of native trees along roads, around eri and other nearby areas to act as acoustic barriers.
- Sound proof operator's cabin for mineral transport vehicles/ tippers.
- Proper and regular maintenance of equipments may lead to less noise generation.
- Providing in-built mechanism for reducing sound emissions.

Further green belt and afforestation will be planned and executed to abate noise and dust propagation in the area.

4.4.3 GROUND VIBRATIONAL DUE TO BLASTING EFFECTS:

There will not be any drilling and blasting operation involved in the mining operation. Hence, vibration due to blasting is not envisaged.

4.5 LAND ENVIRONMENT:

All the 5 leases are falling in in the same area in S.F.No.390(P) and it is eri poramboke land. The pre mining , during mining & post mining land use plan is as follows:

Table 4.12: Land Use Table

Name of the project	Activities	Present Land use (Ha)	Area at the end of present plan period	Land use at the end of life of mine
G.O.43	Mining (Quarry)	---	1.0000	1.0000
	Top soil stacking	---	0.2500	0.2500
	Road	---	0.0200	0.0200
	Area under plantation	---	0.3200	0.3200
	Unutilized area	4.75.50	3.1650	3.1650
	Total	**4.75.50**	**4.75.50**	**4.75.50**
G.O.69	Mining (Quarry)	---	0.75	0.75
	Top soil stacking	---	0.40	0.40
	Road	---	0.02	0.02
	Area under plantation	---	0.31	0.31
	Unutilized area	4.90.00	3.42	3.42
	Total	**4.90.00**	**4.90.00**	**4.90.00**
	Mining (Quarry)	-	1.00	1.00

G.O.70	Top soil stacking	-	0.25	0.25
	Roads	-	0.02	0.02
	Area under plantation	-	0.32	0.32
	Un utilized area	4.75.00	3.16	3.16
	Total	**4.75.00**	**4.75.00**	**4.75.00**
G.O.71	Mining (Quarry)	-	1.50	1.50
	Top soil stacking	-	0.20	0.20
	Road	-	0.02	0.02
	Area under plantation	-	0.08	0.08
	Unutilized area	4.80.00	3.08	3.08
	Total	**4.80.00**	**4.80.00**	**4.80.00**
G.O.57	Mining (Quarry)		1.25	1.25
	Top soil stacking	---	0.32	0.32
	Roads	---	0.02	0.02
	Area under plantation	---	0.16	0.16
	Un utilized area	4.75.0	3.00	3.00
	Total	**4.75.0**	**4.75.0**	**4.75.0**

Out of 2.00 m of depth of mining , since the mineral recovery is just 10% of the ROM material removed, the entire 0.50m Top clayey soil + 90% of the reject material will be used for backfilling the mined out area and ultimately the entire lease area will brough back to premining condition. As such no adverse impact on land environment is expected.

4.6 BIOLOGICAL ENVIRONMENT:

4.6.1 EXISTING FLORA AND FAUNA:

The core zone area is barren with thorny prosophis juliflora ,grasses and bushes. Details of flora/fauna pattern in core and buffer zones have been described in chapter - III.

4.6.2 IMPACT OF MINING ON BIOLOGICAL ENVIRONMENT:

The significance of impact on biological environment due to mining and allied activities on various fronts is described below:

Table 4.13: Impact on Biological Environment

S.No	ISSUES	OBSERVATIONS
1	Clearance of vegetation due to mining and allied activities	The leases are in Eri poramboke land which is mostly barren with grasses & thorny shrubs only. As such no

		major clearance of vegetation is involved.
2	Retardation of tree growth, tip burning, etc, due to deposition of dust and the Particulate matter generated from the mining operation.	Since simple shallow manual mining will be carried out no adverse impact on Ambient air quality is envisaged. Necessary mitigative measures like dust suppression, proper maintenance of equipment's, roads will be carried out to prevent dust generation and impact on the surrounding environ.
3	Proximity to national park/ wildlife sanctuary/reserve forest/mangroves/Coastline/estuary/ sea	The mining lease area and the 10 km buffer zone from the periphery of the core zone is devoid of declared ecologically sensitive features like national parks, biospheres, sanctuaries, etc. Simple manual manual mining is expected not to cause any adverse impact on the surrounding environ and as such no impact due to mining operations on the R.F is expected.
4	Release of effluents into water body that also supplies water to wildlife	There is no proposal to discharge any effluent into nearby water bodies.
5	Proposed project could increase siltation that would affect nearby biodiversity area	Not envisaged.
6	Activities of the project affects the breeding/nesting sites of birds and animals	Not envisaged
7	Located near an area populated by rare or endangered species	Not applicable.
8	Risk of fall/slip or cause death to wild animals due to project activities	Not envisaged
9	Project affects the forest-based livelihood/any specific forest product on which local livelihood depends	Not applicable
10	Project likely to affect migration routes	No migration routes are in the area.
11	Project likely to affect flora of an area, which have medicinal value	No such significantly important medicinal value species within the ML area and its nearby region.
12	The project likely to affect wetlands, fish breeding grounds, marine ecology	Not applicable.
13	Project affects the Agriculture, Forestry and Traditional Practices	Considering the little magnitude of operation in the eri poramboke land such scenario not envisaged .
14	Impact on soil health and biodiversity	Mined out area will be restored back to premining condition.

There are no migratory corridors, migratory avian-fauna, rare endemic and endangered species. Therefore, there shall be no impacts due to mining activity on them. Even though there are no adverse 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.

4.6.3 CONTROL MEASURES FOR BIOLOGICAL ASPECTS:

4.7 SOCIO ECONOMIC ENVIRONMENT:

Since the lease area is Government land no rehabilitation or resettlement is involved. Total manpower requirement for all the 5 leases will be about 50 people including common statutory manpower. . Besides, on indirect basis through allied opportunities in logistics, trading, repairing works etc. good employment potential will arise in this area, which will provide raising income levels and standards of living in the area through various service related activities connected with the project operations as shown under.

- Project related logistical operations for transport, etc,
- Various trading services for consumer goods, spare parts, sundry items, etc.
- Contractual services connected with the project.
- Green belt and horticultural works in the project.
- Casual labor needs for various activities.

Besides, there will be improvement in the following aspects due to project operation:

- ❖ Improvement in infrastructural facilities, providing education aids etc. in nearby schools
- ❖ Betterment of drinking water facilities.
- ❖ Benefit to the State and the Central governments through financial revenues by way of royalty, tax, duties, etc from this project directly and also indirectly.

From above details, it is clear that the project operations will have highly beneficial positive impact in the area as more such activities will be carried out in the future also.

However, towards the socio economic development of the surrounding area, the proponent has earmarked totally an amount of Rs.10 Lakhs for all the 5 leases together under Corporate Environmental Responsibility. The activities identified under CER will be implemented in a phased manner in provision of desired facilities in nearby Government Schools.

4.8 OCCUPATIONAL HEALTH AND SAFETY:

In general , anticipated occupational illness sequel to mining activities can be as follows:

- Dust related pneumonia
- Tuberculosis
- Rheumatic arthritis
- Segmental vibration
- Miner's Nystagmus
- Eye diseases with irritation of eye, etc.

Incase of this project, since simple manual shallow depth mining with very less production is proposed, occupational health impact is expected to be insignificant. To reduce pollution emanation from the project, various measures given above will be followed.In addition to above measures, the following remedial steps are being and will be enforced to ensure minimization of occupational health and safety problems.

- Medical examination of workers by qualified doctors, as per DGMS circulars.
- Regular awareness campaigns amongst staff and workers
- Staff will be provided with PPE to guard against excess noise levels, Dust generation and inhalation, etc., as per standards prescribed by DGMS.

The following safety gadgets will be provided to the staff and workers based on their area of operation and work & requirement:

Sl No	Safety Equipments
1.	Helmets
2.	Shoes
3.	Goggles
4.	Dust Mask
5.	Hand Gloves
6.	Ear Muffs

4.9 LOGISTICAL SYSTEM:

Entire ROM from the mines will be transported to the proponents nearby Beneficiation plant by tractor / trucks. The reject material will be transported back to the mine pit and used for backfilling the mined out voids.

Table 4.14: Details of Transportation

		ROM Quantity					
Sl.no	**Particulars of activity**	**GO43**	**GO69**	**GO70**	**GO71**	**GO57**	**Total**
A	Maximum Quantity Transported (TPA)	9000	9750	13824	10800	6912	--
B	No of days in a year	200	200	200	200	200	200
C	Effec.Transport hours per day	6	6	6	6	6	6
D	Truck Capacity in T	6	6	6	6	6	6
	Trips per hour	1.25	<1	1.35	1.92	1.50	7

From the above table it is seen that there will be about 7 trips per hour. The existing road can absorb this traffic due to this project. However, the following mitigative measures are suggested:

- Water sprinkling on material in the transport vehicles before transporting, so that no dust nuisance during transport will arise.
- Plantation on either side of the transport road in consultation with the concerned department.
- Proper maintenance of transport roads
- Proper maintenance of transport vehicles.
- Avoiding overloading of material
- Covering of loaded vehicles with tarpaulins sheet.
- Limiting of speed
- Provision of tyre washing facility at the mine outlet

4.10 WASTE MANAGEMENT:

Solid Waste: The waste/mineral reject generated in the plant will be brought back and backfilled in the mined out void. Top soil will be spread over the backfilled area and the mined out pit will be restored back to pre mining condition.

Liquid waste: There is no process effluent generation from this mine. Hence no liquid waste is generated.

Hazardous waste management: In this project the following management practices will be followed:

- Ensuring availability of different colour bins for collection of different types of waste.
- Ensuring that the fire extinguisher system is available at hazardous material storage area.

ROM Material is inert and non hazardous comprising (10% garnet and 90% silica, clay and silt). Garnet is separated by magnetic separation without any chemical process. Remaining non hazardous and inert ROM will be backfilled. As such no hazardous material is involved.

The hazardous waste if any will be disposed through authorized recyclers or re-processors periodically. The hazardous wastes will be transported in accordance with the provisions of rules. By effective implementation of above said mitigation measures no major impact due to Hazardous waste is expected.

Plastic waste: Single use plastics/ use and throwaway plastics will be banned in the site as directed by the Tamil Nadu Government vide GO(Ms)No.84 regarding ban on use of plastic products. The employees will be encouraged to use compostable material or ecofriendly material.

* * * * * * * *

CHAPTER - V

ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

CHAPTER 5

ANALYSIS OF ALTERNATIVES

5.1 ALTERNATE TECHNOLOGY:

In this project opencast manual mining method using spades axes & baskets, loading it in to trucks / tippers and transportation will be adopted. No drilling and blasting involved.

Initially, top clayey soil will be removed and dumped temporarily in the earmarked dump site based on the requirement and later spread over backfilled area for reclamation purposes. Mined garnet rich stream sediments (ROM) will be transported to the pre-concentration plant for separation of garnet sand. The waste/mineral reject generated in the plant will be brought back and backfilled in the mined out void. Top soil will be spread over the backfilled area and the mined out pit will be restored back to pre mining condition. After creation of sufficient floor width simultaneous production and backfilling & reclamation will be resorted to

5.2 ALTERNATE SITE:

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

* * * * * * * *

CHAPTER - VI

ENVIRONMENTAL MONITORING PROGRAMME

CHAPTER 6

ENVIRONMENTAL MONITORING PROGRAMME

6.1 GENERAL

In these projects, appropriate environmental monitoring programme are framed. Regular, systematic and sustained programme schedules for implementation and monitoring of various control measures are devised with clear cut guidelines of various concerned plans for keeping a continuous surveillance on the various environmental quality parameters in the area.

The monitoring schedules are planned to aim at regular and systematic study of various pollution levels with respect to air and water quality, noise levels etc., to ensure that they conform to the standards laid down by the Environment Protection Act, 1986 and various Central and State Pollution Control Board Limits.

The various methodologies and frequency of studies of all environmental quality parameters will be as per prescribed norms laid down by MOEF&CC and State Pollution Control Board. This being a small quarry operation, the Mines in-charge will take care of all the environmental related works also.

Environmental control measures include components like air, water and soil quality, noise levels, afforestation measures, etc. For monitoring of environment over the life of the mine, a set of stations for study of quality parameters are fixed as per the actual requirements and prevailing conditions of environmental factors, as dictated from time to time, depending on the prevailing pollution levels.

6.2 MONITORING SCHEDULES FOR VARIOUS PARAMETERS

The monitoring schedules are planned for systematic study of various environmental parameters like air, water qualities, noise levels, etc. to ensure that they conform to the standards laid down by Environmental Protection Act and various statutory Limits. The monitoring schedules are planned on a cluster basis including all the leases falling in the cluster to be adopted i. However, based on the need and priority it may be suitably modified / improved in consultation with local authorities.

Table 6.1: Environmental Monitoring Schedule

S.No	Environmental Parameters	Parameters to be monitored	Monitoring area coverage /locations	Frequency of monitoring
1	Air Quality	Sulphur dioxide (SO_2), Oxides of Nitrogen (NO_2), Respirable Particulate Matter ($PM_{2.5}$ and PM_{10}).	2 locations in the buffer zone and 2 work zone locations on a cumulative basis.	Once in a year in each location.
2	Water Quality	General, Physical, and chemical parameters	Ground Water samples (around the project area)	Once in a year
3	Noise	Leq. Lmax Lmin, Leq Day & Leq Night dB(A)	Work zone locations and buffer zone villages	Once in a year
4	Socio Economic Environment	Socio Economic Survey, Review of implementation of CER activities proposed	Buffer Zone	Yearly basis
5	Occupational Health	Occupational health survey to detect early incidence of diseases, Audiometry Test for workers in noise prone area and review of safety matters.	Staff and Workers involved in the project	Once in a year
6	Greenbelt	Maintenance	Proposed plantation area	Regularly

6.3 LEGISLATIVE AND REGULATORY FRAME WORK:

The project will have environmental policy declaring its responsibility and commitment to protect the environment and to ensure public safety. The existing policy will be available with all concerned officials of the plant. The following environmental standards as per methodologies prescribed, by MOEF/CPCB/TNPCB will be enforced in this project:

Table 6.2: Environmental Standards

Standards	Issued By	Reference
National Ambient Air Quality Standards	Central Pollution Control Board	Table No. 6.3
Water quality standards per IS 10500:2012	Bureau of Indian Standards	Table No.6.4
Noise Standards	CPCB / MoEF&CC	Table No.6.5

Table 6.3: National Ambient Air Quality Standards

[भाग III—खण्ड 4] भारत का राजपत्र : असाधारण 3

NATIONAL AMBIENT AIR QUALITY STANDARDS
CENTRAL POLLUTION CONTROL BOARD
NOTIFICATION
New Delhi, the 18th November, 2009

No. B-29016/20/90/PCI-L.—In exercise of the powers conferred by Sub-section (2) (h) of section 16 of the Air (Prevention and Control of Pollution) Act, 1981 (Act No.14 of 1981), and in supersession of the Notification No(s). S.O. 384(E), dated 11th April, 1994 and S.O. 935(E), dated 14th October, 1998, the Central Pollution Control Board hereby notify the National Ambient Air Quality Standards with immediate effect, namely:-

NATIONAL AMBIENT AIR QUALITY STANDARDS

S. No.	Pollutant	Time Weighted Average	Concentration in Ambient Air		
			Industrial, Residential, Rural and Other Area	Ecologically Sensitive Area (notified by Central Government)	Methods of Measurement
(1)	(2)	(3)	(4)	(5)	(6)
1	Sulphur Dioxide (SO_2), µg/m³	Annual*	50	20	- Improved West and Gaeke
		24 hours**	80	80	-Ultraviolet fluorescence
2	Nitrogen Dioxide (NO_2), µg/m³	Annual*	40	30	- Modified Jacob & Hochheiser (Na-Arsenite)
		24 hours**	80	80	- Chemiluminescence
3	Particulate Matter (size less than 10µm) or PM_{10} µg/m³	Annual*	60	60	- Gravimetric - TOEM
		24 hours**	100	100	- Beta attenuation
4	Particulate Matter (size less than 2.5µm) or $PM_{2.5}$ µg/m³	Annual*	40	40	- Gravimetric - TOEM
		24 hours**	60	60	- Beta attenuation
5	Ozone (O_3) µg/m³	8 hours**	100	100	- UV photometric - Chemilminescence
		1 hour**	180	180	- Chemical Method
6	Lead (Pb) µg/m³	Annual*	0.50	0.50	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper - ED-XRF using Teflon filter
		24 hours**	1.0	1.0	
7	Carbon Monoxide (CO) mg/m³	8 hours**	02	02	- Non Dispersive Infra Red (NDIR) spectroscopy
		1 hour**	04	04	
8	Ammonia (NH_3) µg/m³	Annual*	100	100	-Chemiluminescence
		24 hours**	400	400	-Indophenol blue method

(1)	(2)	(3)	(4)	(5)	(6)
9	Benzene (C_6H_6) $\mu g/m^3$	Annual*	05	05	- Gas chromatography based continuous analyzer - Adsorption and Desorption followed by GC analysis
10	Benzo(a)Pyrene (BaP) - particulate phase only, ng/m^3	Annual*	01	01	- Solvent extraction followed by HPLC/GC analysis
11	Arsenic (As), ng/m^3	Annual*	06	06	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper
12	Nickel (Ni), ng/m^3	Annual*	20	20	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper

* Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 08 hourly or 01 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

Note. — Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigation.

SANT PRASAD GAUTAM, Chairman
[ADVT-III/4/184/09/Exty.]

Note: The notifications on National Ambient Air Quality Standards were published by the Central Pollution Control Board in the Gazette of India, Extraordinary vide notification No(s). S.O. 384(E), dated 11th April, 1994 and S.O. 935(E), dated 14th October, 1998.

Table 6.4: IS – 10500 :2012 Standards

Table 1 Organoleptic and Physical Parameters
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 3025	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Colour, Hazen units, *Max*	5	15	Part 4	Extended to 15 only, if toxic substances are not suspected in absence of alternate sources
ii)	Odour	Agreeable	Agreeable	Part 5	a) Test cold and when heated b) Test at several dilutions
iii)	*p*H value	6.5-8.5	No relaxation	Part 11	—
iv)	Taste	Agreeable	Agreeable	Parts 7 and 8	Test to be conducted only after safety has been established
v)	Turbidity, NTU, *Max*	1	5	Part 10	—
vi)	Total dissolved solids, mg/l, *Max*	500	2 000	Part 16	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 2 General Parameters Concerning Substances Undesirable in Excessive Amounts
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Aluminium (as Al), mg/l, *Max*	0.03	0.2	IS 3025 (Part 55)	—
ii)	Ammonia (as total ammonia-N), mg/l, *Max*	0.5	No relaxation	IS 3025 (Part 34)	—
iii)	Anionic detergents (as MBAS) mg/l, *Max*	0.2	1.0	Annex K of IS 13428	—
iv)	Barium (as Ba), mg/l, *Max*	0.7	No relaxation	Annex F of IS 13428* or IS 15302	—
v)	Boron (as B), mg/l, *Max*	0.5	1.0	IS 3025 (Part 57)	—
vi)	Calcium (as Ca), mg/l, *Max*	75	200	IS 3025 (Part 40)	—
vii)	Chloramines (as Cl_2), mg/l, *Max*	4.0	No relaxation	IS 3025 (Part 26)* or APHA 4500-Cl G	—
viii)	Chloride (as Cl), mg/l, *Max*	250	1 000	IS 3025 (Part 32)	—
ix)	Copper (as Cu), mg/l, *Max*	0.05	1.5	IS 3025 (Part 42)	—
x)	Fluoride (as F) mg/l, *Max*	1.0	1.5	IS 3025 (Part 60)	—
xi)	Free residual chlorine, mg/l, *Min*	0.2	1	IS 3025 (Part 26)	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be minimum 0.5 mg/l
xii)	Iron (as Fe), mg/l, *Max*	0.3	No relaxation	IS 3025 (Part 53)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xiii)	Magnesium (as Mg), mg/l, *Max*	30	100	IS 3025 (Part 46)	—
xiv)	Manganese (as Mn), mg/l, *Max*	0.1	0.3	IS 3025 (Part 59)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xv)	Mineral oil, mg/l, *Max*	0.5	No relaxation	Clause 6 of IS 3025 (Part 39) Infrared partition method	—
xvi)	Nitrate (as NO_3), mg/l, *Max*	45	No relaxation	IS 3025 (Part 34)	—
xvii)	Phenolic compounds (as C_6H_5OH), mg/l, *Max*	0.001	0.002	IS 3025 (Part 43)	—
xviii)	Selenium (as Se), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 56) or IS 15303*	—
xix)	Silver (as Ag), mg/l, *Max*	0.1	No relaxation	Annex J of IS 13428	—
xx)	Sulphate (as SO_4) mg/l, *Max*	200	400	IS 3025 (Part 24)	May be extended to 400 provided that Magnesium does not exceed 30
xxi)	Sulphide (as H_2S), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 29)	—
xxii)	Total alkalinity as calcium carbonate, mg/l, *Max*	200	600	IS 3025 (Part 23)	—
xxiii)	Total hardness (as $CaCO_3$), mg/l, *Max*	200	600	IS 3025 (Part 21)	—
xxiv)	Zinc (as Zn), mg/l, *Max*	5	15	IS 3025 (Part 49)	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 6.5: Noise Level Standards

Area Code	Category of Area	Limits in dB(A) Leq	
		Day Time	Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

Note :

1. Day time shall mean from 6 a.m. and 10.0 p.m.
2. Night time shall mean from 10.0 p.m. and 6 a.m.
3. Silence zone is an area comprising not less than 100 meters around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority.
4. Mixed categories of areas may be average as one of the four above mentioned categories by the competent authority.

* dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

A “decibel” is a unit in which noise is measured.

“A”, in dB(A) Leq, denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.

Leq: It is energy mean of the noise level over a specified period.

Table 6.6: Permissible Noise For Industrial Workers As Laid Down By CPCB

Exposure time (in hr. per day)	Limit in dB(A)
8	**90**
4	**93**
2	**96**
1	**99**
½	**102**
¼	**105**
1/8	**108**
1/16	**111**
1/32	**114**

The above said monitoring location and the frequency of monitoring shall be suitably modified in consultation with the nodal agency as per the actual requirements and prevailing conditions of the mine and environmental factors, as dictated from time to time, depending on the prevailing pollution levels, if required.

6.4 ENVIRONMENTAL MONITORING COST:

Towards environmental monitoring it is proposed to allocate a budget of Rs. 50,000 per annum for each project. Further details of the capital and recurring cost of environmental management has been provided in in Table No. 10.2, Chapter-X.

* * * * * * * *

CHAPTER - VII

ADDITIONAL STUDIES

CHAPTER 7
ADDITIONAL STUDIES

7.1 GENERAL

The additional studies covered for this EIA / EMP report are:

1. Public consultation of the project as per MoEF & CC and ToR condition.
2. Risk Assessment and Disaster Management Plan in connection with mining and allied operations of the project will be spelt out in detail to cover possible dangers /risks/explosions/accidents, etc. likely to arise from the project operations, including onsite and off-site emergency plans to meet the disastrous situations if any.
3. Mine closure planning and various advance actions and finalization of plan to effect closure/abandonment of the mine at the end of mine life.

7.2 PUBLIC CONSULTATION PROCESS

This combined draft EIA/EMP report will be exposed to public consultation as per mandatory procedures through the Collector, Trichy District and State Pollution Control Board officials after giving 30 days advance notice in two local newspapers about the scheduled date and time for conduct of the public hearing procedures. The opinions, concerns and objections of the public of the area or other concerned entities will be recorded during the public hearing and suitable replies in the matter will be given by the government officials and the project proponent's representative during the public hearing session. All the public queries and the replies to each query by the project proponent and officials concerned will be recorded as proceedings & minutes and forwarded to SEIAA, Tamil Nadu after incorporating the same in the Final EIA/EMP report for approval by SEIAA, Tamil Nadu.

7.3 CUMULATIVE IMPACT ASSESSMENT:

Combined impact of 5 leases in the eri poramboke land is already described in chapter – IV. Apart from these 5 leases, there are 2 more leases of the proponent within 500m radius which are located in patta lands owned bythe applicant.

Details of all the 7 leases in the cluster are as follows:

Table 7.1 LIST OF QUARRIES WITHIN 500 METER RADIUS

S.No	Name of lease	Location	Extent in Ha	Name of the Owner
1	GO 43	S.F.No.390(P) – Eri poramboke land, Kottathur village, Musiri taluk, Trichy district, Tamil Nadu.	4.75.5	, Tvl.Riverways Mines and Minerals Ltd
2	GO 69		4.90.0	Tvl.Riverways Mines and Minerals Ltd
3	GO 70		4.75.0	Tvl.Riverways Mines and Minerals Ltd
4	GO 71		4.80.0	Tvl.Riverways Mines and Minerals Ltd
5	GO 57		4.75.0	Tvl.S.S.Minerals
6	P1	S.F. No – Patta Land 95/2A, 2B, 4B, 4C, 5A, 5B, 6A, 6B, 97/2B & 2E, Kottathur village	2.10.0	Tvl.S.S.Minerals,
7	P2	S.F. No- 137/7, 348/1A, 1B, 1C1, 1C2, 1C3, 2B1, 3A, 4, 5, 6B, 7A, 8, 9, 11, 12 & 13 – Patta Land Naduvalur Village	3.07.0	Tvl.Riverways Mines and Minerals Ltd
		TOTAL CLUSTER EXTENT*	**29.12.50**	

Location of all the leases in the cluster is given in Figure No 7.1 below:

Figure 7.1: Location of all the leases in the cluster



The details of the other 2 patta lease details are as follows:

Table 7.2 SALIENT FEATURES OF PROPOSAL "P1"

<table>
<tr><td>Name of the Mine</td><td colspan="5">Tvl.S.S. Minerals garnet Sand Mine</td></tr>
<tr><td>Land Ownership</td><td colspan="5">It is a Patta land, S.F.No. 95/2A, 2B, 5A, 5B, 6A, 6B, registered in the name of Tvl.S.S. Minerals Managing Partner vide patta no. 1183 and S.F.No. 95/4B, 97/2B, 97/2E, registered in the name of Tvl.S.S. Minerals Sundaramoorthyvide patta no. 2643 & S.F.No. 95/4C, registered in the name of Balasubramaniyan vide patta no. 2644
The lease deed was executed hence the land is under mining lease.</td></tr>
<tr><td>Land classification</td><td colspan="5">It is a Patta Land-Punjai (Barren Land)</td></tr>
<tr><td>SF No & Area (Ha)</td><td colspan="5">95/2A, 2B, 5A, 5B, 6A, 6B, 4B, 4C, 97/2B & 97/2E & 2.10.0 Ha</td></tr>
<tr><td>Village,Taluk & District</td><td colspan="5">Kottathur village, Musiri Taluk and Trichy District</td></tr>
<tr><td>Toposheet No</td><td colspan="5">58-I/12</td></tr>
<tr><td>Latitude between</td><td colspan="5">11°06.197'N to 11°06.097'N</td></tr>
<tr><td>Longitude between</td><td colspan="5">78°39.590'E to 78°39.506'E</td></tr>
<tr><td>Highest Elevation</td><td colspan="5">126-127m MSL</td></tr>
<tr><td>Proposed Depth of Mining</td><td colspan="5">2.5m below the ground level</td></tr>
<tr><td rowspan="2">Geological Resources</td><td colspan="5">Garnet in Tonnes</td></tr>
<tr><td colspan="5">78,242</td></tr>
<tr><td rowspan="2">Mineable Reserves</td><td colspan="5">Garnet in Tonnes</td></tr>
<tr><td colspan="5">39,544</td></tr>
<tr><td>Yearwise Production</td><td colspan="5">Garnet in Tonnes
<table>
<tr><th>Year</th><th>ROM Ts</th><th>Garnet Recovery @ 35% in Tonnes</th><th>Mineral Rejects in Tonnes</th><th>Topsoil in m^3</th></tr>
<tr><td>I</td><td>19,780</td><td>6,923</td><td>12,857</td><td>2,357.50</td></tr>
<tr><td>II</td><td>5,490</td><td>1,921</td><td>3,568.50</td><td>727.50</td></tr>
<tr><td>III</td><td>4,758</td><td>1,665</td><td>3,092.70</td><td>630.50</td></tr>
<tr><td>IV</td><td>4,758</td><td>1,665</td><td>3,092.70</td><td>630.50</td></tr>
<tr><td>V</td><td>4,758</td><td>1,665</td><td>3,092.70</td><td>630.50</td></tr>
<tr><td>Total</td><td>39,544</td><td>13,840</td><td>25,703.60</td><td>4976.50</td></tr>
</table></td></tr>
<tr><td>Ultimate Pit Dimension</td><td colspan="5">162m (L) x 78m (W) x 2.5m (D) bgl</td></tr>
<tr><td>Method of Mining</td><td colspan="5">Non-Conventional Opencast Mining Method using spades axes & baskets, loading it in to trucks/tippers for transportation without drilling and blasting</td></tr>
</table>

Table 7.3 SALIENT FEATURES OF PROPOSAL "P2"

<table>
<tr><td>Name of the Mine</td><td>Tvl. Riverways Mines and Minerals Ltd</td></tr>
<tr><td>Land Ownership</td><td>It is a Patta land, Registered in the name of Riverways Mines and Minerals Ltd vide.1438</td></tr>
<tr><td>Land classification</td><td>It is a Patta Land-Punjai (Barren Land)</td></tr>
<tr><td>SF No & Area (Ha)</td><td>137/7, 348/1A, 1B, 1C1, 1C2, 1C3, 2B1, 3A, 4, 5, 6B, 7A, 8, 9, 11, 12 & 13</td></tr>
<tr><td>Village,Taluk & District</td><td>Naduvalur village, Thuraiyur Taluk and Trichy District</td></tr>
<tr><td>Toposheet No</td><td>58-I/12</td></tr>
<tr><td>Latitude between</td><td>11°06.013'N to 11°06.136'N</td></tr>
<tr><td>Longitude between</td><td>78°39.368'E to 78°39.613'E</td></tr>
<tr><td>Highest Elevation</td><td>125-127m MSL</td></tr>
<tr><td>Proposed Depth of Mining</td><td>2.5m below the ground level</td></tr>
<tr><td rowspan="2">Geological Resources</td><td>Garnet in Tonnes</td></tr>
<tr><td>1,19,474</td></tr>
<tr><td rowspan="2">Mineable Reserves</td><td>Garnet in Tonnes</td></tr>
<tr><td>49,366</td></tr>
<tr><td>Yearwise Production</td><td>
<table>
<tr><th>Year</th><th>ROM</th><th>Garnet Recovery @ 35% in Tonnes</th><th>Mineral Rejects in Tonnes</th><th>Topsoil in m^3</th></tr>
<tr><td>I</td><td>24,948</td><td>8731.80</td><td>16,216.20</td><td>2,361</td></tr>
<tr><td>II</td><td>6,372</td><td>2230.20</td><td>4,141.80</td><td>846</td></tr>
<tr><td>III</td><td>6,270</td><td>2194.50</td><td>4,075.50</td><td>1,128</td></tr>
<tr><td>IV</td><td>6,208</td><td>2172.80</td><td>4,035.20</td><td>629</td></tr>
<tr><td>V</td><td>5,568</td><td>1948.80</td><td>3,619.20</td><td>816</td></tr>
<tr><td>Total</td><td>49366</td><td>17,278</td><td>32,088</td><td>5,780</td></tr>
</table>
</td></tr>
<tr><td>Existing pit dimension (As per Approved mining plan)</td><td>Pit-I: 70m (L) x 17m (W) x 2.0m (D) bgl</td></tr>
<tr><td>Ultimate Pit Dimension</td><td>Pit – I: 142m (L) x 82m (W) x 2.5m (D) bgl
Pit – II : 95m (L) x 36m (W) x 2.5m (D) bgl</td></tr>
<tr><td>Method of Mining</td><td>Non-Conventional Opencast Mining Method using spades axes & baskets, loading it in to trucks/tippers for transportation without drilling and blasting</td></tr>
</table>

Source: Approved Mining Plan

Since manual shallow depth mining with using spades axes & baskets, loading it in to trucks/tippers for transportation without drilling and blasting will be carried out in all the 7 leases , and the cumulative production involved is also very low, by effective implementation of all the mitigative measures given in the EIA/ EMP report , no significant impact on the surrounding environ is expected on cumulative basis also.

7.4 RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN

Risk assessment is a process whereby risks are analysed, assessed and risk management priorities are evaluated. It is defined as the characterization of the potential adverse effect to human health & environment due to environmental hazards.

Objectives of risk assessment are :-

- Identifying hazardous activities
- Assessment of risk level and severity in different operations
- Identification of control measures
- Setting monitoring process
- Reduce the impact of mishaps of all kinds
- Reduce the inherent potential for major accidents.

Methodology of Risk assessment:-

- Collection of information & identification of hazard
- Classify their severity and probability of occurrence
- Identification of exposed risks
- Assess the risk and risk rating based on
    - Probability
    - Exposure
    - Consequence
- Prioritization of the risks
- Implementation of control measures
- Monitoring risk assessment
- Evaluation and correction

As already mentioned, manual mining method using spades axes & baskets, loading it in to trucks/tippers and transportation without drilling and blasting will be adopted in these leases.

Production from these leases are less and as such the magnitude of operation is also less. Burrowing of sand will be done for a shallow depth of 2m only in the eri poramboke land. Besides, mining will be done in non mosoon period only. As such no risk or disaster is expected due to the project operations.

7.5 MINE CLOSURE PLAN:

Although short term phenomenon, mining operations are liable to have long lasting impacts on landscape, ecology and socio –economic pattern of surrounding area, unless proper measures are systematically planned right from beginning of mine operations to mitigate these negative effects to the minimum statutory sustainable levels. Thus, it is imperative that any mining venture should have adequate closure plan addressing issue such as reclamation, environmental protection, rehabilitation of disturbed area etc.

Depth of mining is 2m comprising 0.5m top clay/alluvium + 1.5m ROM garnet. Top clayey soil will be dumped temporarily in the earmarked dump site based on the requirement and later spread over backfilled area for reclamation purposes. As such ultimately there will not be any dump within the lease area. The mined garnet rich stream sediments (ROM) will be transported to the pre-concentration plant for separation of garnet sand. The waste/mineral reject generated in the plant will be brought back and backfilled in the mined out void. Top soil will be spread over the backfilled area and the mined out pit will be restored back to pre mining condition.

The various schedules for mining activities regarding production of garnet sand, waste disposal, proposed land use pattern, environmental preservation measures, , etc. have been fully covered in the earlier chapters in this EIA/EMP report.

Along with the review of Mining plan , Progressive Mine closure plant is prepared for these leases and got approved from IBM.

* * * * * * *

CHAPTER - VIII

PROJECT BENEFITS

CHAPTER 8

PROJECT BENEFITS

The eri poramboke land is blessed with garnet sand and commercial exploitation of the same offers several advantages, primarily due to the versatility and high demand for industrial and decorative applications. It provides a source of income and employment, particularly in areas where garnet deposits are abundant, and contributes to local economies. Furthermore, garnet's unique properties make it a valuable abrasive and gemstone leading to its use in various industries. mining and processing of garnet can stimulate economic growth in the region, as well as generate revenue for the government.

Garnet sand mines and associated activities in the region like, mineral processing at pre concentration plant, transportation, will bring improvements in physical and social infrastructures in the area like:

- Direct employment opportunity of 10 people and for more than 50 people indirectly.
- Indirect employment to scores of people supporting lively hoods of individuals and families in the region.
- Financial gains for the state and central governments, through collection of various taxes like royalty, GST, etc.,
- Foreign exchange due to export of garnet
- Improvement of the General Living Standard of the People in the Vicinity
- Overall Improvement in HDI (Human Development Index)
- Improvement in Per Capita Income.
- Providing certain facilties for the local schools and panchyats

In short, mining operations in these leases will benefit directly and indirectly in the fields of potential employment opportunities, improved per capita income for local people, improved social welfare facilities, etc.

In view of above facts, this project assumes great importance for regional and national growth pattern in its own way.

* * * * * * * *

CHAPTER - IX

ENVIRONMENTAL COST BENEFIT ANALYSIS

CHAPTER 9

ENVIRONMENTAL COST BENEFIT ANALYSIS

Appendix-III of the MoEF notification S.O. 1533 dated 14.09.2006, which describes the generic structure of Environmental Impact Assessment document, states that the chapter' Environmental cost benefit analysis' is applicable if it is recommended during scoping stage.

In the Terms of Reference issued by SEIAA Tamil Nadu for these 5 leases, Environmental cost benefit analysis is not prescribed. Hence, it is not applicable.

* * * * * * *

CHAPTER - X

ENVIRONMENTAL MANAGEMENT PLAN

CHAPTER 10

ENVIRONMENTAL MANAGEMENT PLAN

10.1 INTRODUCTION:

This chapter describes the implementation strategies of the environmental management measures described through the course of this EIA/EMP report for the purpose of mitigating impacts due to the proposed mining operations.

10.2 COMPONENTS OF THE ENVIRONMENTAL MANAGEMENT PLAN:

The environmental management plan comprises identification of the major impacts due to project operations and their suitable mitigative measures. (Provided in an elaborate manner in Chapter-IV) Based on the environmental policy of the company, the environmental management cell will oversee the implementation of these mitigative measures. The details of the proponent's environmental policy, environmental management cell and also the budgetary allocation towards various environmental management measures has been elaborated in this chapter.

10.2.1 ENVIRONMENTAL POLICY:

The proponent will frame a well-planned Environment, Health and Safety Policy. Additionally, the Environmental management cell as described below in Figure No. 10.1 below will also ensure the following in line with their policy:

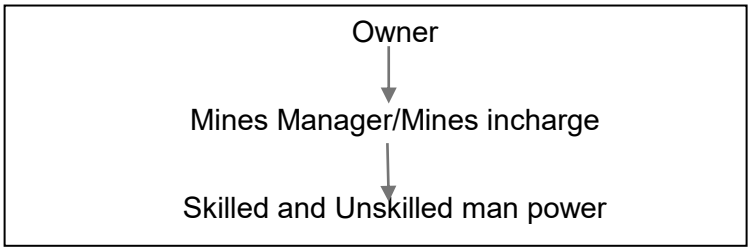
- Ensuring risk-free and safe mining operations by following all rules and conditions prescribed in the Indian mines Act, metalliferrous mining regulation, mineral conservation and development rules, etc,
- Ensuring environmental preservation by adoption of remedial measures for control of air, water quality, noise status, biological improvements, green belt creation, etc,.
- Extending CER activities to cater to the needs of local community for various benefits like improvement of physical and social infrastructures for the welfare of local community.
- Ensuring that all mining operations are strictly conducted keeping with regulatory standards & maintaining safe working environment in the area.

- ❖
- ❖ Providing periodical training on safety, Health, & Environment to all employers.
- ❖ Any infringement / violation of any rule or unsafe mining operations should be reported mines manager, who will take immediate corrective measures for avoiding major disasters. The report will ultimately reach the owner through upwardly hierarchical communicative channels from the lowest level to superior levels in a quick time bound duration.
- ❖ Remedial measures for such violations and deviations should be taken care by the mines manager to avoid any hazards or disasters in the mine and nearby areas. The persons responsible for such violations will be punished through appropriate disciplinarily penal actions.
- ❖ The EC conditions and stipulations will be strictly observed by Mines manager of the mines.

10.2.2 ENVIRONMENTAL MANAGEMENT CELL:

Considering that the leases in cluster are to be operated by the same proponent, there will be a common environmental management cell. The Mines Manager/Mine Incharge of the mines will undertake effective monitoring and implementation of various environmental control measures promptly and effectively and to oversee various environmental management schemes for air quality control, water quality status, noise level control, plantation programme, social development schemes, etc in the mine. The organizational chart for the same has been provided below:

Figure 10.1: Organization Chart



The Mines Manager/Mines Incharge in the mine project site will be directly responsible for various environmental activities in the site. The owner will correlate and oversee the environmental activities and their effective implementation in consonance with the guidelines in the EMP. The Mines Manager/Mines Incharge will oversee the environmental administration at the mine and he will directly supervise all activities of environmental administration on environmental issues. Necessary assistance from sub ordinates, external consultants and laboratories shall be taken.

Environmental control measures will span various factors like land degradation, air, water and soil quality, noise levels, effective land reclamation for excavated areas, afforestation measures, etc. The administrative functions are given below.

- To observe the implementation of environmental control measures.
- To study the effects of project activities on the environment.
- To ensure implementation of Plantation Programme. Regular monitoring of survival rate of plants is carried out to achieve the desired result.
- To keep records of monitoring etc., in a systematic way, so as to facilitate easy access, when needed by statutory agencies, etc. Also send prescribed returns to statutory authorities.
- To ensure that plantation is carried out in the identified places.
- Conducting environmental studies and reporting to SPCB.
- To interact and liaise with Government Departments.
- To evaluate the performance of existing pollution control equipment and systems periodically and take timely action to keep the equipment at its optimum performance condition.
- To take immediate preventive action in case of some unforeseen environmental pollution attributable to the project.
- Conducting safety audits and programmes to create safety awareness in workers/ staff as per need.
- Conducting annual health audits to detect any health problems promptly in the workers/staff. This will reduce occupational health problems.

- ❖ Carrying out socio economic study in the surrounding areas to find out the benefits derived by the society due to the project and also to fulfill the deficiency, if any, immediately.
- ❖ Ensuring proper planned mine closure arrangements

Considering the other leases in the cluster, the Environmental Management Cell will also act as a Cluster Management Committee and coordinate with the other mines in the cluster. The various activities undertaken to be undertaken by this committee are detailed below:

- Effective implementation of the environmental management measures in a holistic manner
- Devising an operation plan for mining and transportation activities.
- Various natural calamities like rain, flooding, evacuation plans etc. will also be deliberated by this committee to form risk management and emergency management plan pertaining to the cluster.
- The environmental policy of the company will be implemented and proper sustainable mining in accordance with statutory regulations will be enforced for the quarries in the cluster.
- Furnishing action plan regarding restoration strategy
- Deliberate on the health of the workers involved in the mining and also the health of the public
- Furnishing action plan to achieve sustainable development goals with regards to water, sanitation and safety.
- Implementation of steps to effectively utilize energy.

10.2.3 ENVIRONMENTAL MANAGEMENT PLAN:

10.2.1.1 General:

Systematic monitoring systems and well-conceived and efficient Environment Management Plan will ensure that during the project operations, the various environmental parameters, are well within the statutorily sustainable limits. The environmental control measures proposed to keep

various environmental parameters of the project in terms of air, water, noise, land, biological environment, etc. has been described below.

10.2.2.2 Air Quality:

Due to manual shallow depth mining operations proposed in these leases, though no impact on air quality is expected, for controlling the small scale pollution due to road transportation , the following mitigative measures will be ensured:

- Regular wetting of transport road using mobile water tanker
- Proper maintenance of haul road and transport road
- Avoiding overloading of vehicles
- Covering of loaded vehicles with tarpaulins to avoid spillage during transportation
- Proper maintenance of transport vehicles to keep the gas emission under check

10.2.2.3 Water Environment:

This being a manual mining in Eri poramboke land for a depth of 2m only in non monsoon dry period, the activity will be more of a desilting work and result in no significant impact on the water environment . Although there will not be any generation of discharge of effluents in to the lease area or drawl of water from it and impact on water environment, Planting vegetation, including trees, along water body edges and in surrounding areas can help stabilize soil, reduce erosion, and provide natural filtration. Besides, periodical Water Quality Monitoring of eri water during water available period monsoon season to ensure that there is no impact on it.

10.2.2.4 Noise Environment:

During the project operations, various control measures as listed below will be carried out to mitigate adverse impact due to the noise generated due to mining and allied activities:

- Planting rows of native trees along roads, around eri and other nearby areas to act as acoustic barriers.
- Sound proof operator's cabin for mineral transport vehicles/ tippers.
- Proper and regular maintenance of equipments may lead to less noise generation.

- Providing in-built mechanism for reducing sound emissions.

10.2.2.6 Biological Environment:

The mining lease area and 10km buffer zone are devoid of declared ecologically sensitive features such as national parks, sanctuaries etc. Besides, no Schedule-I animals are observed in the core and buffer zone. There will be no major clearance of vegetation involved in this project. However, good greenbelt and plantation programmes are planned in the nearby area.

Elaborate details regarding the same is provided under section 4.6. Chapter-IV.

10.2.2.7 Socio-Economic Environment:

The proposed project operation will provide positive impacts in the region on the employment area as well as on physical and social infrastructural status. Many other tangible benefits will be gained by the local people in the surrounding areas due to establishment of associated beneficiation plant, trading operations, contractual needs, casual labor, green belt development, etc. Towards the socio-economic development of the surrounding area, , the proponent has earmarked totally an amount of Rs.15 Lakhs for all the 5 leases together under Corporate Environmental Responsibility. The activities identified under CER will be implemented in a phased manner in provision of desired facilities in nearby Government Schools.

10.3 ENVIRONMENTAL POLLUTION CONTROL COST:

In this proposed quarry Implementation of environmental control measures as stated above involves capital as well as recurring expenses. The probable capital and recurring environmental control cost are calculated and given below **Table No – 10.1.**

Table 10.1: Environmental Control Cost

(Rs. in Lakhs)

Activities	Mitigation Measure	Provision for Implementation	Capital	Recurring
Air Environment	Compaction, gradation and drainage on both sides for Haulage Road	Rental Dozer & drainage construction on haul road @ Rs. 10,000/- per hectare; and yearly maintenance @ Rs. 10,000/- per hectare	0.48	0.48
	Water sprinkling by own water tankers	Water Sprinkling (thrice a day) Cost for recurring	8.00	0.50
	Muffle blasting – To control fly rocks during blasting	Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts	-	-
	Wet drilling procedure / latest eco-friendly drill machine with separate dust extractor unit	Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500 per unit recurring cost for maintenance	-	-

	No overloading of trucks/tippers/tractors	Monitoring through weighing machines	-	0.25
	Stone carrying trucks will be covered	Monitoring if trucks will be covered by tarpaulin	-	0.10
	Enforcing speed limits of 20 km/hr within ML area	Installation of Speed Governers @ Rs. 5000/- per Tipper/Dumper deployed	0.05	0.01
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes by Manual Labour	-	0.05
	Regular sweeping and maintenance of approach roads for at least about 200 m from ML Area	Provision for 2 labours @ Rs.10,000/labour (Contractual) per Hectare	-	0.50
	Installing wheel wash system near gate of quarry	Installation + Maintenance + Supervision	-	-
	Sub-Total - A		**8.53**	**1.88**
Noise Environment	Source of noise will be during operation of transportation vehicles, HEMM for this proper maintenance will be done at regular intervals.	Provision made in Operating Cost	-	-
	Oiling & greasing of Transport vehicles and HEMM at regular interval will be done	Provision made in Operating Cost	-	-
	Adequate silencers will be provided in all the diesel engines of vehicles.	Provision made in Operating Cost	-	-
	It will be ensured that all transportation vehicles carry a fitness certificate.	Provision made in Operating Cost	-	-
	Safety tools and implements that are required will be kept adequately near blasting site at the time of charging.	Provision made in OHS part	-	-
	Line Drilling all along the boundary to reduce the PPV from blasting activity and implementing controlled blasting.	Provision made in Operating Cost	-	-
	Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured.	Blowing Whistle by Mining Mate / Blaster / Compentent Person (Provision made in Operating Cost)	-	-
	Provision for Portable blaster shed	Installation of Portable blasting shelter	-	-
	NONEL Blasting will be practiced to control Ground vibration and fly rocks	Bulk density of rock = 2.6 for Rough Stone/Granite; = 2.5 for Limestone; 6 tons of production requires 1 kg pf explosives; Cost of NONEL = Rs. 30 per kg.	-	-
	Sub-Total - B		**0.00**	**0.00**
Waste Management	Waste management (Spent Oil, Grease etc.,)	Provision for domestic waste collection and disposal through authorized agency	0.25	0.20
		Installation of dust bins	0.05	0.02
	Bio toilets will be made available outside mine lease on the land of owner itself	Provision made in Operating Cost	-	-
	Sub-Total - C		**0.30**	**0.22**
Mine Closure	1.Progressive Closure Activity - Surface Runoff managent	Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance of Rs. 5,000/- per annum	0.50	0.25
	2.Progressive Closure Activity Barbed Wire Fencing to quarry area will be provisioned.	Per Hectare fencing Cost @ Rs. 2,00,000/- with Maintenance of Rs 10,000/- per annum	-	-
	3.Progressive Closure Activity Green belt development - 200 trees inside lease area &	Site clearance, preparation of land, digging of pits / trenches, soil amendments, transplantation	-	-

	300 trees outside the lease area	of saplings @ 100 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring)		
		Avenue Plantation @ 150 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	1.50	0.30
	4.Implementation of Final Mine Closure Actity as per Approved Mining Plan on Last Year	Few activities already covered as progressive closure activities as greenbelt development, wire fencing, garland drain.*For Final Closure Activities 15% of the proposed closure cost will be spent during the final mine closure - stage - Last Year	0.30	-
	5.Contribution towards Green Fund. As per TNMMCR 1959, Rule 35 A	The Contribution towards Green Funds @ 10% of Seigniorage fee are indicated as part of EMP Budget and not necessarily implemented in the Project Site	0.00	-
	Sub-Total - D		**2.00**	**0.55**
Implementation of EC, Mining Plan & DGMS Condition	Size 6' X 5' with blue background and white letters as mentioned in MoM Appendix II by the SEAC TN	Fixed Display Board at the Quarry Entrance as permanent structure mentioning Environmental Conditions	-	-
	Air, Water, Noise and Soil Quality Sampling every 6 Months for Compliance Report of EC Conditions	Submission of 2 Half Yearly Compliance - Lab Monitoring Report as per CPCB norms	0.00	0.25
	Workers will be provided with Personal Protective Equipment's	Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee) - 34 Employees	0.25	0.10
	Health check up for workers will be provisioned	IME & PME Health check up @ Rs. 1000/- per employee	0.00	0.20
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/- for 2 kits	0.00	0.10
	Slope stability action plan	Slope stability action plan in the end of fourth year plan period	0.00	0.00
	Mine will have safety precaution signages, boards.	Provision for signages and boards made	0.10	0.02
	No parking will be provided on the transport routes. Separate provision on the south side of the hill will be made for vehicles /HEMMs. Flaggers will be deployed for traffic management	Parking area with shelter and flags @ Rs. 50,000/- per hectare project and Rs. 10,000/- as maintenance cost	0.00	0.10
	Installation of CCTV cameras in the mines and mine entrance	Camera 4 Nos, DVR, Monitor with internet facility	0.30	0.05
	Implementation as per Mining Plan and ensure safe quarry working	Mines Manager (1st Class / 2nd Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116 of MMR,1961 @ 40,000/-for Manager & @ 25,000/- for Foreman / Mate	-	-
Conservation Measures			-	-
Sub-Total - E			**0.65**	**0.82**
Grand Total			11.48	3.47

Towards EMP measures, Rs.11.48 lakhs is allocated under capital cost. Besides, Rs.3.46 lakhs per annum will be spent under recurring cost. All the recurring cost of maintenance of pollution control measures, environmental monitoring etc., will be met from revenue.

10.4 CONCLUSION:

Simple shallow depth manual mining with less production is expected not to cause significant impact on the surrounding environ due to effective implementation of above said well planned Environmental Management Plan. The environmental management strategy as explained above will prove that industrial growth, if properly planned with all environmental concerns and appropriate remedial measures can go a long way to improve life pattern and living conditions of the local community around the project.

* * * * * * *

CHAPTER-XI

SUMMARY AND CONCLUSION

CHAPTER 11

SUMMARY & CONCLUSION

11.1 INTRODUCTION:

The purpose of the report is to obtain environmental clearance for the proposed 5 nos of Garnet Sand Deposit Mines of Tvl.Riverways Mines and Minerals Ltd (4 nos) and Tvl.S.S.Minerals (1no) located in Musiri taluk, Trichy district, Tamil Nadu . Tvl.Riverways Mines and Minerals Ltd & Tvl.S.S.Minerals are associated companies with the same promoters & the 5 quarry leases are located within 500m radius. The leases details are given below:

S.No	Name of lease	Location	Extent	Authorized Person	Status of leases
1	GO 43	S.F.No.390(P) – Eri poramboke land, Kottathur village, Musiri taluk, Trichy district, Tamil Nadu.	4.75.5	K.Balasubramanian, Managing Director, Tvl.Riverways Mines and Minerals Ltd	Fresh lease
2	GO 69		4.90.0	K.Balasubramanian, Managing Director, Tvl.Riverways Mines and Minerals Ltd	
3	GO 70		4.75.0	K.Balasubramanian, Managing Director, Tvl.Riverways Mines and Minerals Ltd	
4	GO 71		4.80.0	K.Balasubramanian, Managing Director, Tvl.Riverways Mines and Minerals Ltd	
5	GO 57		4.75.0	N.Samuel Baskaran, Partner, Tvl.S.S.Minerals	

As per MoEF&CC notification vide S.O.1533(E) dated 14.09.2006 and its subsequent amendments, non-coal mining projects are divided into the following categories as mentioned in Table No.1.1.

Table 11.1: Screening of Schedule 1(a) Projects

MoEF&CC Notification reference	Project or Activity		Category with threshold limit		Conditions if any
			A	B	
S.O. 1886(E) dated 20.04.2022	1 (a)	Mining of Minerals	> 250 Ha of mining lease area in respect of non-coal mine lease	All mining lease area in respect of minor minerals leases and ≤ 250 Ha mining lease area in respect of major mineral mining lease other than coal.	General condition shall apply

Source: MoEF&CC Notifications S.O.1533(E) dated 14.09.2006, S.O.3977(E) dated 14.08.2018, S.O.3194(E) dated 14.07.2022

Considering that this is a Garnet sand mining project which is a major mineral, this project falls under Sector 1(a) i.e.; Mining of Minerals under Category B1 and as per MoEF & CC notification, this proposal necessitates preparation of EIA/EMP report along with public hearing.

Since all the 5 leases belong to 2 associate companies of the same promoters and are in cluster situation within 500m radius, a common EIA report for all the leases having separate EMP Plan for individual projects has been prepared. As such this combined EIA report is prepared based on standard and additional Terms of Reference issued by SEIAA, Tamil Nadu and is in conformance of the generic structure prescribed by MOEF&CC and approved mining plan.

11.2 Salient details of the project:

Table 11.2: Salient details of the project

A.Statutory Clearances					
Project Name	**G.O.Ms.No.43**	**G.O.Ms.No.69**	**G.O.Ms.No.70**	**G.O.Ms.No.57**	**G.O.Ms.No.71**
Precise area G.O	G.O.3D No.43 dated 27.09.2010	G.O.3D No.69 dated 27.12.2010	G.O.3D No.70 dated 29.12.2010	G.O.3D No.57 dated 03.11.2010	G.O.3D No.71 dated 29.12.2010
Lease Execution	06.04.2018 valid upto 05.04.2038	06.04.2018 valid upto 05.04.2038	06.04.2018 valid upto 05.04.2038	06.04.2018 valid upto 05.04.2038	06.04.2018 valid upto 05.04.2038
Review of mining plan for the period 2023 -2024 to 2027-2028 Approved by IBM	vide letter No TN/TCR/GNT/ROMP-1761.MDS dated 01.08.2024	approved by IBM vide letter No TN/TCR/GNT/ROMP-1759.MDS dated 01.08.2024	approved by IBM vide letter No TN/TCR/GNT/ROMP-1760.MDS dated 20.08.2024	approved by IBM vide letter No TN/TCR/GNT/ROMP-1763.MDS dated 14.08.2024	vide letter No TN/TCR/GNT/ROMP-1758.MDS dated 22.08.2024
500m radius letter	Rc.No.217/2002/Mines dated 13.04.2018	Rc.No.221/2002/Mines dated 13.04.2018	Rc.No.223/2002/Mines dated 13.04.2018	Rc.No.214/2002/ Mines dated 13.04.2018	Rc.No.225/2002/Mines dated 13.04.2018
Rev. PWD Letter	K.No./V.B/V-1/K-76/2019 dated 18.02.2019	K.No./V.B/V-1/K-76/2019 dated 18.02.2019	K.No./V.B/V-1/K-76/2019 dated 18.02.2019	K.No./V.B/V-1/K-76/2019 dated 18.02.2019	K.No./V.B/V-1/K-76/2019 dated 18.02.2019
Letter from Industries Department*	G.O.3D No.05 dated 01.03.2023	G.O.3D No.07 dated 02.03.2023	G.O.3D No.08 dated 02.03.2023	G.O.3D No.10 dated 02.03.2023	G.O.3D No.06 dated 01.03.2023

B.Application for Environmental Clearance					
Particulars	**G.O.Ms.No.43**	**G.O.Ms.No.69**	**G.O.Ms.No.70**	**G.O.Ms.No.71**	**G.O.Ms.No.57**
Proposal no	11809522461	522482	522638	522487	523816
File no	11809	11810	11811	11812	11834
Terms of Reference	SEIAATN/F/No.6507/SEAC/ToR-1487/ 2023 dt 22.06.2023.	SEIAA-TN/F/No.6508/SEAC/ ToR-1497/2023 dtd 22.06.2023	SEIAA-TN/F/No.6510/SEAC/ ToR-1490/2023 dt 22.06.2023	SEIAA-TN/F/No.6511/SEAC /ToR-1478/2023 dtd 22.06.2023.	SEIAA-TN/F/No.6509/SEAC/ToR-1493/2023 dt 22.06.2023.

Amendment in TOR	TO25B108TN5433895A dt.07.04.2025	TO25B108TN5433895A dt.07.04.2025	TO25B108TN5433895A dt.07.04.2025	TO25B108TN5433895A dt.07.04.2025	TO25B108TN5433895A dt.07.04.2025
Baseline Data Collection	Post monsoon season Oct-Dec-2024	Post monsoon season Oct-Dec-2024	Post monsoon season Oct-Dec-2024	Post monsoon season Oct-Dec-2024	Post monsoon season Oct-Dec-2024

C.Site Details					
Project Name	**G.O.Ms.No.43**	**G.O.Ms.No.69**	**G.O.Ms.No.70**	**G.O.Ms.No.71**	**G.O.Ms.No.57**
Location	SF.No.390 (P) – Eri poramboke land, Kottathur village, Thuraiyur taluk, Trichy district, Tamil Nadu.				
Latitude	11°05'52.06"N to 11°06'02.77"N	11°06’05.43’’N to 11°06’13.93’’N	11°06'01.10"N to 11°06'12.76"N	11°05’54.19’’N to 11°06’01.55’’N	11°06'14.43"N to 11°06'20.99"N
Longitude	78°39'56.71"E to 78°40'02.72"E	78°39’49.60’’E to 78°39’57.51’’E	78°40'05.95"E to 78°40'11.95"E	78°39’46.44’’E to 78°39’54.69’’E	78°39' 54.80"E to 78°40'05.89"E
Nearest Town	Thuraiyur – 7.9km - NW	Thuraiyur – 7.5km - NW	Thuraiyur – 8.0km - NW	Thuraiyur – 7.7km - NW	Thuraiyur – 7.5km - NW
Nearest Highway	SH-142- 5.4Km-N	SH-142- 5.0Km-N	SH-142- 5.3Km-N	SH-142- 5.0Km-N	SH-142- 4.9Km-N
Nearest Railway Station	Uthamar kovil – 25km South, Trichy RS – 33km – S				
Nearest Airport	Tiruchirappalli – 40km – South				
Accessibility	Leases are approachable from Kottathur to Puthanampatti road which is connected to Turaiyur – Nakkasalem road (SH-142)				
Topography	Plain land with the elevation in the range of 141m to 147m MSL.				

S. No	**Particulars**	**G.O.Ms.No.43**	**G.O.Ms.No.69**	**G.O.Ms.No.70**	**G.O.Ms.No.71**	**G.O.Ms.No.57**
D.Environmental Setting of the Study Area						
1	Reserved/Protected forests	Sattanur RF – 1.1 km – SW, Ragalavadi RF – 4.0 km – SW, Kottatur RF – 1.7 km – NE, Pulivalam RF – 7.6 km – SW, Omandur RF – 5.7 km – S, Vellakkalpat RF – 5.8 km – SE, Edumalai RF – 7.3 km – SE, Kurichi malai RF – 4.5 km –	Sattanur RF – 830 M – SW, Ragalavadi RF – 4.4 km –W, Kottatur RF – 1.4 km – NE, Pulivalam RF – 7.5 km – SW, Omandur RF – 5.2 km – S, Vellakkalpat RF – 5.2 km – SE, Edumalai RF – 6.7 km – SE, Kurichi malai RF	Sattanur RF – 450 m – SW, Ragalavadi RF – 3.8 km – SW, Kottatur RF – 2.0km – NE, Pulivalam RF – 7.0 km – SW, Omandur RF – 5.1 km – S, Vellakkalpat RF – 5.2 km – SE, Edumalai RF – 7.2 km – SE, Kurichi	Sattanur RF – 800 m – SW, Ragalavadi RF – 3.9 km – SW, Kottatur RF – 2.4km – NE, Pulivalam RF – 7.3 km – SW, Omandur RF – 4.2 km – S, Vellakkalpat RF – 5.5 km – SE, Edumalai RF – 7.4 km – SE, Kurichi malai RF – 4.9 km –	Sattanur RF – 455m – SW, Ragalavadi RF – 4.1km – SW, Kottatur RF – 1.8km – NE, Pulivalam RF – 7.2km – SW, Omandur RF – 4.8km – S, Vellakkalpat RF – 5km – SE, Edumalai RF – 6.9km – SE, Kurichi malai RF – 5.2km – NW, Palamalai RF –

S. No	Particulars	G.O.Ms.No.43	G.O.Ms.No.69	G.O.Ms.No.70	G.O.Ms.No.71	G.O.Ms.No.57
		NW, Palamalai RF – 8.7 km – N and Nakkasalem RF – 7.3 km - NE	– 5.1 km – NW, Palamalai RF – 8.9 km – N and Nakkasalem RF – 7.5 km - NE	malai RF – 5.1km – NW, Palamalai RF – 9.3 km – N and Nakkasalem RF – 7.9km - NE	NW, Palamalai RF – 9.0 km – N and Nakkasalem RF – 7.8km - NE	9.1km – N and Nakkasalem RF – 7.8km - NE
2	Other Industries in the study area	Other leases of Riverways mines and minerals and S.S.Minerals, Ink Factory (2km South), two stone quarries near Perumal hills, Solar power industry, Poultry farm etc are found in the buffer zone.				
3	Nearest major water bodies	Uppar river – 1.1 km – SE, Gundar – 9.3 km - W	Uppar river – 900 m – SE, Gundar – 9.7 km – W	Uppar river –1.4km – SE, Gundar – 9.1 km - W	Uppar river – 1.3km – SE, Gundar Nadi – 9.5km - W	Uppar river –1.4km – SE, Gundar – 9.5 km - W
4	Seismic zone	Area falls in Zone-II (Least Active)				
5	Nearest villages	Kottathur - 360m – E Puthanampatti – 4.5 km – SE Abinimangalam – 4.4 km – S Thinnanur – 8.6 km - SW	Kottathur – 200 m – E Puthanampatti – 4.2 km – SE Abinimangalam – 3.8 km – S Thinnanur – 6.4 km - SW	Kottathur - 730m – NE Puthanampatti – 4.2 km – SE Abinimangalam – 3.7 km – S Thinnanur – 6.1 km - SW	Kottathur - 580m – NE Puthanampatti – 4.5 km – SE Abinimangalam – 4.4 km – S Thinnanur – 8.6 km - SW	Kottathur - 600m – NE Puthanampatti – 3.6 km – SE Abinimangalam – 1.3 km – W Thinnanur – 6.0 km - SW
6	Defence installations	Nil within 10 km radius				
7	Notified Archaeologically important places, Monuments	Nil within 10 km radius				
8	Local Places of Historical and Tourism Interest	Nil within 10 km radius				
9	Environmental sensitive areas, Protected areas as per Wildlife Protection Act, 1972 (Tiger reserve, Elephant reserve, Biospheres, National parks, Wildlife	Nil within 10 km radius				

S. No	Particulars	G.O.Ms.No.43	G.O.Ms.No.69	G.O.Ms.No.70	G.O.Ms.No.71	G.O.Ms.No.57
	sanctuaries, community reserves and conservation reserves)					

11.2.1 Technical Description

A.Technical Description						
sl no	Particulars	G.O.43	G.O.69	G.O.70	G.O.71	G.O.57
1	Extent in Ha	4.75.5	4.90.0	4.75.0	4.80.0	4.75.0
2	Type of land	Eri poramboke land				
3	Exploration	Based on reconnaissance survey, exposures & trial pits				
4a	Total mineable Reserves (T)	28800	20736	29700	42048	36000
4b	Garnet Reserves @ 10% recovery	2880	2074	2970	4205	3600
5a	Peak Production capacity ROM in Tonnes per annum	9000	6912	9750	13814	10800
5b	Garnet production at 10% recovery in Tonnes per annum	900	691	975	1381	1080
6	**Method of mining:** Opencast manual mining method using spades axes & baskets, loading it in to trucks/tippers and transportation. No drilling and blasting involved. Initially, top clayey soil will be removed and dumped temporarily in the earmarked dump site based on the requirement and later spread over backfilled area for reclamation purposes. Mined garnet rich stream sediments (ROM) will be transported to the pre-concentration plant for separation of garnet sand. The waste/mineral reject generated in the plant will be brought back and backfilled in the mined out void. Top soil will be spread over the backfilled area and the mined out pit will be restored back to pre mining condition. After creation of sufficient floor width simultaneous production and backfilling & reclar Removal of Top soil/ clay (0.5m) ↓ Loading of ROM manually in to tippers/trucks ↓ Transportation to mineral pre – concentration plant ↓ Waste from plant will be used for Backfilling the mined out					
7	Ultimate mine depth	2m	2m	2m	2m	2m

8	Waste Generation & management	Since the recovery of ROM is expected to be 10%, the balance 90% reject from the processing plant will be transported back and backfilled in the mined out area. Top soil will be spread over the backfilled area and the mined out pit will be restored back to primining condition.				
9	Grade of Ore	SiO2 – 34% to 38%				
10	Ore end use	Garnet is used as abrasive material in various applications.				
11	Lease period	All the 5 leases are valid upto 05.04.2038.				
12	Project cost (Rs in lakhs)	10.0Lakhs	10.0Lakhs	10.0Lakhs	10.0Lakhs	10.0Lakhs

SLNO	Particulars	G.O.43	G.O.69	G.O.70	G.O.71	G.O.57
B.Project Requirements						
Manpower	The total manpower for all the 5 leases will be about 50 people including common statutory manpower. Besides, scores of people will benefit through allied services like trading, logistics, casual labors or needs, plant operation etc.					
Water Requirement and Source	Total water requirement for all the 5 leases – 8cu.m, Domestic – 2.0cu.m, Dust suppression and Afforestation – 6.0 cu.m. Required water will be procured from outside.					
Power Requirement	No electricity needed for mining operation. The minimum power requirement for office, etc will be met from state grid.					
Site Services	Common site services (for all 5 leases) like mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.					

11.3 EXISTING ENVIRONMENTAL SCENARIO:

11.3.1 GENERAL:

The studies and data collection have been carried out systematically and meticulously as per relevant IS codes, CPCB and MoEF&CC guidelines and as per approved ToR during **Post monsoon Season 2024 (October 2024 to December 2024)** For the purpose of this study, the area has been divided into two zones, namely, core and buffer zones. The combined lease area is considered to be the core zone while the buffer zone encompasses a 10km radius from the periphery of the core zone.

11.3.2 SOCIO-ECONOMIC STATUS:

The buffer zone encompassing 10 km radius from the periphery of core zone consists of 34 rural villages from four Taluks namely Musiri Taluk, Manachanallur Taluk and Thuraiyur Taluk of Trichy district followed by Kunnam Taluk from Perambaur District. The study details based on 2011 census data are highlighted below:

Table 11.3: Social, Economic And Demographic Profile of the Study Area

Details	Population	Percentage
A. Gender-wise distribution		
Male Population	59599	49.66
Female Population	60426	50.34
Total	**120025**	**100**
B. Caste-wise population distribution		
Scheduled Caste	28870	24.05
Scheduled Tribes	500	0.42
Other	90655	75.53
Total	**120025**	**100**
C. Literate and Illiterate population		
Literate Males	44993	37.48
Literate Females	37538	31.28
Total Literate Population	**82531**	**68.76**
Others Males	14606	12.17
Others Females	22888	19.07
Others Population	**37494**	**31.24**
Total	**221595**	**100**
D. Occupational structure		
Main workers	59712	49.75
Marginal workers	6222	5.18
Total Workers	**65934**	**54.93**
Total Non-workers	**54091**	**45.07**
Total	**221595**	**100**

11.3.2.1 SAMPLE SURVEY:

Nearby villages were visited for conducting sample Village survey on all socio-economic aspects and requirements of the people. The existing socio-economic scenario is studied and CER activities are also suggested to the proponent. The study details are given in **Para 3.2.4, Chapter – III**.

11.3.3 EXISTING ENVIRONMENTAL QUALITY:

Table 11.4: Baseline Data

A. Meteorological Data		
Parameters	**Minimum**	**Maximum**
Temperature In ^{0}c	21.7	38.0
Humidity in %	42.3	99.0
Wind speed in km/hr	<1.8	27.7

Predominant wind direction from	NE		
B. Ambient Air Quality Data – 5 Locations			
Parameters	**Core Zone**	**Buffer Zone**	**Limits**
Particulate Matter (Size <10 µm)	42.4-52.1	41.1-60.1	100
Particulate Matter (Size <2.5 µm)	19.5-24.0	18.6-27.6	60
Sulphur Dioxide (as SO_2)	4.6-6.9	4.4-7.8	80
Nitrogen Dioxide (as NO_2)	7.5-9.8	7.2-11.2	80
Conclusion: The existing Ambient Air Quality levels for PM10, PM2.5, SO2 and NO2, are within the NAAQ standards prescribed CPCB limits. The CO values in all the locations were found to be below detectable limit. Silica values in the study area are found to be below detectable limit. (Detection limit – 0.05 mg/m3)			
C. Water Quality – 5 Locations			
pH at 25 ˚C	6.97 - 7.58	**6.5-8.5**	
Total Dissolved Solids, mg/L	440 - 930	**2000**	
Chloride as Cl-, mg/L	94.5 – 415	**1000**	
Total Hardness (as CaCO3), mg/L	278-582	**600**	
Total Alkalinity (as CaCO3), mg/L	115-509	**600**	
Sulphates as SO42-, mg/L	12.6-114	**400**	
Iron as Fe, mg/L	0.04 – 0.09	**0.3**	
Nitrate as NO3, mg/L	1.68 – 3.05	**45**	
Fluoride as F, mg/L	0.32 – 0.56	**1.5**	
Conclusion: The water quality of ground water is found to be within the prescribed Permissible limits of IS: 10500 Norms in the absence of an alternative source as per Drinking Water Specifications.			
D. Noise Levels – 5 Locations			
Parameter	**Core Zone**	**Buffer Zone**	**Limit**
Day Equivalent	47.4	48.1 – 51.4	55
Night Equivalent	39.4	39.3 – 40.5	45
Comparing with the MOEF&CC Norm of 55 dB(A) for day time and 45 dB(A) for night time, the monitored ambient noise levels were within the limit values for Residential areas.			
E. Soil Quality – 5 Locations			
Parameter	**Core Zone**	**Buffer Zone**	
pH	7.19	6.65-6.92	
Electrical Conductivity (µmho/cm)	35.97	70.43-110.2	
Organic matter (%)	0.56	0.64-1.25	
Total Nitrogen (mg/kg)	136	176-522	
Phosphorus (mg/kg)	1.12	0.86-0.98	
Sodium (mg/kg)	872	860-1032	
Potassium (mg/kg)	760	715-1172	
Soil is of clay loam type.			

11.3.4 LAND ENVIRONMENT:

For the present study on land use pattern in the study area, remote sensing satellite data have been used. The area estimated of land use categories around the 10km buffer zone is provided below:

Table 11.5: Land Use in 10Km Buffer Zone

S.No	Landuse Feature	Area (Sq.Km)	Percentage
1	Agriculture/ Plantation	114.13	34.14
2	Fallow Land	128.69	37.45
3	Land Without Scrub	17.59	5.12
4	Water bodies	2.63	0.77
5	Solar Plant / infrastructure	0.77	0.22
6	Reserve Forest & Land With Scrub	69.33	19.25
7	Settlement / infrastructure	10.51	3.06
	Total	343.64	100

From the above table it is seen that 37.45 % of the buffer area is fallow land followed by 34.14 % classified under the Agriculture/ Plantation followed by, 5.12 % constitutes land with scrub and the balance 23.29 % falls under other land use categories.

11.3.5 BIOLOGICAL ENVIRONMENT:

11.3.5.1 Flora:

The lease area is a Eri poramboke land with thorny bushes (Prosophis juliflora), grasses and shrubs only.

Buffer Zone comprise of Seasonal Agricultural land, waste land/barren land & Numerous RF's, Agricultural activities are carried out along the streams / ponds and wherever irrigational facilities area available. Pulses are primarily grown as rain-fed crops. Banana, Paddy, Coconut, Sugar cane, brinjal, cotton, agathileerai and black gram are also carried out in patches.

RFs in the study area, is mostly of scrubby type. Plantation under social forestry scheme with Dalbergia Sp, Neem is developed by Forest Department in most of the RF. Besides, Agave, Accacia Sp., Prosophis, and shrubs are present in these RF.

Only common floristic species are found in the study area. The list of flora in the core and buffer zone is provided in Table No.3.24 and 25, Chapter-III. There are no Rare, Endangered, and Threatened Flora species in the lease and their surrounding study area.

11.3.5.2 Fauna:

There is no Wild Life Sanctuary or National Park within the study area of 10 km. Domesticated animals, are commonly found. From the study it observed that the area in general consists of species of least concern only. No threatened or endemic or endangered species are observed. The area does not form the migratory path of the birds also. List of fauna within the study area is given in Table No – 3.14, Chapter-III.

11.3.6 HYDROLOGICAL STUDY:

As already mentioned, the leases are situated in Government Eri poramboke land (SF no 390(P)). This Kottathur eri covers an area of 102.43 ha with the aiyacut of 94.34 ha mostly in the downstream side. Rainwater from the upstream side originating near the lease area on the north west side from pagalavadi RF and northern side during the monsoon season flows through this eri. Due to elevation difference, this water drains immediately on the down stream south eastern side and further connected to Uppuodai . This eri acts more of a passage of rainwater. Besides, due to less water holding nature and good soil impermeability this eri remains dry for most of the year. Since only shall depth of manual mining will be carried out during non monsoon days, with proper runoff management measures, the drainage of the down stream side can be ensured. Its details are given in Chapter – IV.

Drainage map of the study area and ground water prospects map are given in Figure 3.15 & 3.16 respectively. From the map it is seen that the drainage of the area is of dentric pattern flowing from North, North west to SE. The prospects of water near the streams and ponds are of shall nature ,whereas at away places it is lower.

Well & Borewell inventory carried out the area is given Table 3.15 to 3.16 & contour map interpreted from this is given in Figure3.17 to 3.22. From the study it is seen that the wells in the area are of around 30ft deep and borewells are around 125 to 150feet deep. In the study area, the shallow aquifer is developed through dug wells and deeper aquifer through tube wells. The groundwater has revealed that potential fractures are encountered at deeper levels.

11.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES:

11.4.1 GENERAL:

The identified impacts due to these mines during mining and associated activities have been studied in relation to various environmental components like Air, water, noise, vibration, land, transport etc.

11.4.2 AIR ENVIRONMENT:

The principal sources of air pollution in general due to mining and allied activities are dust generation in the mine due to various activities such as excavation of material, movement of HEMM, loading, unloading and transportation operations.. Besides, Gas emission also occur as a result of emission of SO2, NOx, CO etc., from diesel driven mining equipment, compressors, generator sets, etc.

In case of these mines , the dust or gaseous emission and subsequent impact on air quality is expected to be insignificant due to the following reasons:

- Depth of mining is 2.00 m only (0.50m Top clayey soil + 1.50m ROM Garnet)
- Material is soft and as such no drilling & blasting is involved
- Simple manual system of mining using spades axes & baskets will be the excavation method.
- Total production from all the 5 leases is very less and as such there will be hardly 7 trips /hour of ROM material transportation to the processing plant is involved . The waste material from the plant after recovery of garnet will be transported back in the same vehicle avoiding additional transportation.
- The waste material will be simultaneously re-casted back into the mined out void
- Gaseous emissions like SO2, NOx & CO are controlled from the source itself by using very low sulphur content fuel, using advanced diesel engines to abate NOx & CO emission from the machinery. Besides, due to adoption of manual mining and less production Less fleet of equipment's only is involved.

MITIGATION MEASURES:

Even for controlling the small scale pollution due to road transportation , the following mitigative measures will be ensured:

- ✓ Regular wetting of transport road using mobile water tanker
- ✓ Proper maintenance of haul road and transport road
- ✓ Avoiding overloading of vehicles
- ✓ Covering of loaded vehicles with tarpaulins to avoid spillage during transportation
- ✓ Proper maintenance of transport vehicles to keep the gas emission under check

From the above it could be seen that there may not be adverse impact on air quality due to mining operations in this lease due to small scale subdued activity in the area.

The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model developed by Lakes Environmental Software which is based on steady state Gaussian plume dispersion. Ground Level Concentration (GLC).

The cumulative post project concentration with respect to PM10 is in the range of 52.4 μg/m3 to 61.1 μg/m3 and with respect to PM2.5 are in the range of 24.2μg/m3 to 28.6 μg/m3 which are within the statutory limits in each case.

For preservation of environment in this mine strict enforcement of management schemes will be undertaken for taking corrective actions, as needed. By adopting the effective implementation of all the mitigative measures, no adverse impact on Air quality due to the mining operations in these leases are expected.

11.4.3 WATER ENVIRONMENT:

Total water requirement for all the 5 leases is 8cu.m, Domestic – 2.0 cu.m, Dust suppression and Afforestation – 6.0 cu.m. Required water will be procured from outside..

This being a manual mining in Eri poramboke land for a depth of 2m only in non monsoon dry period, the activity will be more of a desilting work and there will not be any significant impact on the water environment. There will not be any effluent generation or alteration in drainage course or intersection of ground water table or affecting of ground water regime.

Although there will not be any generation of discharge of effluents in to the lease area or drawl of water from it and impact on water environment, Planting vegetation, including trees, along water body edges/bunds and in surrounding areas can help stabilize soil, reduce erosion, and provide natural filtration. Though mining will be carried out in non monsoon days and no water is expected to be present in the area, it is proposed to construct peripheral drain in the overall lease area on

the north west, north side to SE corner to ensure free flow of water if any for the downstream users. By this way no impact on the surface water flow is expected. Mining in this eri will be more of desilting work and it is expected to augment the water holding capacity of the tank further. Besides, periodical Water Quality Monitoring of eri water during water available period monsoon season to ensure that there is no impact on water environment.

11.4.4 NOISE ENVIRONMENT:

Since manual mining of mineral without drilling & blasting is proposed in these leases, apart from movement of few mineral transport vehicles , there are no noise generating source or activity is involved. As such no major noise generation is envisaged. Besides, since the mining operations will be carried out in isolated leases, due to natural attenuation effects, no impact on noise will be felt by the faraway community.

by following mitigative measures for noise control, the impact on noise levels will be insignificant:

- Planting rows of native trees along roads, around eri and other nearby areas to act as acoustic barriers.
- Sound proof operator's cabin for mineral transport vehicles/ tippers.
- Proper and regular maintenance of equipments may lead to less noise generation.
- Providing in-built mechanism for reducing sound emissions.

Further green belt and afforestation will be planned and executed to abate noise and dust propagation in the area.

11.4.4.1. VIBRATION:

There will not be any drilling and blasting operation involved in the mining operation. Hence, vibration due to blasting is not envisaged.

11.4.5 IMPACT ON LAND ENVIRONMENT:

Out of 2.00 m of depth of mining , since the mineral recovery is just 10% of the ROM material removed, the entire 0.50m Top clayey soil + 90% of the reject material will be used for backfilling the mined out area and ultimately the entire lease area will brough back to premining condition. As such no adverse impact on land environment is expected.

11.4.6 BIOLOGICAL ENVIRONMENT:

The leases are in Eri poramboke land which is mostly barren with grasses & thorny shrubs only. As such no major clearance of vegetation is involved.

Since simple shallow manual mining will be carried out no adverse impact on Ambient air quality is envisaged. Necessary mitigative measures like dust suppression, proper maintenance of equipment's, roads will be carried out to prevent dust generation and impact on the surrounding environ. About 1000 trees will be planted in the peripheral eri bund, approach road from the eri periphery to the proposed beneficiation plant area, community plantation in the available lands in the nearby villages in consultation with the panchayat heads and Government officials.

11.4.7 SOCIO ECONOMIC ENVIRONMENT:

Since the lease area is Government land no rehabilitation or resettlement is involved. Total manpower requirement for all the 5 leases will be about 50 people including common statutory manpower.. Besides, on indirect basis through allied opportunities in logistics, trading, repairing works etc. good employment potential will arise in this area, which will provide raising income levels and standards of living in the area through various service related activities connected with the project operations

Towards the socio-economic development of the surrounding area, , the proponent has earmarked totally an amount of Rs.15 Lakhs for all the 5 leases together under Corporate Environmental Responsibility. The activities identified under CER will be implemented in a phased manner in provision of desired facilities in nearby Government Schools.

11.4.8 OCCUPATIONAL HEALTH AND SAFETY ASPECTS:

In order to ensure minimisation of occupational health and safety problems in the project operation, the following preventive remedial measures will be effectively exercised in the project operations, so as to comply with applicable standards.

- Medical examination of workers at pre-entry level stage of workers, etc., by qualified doctors, with periodical examination of all workers/staff at least once a year, as per DGMS circulars.
- Regular awareness campaigns amongst staff and workers

- Staff will be provided with PPE to guard against excess noise levels, Dust generation and inhalation, etc., as per standards prescribed by DGMS.

11.4.9 IMPACT ON LOCAL LOGISTICAL SYSTEM DUE TO PROJECT:

Entire ROM from the mines will be transported to the proponents nearby Beneficiation plant by tractor / trucks. The reject material will be transported back to the mine pit and used for backfilling the mined out voids.

Overall, there will be about 7 trips per hour cumulatively. The existing road can absorb this traffic due to this project. The following mitigative measures are suggested for mitigation of adverse impacts on the logistical aspect of the project:

- ❖ Water sprinkling on material in the transport vehicles before transporting, so that no dust nuisance during transport will arise.
- ❖ Plantation on either side of the transport road in consultation with the concerned department.
- ❖ Proper maintenance of transport roads and vehicles
- ❖ Avoiding overloading of material
- ❖ Covering of loaded vehicles with tarpaulins sheet if warranted.
- ❖ Provision of tyre washing facility at the mine outlet

11.4.10 WASTE MANAGEMENT:

The waste/mineral reject generated in the plant will be brought back and backfilled in the mined out void. Top soil will be spread over the backfilled area and the mined out pit will be restored back to pre mining condition.There is no process effluent generation from both mines. Hence no liquid waste is generated.

ROM Material is inert and non hazardous comprising (10% garnet and 90% silica, clay and silt). Garnet is separated by magnetic separation without any chemical process. Remaining non hazardous and inert ROM will be backfilled. As such no hazardous material is involved.

The hazardous waste generated if any will be stored in a separate storage area with impervious containers for waste oil, oil contaminated clothes, used lead acid batteries, scraps, tyre storage

etc. It will be disposed through authorized recyclers or re-processors periodically. The hazardous wastes will be transported in accordance with the provisions of rules. By effective implementation of above said mitigation measures no major impact due to Hazardous waste is expected.

Single use plastics/ use and throwaway plastics will be banned in the site as directed by the Tamil Nadu Government vide GO(Ms)No.84 regarding ban on use of plastic products. The employees will be encouraged to use compostable material or reusable material.

11.5 ENVIRONMENTAL MONITORING PROGRAMME:

The monitoring schedules are planned for systematic study of various pollution levels with respect to air and water qualities, noise levels, etc. to ensure that they conform to the standards laid down by Environmental Protection Act and various statutory Limits.

Monitoring location and the frequency of monitoring shall be suitably modified in consultation with the nodal agency as per the actual requirements and prevailing conditions of the mine and environmental factors, as dictated from time to time, depending on the prevailing pollution levels, if required.

Towards EMP measures, Rs.11.48 lakhs is allocated under capital cost. Besides, Rs.3.46 lakhs per annum will be spent under recurring cost. All the recurring cost of maintenance of pollution control measures, environmental monitoring etc., will be met from revenue.

Further details of the capital and recurring cost of environmental management have been provided in in Table No. 10.1, Chapter-X.

11.6 ADDITIONAL STUDIES:

This combined draft EIA/EMP report will be submitted for public hearing as per mandatory procedures through the District Collector and State Pollution Control Board officials after giving 30 days advance notice in two local newspapers about the scheduled date and time for conduct of the public hearing procedures. The opinions, concerns and objections of stakeholders will be recorded during the public hearing. All the public queries and the replies to the query by the project proponent and officials concerned will be recorded and incorporated in the EIA/EMP report for approval by SEIAA, Tamil Nadu.

Combined impact of 5 leases in the eri poramboke land is already described in chapter – IV. Apart from these 5 leases, there are 2 more leases of the proponent within 500m radius which are located in patta lands owned bythe applicant.

Since manual shallow depth mining with using spades axes & baskets, loading it in to trucks/tippers for transportation without drilling and blasting will be carried out in all the 7 leases , and the cumulative production involved is also very low, by effective implementation of all the mitigative measures given in the EIA/ EMP report , no significant impact on the surrounding environ is expected on cumulative basis also.

Elaborate description in respect of Risk Assessment and Mine closure plan are given in **Chapter - VII**.

11.7 CONCLUSION:

Simple shallow depth manual mining with less production is expected not to cause significant impact on the surrounding environ due to effective implementation of above said well planned Environmental Management Plan. The environmental management strategy as explained above will prove that industrial growth, if properly planned with all environmental concerns and appropriate remedial measures can go a long way to improve life pattern and living conditions of the local community around the project in the fields of potential employment opportunities, improved per capita income for local people, improved social welfare facilities in respect of education facilities, etc. in its own way and also revenue to Government through royalty, taxes etc.

* * * * * * * * *

CHAPTER - XII

DISCLOSURE OF CONSULTANTS ENGAGED

CHAPTER 12

DISCLOSURE OF CONSULTANTS ENGAGED

Creative Engineers & Consultants, Chennai is an **NABL** accredited testing laboratory and **NABET** accredited EIA consultancy. Established over 25 years ago, this company has steadily made good strides in the environmental impact assessment fields, and is also one of the first companies to get accredited by NABET as an Accredited Consultant Organization as early as 2011. Creative Engineers & Consultants has to its credit, successful completion of numerous EIA/EMP reports, grant of environmental clearances and periodic environmental monitoring works. Presently, the company has been accredited by NABET as a 'Category-A' organization for the sectors of Mining of Minerals (opencast only), Thermal Power Plants, Mineral Beneficiation and Cement Plants with the accreditation valid upto 23.12.2026. The team of experienced professionals that are a part of this organization has been detailed below.

Figure 12.1: Disclosure of consultants engaged

EXPERT NAME	QUALIFICATION	POSITION	EXPERIENCE
Mr. P. Giri	AMIE (Mining)	EIA Coordinator & Functional area Expert (AP,NV,HW),	Over 30 years of experience in EIA/EMP report, mine plan preparation, including modeling
Mr. K. Shankar	M.Sc (Geology). PGMEMG	Functional area Expert (GEO, HG, SHW, RH) & IBM approved RQP.	Over 25 years of experience in EIA/EMP report, Mine plan, hydrological report preparation
Mr.S.S.Rajendran	M.Sc. (Pharmaceutical Chemistry)	Lab head	More than 9 years of experience in Environmental laboratory.
Mr. R. Babu raj	M.A (Sociology), B.Com(Y.L&Cost), ITI, Advance Diploma in Computer application	Functional Area Expert (Socio Economy)	Over 15 years of experience in dispersion modeling, computer applications. Specialized in CAD and computer software, applications. 5 years experience in the field of socio economy and its allied report preparation.
Mr. B. Govindaraman	B.Sc.	Field technician	Over 20 years of field monitoring & data collection experience

EXPERT NAME	QUALIFICATION	POSITION	EXPERIENCE
Dr.B.Swamynathan	M.Sc (Ecology & Environmental Sciences), M.Phill (Botany), Ph.D (Ecology & Environmental Sciences)	EIA Coordinator & Functional Area Expert (EB,SC,LU&AP)	More than 12 years of experience in Environment and allied fields.
Ms. G. Sandhya	B. Tech Chemical Engineering M.Tech Environmental Engineering	EIA Coordinator & Functional Area Expert (AQ&WP)	Over 6 years experience in preparation of EIA/EMP reports

* * * * * * * *