DRAFT ENVIRONMENTAL IMPACT ASSESSMENT
&
ENVIRONMENT MANAGEMENT PLAN

"VIOLATION" CATEGORY – MAJOR MINERAL – NON-FOREST LAND – CAPTIVE USE

SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES

S.F.Nos - 693/1, 2, 3, 4 & 7, Sirugudi Village, Natham Taluk, Dindigul District

EXTENT – 1.70.0 ha (Patta Land)

Available Mineable Reserves = 74,277 tonnes (ROM)

Five Year Mining Plan Period = 66,383 tonnes (ROM)

(As per MMDR Amendment Act 2015, the period of Mining Lease is 50 years from grant of Mining Lease)

Lease Period = 1996 to 2046 & Review of Mining Plan Period = 2020-21 to 2024-25

Project Proponent

M/s. Sivam Mines,

Represented By – Thiru. S.Ilangovan (Managing Partner)
6/209, Main Road, Sirugudi Post,
Natham (Tk), Dindigul District

Submitted for

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

Complied as per TOR vide
Lr No. SEIAA–TN/F.No.6251/TOR-419/2018 Dated 22.05.2018
Extension of ToR obtained vide
Letter No. SEIAA-TN/F.No.6251/TOR-419/Extn/2018 Dated: 21.12.2022
(ToR Valid upto 21.05.2023)

Environmental Consultant
GEO EXPLORATION AND MINING SOLUTIONS
Old No. 260-B, New No. 17,
Advaitha Ashram Road, Alagapuram,
Salem – 636 004, Tamil Nadu, India
Accredited for sector 1 Cat 'A', sector 31 & 38 Cat 'B'
Certificate No : NABET/EIA/2225/RA 0276
Phone: 0427-2431989,
Email: infogeoexploration@gmail.com
Web: www.gemssalem.com

Laboratory
EHS 360 LABS PRIVATE LIMITED,
10/2 Ground floor, 50th street, 7th Avenue,
Ashok Nagar, Chennai – 600 083.

Baseline Monitoring Period

October 2023 to December 2023

JUNE 2024

TABLE OF CONTENTS

1. INTRODUCTION 1

1.0 PREAMBLE 1
1.1 PURPOSE OF THE REPORT 4
1.2 IDENTIFICATION OF THE PROJECT AND PROJECT PROPONENT: 4
1.2.1 IDENTIFICATION OF THE PROJECT 4
1.2.2 IDENTIFICATION OF THE PROJECT PROPONENTS 5
1.2.3 PROJECT CONSULTANTS: 5
1.3 GENERAL INFORMATION ON MINING OF MINERALS 6
1.4 ENVIRONMENTAL CLEARANCE 6
1.5 BRIEF DESCRIPTION OF THE PROJECT: 8
1.5.1 PROJECT NATURE, SIZE & LOCATION 8
1.5.2 SIZE OF THE PROJECT 8
1.5.3 PAST PRODUCTION DETAILS TABLE 9
1.6 NEED OF THE PROJECT AND IMPORTANCE TO THE COUNTRY AND REGION 9
1.7 REGULATORY COMPLIANCE 11
1.8 SCOPE OF THE STUDY: 11
1.8.1 DATA GENERATION AND COLLECTION 12
1.9 TERMS OF REFERENCE 14
1.10 ENVIRONMENTAL POLICY 21
1.10.1 POST ENVIRONMENT CLEARANCE MONITORING 22
1.10.2 TRANSFERABILITY OF ENVIRONMENTAL CLEARANCE 22
1.11 GENERIC STRUCTURE OF EIA DOCUMENT 22

2. PROJECT DESCRIPTION 25

2.0 GENERAL: 25
2.1 LOCATION OF THE PROJECT 25
2.2 LEASE HOLD AREA 31
2.3 REGIONAL GEOLOGY:- 35
2.3.1 LOCAL GEOLOGY 35
2.4 QUALITY OF RESERVES 38
2.4.1 CALENDAR PROGRAM FOR ORE AND WASTE RATIO 39
2.5 METHOD OF MINING AND PROCESS DESCRIPTION. 40
2.5.1 EXTENT OF MECHANIZATION: 40
2.5.2 DRILLING AND BLASTING: 40
2.5.3 STORAGE OF EXPLOSIVES: 41
2.5.4 HANDLING OF TOP SOIL 41
2.5.5 WASTE MANAGEMENT 41
2.5.5 GREEN BELT DEVELOPMENT 41
2.5.6 RECLAMATION AND REHABILITATION 42
2.6 GENERAL FEATURES. 42
2.6.1 DRAINAGE PATTERN. 42
2.6.2 TRAFFIC DENSITY: 42
2.6.3 MINERAL BENEFICIATION AND PROCESSING. 43
2.6.4 POWER, WATER SUPPLY AND OTHER INFRASTRUCTURE REQUIREMENT 43
2.6.5 WATER SOURCE & REQUIREMENT 43
2.6.6 POWER SUPPLY 44
2.6.7 FUEL DETAIL 44
2.7 EMPLOYMENT POTENTIAL: 44
2.8 PROJECT IMPLEMENTATION SCHEDULE 45
2.8.1 POST MINING LAND USES: 45
2.8.2 PROJECT COST 45

3.DESCRIPTION OF ENVIRONMENT 46
3.0 GENERAL 46
3.1 LAND ENVIRONMENT 49
3.1.1 METEOROLOGY. 49
3.1.2 METEOROLOGICAL DATA RECORDED AT SITE 49
3.1.3 LAND USE/ LAND COVER: 50
3.1.4 DESCRIPTION OF LAND USE 50
3.1.5 ENVIRONMENTAL FEATURES IN THE STUDY AREA 53
3.1.6 TOPOGRAPHY: 54
3.1.7 DRAINAGE PATTERN OF THE AREA. 54
3.1.8 SEISMIC SENSITIVITY 54
3.1.9 SOIL CHARACTERISTICS: 56
3.1.10 SOIL STATUS 60
3.2 WATER ENVIRONMENT: 60
3.2.1 SURFACE WATER: 60
3.2.2 GROUND WATER CONDITIONS: 60
3.2.3 WATER ANALYSIS LOCATIONS 63
3.3 AIR ENVIRONMENT: 68
3.3.1 SELECTION OF AIRQUALITY MONITORING STATIONS LOCATIONS 68
3.3.2 SITE SPECIFIC METEOROLOGY 69
3.3.3 CLIMATOLOGY: 69
3.3.4 AMBIENT AIR QUALITY 70
3.3.5 PERIOD OF STUDY 72
3.3.6 INSTRUMENTS USED FOR SAMPLING & ANALYSIS 72
3.3.7 SAMPLING AND ANALYTICAL TECHNIQUES 72
3.3.8 AIR QUALITY MODELLING 88
3.3.9 OBSERVATIONS OF RESULTS 94
3.4 NOISE ENVIRONMENT 96
3.5 BIOLOGICAL ENVIRONMENT 101
3.5.1 OBJECTIVE OF THE STUDY 101
3.5.2 STUDY APPROACH & METHODOLOGY ADOPTED 101
3.5.3 SAMPLING METHODOLOGY 101
3.5.4 FLORA & FAUNA AT THE STUDY AREA 102
3.5.4 FLORA & FAUNA AT THE STUDY AREA 102
3.6 SOCIO-ECONOMIC ENVIRONMENT 105
3.6.1 OBJECTIVES 105
3.6.2 METHODOLOGY ADOPTED FOR THE STUDY 105
3.6.3 DESCRIPTION OF THE STUDY AREA 106
3.6.4 POPULATION OF THE STUDY AREA 108
3.6.5 LITERACY: 108
3.6.6 WORKERS OCCUPATIONAL PATTERN IN THE STUDY AREA: 108
3.6.7 EDUCATIONAL FACILITIES 109
3.6.8 HEALTH AND MEDICAL FACILITIES 110
3.6.9 SUMMARY OF THE BASELINE STATUS: 111
4. ANTICIPATED ENVIRONMENT IMPACT AND ITS MITIGATION MEASURES 112
4.0 GENERAL 112
4.1 LAND ENVIRONMENT: 113
4.2 WATER ENVIRONMENT 114
4.3 AIR ENVIRONMENT 115
4.4 NOISE ENVIRONMENT 116
4.5 BIOLOGICAL ENVIRONMENT 116
4.6 SOCIO ECONOMIC ENVIRONMENT 117

4.7 WASTE MANAGEMENT AND MITIGATION MEASURES. 118
4.8 MINE CLOSURE AND MITIGATION MEASURES 119
5. ANALYSIS OF ALTERNATIVE (TECHNOLOGY & SITE) 120
5.0 INTRODUCTION: 120
5.1 ANALYSIS OF ALTERNATIVE TECHNOLOGY 120
6.ENVIRONMENTAL MONITORING PROGRAMME 121
6.1 INTRODUCTION 121
6.2 ENVIRONMENTAL MONITORING CELL 122
6.3 OCCUPATIONAL HEALTH AND SAFETY: 125
6.4 BUDGETARY PROVISION FOR EMP 125
7. ADDITIONAL STUDIES 127
7.0 PUBLIC CONSULTATION: 127
7.1 RISK ASSESSMENT 127
7.1.1 OBJECTIVES OF RISK ASSESSMENT 127
7.1.2 METHODOLOGY OF RISK ASSESSMENT: 127
7.1.3 DISASTER MANAGEMENT PLAN: STRUCTURE 130
7.1.4GENERAL RESPONSIBILITIES OF EMPLOYEES DURING AN EMERGENCY 130
7.2 RECLAMATION AND REHABILITATION 130
8. PROJECT BENEFITS 131
8.1 GENERAL 131
8.2 PROJECT BENEFITS 131
8.3 BENEFITS TO LOCAL AND REGIONAL ECONOMY 132
8.4 EMPLOYMENT POTENTIAL 132
8.5 TANGIBLE SOCIAL BENEFITS 133
9. ENVIRONMENTAL COST BENEFIT ANALYSIS. 134
10. ENVIRONMENT MANAGEMENT PLAN 135
10.0 GENERAL 135
10.1 AIR POLLUTION MANAGEMENT AND CONTROL 135
10.2NOISE AND VIBRATION MITIGATION: 136
10.3WATER MANAGEMENT & POLLUTION CONTROL 137
10.4 LAND RECLAMATION AND WASTE MANAGEMENT 138
10.5BIOLOGICAL ENVIRONMENT 139
10.6OCCUPATIONAL HEALTH SAFETY 140
10.7 BUDGETARY PROVISION FOR ENVIRONMENTAL MANAGEMENT PLAN 141
10.8 CONCLUSION – 141
11. SUMMARY AND CONCLUSIONS 142
12.0 DISCLOSURE OF CONSULTANTS ENGAGED 144
13. ASSESSMENT OF ECOLOGICAL DAMAGE, REMEDIATION PLAN AND NATURAL AND COMMUNITY RESOURCE AUGMENTATION PLAN 148
13.0 BACKGROUND OF THE PROJECT 148
13.1 METHOD OF MINING 150
13.2 BASED ON SITE SPECIFIC FEATURES AND NATURE OF MINING INVOLVED, THE FOLLOWING ARE ADDRESSED IN THIS CHAPTER 150
13.3 SCALE OF DAMAGE / ECOLOGICAL DAMAGE ASSESSMENT – 152

LIST OF TABLES

TABLE 1.1: IDENTIFICATION OF THE PROJECT 5

TABLE 1.2: SALIENT FEATURES OF THE PROJECT AND SITE 8

TABLE 1.3: RESOURCES AND RESERVES 8

TABLE 1.4: PRODUCTION DETAILS 9

TABLE 1.5: PRODUCTION OF LIMESTONE IN INDIA, TAMIL NADU &DINDIGUL 10

TABLE 1.6: STATUTORY APPROVALS 11

TABLE 1.7: REGULATORY SCOPING CARRIED OUT FOR EIA AS PER TOR 12

TABLE 2.1: LOCATION DETAILS 31

TABLE 2.2: EXTERNAL INFRASTRUCTURES 31

TABLE 2.3: NEAREST SURFACE FEATURES 31

TABLE 2.4: NEAREST WATER BODIES WITHIN 10KM RADIUS 31

TABLE 2.5: EXPLORATION AND CHEMICAL ANALYSIS DETAILS 38

TABLE 2.6 MINERAL RESERVES AS PER UNFC CLASSIFICATION 38

TABLE 2.7: SUMMARY OF YEAR WISE 39

TABLE 2.8: LIST OF MACHINERIES 40

TABLE 2.9: DRILLING AND BLASTING 40

TABLE 2.10: DISPOSAL OF WASTE 41

TABLE 2.11: LAND USE PATTERN OF THE LEASE AREA 42

TABLE 2.12: TRAFFIC DENSITY 43

TABLE 2.13: WATER REQUIREMENT 44

TABLE 2.14: EMPLOYMENT POTENTIAL 45

TABLE 2.15 PROJECT IMPLEMENTATION SCHEDULE 45

TABLE 2.16 PROJECT COST 45

TABLE 3.1: ENVIRONMENTAL MONITORING ATTRIBUTES AND FREQUENCY 47

TABLE 3.2: LAND USELAND COVER TABLE 10KM RADIUS 50

TABLE 3.3: ENVIRONMENTAL SETTINGS OF THE STUDY AREA 53
TABLE 3.4: DETAILS OF SOIL MONITORING STATIONS 56
TABLE 3.5: SOIL QUALITY MONITORING DATA 59
TABLE 3.6: WATER SAMPLING LOCATIONS 63
TABLE 3.7: WATER QUALITY DATA 67
TABLE 3.8: AMBIENT AIR QUALITY MONITORING STATIONS 68
TABLE 3.9: LAST FIVE YEARS RAINFALL DATA 69
TABLE 3.10 AMBIENT AIR MONITORING INSTRUMENTS:– 72
TABLE 3.11 TESTING METHOD FOLLOWED FOR AMBIENT AIR QUALITY:– 72
TABLE 3.12: AMBIENT AIR QUALITY – AAQ1 74
TABLE 3.13: AMBIENT AIR QUALITY – AAQ2 75
TABLE 3.14: AMBIENT AIR QUALITY – A3 76
TABLE 3.15: AMBIENT AIR QUALITY – AAQ4 77
TABLE 3.16: AMBIENT AIR QUALITY – AAQ5 78
TABLE 3.17: AMBIENT AIR QUALITY – AAQ6 79
TABLE 3.18: AMBIENT AIR QUALITY – AAQ7 80
TABLE 3.19: AMBIENT AIR QUALITY – AAQ8 81
TABLE 3.20: AMBIENT AIR QUALITY – AAQ9 82
TABLE 3.21: AMBIENT AIR QUALITY – AAQ10 83
TABLE 3.22: AMBIENT AIR QUALITY – AAQ11 84
TABLE 3.23: ABSTRACT OF AMBIENT AIR QUALITY DATA – AAQ1& AAQ2 85
TABLE 3.24: ABSTRACT OF AMBIENT AIR QUALITY DATA – AAQ3 & AAQ4 85
TABLE 3.25: ABSTRACT OF AMBIENT AIR QUALITY DATA – AAQ5& AAQ6 86
TABLE 3.26: ABSTRACT OF AMBIENT AIR QUALITY DATA – AAQ7& AAQ8 86
TABLE 3.27: ABSTRACT OF AMBIENT AIR QUALITY DATA – AAQ9& AAQ10 87
TABLE 3.28: ABSTRACT OF AMBIENT AIR QUALITY DATA – AAQ 11 87

TABLE 3.29: EMISSION SOURCE 89
TABLE 3.30: EMISSION RATES FOR HEAVY DUTY VEHICLES (AVERAGE) 91
TABLE 3.31: EXPECTED GROUND LEVEL CONCENTRATIONS 92
TABLE 3.32: NOISE LEVEL MONITORING DONE IN THE LOCATION 96
TABLE 3.33: AMBIENT NOISE LEVELS 100
TABLE 3.34: FLORA IN THE CORE ZONE (ML Area) 102
TABLE 3.35: FLORA IN THE BUFFER ZONE 102
TABLE 3.36: FAUNA IN THE CORE ZONE (ML Area) 103
TABLE 3.37: FAUNA IN THE BUFFER ZONE 103
TABLE 3.38: DEMOGRAPHY PROFILE OF THE STUDY AREA 107
TABLE 3.39: OCCUPATIONAL PATTERN OF THE AREA 109
TABLE 3.40: EDUCATION FACILITIES IN THE STUDY AREA 109
TABLE 3.41: MEDICAL FACILITIES IN THE STUDY AREA 110
TABLE 4.1: WATER REQUIREMENT 114
TABLE 4.2 IDENTIFIED CSR ACTIVITIES 118
TABLE 6.1: PROPOSED ENVIRONMENTAL MONITORING PROGRAM 121
TABLE 6.2: ENVIRONMENTAL MONITORING PROGRAM PROPOSED 123
TABLE 6.3 ENVIRONMENT MONITORING BUDGET 126
TABLE 7.1: ANALYSIS OF CAUSES AND CONTROL MEASURES 129
TABLE 10.1: AIR POLLUTION MANAGEMENT AND CONTROL 135
TABLE 10.2: NOISE AND VIBRATION MITIGATION 136
TABLE 10.3: RECOMMENDED SPECIES TO PLANT IN THE GREENBELT 139
TABLE 10.4: GREENBELT DEVELOPMENT PLAN 139
TABLE 10.5: EMP BUDGET 141
TABLE 13.1: DAMAGE DUE TO CHANGE IN LAND USE / LAND COVER 152
TABLE 13.2: ENVIRONMENTAL SAFEGUARDS SUPPOSED TO BE IMPLEMENTED 154

TABLE 13.3: DAMAGE DUE TO NON-IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT MEASURES 156

TABLE 13.4: TOTAL DAMAGE COST 161

TABLE 13.5: REMEDIATION PLAN WITH ACTION PLAN SPECIFIC TO THE REGION ALONG WITH BUDGET 161

TABLE 13.6: YEAR WISE SUMMARY OF REMEDIATION PLAN WITH COST 162

TABLE 13.7: NATURAL RESOURCE AUGMENTATION PLAN SPECIFIC TO THE REGION ALONG WITH ACTION PLAN 162

TABLE 13.8: THE COMMUNITY RESOURCES DEVELOPMENT PLAN SPECIFIC TO THE REGION ALONG WITH ACTION PLAN 162

TABLE 13.9: SUMMARY OF AMOUNTS WHICH WILL BE SPENT FOR REMEDIATION PLAN, NATURAL RESOURCE AUGMENTATION PLAN AND COMMUNITY RESOURCE AUGMENTATION PLAN 163

LIST OF FIGURES

FIGURE 2.1: LOCATION MAP OF THE PROJECT AREA WITH CO ORDINATES 26

FIGURE 2.2: DIGITIZED LOCATION MAP ON THE GEO REFERENCED TOPOSHEET (10Km RADIUS) 27

FIGURE 2.3: DIGITIZED LOCATION MAP ON THE GEO REFERENCED TOPOSHEET (5KM RADIUS) 28

FIGURE 2.4: LOCATION MAP COVERING 2KM RADIUS 29

FIGURE 2.5: LOCATION MAP COVERING 1KM RADIUS 30

FIGURE 2.6: TOPOGRAPHICAL VIEW OF LEASE AREA 32

FIGURE 2.7: MINE LEASE AREA COVERING WITH 300M AND 500M RADIUS 33

FIGURE 2.8: SURFACE PLAN OF MINE LEASE AREA 34

FIGURE 2.9: GEOLOGY MAP OF THE AREA COVERING 10 km RADIUS 36

FIGURE 2.10: GEOLOGICAL PLAN AND SECTIONS OF MINE LEASE AREA 37

FIGURE 2.11: YEAR WISE PLAN 39

FIGURE 3.1: BASE MAP OF THE STUDY AREA 48

FIGURE 3.2: LAND USE LAND COVER MAP OF THE STUDY AREA (10KM RADIUS) 51

FIGURE 3.3: PIE DIAGRAM OF LAND USE LAND COVER 52

FIGURE 3.4: DRAINAGE MAP OF THE STUDY AREA COVERING 10KM RADIUS 55

FIGURE 3.5: SOIL SAMPLES COLLECTION LOCATION MAP 57

FIGURE 3.6: SOIL MAP OF THE STUDY AREA 58

FIGURE 3.7: DISTRICT GROUND WATER LEVEL CHART 61

FIGURE 3.8: GROUND WATER PROSPECTS OF THE STUDY AREA 62

FIGURE 3.9: WATER QUALITY MONITORINGLOCATIONS 65

FIGURE 3.10: WATER SAMPLE COLLECTION IN MINE PITAND PUBLIC WATER TANK 66

FIGURE 3.11: WIND ROSE DIAGRAM 70

FIGURE 3.12: AMBIENT AIR QUALITY MONITORING PHOTOS 70

FIGURE 3.13: AIR QUALITY MONITORING LOCATION MAP 71

FIGURE 3.14 TERRAIN MAP OF THE STUDY AREA 89

FIGURE 3.15: PM_{10} -24 HOUR AVERAGE 91

FIGURE 3.16: $PM_{2.5}$ -24 HOUR AVERAGE 91

FIGURE 3.17: NO_X – 24 HOUR AVERAGE 92

FIGURE 3.18: NOISE LEVEL MONITORING PHOTOS 98

FIGURE 3.19: NOISE MONITORING LOCATION MAP 99

FIGURE 3.20: OCCUPATIONAL PATTERN OF THE STUDY AREA 109

FIGURE 3.21 BAR DIAGRAM SHOWING THE MEDICAL FACILITIES 110

FIGURE 6.1 ENVIRONMENTAL MONITORING CELL STRUCTURE 122

FIGURE 7.1 LAYOUT OF RISK ASSESSMENT 128

FIGURE 10.1: WATER SPRINKLING ON HAUL ROADS 136

FIGURE: 10.2 DUMP DESIGN 138

FIGURE10.3: PERSONAL PROTECTIVE EQUIPMENT TO THE MINE WORKERS 140

LIST OF ANNEXURES

ANNEXURE I	COPY OF TOR ……...	169-191
ANNEXURE II	COPY OF PROCEEDINGS……	192-193
ANNEXURE III	COPY OF LAST PERMIT ISSUED BY THE DEPT. OF GEOLOGY AND MINING, SALEM…….	194-195
ANNEXURE IV	APPROVED REVIEW OF MINING PLAN WITH APPROVAL LETTER ……..	196-325
ANNEXURE V	BASELINE STUDIES…….	326-531
ANNEXURE VI	COPY OF NABET CERTIFICATE ……...	532

1. INTRODUCTION

1.0 PREAMBLE

Environmental Impact Assessment (EIA) study is a process, used to identify the environmental, social and economic impacts of a project prior to decision-making. It is a decision making tool, which guides the decisionmakers in taking appropriate decisions for proposed projects. It aims predicting environmental impacts at an early stage of project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options to decision makers. By using EIA, both environmental and economic benefits can be achieved. EIA systematically examines both beneficial and adverse consequences of the proposed project and ensure that these impacts are taken into account during the project designing.

The Ministry of Environment & Forests, Government of India, made environmental clearance (EC) for certain development projects mandatory through its notification of 27th January 1994 under the Environment Protection Act, 1986. Keeping in view of the experience gained in environmental clearance process over a period of one decade, the MoEF&CC came out with Environmental Impact Notification, S.O. 1533 (E), Dated: 14th September 2006. The notification has been amended from time to time. It has been made mandatory to obtain environmental clearance for different kinds of development projects (Schedule-1 of notification). But, there was no provision of Environmental Clearance for Major Mineral < 5 ha category.

Initially, the mining lease for limestone mining was granted to Thiru. S.Asaialangaram, Dindigul District vides G.O. Ms.No. 1691, Dated: 04.12.1982 for a period of 3 years28.02.1983 to 27.02.1986. The lease was first renewed for a period of 10 years with effect from 28.02.1986 to27.02.1996 vides G.O.Ms. No.1439/Inds, Dated: 13.12.1990.

Second renewal was granted vide G.O.(3D).No.83, Industries (MMA2) Department, Dated:09.10.1996 for a period of 20 years from 28.02.1996 to 27.02.2016 and the lease deed was executed on 17.01.1997.

Then the lease was transferred to M/s. Sivam Mines., 6/209, Main Road, Sirugudi Post, Natham (Tk), Dindigul District vide G.O.(D) No.173 Industries (MMA1) Department, Dated: 05.11.2014.

Now, as per MMDR Amendment Act 2015, the validity of lease period is extended upto 31.03.2030 and the Modified Mining Plan & Progressive Mine Closure Plan was prepared by RQP and Approved by Regional Controller of Mines, Indian Bureau of Mines, Chennai vide Letter No. TN/DGL/MP/LST-1969-MDS Dated: 30.03.2016 (Mining Plan Period – 2015 – 16 to 2019 – 20).

As on the date of MoEF & CC Notification S.O. 804 (E) Dated: 14.03.2017, the project had no Environmental Clearance and it was clearly communicated by order to apply for environmental clearance under this notification. Therefore, the project proponent applied for environmental clearance vide online proposal no. IA/TN/MIN/64263/2017 Dated: 29.04.2017.

MoEF & CC vide notification S.O. 1030 (E) Dated: 08.03.2018, notified that violation projects of Category B –the appraisal and approval thereof shall vest with the State or Union territory level Expert Appraisal Committees and State or Union territory Environment Impact Assessment Authorities in different States and Union territories, constituted under sub-section (3) of section 3 of the Environment (Protection) Act, 1986.

Therefore, the online proposal was transferred to SEIAA – TN vides online proposal number SIA/TN/MIN/23073/2018Dated 03.04.2018 and accepted by SEIAA on 11.07.2018.

ToR was issued vide Lr.No.SEIAA-TN/F.No.6251/TOR-419/2018 Dated: 22.05.2018.

Proponent applied for the extension for the existing ToR vide online proposal No SIA/TN/MIN/268968/2022 Dated 21.04.2022. The proposals were considered in 335th SEAC – TN Meeting held on 06.12.2022 and issued Terms of Reference (ToR) vide Lr.No.SEIAA-TN/F.No.6251/TOR-419/Ext/2018 Dated: 21.11.2022, The validity of the Terms of Reference is upto **21.05.2023.**

Again, the proposal was placed as TA in 392nd SEAC Meeting held on 14.07.2023 and committee recommended to grant of Environmental Clearance. Subsequently, based on the SEAC recommendation, the proposal was placed in 642nd SEIAA meeting held on 31.07.2023 asked for additional details.

After submitting the details, the proposal was placed in 440th SEAC meeting held on 11.01.2024 and committee decided to modify the earlier recommendation made by the committee in 392nd SEAC meeting held on 14.07.2023 as:

- Project proponent and the EIA coordinator must submit an explanation for submitting the EIA report without conducting Public Hearing.

- The PP should complete the public hearing and rework the remediation plan as per CPCB guidelines and resubmit the document.

Even though there is no provisions to extent the validity of earlier issued Terms of Reference beyond 4 years, in order to proceed further and bring the proponent under the ambit of EIA Notification, 2006 by regulating the past violations committed, the committee decided that

- SEIAA may write a letter to TNPCB to consider the above-mentioned cases as a special case and shall be requested to conduct public hearing as per the procedure laid down in EIA Notification, 2006 with the updated baseline data along with EIA Report and the same shall be completed within one year from the date of issue of letter.

The proposal was placed in 697th SEIAA meeting held on 15.02.2024 and authority decided that the Member Secretary, SEIAA shall write a letter to TNPCB to consider the above-mentioned cases as a special case and shall be requested to conduct public hearing as per the procedure laid down in EIA Notification, 2006 with the updated baseline data along with EIA Report and the same shall be completed within one year from the date of issue of letter.

In the view of above, Authority decided to request the Member Secretary, SEIAA to communicate the minutes to the project proponent.

As per Gazette Notification S.O. 3977 (E) of 14th August 2018, Mining Projects are classified under two categories i.e. A (> 100 Ha) and B (< 100 Ha), Category-A projects (including expansion and modernization of existing projects) require Environmental Clearance from Central Government (Ministry of Environment, Forests and Climate Change, Government of India, New Delhi) while Category–B projects are considered by State Level Environmental Impact Assessment Authority (SEIAA), constituted by MoEF&CC, New Delhi. If incase, any Category "B" project attracts the "General Condition" given in the EIA Notification, it shall be treated as Category "A" and will be considered at MoEF&CC, New Delhi.

Which in turn redirects to parent notification where there is no categorization of category < 5 ha, and no public hearing clause attracts this category of projects below 5 ha.

This EIA report is prepared for Sirugudi Limestone Mine of M/s. Sivam Mines – Extent 1.70.0 ha with proposed capacity of 42,979 tonnes (ROM + Topsoil) at S.F. No. 693/1, 2, 3, 4 & 7in Sirugudi Village, Natham Taluk, Dindigul District and Tamil Nadu State. The project falls under category "B" and requires Environmental Clearance from SEIAA Tamil Nadu.

1.1 PURPOSE OF THE REPORT

The sole purpose of the Environmental Impact Assessment report is to assess the beneficial and adverse impacts of the project on the existing environmental systems and to propose appropriate pollution control measures to ensure a secure, hale and healthy environment.

Thus the report is a presentation of environmental consequences of the project activity so that all the factors are considered tactfully in eventually claiming a decision. The main objectives are described as follows:

- Evaluation of current level of pollution (air, soil, water & noise) in and around the mine under the existing conditions
- Assessment of existing Environmental Status of Water, Air, Flora, Fauna, Demography and Land use pattern.
- Suggested measures, recommendations for pollution control, monitoring equipment's and organizational set up for maintenance of pollution control.

The ToR was issued by SEIAA – TN for preparation of Environmental Impact Assessment report (EIA) and Environmental Management Plan EMP along with Ecological Damage Assessment, Remediation Plan, Natural Resource Augmentation Plan and Community Resource Augmentation Plan.

The proponent has engaged M/s. Geo Exploration & Mining Solutions an Accredited Organization under Quality Council of India – National Accreditation Board for Education & Training, New Delhi for preparation of Environmental Impact Assessment and Environmental Management Plan Report for obtaining Environmental Clearance from SEIAA Tamil Nadu.

1.2 IDENTIFICATION OF THE PROJECT AND PROJECT PROPONENT:

1.2.1 IDENTIFICATION OF THE PROJECT

Initially, the mining lease for limestone mining was granted to Thiru. S.Asaialangaram, Dindigul District vides G.O. Ms.No. 1691, Dated: 04.12.1982 for a period of 3 years28.02.1983 to 27.02.1986. The lease was first renewed for a period of 10 years with effect from 28.02.1986 to27.02.1996 vides G.O.Ms. No.1439/Inds, Dated: 13.12.1990.

Second renewal was granted vide G.O.(3D).No.83, Industries (MMA2) Department, Dated: 09.10.1996 for a period of 20 years from 28.02.1996 to 27.02.2016 and the lease deed was executed on 17.01.1997.

Then the lease was transferred to M/s. Sivam Mines., 6/209, Main Road, Sirugudi Post, Natham (Tk), Dindigul District vide G.O.(D) No.173 Industries (MMA1) Department, Dated: 05.11.2014.

TABLE 1.1: IDENTIFICATION OF THE PROJECT

Description	Details
S.F.No's	693/1, 2, 3, 4 & 7
Extent& Classification	1.70.0 ha Patta
Village, Taluk, District	Sirugudi Village, Natham Taluk, Dindigul District
Latitude Between	N 10° 14.486'to N 10° 14.595
Longitude Between	E 78° 17.700'toE 78° 17'809'
MSL	229
Average Proposed Production	5115 tonnes per annum of Limestone @ 60% Recovery
Proposed Depth of Mining	17 m bgl (2 m Topsoil + 15 m Limestone)
Dip	80° NW
Strike	N 60° E – S 60° W
Existing Pit Dimension	113 m (L) * 75 m (W) * 14 m (D) – Pit 1 45 m (L) * 20 m (W) * 12 m (D) – Pit 2

Source: Approved Mining Plan

1.2.2 IDENTIFICATION OF THE PROJECT PROPONENTS

Name and address of the proponents

Name of the lessee	:	M/s. Sivam Mines
Address	:	6/209, Main Road, Sirugudi Post, Natham (Tk), Dindigul District,
District	:	Dindigul
State	:	Tamil Nadu
Pin code	:	624 404
Mobile No	:	+91 94430 67632
Email id.	:	ilangovanmadhavi4.9@gmail.com

M/s. Sivam Mines is partnership firm. Thiru. S.Asaialangaram, Thiru. S. Ilangovan, Thiru.I.Vijay Alangar and Selvi. I.Sempon Manickam are partners and Thiru. S. Ilangovan is the Managing Partner of the firm (Partnership Deed Enclosed as Annexure Volume 1).

1.2.3 PROJECT CONSULTANTS:

Name and address of the Consultant:

M/s. Geo Exploration and Mining Solutions
No 17, Advaitha Ashram Road,
Alagapuram, Salem – 636 004

Tamil Nadu, India
Email:infogeoexploration@gmail.com
Website: www.gemssalem.com
Phone: 0427 – 2431989
NABET Certificate No: NABET/EIA/1922/SA 0139 Valid upto 29.04.2023

1.3 GENERAL INFORMATION ON MINING OF MINERALS

Geologically, Tamil Nadu is a treasure trove of various mineral-bearing rocks ranging in age from Pre-Cambrian, Cretaceous, Tertiary and Quaternary Formations. Tamil Nadu is endowed with rich minerals like, lignite, limestone, bauxite, magnesite, fire-clay, quartz, feldspar, gypsum and dimension stones with which the state possesses a prominent place in mineral production in India. Mineral production has been a major factor in providing employment especially in backward areas, earning valuable royalty and foreign exchange. The existence of high-class infrastructure facilities and business environment, further add to the prospect of mineral development and mineral based industries in the state.

This project is about mining crystalline Limestone in Sirugudi village, Natham taluk, Dindigul District.

1.4 ENVIRONMENTAL CLEARANCE

As per the EIA Notification S.O. No. 1533 (E) Dated: 14th September 2006 Mining Projects are classified as Category "A" and Category "B".

The Environmental Clearance process for the project will comprise of four stages. These stages in sequential order are given below:-

1. Screening
2. Scoping,
3. Public consultation &
4. Appraisal

Screening –

As per Gazette Notification S.O. 3977 (E) Dated: 14th August 2018, the project is classified as Category "B", The extent of mining area is 1.70.0 ha and the projects doesn't attract any General Condition & Specific Conditions. **Hence, the proposal for Grant of Environmental Clearance is submitted to SEIAA – Tamil Nadu.**

Scoping –

Based on the documents furnished, SEIAA – TN considered the project under Category "B" and the authority prescribed the Terms of Reference (ToR) vide ToR Letter No. Lr.No.SEIAA-TN/F.No.6251/TOR-419/Ext/2018 Dated: 21.12.2022, The validity of the Terms of Reference is upto 21.05.2023.

Public Consultation –

The Public Hearing shall be arranged in a systematic, time bound and transparent manner ensuring widest possible public participation at the project site(s) or in its close proximity District -wise, by Pollution Control Board (TNCB). The procedure for conducting Public Hearing shall be as per Appendix – IV of EIA Notification, 2006.

Appraisal –

Appraisal means the detailed scrutiny by the state expert appraisal committee (SEAC) of the application and other documents like the final EIA & EMP report, outcome of the public consultations including public hearing proceedings, submitted by the proponent to the regulatory authority concerned for grant of environmental clearance. This appraisal shall be made by State Level Expert Appraisal Committee concerned in a transparent manner in a proceeding to which the proponent shall be invited for furnishing necessary clarifications in person or through an authorized representative. On conclusion of this proceeding, the State Level Expert Appraisal Committee concerned shall make categorical recommendations to the regulatory authority concerned either for grant of environmental clearance on stipulated terms and conditions, or rejection of the application for environmental clearance, together with reasons for the same.

This report has been prepared as per the Terms of Reference issued by SEIAA – TN and using the following references:

- EIA Notification, 14thSeptember, 2006
- Guidance Manual of Environmental Impact Assessment for Mining of Minerals, Ministry of Environment and Forests, 2010
- ToR issued by SEIAA – TN
- Approved Mining Plan
- In addition, other relevant standards for individual activities such as sampling and testing of environmental attributes have been followed.

1.5 BRIEF DESCRIPTION OF THE PROJECT:

The mining lease is existing limestone mines which for captive use, non-forest land, open cast category "A" other than fully mechanized. The limestone is proposed to win by deploying hydraulic excavators coupled with tippers. The Produced Limestone is proposed to supply to the nearby cement industries and limestone based industries.

1.5.1 PROJECT NATURE, SIZE & LOCATION

TABLE 1.2: SALIENT FEATURES OF THE PROJECT AND SITE

Description	Details
S.F.No's	693/1, 2, 3, 4 & 7
Extent& Classification	1.70.0 ha Patta
Village, Taluk, District	Sirugudi village, Natham Taluk, Dindigul District
IBM Registration No	IBM/5284/2011 Dated 25.11.2011
Mine code	38TMN06007
Latitude Between	N 10° 14.486'to N 10° 14.595
Longitude Between	E 78° 17.700'toE 78° 17'809'
Nearest town	Dindigul NW-37Km
Nearest NH	NH 45-B Trichy – Madurai–9Km East.
Nearest SH	SH -35 (Dindigul - Natham - Singampunari - Tiruppattur - Karaikudi Rastha) Districts connected= Dindigul, Madurai, Sivagangai. Distance and Direction from the project area = 3.50Km South side
Nearest railway station	Dindigul Railway Station 35Km North West
Nearest airport	Madurai international Airport 50Km South Western side of the area
Seismic sensitivity	The Seismic Sensitivity of the project area is categorized as Zone II https://moes.gov.in/writereaddata/files/LS_EN_20032020_385.pdf

Source: Approved Mining Plan

1.5.2 SIZE OF THE PROJECT

TABLE 1.3: RESOURCES AND RESERVES

Description	Quantity in tonnes			
Geological Resources Reassessed	5,29,865			
Mineral reserves (111) ROM Reassessed	74,277			
Limestone @ 60% Reassessed	44,566			
Total Waste (Mineral rejects)	14,855			
Topsoil	2,576			
Proposed Production for 5 Year Mining Plan Period	ROM	Limestone @60%	Low Grade Lst @ 20%	Topsoil
	66,383	39,830	13,277	2,576
Average Production of Limestone per annum	7,966			

Limestone Production per day	27

Source: Approved Mining Plan

1.5.3 PAST PRODUCTION DETAILS TABLE

The mining operation was commenced in the year of 1983 and the requirement of Environmental Clearance for Major Mineral Mining below 5 ha was not required until based on clarification letter by MoEF & CC Z-11013/24/2017-IA.II (M) Dated: 03.04.2017 regarding Requirement of Environmental Clearance for Major Minerals below 5 hectares, it was communicated that mining leases which continue to operate without obtaining EC after 15.01.2016 shall be considered as violation cases and the same shall be dealt in accordance with the violation policy under Environmental Impact Assessment Notification, 2006 as amended.

The last permit was issued and the quarrying operation stoppage details as well penalty paid are certified by Assistant Director, Department of Geology and Mining, Dindigul District vide letter Rc.No. 618/2019 (Mines) Dated: 06.08.2019.

TABLE 1.4: PRODUCTION DETAILS

Sl.No.	Period	Quantity Produced	Mineral Royalty
1	**15.01.2016 – 10.01.2017***	**3000 tonnes**	**Rs 13, 87,500/-**

* Mining Operations were stopped from 10.01.2017

1.6 NEED OF THE PROJECT AND IMPORTANCE TO THE COUNTRY AND REGION

Limestone is one of the important mineral, which finds extensive use in the modern civilization and plays an important role in the development program of the country.

The demand for the limestone is increasing because of its multi furious uses in Industrial projects, irrigation and hydro-power schemes, construction works, etc., most important uses of limestone are in Metallurgical and chemical industries and the manufacture of cement.

The demand for limestone has been rapidly going up and it has become imperative that more and more limestone suitable for various industrial uses.

It is notable that the Tamil Nadu State is richly endowed with various types of limestone especially south Tamil Nadu, the need for state can be met with from its own resources, it may be in a position to fulfill the demands of other states as well.

In India the production of limestone in 2016-17 at 313.2 Million Tonnes increased by about 2% as compared to that of the previous year. Rajasthan was the leading producing state accounting

for (21%) of the total production of limestone, followed by Madhya Pradesh & Andhra Pradesh (11% each), Chhattisgarh & Karnataka (10%each), Gujarat, Tamil Nadu and Telangana (8% each).

TABLE 1.5: PRODUCTION OF LIMESTONE IN INDIA, TAMIL NADU &DINDIGUL

Production of Limestone	(QTY 000 in Tonnes)	
	2015-16	2016-17
India	307001	313196
Tamil Nadu	23008	23840
Dindigul	415	435

Source: Indian mineral yearbook 2017, 56th edition (Government of India Ministry of Mines, Indian Bureau of Mines)

In India, limestone mines are worked by opencast method. Captive mines and Non captive mines are mechanized and supply feed to cement and iron & steel units. The face length, width and height of the benches correspond to the mining machinery deployed and production schedule. Heavy earth moving machinery like 3.3 to 4 cu m capacity hydraulic excavators in combination with 10-35 Tonnes dumpers is normally used. Other mines are mainly worked by semi-mechanized and manual opencast mining methods. As per MCDR reports drilling are done by Jack hammer & Wagon drill and blasting is done by Slurry explosives, Emulsion explosives etc.,

Limestone in Tamil Nadu is consumed by various industries like Cement, Steel, Paper, Foundry, Poultry feed, Fertilizer and Chemicals.

The principal use of limestone is in the Cement Industry. Other important uses are as raw material for the manufacture of quicklime (Calcium Oxide), Slaked lime (Calcium hydroxide) and mortar. Pulverized limestone is used as a soil conditioner to neutralize acidic soils (agricultural lime).

IMPORTANCE FOR THE REGION (STUDY AREA)

- The entire mined out mineral is been utilized by the Cement and lime based industries and Manufacturing unit in open market. The grade is been approved and fit for industries standards.
- The standard of the local villages enhance and employment opportunity has been generated to local community. The project provides direct employment opportunities to about 11 employees and indirectly shall create secondary employment opportunity for local people in mineral transport, service sectors, garages, shops/canteen, etc.,
- There is a great demand for Limestone mineral, to fulfill the demand of market the mined out Limestone will be supplied in the open market.
- Government will get seigniorage fees, Royalty, DMF (District Mineral Fund) GST etc.,

1.7 REGULATORY COMPLIANCE

TABLE 1.6: STATUTORY APPROVALS

STATUTORY APPROVALS	
Lease granted	G.O. Ms. No.1691, Dated: 04.12.1982 (3 Years)(1983-1986) (First renewal vide G.O. Ms. No.1439/Inds, Dated: 13.12.1990) (10 years)(1986- 1996) (Second renewal vides G.O. 3(D). No.83 Inds (MMA2) Dept., Dated: 09.10.1996) (20 years)(1996-2016)
Deemed Extension	As per the MMDR Amendment Act 2015, the validity of the lease period shall be deemed to have been extended upto 31.03.2030.
Mining plan period	The Mining Plan (1996-97 to 2000-01) was approved by Indian Bureau of Mines vide letter No.TN/D-Anna/MP/LST-825-MDS, Dated: 12.07.1995.
1st Scheme of mining	2001-02 to 2005-06 Approved by IBM vide letter No TN/DGL/LST/MS/114/MDS, Dated: 14.02.2002.
2nd Scheme of mining	2006-07 to 2010-11 Approved by IBM letter No TN/DGL/LST/MS-457-MDS, Dated: 10.09.2007.
3rd Scheme of Mining	2012-13 to 2015-16 Approved by IBM letter No.TN/DGL/LST/MS-776.MDS, Dated: 28.03.2013
Review of Mining Plan	Review of Mining Plan 2016-17 to 2020-21 Approved by IBM vide Letter No.TN/DGL/MP/LST-1969-MDS, Dated: 30.03.2016.
Review of Mining Plan	Review of Mining Plan 2020-21 to 2024-25 Approved by IBM vide Letter No.TN/DGL/ROMP/LST-1584-MDS, Dated: 10.01.2020.

1.8 SCOPE OF THE STUDY:

This EIA studies evaluates the predicted impact of the mining activities on the environment. Based on the identification and quantification of the impacts various remedial measures considered like air pollution control system, recycling of mine pit water, greenbelt development plans which are useful for controlling environmental degradation due to the proposed mining project.

The baseline monitoring study was conducted during the post monsoon season (October – December 2023) for various environmental components to assess the anticipated impacts of the project on the environment and suggest suitable mitigation measures for likely adverse impacts due to the proposed project.

For these aspects various monitoring studies have been carried out and this EIA EMP report has been prepared as per the generic structure (Appendix – III) specified in the EIA Notification 2006.

1.8.1 DATA GENERATION AND COLLECTION

The base line data have been generated by M/s EHS 360 LABS PRIVATE LIMITED Certified & MoEF Recognized Laboratory in accordance with the requirement of statutory agencies to carry out all the regulatory scoping as per the Terms of Reference issued to the project proponents. The monitoring and testing have been carried out as per the guidelines of MoEF and the IS standards. Monitoring has been conducted for the following parameters:

TABLE 1.7: REGULATORY SCOPING CARRIED OUT FOR EIA AS PER TOR

Sl.No	Description	No of Locations	Total No of Samples
1	Air Ambient air monitoring (24 hourly samples), continuously for 2 days in a week for 4 weeks in a month. Parameters: PM10, SO2, NOx. etc., (As per IS 5182 (Part 1-23), National Ambient Air Quality Standards and CPCB)	11 Locations	264 Samples
2	Meteorological parameters at hourly duration for 3 months Parameters: a. Wind speed, direction b. Relative humidity c. Temperature d. Cloudiness e. Rainfall	1 Location	Primary Data – at project site Secondary Data from IMD Station.
3	WATER Water/Effluents samples to be collected from each of the various locations (surface and ground water) in core and buffer zone (10 km radius). Analyzed as per IS 10500, IS 3025 And IS 2488 (Part 1-5) Parameters: Water/Effluents: tested for physical, chemical and biological parameters as well Grab sampling once in a Season for Ground Water.	11 Locations	11 Samples
4	Soil Quality Monitoring. Once during study period for Physio-Chemical Characteristics. As per IS 2720.	9 Locations	9 Sample
5	Noise Quality monitoring IS 9989 and As per CPCB Guidelines Hourly observation for 24 hours per location once in the Season At all air quality monitoring station for	21 Locations	

	L_{eq}, L_{day} and L_{night} values.	

The following data's were collected and discussed in this report

- Identification of Eco-Sensitive Places, Wild Life Sanctuaries, Biosphere Reserves within 10 KM Radius through the base map.
- Religious Places / Historical Monuments and Tourist Places within 10 Km Radius.
- Land use pattern within core zone and buffer zone (10 Km Radius around the core zone) based on Bhuvan.
- Population Density, Welfare Amenities and Demography based on last available Census data for entire study area.
- Collecting the Meteorological Data, for past data's from IMD Station and relevant websites.
- Geo-Hydrological aspects based on available data from various secondary sources and correlated by the consultant at the field site.
- Identification of water bodies, hills, roads etc., within 10 Km Radius.
- Details of Fauna and Flora within a distance of 10 Km from the project site and information about Forests, if any.
- Socio Economic studies within 10Km buffer zone by secondary sources like District Census handbook correlating the same by primary survey.

1.9 TERMS OF REFERENCE

The Terms of Reference were issued by State Expert Appraisal Committee (SEAC), Tamil Nadu and their incorporation in EIA report.

I. Additional Conditions		
1	The limestone quarry involves raw material extraction, transportation and comminution. Therefore, large quantity of diesel and electricity are supposed to be consumed in the production. The diesel fuel and electricity to be consumed to be furnished	The mining operation will be carried out day time only no Electricity will be used for the mining operation. Diesel consumption for this project would be around 230 – 250 Ltrs per day.
2	What are the green mining technologies to be adopted for reducing GHC/Coz emissions and lowering the carbon footprint in the limestone mining.	Three tier plantation will be carried out around the boundary barrier and BSVI vehicles only allowed to work in the project site.
3	Strategies adopted for safety and healthy mining operations.	Method of mining and strategies for safe mining operation is discussed in the Chapter No 2 Page No. 44
4	What are the transparency and accountability system in place during the operation and post-operation period of the project.	Mining operation will be carried out under the supervision of Mines Manager. CCTV cameras will be installed four corners of the lease area.
5	What are the In-House environmental performance and evolution tools to understand negative impacts of mining.	Environmental Monitoring cell headed by the Mines manager will be formed and the Environmental policy is given in the Chapter No.6.
6	Detailed study to be made on material flow analysis and Life Cycle Assessment (LCA) in the process of production	As per the RoMP the life of the mine is 5 years.
7	Through a chart Illustration, clarify the cradle to grave approach for extraction of limestone and anticipated emissions, environmental threats in every stage and mitigation strategy at every stage.	It is an existing quarry; Exploration studies are already carried out the anticipated impacts and mitigation measures are given in the Chapter No. IV.
8	Project Proponent to study impacts on human health viz respiratory impacts, toxicity impacts and radiation impacts.	Occupational study and health impacts of the project is described in the Chapter No – VI. Page No 114.
9	Study to be made on aquatic, terrestrial toxicity, aquatic eutrophication including detailed terrestrial toxicity and their impacts of wildlife and biodiversity	Impact on the biodiversity are described in the Chapter No IV.
10	What is the total water withdrawal consumption, likely temperature rises and climate change impacts.	No withdrawal of water in this project leads to temperature rises and climate changes.
11	What are the chemical exposures in the limestone mining and risks anticipated to environmental and human health.	The limestone is composed of CaO and MgO. CaO is 40 % to 50% and MgO is 2 to 4%. No toxic chemicals in the Limestone hence the risk to the human health is not arise.

II	**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.	Past Production details is discussed under Chapter 1; Table 1.4, Page No. 8.

2.	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	The copies of proceedings of The Director of Geology and Mining, Guindy, Chennai are enclosed as Annexure Volume 1
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 mine lease area, production levels, waste generation and its management, mining technology etc. in the name of lessee are in compatibility with all documents including approved mine plan, EIA Report.
4.	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ toposheet, 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).	Location Map on the Toposheet covering 10 km radius Figure 2.2 (Pg. No. 26) Location Map of the area covering 5 km Radius Figure 2.3 (Pg. No. 27), Land use land cover map of the study area Figure 3.2 (Pg. No. 50)
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.	Geology Map of the area covering 5 km radius Figure 2.9 (Pg. No. 35) Drainage Map of the study area covering 10 km radius Figure 3.4 (Pg. No. 54).
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.	Land use cover table 10 km Radius in Table 3.2, Pg. No. 50. Geology of the area is discussed in the Chapter 2, Page No 34.
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 Environment Policy discussed under Chapter 1, Page No. 20& Environmental Monitoring Detailed in Chapter 6, Page No.120 – 125.
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.	It is an opencast Category “A” other than fully Mechanized mine. Drilling and blasting are discussed in the Chapter 2, Page No.39. Issues relating to mine safety will be dealt by strictly following the DGMS Guidelines as per MMR, 1961 and necessary permission will be obtained.
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 are comprises of core zone and buffer zone (10 km distance from periphery of lease area).
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	No wildlife sanctuaries, National park, migratory routes of fauna and water bodies are in the study area. Land Use of the study area delineating forest area, agricultural land, grazing land, human settlements and other ecological features has been incorporated in Chapter 3.

	post operational phases and submitted. Impact, if any, of change of land use should be given.	Land use plan of the mine lease in operation & post operation phase has been discuss in Chapter 2. Pg. No. 41.
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	Not applicable, no overburden dump is proposed outside the mine lease area.
12.	A 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.	Not Applicable, the Mining lease area does not involve any forest land.
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.	Not Applicable, the Mining lease area does not involve any forest land.
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, the project doesn't attract Recognition of Forest Rights Act, 2006
15.	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	Not Applicable, no RF / PF fall under study area.
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.	Not Applicable, there is no National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Tiger/Elephant Reserves/Critically Polluted areas within 10 km radius of the mining lease area.
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	Not Applicable. There is no National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Tiger/Elephant Reserves/Critically Polluted areas within 10 km radius of the mining lease area.
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	Details biological study (flora & fauna) separately for core zone and buffer zone within 10 km radius of the project site have been incorporated in Chapter 3, Page No 100.

	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.	Project area is not declared in 'Critically Polluted' area and not come under Aravali range.
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, the project doesn't attract the C.R.Z. Notification, 1991
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.	No reclamation and rehabilitation is proposed and neither reclamation nor rehabilitation was carried out during the previous mining activity. Hence reclamation and rehabilitation will not arise.
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.	Baseline data were collected during October – December 2023 has been incorporate in Chapter 3. Air quality, Water quality, Noise level, Soil and Flora and Fauna in core and buffer zones are collected and complied data wise in the EIA report.
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	Air quality modeling has carried out by using AERMOD view 9.6.1 Model for prediction of impact of the proposed mine has been incorporate Chapter 3, Page No 87 – 92. The predominant wind direction recorded during study period is depicted vide Wind rose diagram shown in Chapter 3, Figure No 3.11; Page No.69

	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.	Total water requirement: 2 KLD Chapter 2, Table No 2.11, Page No 41
25.	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Not Applicable Water for dust suppression, plantation and domestic use will be obtained from accumulated rainwater/seepage water in mine pits (when available). Drinking water will be sourced from the approved water vendors,
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.	The rain water collected in the pits after spell of rain will be used for greenbelt development and dust suppression. At the end of life of mine, excavated area will be used as a water reservoir.
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.	No negative impact on the water quality is anticipated, details along with mitigation measures are discussed under Chapter 4, Page No. 113.
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.	The ground water table is at 30-35m below ground level. The ultimate depth of mine working is 17m from the general ground profile the project shall not intersect the ground water table.
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.	There is no stream, seasonal or otherwise passing through the lease area.
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.	Elevation of the lease area is 229m AMSL. Ultimate depth of the mine is 17 m bgl. Water level of the area is 30-35m below ground level.
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.	Greenbelt development Plan &Recommended Species proposed for greenbelt development are given in the Chapter 10, Pg. No. 138.
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,	Transportation will not have significant impact on the existing traffic density/ existing road (refer chapter 2) Chapter No 2. Pg. No. 42. Maximum 2 trips per day is anticipated

	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.	The Mining project improves the social infrastructure of the area.
33.	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	Adequate infrastructure & other facilities to the mine workers are in place and will be renovated after opening of mines
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.	Details about Conceptual post mining land use and Reclamation and Restoration of mined out areas are discussed in Chapter 4 of EIA/EMP 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.	Discussed under Chapter 10, Page No. 139
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.	No Public health implications are anticipated. Discussed in Chapter 3. Page No. 104.
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.	Discussed in Chapter 3. Page No. 104
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.	Discussed in Chapter 10. Page No. 134 - 140
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.	Noted Agreed
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.	No litigation is pending in any court against this 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.	Project Cost = Rs. 75.47 Lakhs EMP Capital Cost = Rs 5.76 Lakh EMP Recurring Cost = Rs 1.86 Lakhs
42.	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	Given in the Chapter 7, Pg. No. 129.
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.	Given in Chapter 8, Pg. No. 130.
44.	**Besides the above, the below mentioned general points are also to be followed:-**	

a.	Executive Summary of the EIA/EMP Report	Enclosed as Annexure Volume 1
b.	All documents to be properly referenced with index and continuous page numbering.	All the documents are 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.	List of Tables and source of the data collected are given properly.
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	Enclosed as Annexure Volume 1
e.	Where the documents provided are in a language other than English, an English translation should be provided.	Not Applicable
f.	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	Enclosed as Annexure Volume 1
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.	Instructions issued by MoEF & CC O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009 are 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	No Modifications is carried out.
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.	Not 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.	All the maps are included in the EIA/EMP report.

1.10 ENVIRONMENTAL POLICY

The proponent affirms to maintain clean and sustainable environment through continual improvement of environmental performance as an integral part of business.

In order to achieve the goal the proponents shall stand committed to –

- Conduct operations in an environmentally responsible manner, to comply with applicable legal and other requirements related to environmental aspects.
- Gradually phase out inefficient operations with modern environmental friendly alternatives.
- Efficient use of natural resources, energy and equipment's.
- Comply with all applicable laws governing environmental protection through appropriate mechanisms.
- Sustainable development and conservation of mineral.
- Actively participate in Social Welfare and Environmental Development activities for the locality around the lease hold area.
- Ensure Environment related information, dissemination and training to all employees.
- Constitute an Environment Monitoring Cell for the project.
- Provide adequate system to minimize dust emission.

The proponent shall organize a Non-Compliance Reporting System, in any case of non-compliance of Environmental issues will be reported directly to the mines manager/ Proponent and the mines manager/Proponent shall assign respective person for taking up the necessary corrective actions.

1.10.1 POST ENVIRONMENT CLEARANCE MONITORING

The project proponent shall submit a half-yearly compliance report in respect of stipulated Environmental Clearance terms and conditions to MoEF & CC Regional Office & SEIAA after grant of EC on 1stJune and 1stDecember of each calendar year as per MoEF & CC Notification S.O. 5845 (E) Dated: 26.11.2018.

Besides the Mines manager or mine agent will submit the periodical compliance reports to

- TNPCB - Half yearly status report
- IBM quarterly, half yearly annual reports
- Director of mines safety,
- Labor enforcement officer,
- Controller of explosives as per the norms stipulated by the department.

1.10.2 TRANSFERABILITY OF ENVIRONMENTAL CLEARANCE

Environmental Clearance granted for a specific project or activity to an applicant may be transferred during its validity to another legal person entitled to undertake the project or activity on application by the transferor or the transferee with a written "no objection" by the transferor, to, and by the regulatory authority concerned, on the same terms and conditions under which the prior environmental clearance was initially granted, and for the same validity period.

1.11 GENERIC STRUCTURE OF EIA DOCUMENT

The overall contents of the EIA report follow the list of contents prescribed in the EIA Notification 2006 and the "Environmental Impact Assessment Guidance Manual for Mining of Minerals" published by MoEF&CC. The report consists of twelve chapters and the content is briefly described in this section.

Chapter 1 – Introduction:

This chapter contains the general information on the location of the mines, mining methods, and major sources of environmental impacts in respect of mining projects and details of environmental clearance process.

Chapter 2 – Project Description:

In this chapter the type of the project, need for the project, project location, layout, project activities during preparation and operation phases, capacity of the project, project operation i.e., land availability, utilities (power and water supply) and infrastructure facilities such as roads, railways, housing and other requirements are provided. The project implementation schedule, estimated cost of development as well as operation etc., is also included.

Chapter 3 – Description of the Environment:

The methodology for assessing various baseline environmental components in the study area prior to the commencement of the project has been identified in this chapter. The various parameters of present environmental status are identified under different aspects, which include location and regional setting of the area, physical aspects such as land use, landcover and soil quality. Hydrological aspect consists of area drainage, surface and ground water quality.

Meteorological aspect contains all the climatic factors and ambient air quality of the study area. Ecological environment describes the flora and fauna of the region. Human aspect includes the demographical features, socio-economic environment and infrastructure facilities of the study area.

Chapter 4 – Anticipated Environmental Impacts & Mitigation Measures:

This chapter describes the anticipated impacts on the environment and the mitigation measures. The method of assessment of impacts including studies carried out, modelling techniques adopted to assess the impacts where pertinent should be elaborated in this chapter. The Environmental Impact Assessment of the project during construction and operation stages is provided. The mathematical modelling exercises pertaining to ground level concentrations of air pollutants have been presented in this chapter with suitable mitigation measures.

Chapter 5 – Analysis of Alternatives:

This chapter gives details of various alternatives both in respect of location of site and technologies to be deployed.

Chapter 6 – Environment Monitoring Programme:

This chapter emphasizes the formation of an Environment Management Cell with trained staff under Senior Environment Engineer equipped with all monitoring facilities for monitoring of all environmental parameters during construction as well as post project monitoring. Organization structure for environmental management and frequency of monitoring has also been provided.

Chapter 7 – Additional Studies:

This chapter covers the details of the additional studies required as per ToR prescribed by MoEF&CC like Risk Assessment, Public Consultation details and Social Impact Assessment and R&R plans.

Chapter 8 – Project Benefits:

The benefits that will be accrued from the project in the locality in particular and society in general as well as development will be identified and described in this chapter.

Chapter 9 – Environmental Cost Benefit Analysis:

Environmental Cost Benefit analysis is not recommended.

Chapter 10 – Environmental Management Plan:

In this chapter, an environmental strategy to mitigate the adverse effects likely to occur on environmental parameters during mining phase has been drawn up for the proposed mining project. Post project monitoring and organization structure for environmental management has been given in this chapter.

Chapter 11 – Summary & Conclusion:

This chapter gives a brief of the focus areas of the report for a quick glance.

Chapter 12 – Disclosure of the Consultant:

The detailed profile of the consultants along with their capabilities, professional expertise and work experiences are highlighted in this chapter.

2. PROJECT DESCRIPTION

2.0 GENERAL:

The Environmental Impact Assessment report has been prepared in terms of EIA Notification of the MoEF & CC Dated: 14.09.2006, as amended and the EIA Guideline Manual for Mining of Minerals (Feb, 2010) of MoEF & CC, Government of India, for seeking Environmental Clearance for Mining of Limestone by M/s. Sivam Mines in Sirugudi Village, Natham Taluk, Dindigul District and Tamil Nadu (Extent 1.70.0 ha) falling under Category 'B'

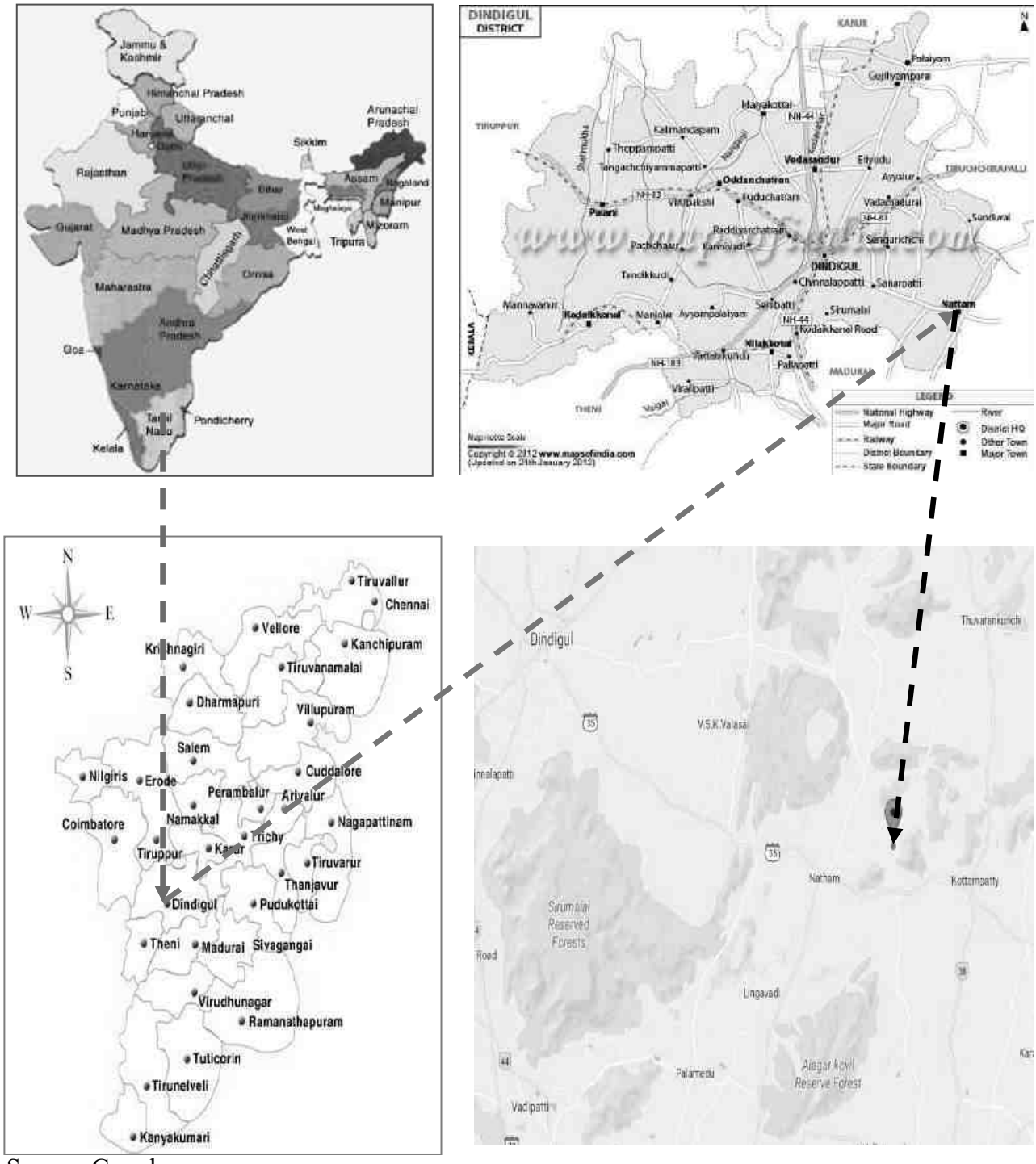
TYPE OF THE PROJECT:

- Existing limestone mines< 5ha, Captive mines, Opencast Mines. There are no technological changes in the mining operations. No ore beneficiation or mineral processing is proposed.
- The method of mining is opencast manual method without involving deep hole drilling and heavy earth moving machineries. The mining operation is being carried out with jack hammer drilling, manual excavation and Manual loading into the tippers.
- Shot hole blasting with slurry explosives is used for given heaving effect in hard strata.
- There are no interlinked projects; the project is site specific, there is no additional area required for this project.
- The mine lease area does not have any water-courses in the form of river, nallah etc. & There is no effluent generation/discharge from the mines.

2.1 LOCATION OF THE PROJECT

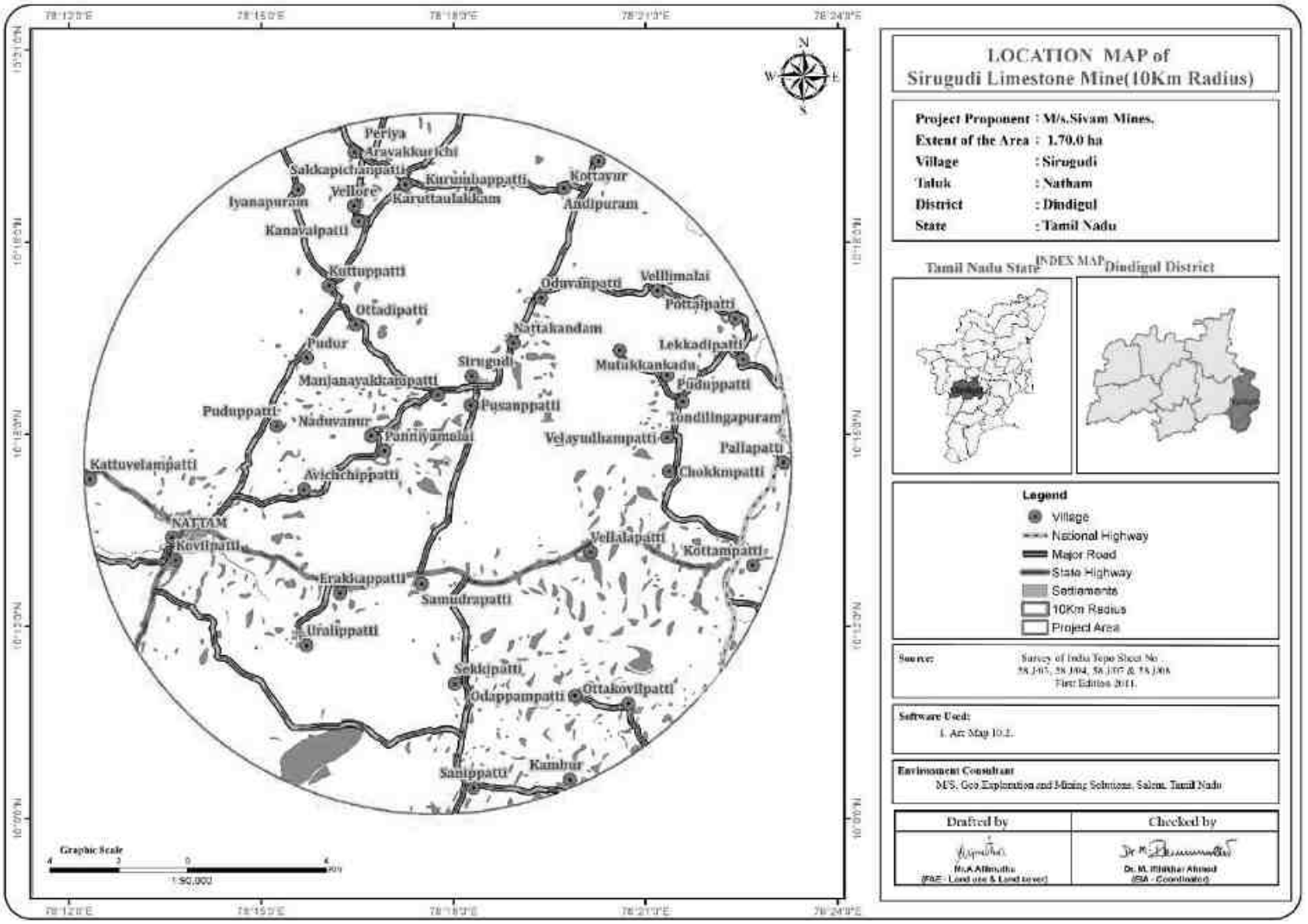
- The mining lease is located in Sirugudi Village, Natham Taluk, Dindigul District and Tamil Nadu (Extent: 1.70.0ha).
- The project falls in Toposheet No: 58 J/08.
- Latitude between N 10° 14.486'to N 10° 14.595'
- Longitude between E 78° 17.700'to E 78° 17'809'
- The project site is about 37 Km from district headquarter. The nearest railway station is located at Dindigul 37 Km North west.
- The project site is well connected by SH 35 - Dindigul - Natham - Singampunari - Tiruppattur - Karaikudi – South Side and NH 45-BTrichy – Madurai–9Km East.
- All the basic infrastructure such as hospitals, post offices, educational institutions, place of worship, banks etc., are available at Dindigul – 37 Km North West.
- The Nearest Airport and Seaport are Madurai 50 Km South west & Tuticorin 165 Km South east respectively.

FIGURE 2.1: LOCATION MAP OF THE PROJECT AREA WITH CO ORDINATES



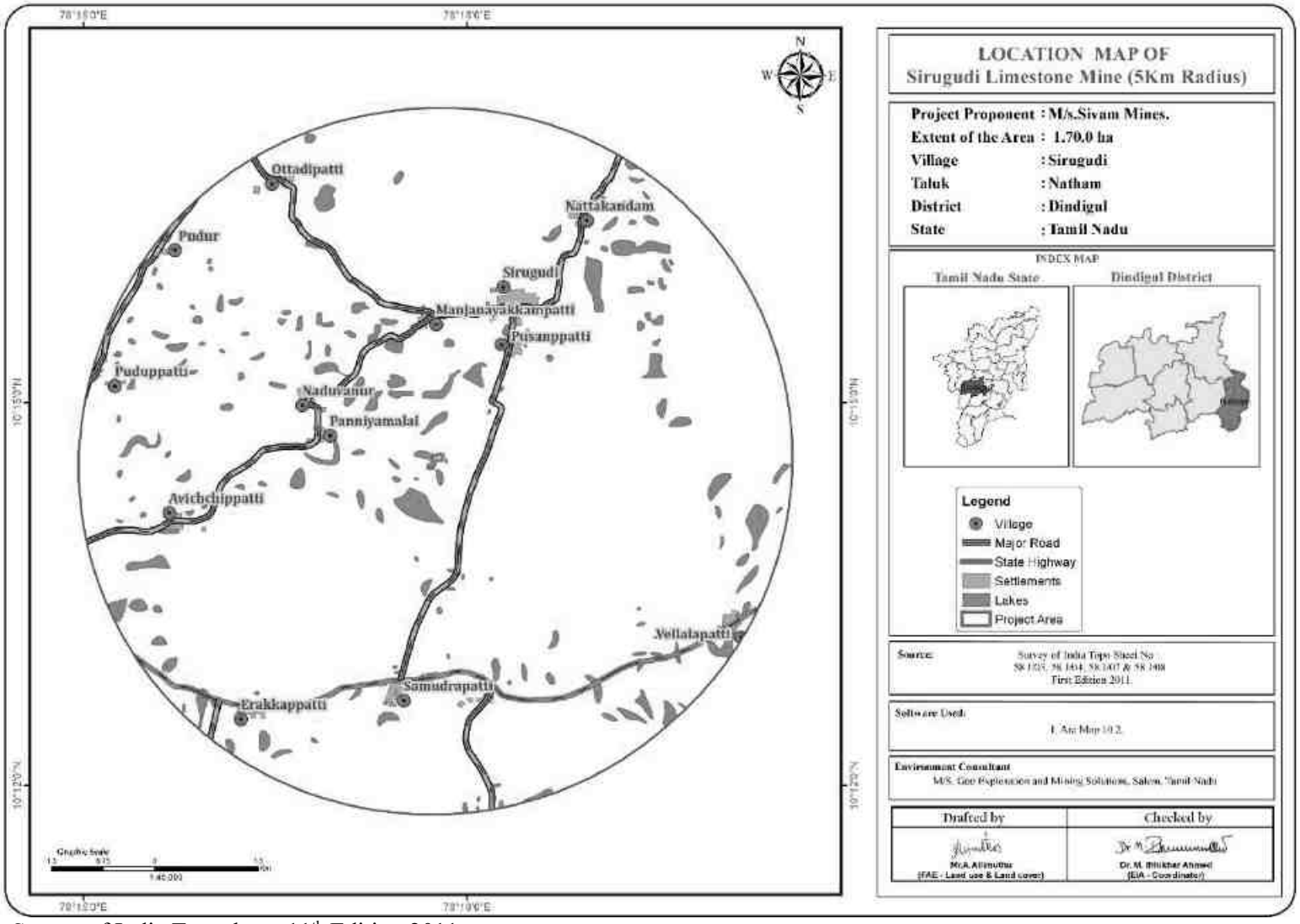
Source: Google maps

FIGURE 2.2: DIGITIZED LOCATION MAP ON THE GEO REFERENCED TOPOSHEET (10Km RADIUS)



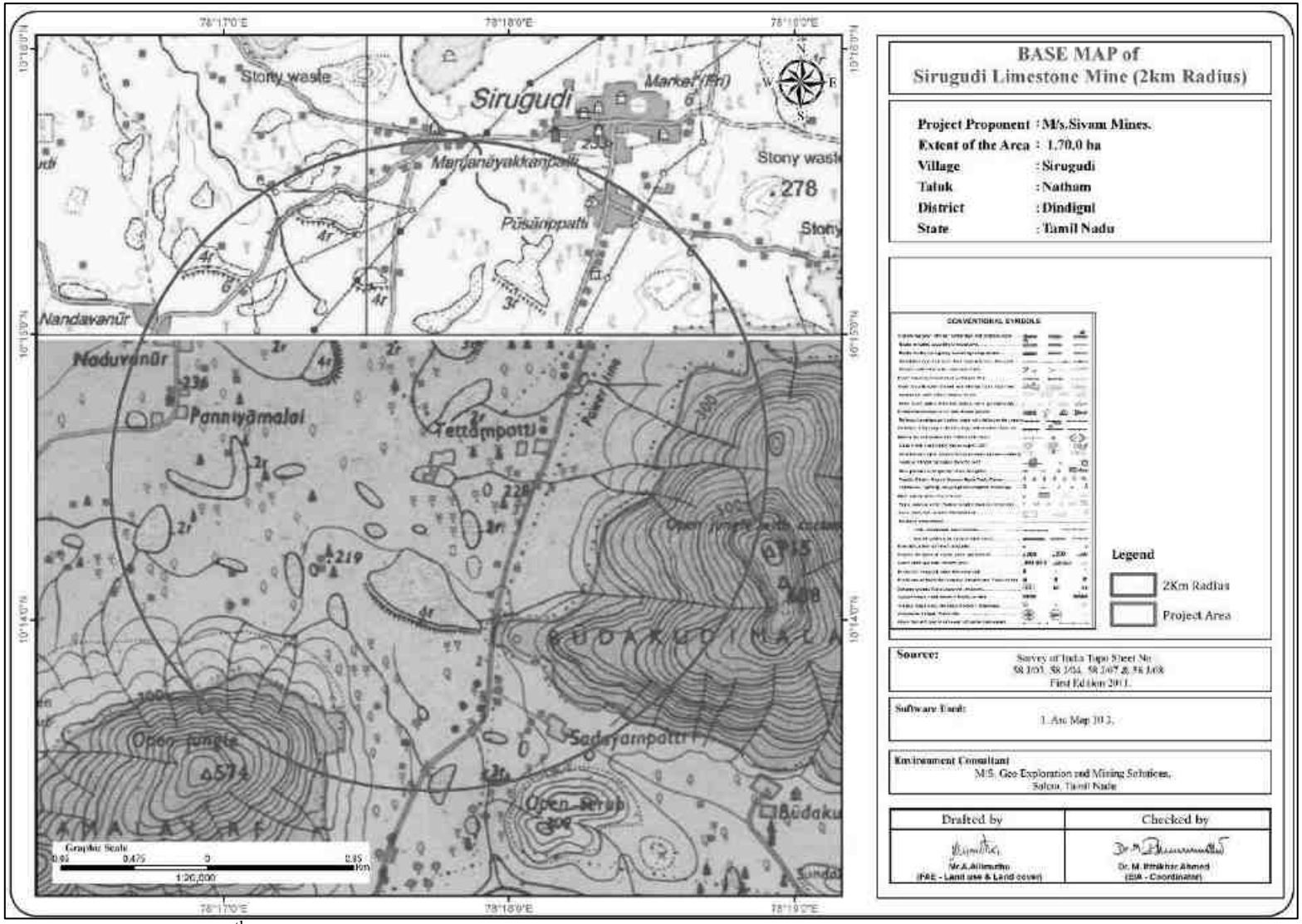
Source: Digitized in Geographical information System (ARC GIS), Survey of India Toposheet, 11th Edition 2011

FIGURE 2.3: DIGITIZED LOCATION MAP ON THE GEO REFERENCED TOPOSHEET (5KM RADIUS)



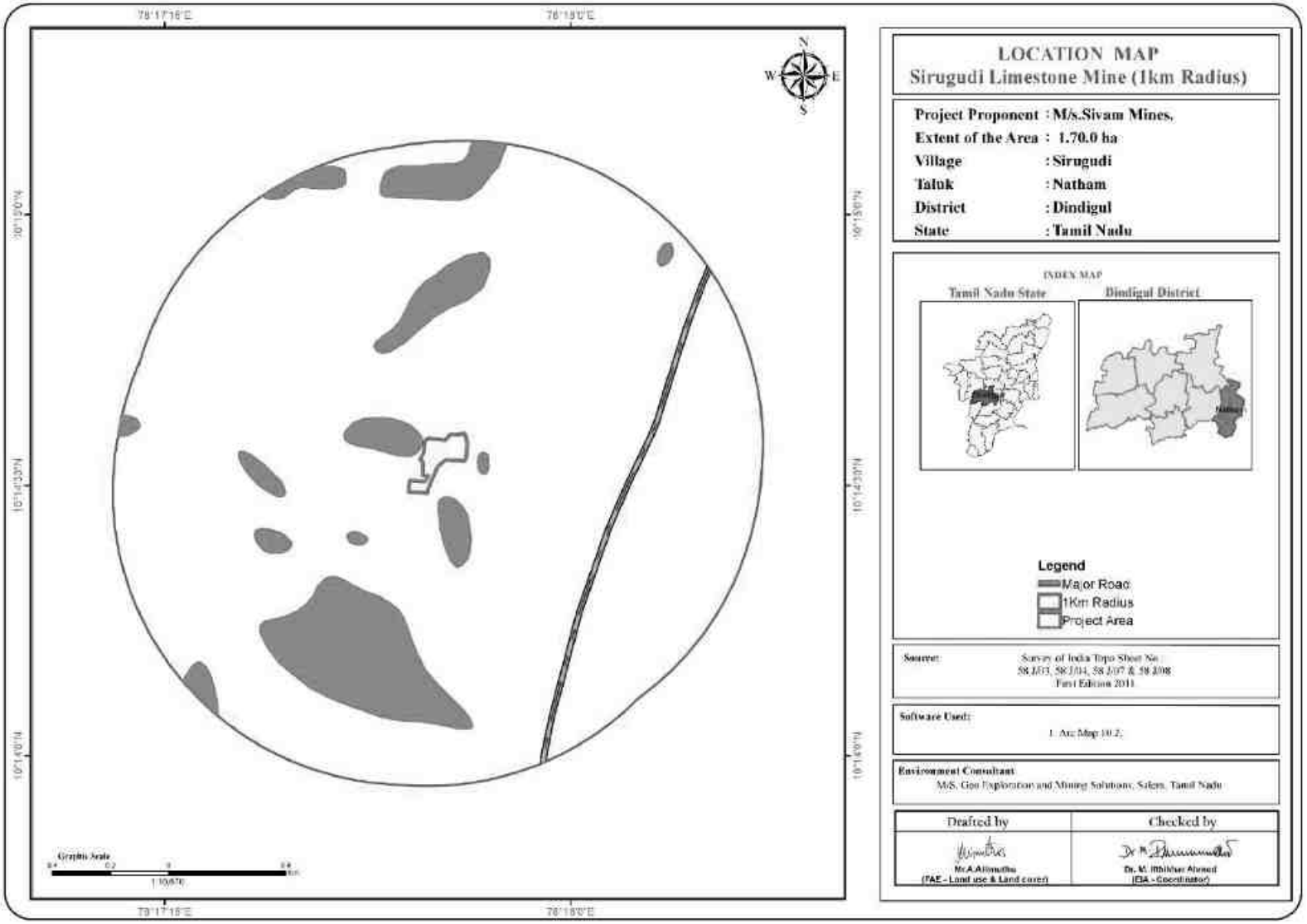
Source:Survey of India Toposheet, 11th Edition 2011

FIGURE 2.4: LOCATION MAP COVERING 2KM RADIUS



Source: Survey of India 11th Edition, 2011

FIGURE 2.5: LOCATION MAP COVERING 1KM RADIUS



Source: Digitized in Geographical information system (ARC GIS), Survey of India 11th Edition, 2011.

2.2 LEASE HOLD AREA

- The lease area is an existing limestone mines which is site specific, captive use, opencast category "A" other than fully mechanized.
- No beneficiation or mineral processing is proposed.
- Mine Lease Area = 1.70.0ha
- General gradient of the area is towards south.

TABLE 2.1: LOCATION DETAILS

Description	Details
Latitude between	N 10° 14.486'to N 10° 14.595
Longitude between	E 78° 17.700'to E 78° 17'809'
MSL	229
Extent	1.70.0 ha
Village Taluk and District	Sirugudi Village, Natham Taluk and Dindigul District.

Source: Approved Mining Plan

TABLE 2.2: EXTERNAL INFRASTRUCTURES

S.No	Particulars	Location	Direction	Approximate Distance in Km
1	Nearest Post office	Sirugudi	NE	3
2	Nearest Town (D.H)	Dindigul	NW	37
3	Nearest Police Station	Natham	SW	8
4	Nearest Govt. Hospital	Natham	SW	8
5	Nearest School	Sirugudi	NE	3
6	Nearest DSP Office	Dindigul	NW	37
7	Nearest Railway Station	Dindigul	NW	37
8	Nearest Airport	Trichy	NE	74
9	Nearest Seaport	Tuticorin	S	165

Source: Approved Mining Plan

There are no significant features within the radius of 500m, it is a dry land. Some people will perform sustenance farming due to the availability of small land during rainy seasons.

TABLE 2.3: NEAREST SURFACE FEATURES

NEAREST MINES WITHIN 500m RADIUS			
SL.No	**Name of the lessee**	**S.F.No**	**Extent**
1	M/s. Sivam Mines	693/5A (P), 696/2, 3 (P), 4 (P), 5, 698/1, 2, 3, 4A, 4B, 4C &5	2.53.0
2	M/s. Sivam Mines	644/4 (Part)	0.24.29
3	M/s. Sivam Mines	630/1A, 1B, 2, 631/10 & 11	0.94.5
5	M/s. Sivam Mines	616/1B (Part), 1C, 618/1(Part) & 619	0.94.0

Source: Approved Mining Plan

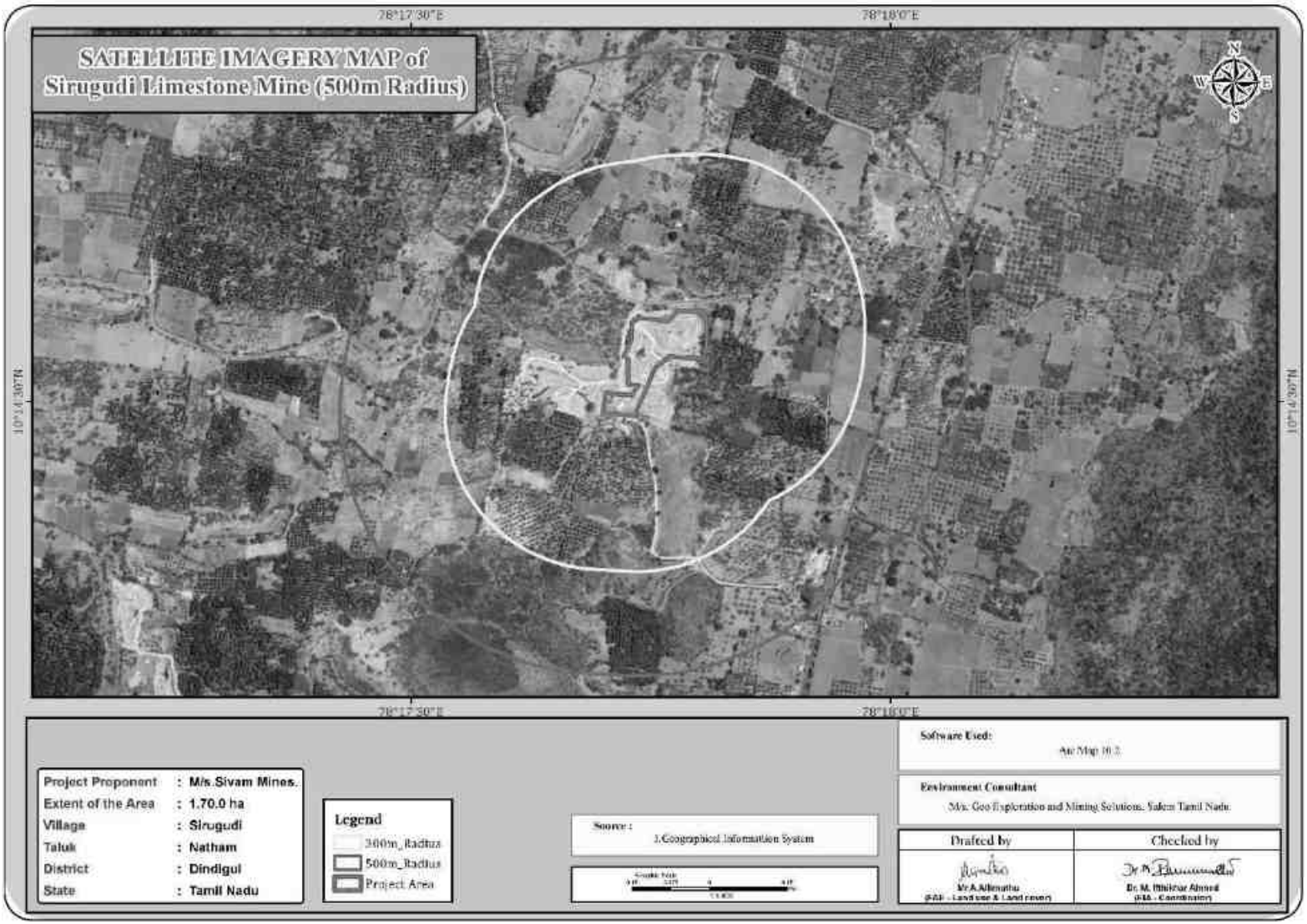
TABLE 2.4: NEAREST WATER BODIES WITHIN 10KM RADIUS

Sl.No.	Water Bodies	Distance and Direction
1	Sirugudi Village Tank	800m South West
2	Sirugudi Village Tank	850 m North

Source: Approved Mining Plan

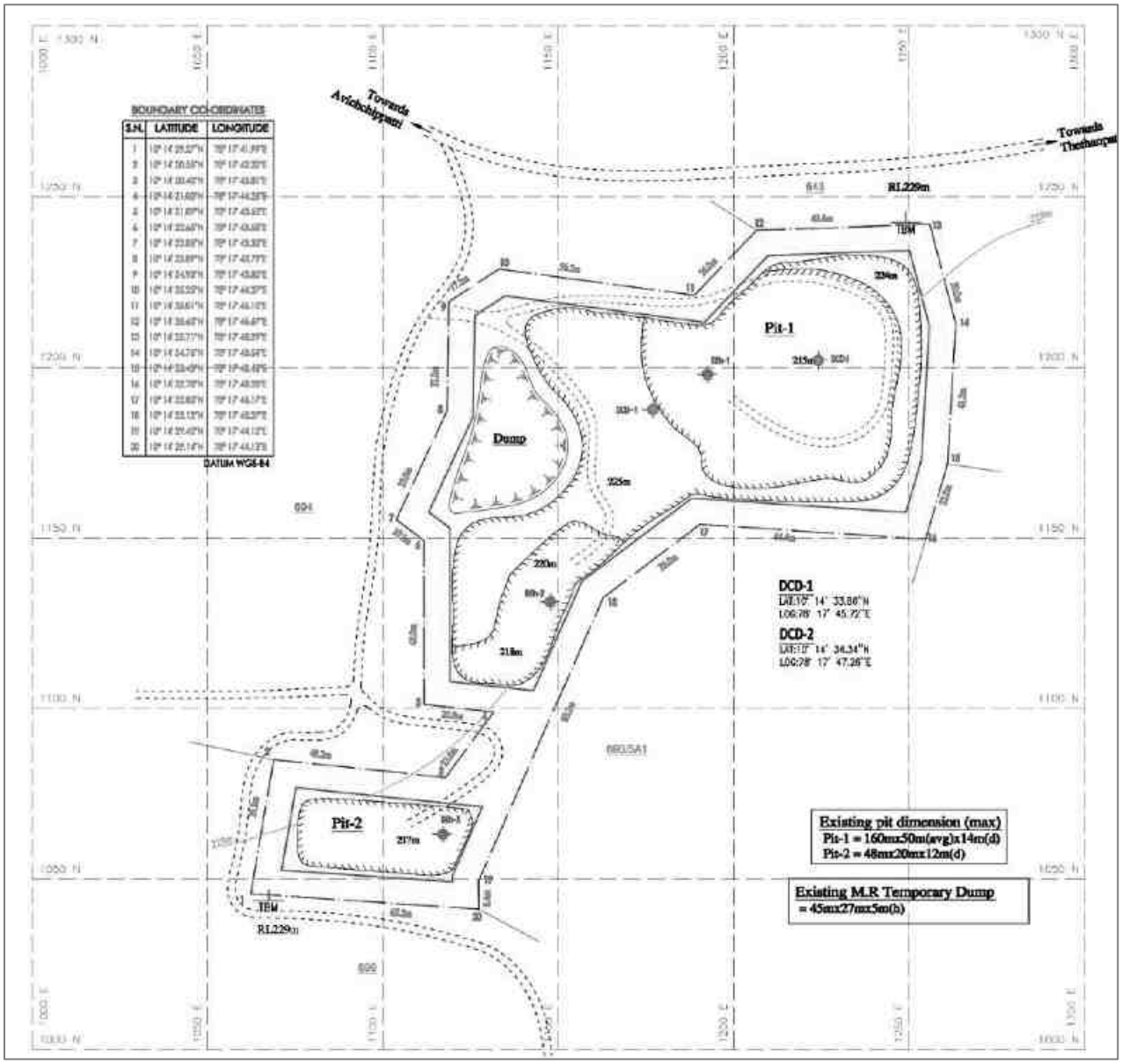
FIGURE 2.6: TOPOGRAPHICAL VIEW OF LEASE AREA

FIGURE 2.7: MINE LEASE AREA COVERING WITH 300M AND 500M RADIUS



Source: Google earth imagery

FIGURE 2.8: SURFACE PLAN OF MINE LEASE AREA



2.3 REGIONAL GEOLOGY:-

The project area comprises crystalline Archaean rocks of deep seated metamorphic origin which include mainly calc-gneiss, cordierite-sillimanite Gneiss, **Biotite gneiss and granite gneiss**. The gneisses appear to have resulted by migratizations of the pre-existing sediments by intrusive of high grade metamorphism viz. High temperatures and pressures. In addition, younger intrusive such as granites, pegmatites and quartz veins are found within the limestone. The above said different types of metamorphosed rocks occur in the form of long, narrow, parallel bands which are traceable over a long distance. Limestone, band is noticed with prominent outcrops.

The regional trend of the limestone formation in the area is N60º E – S60º W with Dip SE80º.

The general geological sequence of the limestone deposits is as follows:

Order of Super position:

AGE		ROCKFORMATION
Recent	-	Reddish Soil
Archean	-	Crystalline Limestone
	-	Calc-gneiss.

2.3.1 LOCAL GEOLOGY

The area was surveyed in detail to prepare a Geological map in the scale of 1:1000 showing the various formations and attitude of the deposit. It is inferred that the Limestone mineral is of cement grade and in the form Band running from N60º E – S60º W with Dip SE80º. Reddish soils cover up to a depth in about 1m. Recovery of minerals is estimated as 60% and 80% of the total excavation of the ore body.

The recovery percentage is based on the knowledge gained from the past mine workings and adjacent working mine in this region, by the field tests carried out in the lease area and analysis done in NABL Laboratories. The recovery percentage was approved by IBM Chennai.

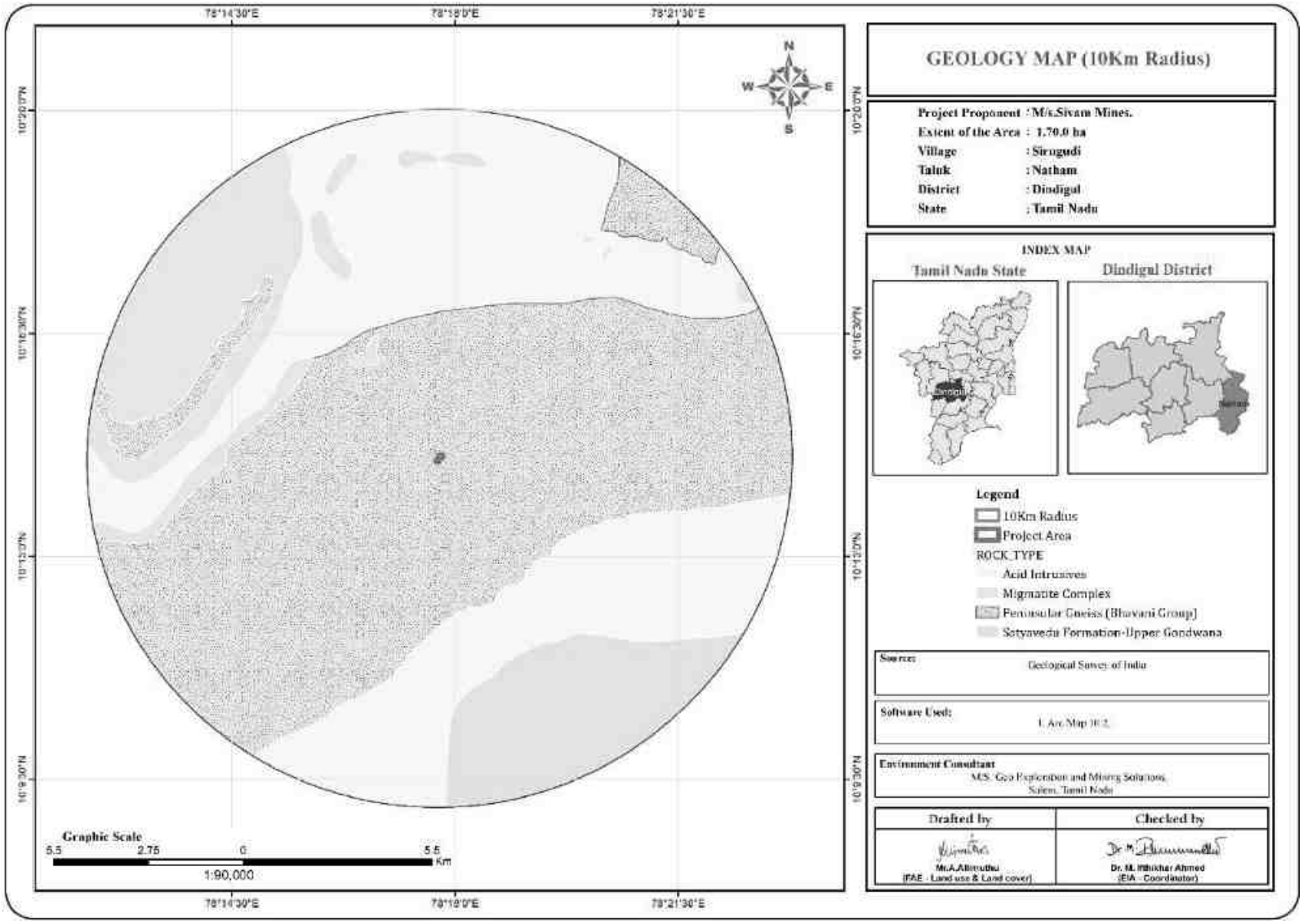
The physical attitudes of the limestone bands are as follows:

Strike direction : N60º E – S60º W

Dip amount and direction : NW 80º

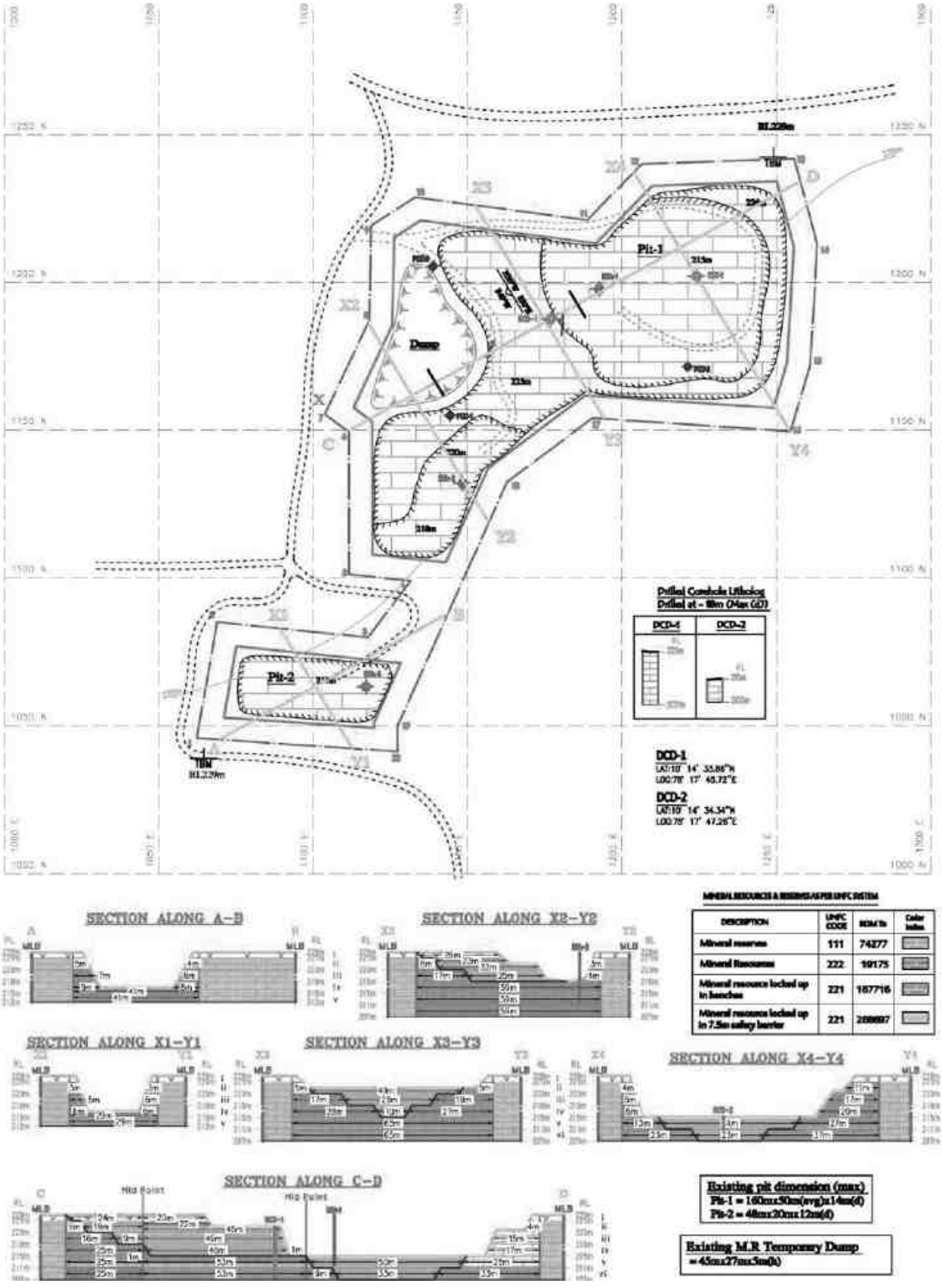
The depth of the mineralization has been proved maximum upto 17m depth with an average of 2.0m topsoil, based on the core drill investigation as per the UNFC classification.

FIGURE 2.9: GEOLOGY MAP OF THE AREA COVERING 10 km RADIUS



Source : Geographical information system (ARC GIS MAP)

FIGURE 2.10: GEOLOGICAL PLAN AND SECTIONS OF MINE LEASE AREA



2.4 QUALITY OF RESERVES

Exploration details as per UNFC.

- The proponent has carried out detailed exploration as per United Nation Framework Classification and re assessed the resources and reserves afresh with his consulting geologist.
- Exploration and chemical analysis for this mine lease area with litho-log and borehole details are given below.

TABLE 2.5: EXPLORATION AND CHEMICAL ANALYSIS DETAILS

No. of bore holes	Depth of boreholes (m)	Depth of deposition of Limestone from the RL	Strata
DBH1	14	226.0m-215.1m	Mined out
		215.1m-212.0m	Limestone
DBH2	12	228.4m-223.2m	Mined out
		223.2m-216.5m	Limestone
DBH3	14	224.2m-215.8m	Mined out
		215.8m-210.0m	Limestone

Chemical analysis table

LIMESTONE	
Parameter	Composition %
Cao	46.75
Mgo	1.25
Fe_2O_3	0.20
Al_2O_3	0.35
SiO_2	8.36
LOI	43.08

Source: Approved Mining Plan

TABLE 2.6 MINERAL RESERVES AS PER UNFC CLASSIFICATION

United Nations Frame work Classification (UNFC)	UNFC Code	Details	Grade
Total Mineral reserves			
*Proved Mineral reserves	111	0.0743	Cement Grade
Probable Mineral Reserves	121 & 122	-	
Total Remaining Resources			
Feasibility Mineral resources	211	-	
Pre-feasibility Mineral resources	221 & 222	0.4556	
Measured Mineral resource	331	-	
Indicated Mineral resources	332	-	
Inferred Mineral resource	333	-	
Reconnaissance Mineral Resource	334	-	
Total Reserves + Resources		0.5299	

Source: Approved Mining Plan

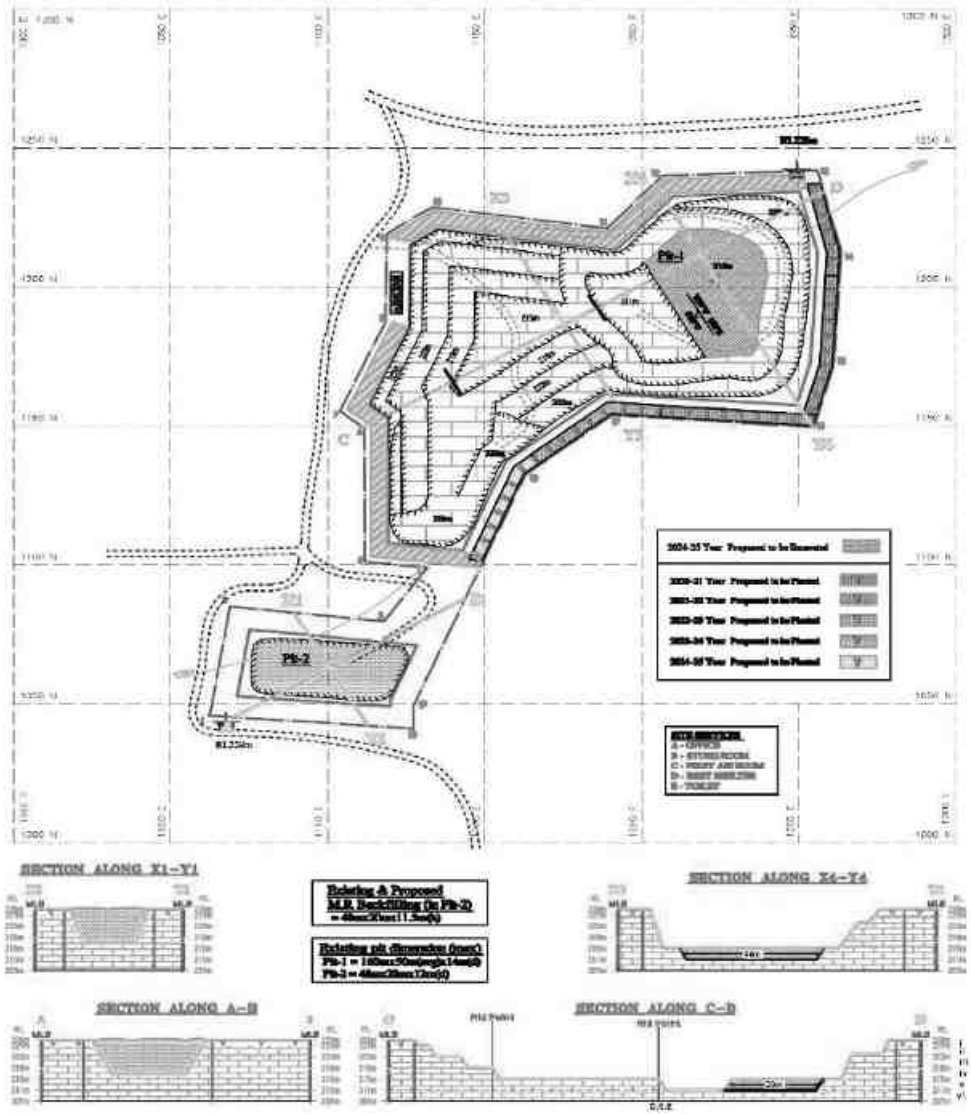
2.4.1 CALENDAR PROGRAM FOR ORE AND WASTE RATIO

TABLE 2.7: SUMMARY OF YEAR WISE

Year	ROM(Ts)	Limestone @ 60% (Ts)	Low grade Limestone @ 20% (Ts)	Mineral Rejects @ 20% (Ts)	Topsoil (Ts)	Ore waste ratio
2020-21	13250	7950	2650	2650	80	1;0.25
2021-22	13406	8043	2681	2681	2496	1;0.25
2022-23	13312	7987	2662	2662	-	1;0.25
2023-24	13146	7887	2629	2629	-	1;0.25
2024-25	13270	7962	2654	2654	-	1;0.25
Total	**66383**	**39830**	**13277**	**13277**	**2576**	**1;0.25**

Source: Approved Mining Plan

FIGURE 2.11: YEAR WISE PLAN



Source: Approved Mining Plan

2.5 METHOD OF MINING AND PROCESS DESCRIPTION.

- The method of mining is Open cast mechanized method categorized as "Opencast category "A" other than fully mechanized"; Hydraulic Excavator coupled with tippers is deployed for the formation of benches and loading.
- There is no mineral processing or ore beneficiation proposed.
- The method of mining is Open cast mechanized mining method.
- Jack hammers with compressors deployed for drilling (short hole drilling), only slurry explosives are used for liberation of limestone from the parent sheet rock.
- After the manual segregation the limestone will be loaded manually into the tippers.
- One bench is proposed on the topsoil with 2.0m height and 4.0width with 45°slope.
- In mineral, five benches are proposed with 3m height & 5m width slope maintained as 60° from horizontal.
- The waste is in the form of Mineral rejects and side burden; the waste will be dumped in the earmarked area.

2.5.1 EXTENT OF MECHANIZATION:

TABLE 2.8: LIST OF MACHINERIES

Type	No	Capacity	Make	Motive power	H.P
Tractor mounted compressor	1	140cfm	Atlas copco	Diesel	45
Portable Compressor	2	250/150 cfm	Elga	Diesel	200
Tipper-Taurus	1	10 tonnes	Ashok Leyland	Diesel	90

Source: Approved Mining Plan

2.5.2 DRILLING AND BLASTING:

TABLE 2.9: DRILLING AND BLASTING

S.No	Parameters	Description
1	Drilling Source:-	Jack hammer operated by the compressed air from tractor mounted compressor or Portable compressors.
2	Drilling parameters:-	Burden 0.7m spacing 0.8m depth 1.5m
3	Charge pattern:-	Charge 0.2 to 0.3kgs per hole. Stemming is 1/3 and explosives 2/3.The stemming material is moisture clay/pyroxenite mixed waste.
4	Initiation System:-	Bottom initiation system with safety fuses and ordinary or /plain electric detonators.
5	No of blast hole:	Number of the hole required per day is 5 – 6, based on the above said parameters.
6	Powder factor:	Powder factor is reported as 6Ts per kg of explosives.

Source: Approved Mining Plan

2.5.3 STORAGE OF EXPLOSIVES:

Drilling and blasting will be carried out only when the hard strata encountered. No magazine is available at mine sites. For each leases agreement is made with authorized explosive dealer for supply of explosives under Form-22. The blasting will be done under the supervision of qualified blaster. The authorized explosive supplier will bring the required explosive in his approved van and take back the remaining explosive after blasting. There is no proposal for storing of explosives in any of the leases.

2.5.4 HANDLING OF TOP SOIL

The average thickness of the top soil is about 1m anticipated quantity of top soil for this plan period is360 tonnes. Top soil will be removed and preserved all along the boundary barrier to facilitate the greenbelt.

2.5.5 WASTE MANAGEMENT

TABLE 2.10: DISPOSAL OF WASTE

Description	Details
Existing waste	38m X 35m X 3m West
Proposed waste (Mineral reject)	Proposed to fill old pit located on south side
	45m X 20m X 12m (h) sloping area- South western part of the pit.
Top soil dump	Top soil will be utilized for greenbelt development.

Source: Approved Mining Plan

The grade below 40% of $CaCO_3$ with contaminations of calc gneiss waste is considered as mineral rejects in these particular formations.

Mineral rejects excavated from the mine will be dump separately as per the predetermined places identified in the above table and it will be backfilled in the mined out pit at the end of the life of the mine.

The small quantity of Municipal waste will be generated and domestic effluent will be discharged in septic tank and soak pit system.

2.5.5 GREEN BELT DEVELOPMENT

In this present plan period 75 Numbers of saplings are proposed to be planted in the in the boundary barrier as indicated in the afforestation plan with 3m X 3m spacing about 1000 Sq.m is proposed for the greenbelt during the present plan period.

2.5.6 RECLAMATION AND REHABILITATION

Reclamation and rehabilitation are not proposed in the present scheme period. After the end of the life of the mine the mined out pit will be allowed to collect the rain water, the pit will be utilized as temporary storage reservoir which will enhance the ground water level.

2.6 GENERAL FEATURES.

Breakup of the land use and land cover within the lease area as approved by the Indian Bureau of Mines, Chennai.

TABLE 2.11: LAND USE PATTERN OF THE LEASE AREA

S.No	Description	Present Area (Ha)	Additional Area required during the present MP Period (Ha) [2020-21 to 2024-25]	Area at the end of plan period and end of life of mine (Ha)
1	Mining (Quarry)	0.89.6	0.16.0	1.05.0
2.	Waste dump	0.12.1	Nil	Nil
	Earthen bund	-	0.13.0	0.13.0
3.	Office & infrastructure	Nil	0.01.0	0.01.0
4.	Processing plant	-	-	-
5.	Mineral stack processing yard	-	-	-
6.	Sub grade mineral stacks	-	-	-
7.	Mine roads	0.02.0	Nil	0.02.0
8.	Areas under plantation	0.04.0	0.10.0	0.14.0
9.	Un utilized area	0.62.0	0.34.0	0.34.4
10.	Total	**1.70.0**		**1.70.0**

Source: Approved Mining Plan

2.6.1 DRAINAGE PATTERN.

The drainage pattern of the area is dendritic pattern. There are no streams, canals or water bodies crossing the project area, hence there is no requirement of stream deviation or canals in the near future.

2.6.2 TRAFFIC DENSITY:

Traffic density measurements were performed at one location at Dindigul – Karaikkudi Road (SH-35), which is about 3.5Km in the west side. Traffic density survey was carried out as per IRC 1960 Guidelines. The monitoring was performed on 27-11-2023. Traffic density measurement were made continuously for 24 hours by visual observation and counting of vehicles under three categories, viz., heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads are high, two skilled persons were deployed simultaneously at each station during each shift- one person on either direction for counting the traffic. At the end of each hour, fresh counting and recording was undertaken.

TABLE 2.12: TRAFFIC DENSITY

Type of vehicle	No of vehicle per day Dindigul – Natham
Heavy Vehicles	243
Light vehicles	372
Three wheelers	842
Grand Total	1457

Source: Field Monitoring Data

Total quantity of limestone to be transported from the mine to captive plant and needy cement industries for the peak production capacity.

Average Proposed production of Limestone per annum	=	7,966 tonnes
Average Proposed production of Limestone per day	=	26 tonnes
Capacity of tipper	=	10 tonnes
No of vehicles for the transportation	=	26 tonnes / 10 tonnes
	=	2-3Trips max per day.

This transportation will not have significant impact on the existing traffic density/ existing road. The transported vehicles are likely to move in the MDR and State Highways. The haulage road does not enroute any nearby villages.

2.6.3 MINERAL BENEFICIATION AND PROCESSING.

There is no proposal for the mineral processing or ore beneficiation in the mine lease area. The mined out limestone after grade separation (manually) will be sold to needy customers in raw form and transported to the own captive plant.

2.6.4 POWER, WATER SUPPLY AND OTHER INFRASTRUCTURE REQUIREMENT

The project does not require any power supply for the mining operations. The Mining activity is proposed during day time only (General Shift 8 AM – 5 PM, Lunch Break 1 PM – 2 PM). Electricity for use in office will be obtained from SEB. There is no DG set in the mine site.

Water shall be obtained from accumulated rainwater/seepage water in mine pits. Packaged Drinking Water is available from the approved water vendors in Sirugudi village which is about 3Km North eastern side.

The temporary infrastructures such as Mine Office, First Aid Room, Rest Shelter etc., are available in the mine lease area. No workshops are proposed inside the mine lease area hence there will not be any process effluent generation from the mine lease area. Domestic effluent from the mine office will be discharged to septic tank and soak pit. There is no toxic effluent expected to generate in the form of solid liquid and gases and the no requirement of waste treatment.

2.6.5 WATER SOURCE & REQUIREMENT

Detail of water requirements in KLD as given below:

TABLE 2.13: WATER REQUIREMENT

Purpose	Quantity	Source
Dust Suppression	0.8 KLD	Rainwater accumulated in Mine Pit
Green Belt	0.8 KLD	Rainwater accumulated in Mine Pit
Domestic &Drinking Purpose	0.4 KLD	Approved Water Vendors
Total	**2 KLD**	

Source: Approved Mining Plan

2.6.6 POWER SUPPLY

Mining is proposed and practiced for day shift only 8AM to 5PM. No workshops are installed inside the mines. Power is required only for the mines office complex. There is no DG set in mine site.

2.6.7 FUEL DETAIL

High Speed Diesel (HSD) is used for mining machineries. HSD will be brought from nearby fuel stations.

Average Consumption of HSD by Mining Machineries is as below –

0.9 to 1.2 m^3 Bucket Capacity Hydraulic Excavator – 150 ltr

Compressor – 40 ltr

10 tonnes Capacity Tipper – 40 ltr

Hence it is computed as average 230-250 ltrs of HSD per day.

2.7 EMPLOYMENT POTENTIAL:

The local labours have been engaged for Mining of limestone, loading and handling of mineral in mining area, watch and ward and plantation activity for proper maintenance.

Beside the proponents engaged skilled and managerial staff to meet the statutory requirement under MMR 1961 and MCDR 1988.

At present, the mine is not operational. The following skilled / unskilled and semi-skilled workers besides managerial and administrative staff shall be proposed to be deployed at the time of re-opening of mine.

TABLE 2.14: EMPLOYMENT POTENTIAL

Present Employment position		Additional requirements during the MP period
Mining engineer	-	1
Geologist	-	1
Foreman	1	-
Mate cum blaster	1	-
Mines office clerk (full time)	1	-
supervisor	1	-
Driver	1	-
Un skilled labour	5	-
Total	**10**	**2**

Source: Approved Mining Plan

2.8 PROJECT IMPLEMENTATION SCHEDULE

The commercial operation will commence after the grant of Environmental Clearance. CTO and CTE will be obtained from the consent authority. The conditions imposed during the Environmental Clearance will be compiled before the start of mining operation.

TABLE 2.15 PROJECT IMPLEMENTATION SCHEDULE

Sl. No.	Particulars	Time Schedule (In Month)*					Remark if any
		1st	2nd	3rd	4th	5th	
1	Environmental Clearance						
2	Consent To Establish						Project Establishment Period
3	Consent To Operate						Production Start Period
*Time line may vary; subjected to rules and regulations /& other unforeseen circumstances							

Source: Anticipated Timeline as per EIA Notification and Other Applicable Rules

2.8.1 POST MINING LAND USES:

After complete exploitation of the limestone mineral from the lease area, the mined out pit will be partially backfilled by the dumping material (Mineral rejects) and partially allowed to collect the rain water which will act as a temporary reservoir, this temporary storage of water will act as an artificial recharge pond.

Adequate measure will be taken care for constructing wall around the mined out area with 2mts height and fenced as per the rules. A watchman (Security guard) will be posted around the clock to prevent inherent entry of public and cattle. During rains the accumulated/stagnated water will be pumped out by means of temporary electric source with 5 HP motor and the water will be utilized for greenbelt.

2.8.2 PROJECT COST

TABLE 2.16 PROJECT COST

Fixed Assets	Rs 5, 15,000/-
Operational Cost	Rs 70, 32,000/-
Total	**Rs 75, 47,000/-**

Source: Pre-feasibility Report

3.DESCRIPTION OF ENVIRONMENT

3.0 GENERAL

Study area

For the description of baseline environmental scenario, the mine area has been considered as the ***core zone***. The area falling within a distance of 10km from the boundary of the core zone has been considered as the ***buffer zone***. The core zone and the buffer zone, combined together are referred to as the study area for determination of baseline status and assessment of environment impacts.

Study period

The Base line environmental quality represents the background scenario of various environmental components in the study area. Monitoring of environmental parameters over a radial distance of 10 km around the mine was carried out during **Post monsoon season -2023 covering the months of October to December.**

Sources of Environmental data

Baseline Environmental study was carried out in an area of 10Km around the mine leases. The baseline information on micro-meteorology, ambient air quality, water quality, noise levels, soil quality and floristic descriptions are drawn from the data's generated by M/s EHS 360 LABS PRIVATE LIMITED Certified & MoEF Recognized Laboratory and meteorological data collected from the nearest IMD station located in Karur paramathi - index KPM 43342.

Apart from these, secondary data have been collected from Census Handbook, Revenue Records, Statistical Department, Soil Survey and Land use Organization, District Industries Centre, forest working plan, Forest Department, Central Ground Water Authority, etc., The generation of primary data as well as collection of secondary data and information from the site and surroundings was carried out during Post monsoon season i.e **October to December 2023.**

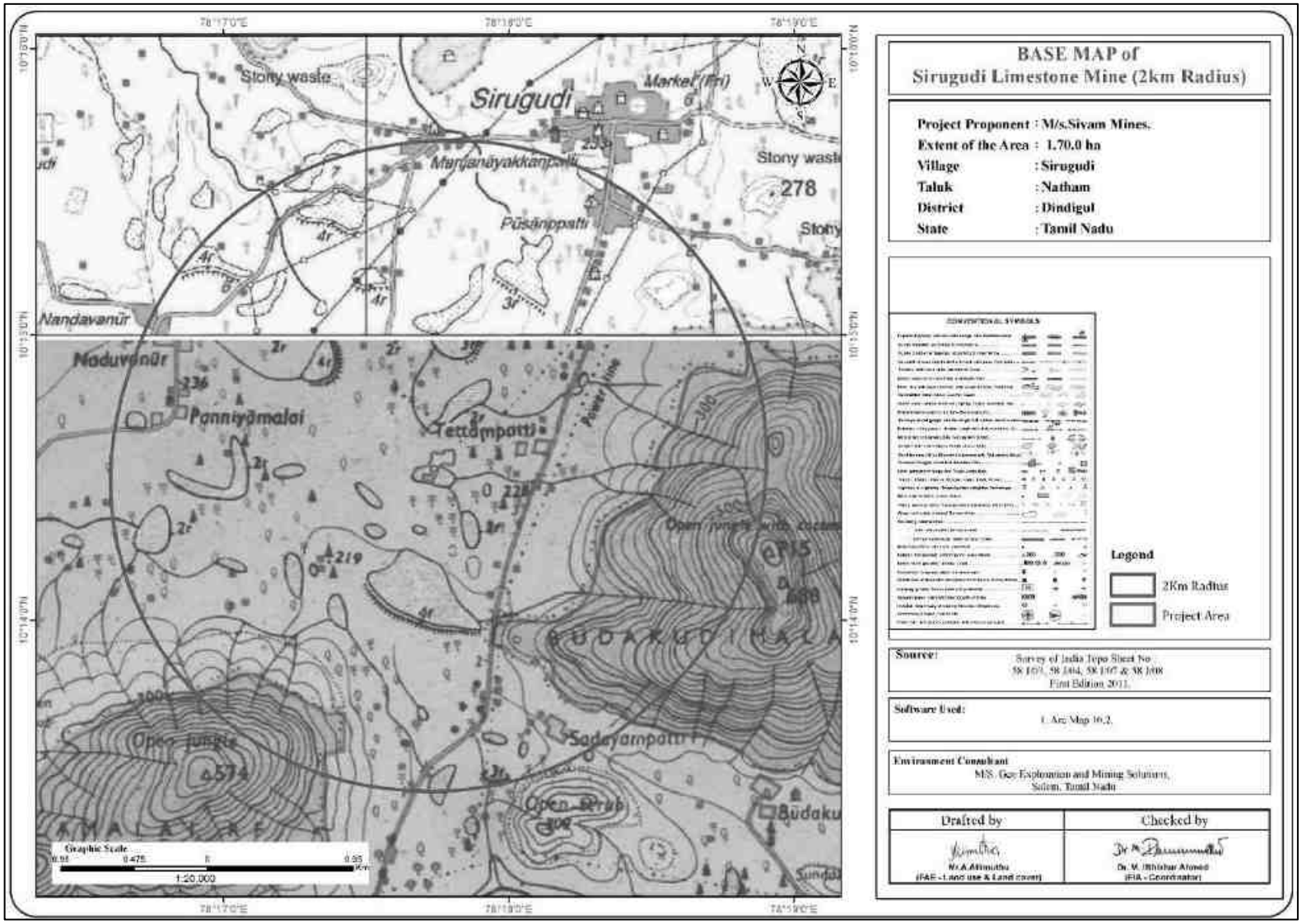
TABLE 3.1: ENVIRONMENTAL MONITORING ATTRIBUTES AND FREQUENCY

ATTRIBUTE	PARAMETERS	FREQUENCY OF MONITORING	PROTOCOL
Meteorology	Wind Speed Wind Direction Temperature Rainfall	1 Hourly Continuous Mechanical/Automatic Weather Station	IS 5182 Part 1-20 Secondary Data from IMD Station.
Ambient Air Quality	PM_{10} $PM_{2.5}$ SO_2 NO_X CO.	24 hourly twice a week for 3 months	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
Water Quality	Physical, Chemical and Bacteriological Parameters	Once during the study period	IS 10500 IS 3025 IS 2488 (Part 1-5)
Ecology	Existing Flora and Fauna	Through field visit during the study period.	Primary Survey by Quadrate & Transect Study
Noise Levels	Background Noise Levels in the study area	Hourly observation for 24 hours per location	IS 9989 As per CPCB Guidelines
Soil Characteristics	Physio-Chemical Characteristics	Once during the study period	IS 2720
Landuse	Landuse Pattern within 10 KM radius of the study area	Data's from census handbook 2011 and from the satellite imagery	Satellite Imagery Primary Survey
Socio Economic Aspects	Socio–Economic Characteristics, Population Statistics and Existing Infrastructure in the study area.	Census handbook, 2011	Primary survey, census handbook & need based assessments.

Source: EIA Guidelines

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

FIGURE 3.1: BASE MAP OF THE STUDY AREA



Source: Survey of India Topo sheet.11th Edition, 2011 BW- Bore water, PW – Pit water, S- Soil, N- Noise, AAQ- Ambient Air quality,

3.1 LAND ENVIRONMENT

3.1.1 METEOROLOGY.

Sampling Methodology

The meteorology data recorded during the study period is useful for proper correlation and interpretation of the baseline information as well as for input to prediction models for air quality dispersion. It is characterized by a hot and dry summer from March – May, a monsoon or rainy season from October - December and winter season from January - March. The climate of the Dindigul District is generally warm. The hottest period of the year is generally from the months of March to May, the highest temperature going up to 38 ^{0}C in April. During field monitoring at study area various meteorological parameters were generated continuous monitoring equipment's to record wind speed, wind direction, temperature and relative humidity.

The methodology adopted for monitoring field observations was as per the standard norms laid down by the Bureau of Indian Standards (IS: 8829) and Regional meteorological center under IMD (Indian Meteorological Department) situated in Karur paramathi vide index No KPM -43342.

3.1.2 METEOROLOGICAL DATA RECORDED AT SITE

Period of Study

The meteorological parameters were recorded at site on hourly basis during the study period (October – December 2023) and consist of parameters like, wind speed, wind direction, temperature and relative humidity.

Temperature

In Dindigul, the average annual temperature is 27.8 °C. The rainfall here averages 717 mm. The driest month is March, with 11 mm of rainfall. The greatest amount of precipitation occurs in October, with an average of 180 mm. The warmest month of the year is May, with an average temperature of 30.4 °C. The lowest average temperatures in the year occur in January, when it is around 24.8 °C. The difference in precipitation between the driest month and the wettest month is 169 mm. The variation in temperatures throughout the year is 5.6 °C. The nearest IMD station for the proposed mine project is Karur paramathi - index KPM 43342.

Relative Humidity

The climate of the district on the whole is slightly humid. The driest months are February and March with average relative humidity of about 40% in the afternoons. During the rainy months the average humidity is appreciably below the saturation level. Skies are generally clear or lightly clouded during the period October to December 2023.

3.1.3 LAND USE/ LAND COVER:

Land use pattern of the area is studied through the Bhuvan (ISRO). The interpretation made visually by identifying the land use cover through the keys given in the map. In the study area 10Km map radius map has been taken for the analysis of landuse cover.

Since the mining is carried out by opencast category "A" other than fully mechanized method, studies on land environment of eco-system play an imperative role in identifying susceptible issues and taking appropriate action to uphold ecological equilibrium in the region. The main objective of this section is to provide a baseline status of the study area covering 10km radius around the proposed mine site so that temporal changes due to the mining activities on the surroundings can be assessed in future.

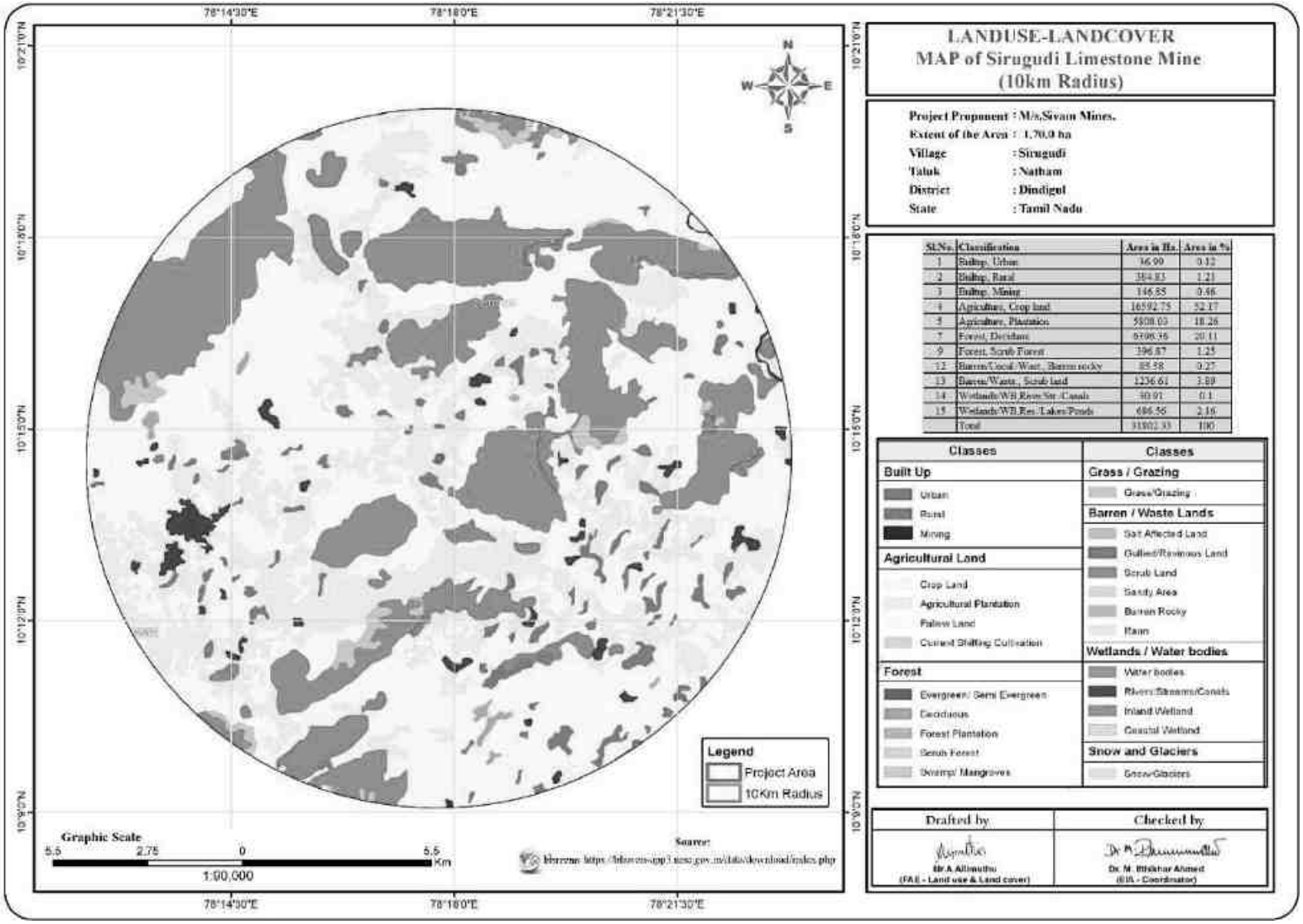
3.1.4 DESCRIPTION OF LAND USE

The distribution of lands within the buffer zone was computed based on the Bhuvan details.

TABLE 3.2: LAND USELAND COVER TABLE 10KM RADIUS

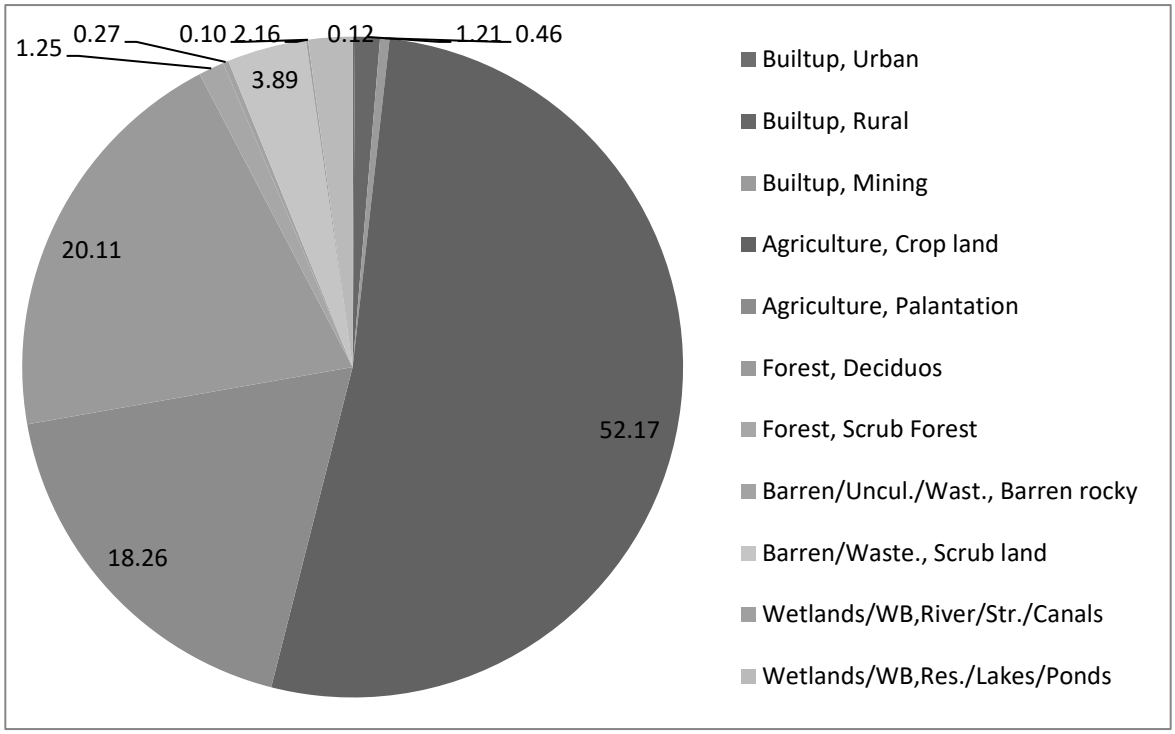
Sl.No.	Classification	Area in Ha.	Area in %
1	Builtup, Urban	36.99	0.12
2	Builtup, Rural	384.83	1.21
3	Builtup, Mining	146.85	0.46
4	Agriculture, Crop land	16592.75	52.17
5	Agriculture, Plantation	5808.03	18.26
7	Forest, Deciduos	6396.36	20.11
9	Forest, Scrub Forest	396.87	1.25
12	Barren/Uncul./Wast., Barren rocky	85.58	0.27
13	Barren/Waste., Scrub land	1236.61	3.89
14	Wetlands/WB,River/Str./Canals	30.91	0.10
15	Wetlands/WB,Res./Lakes/Ponds	686.56	2.16
Total		**31802.33**	**100.00**

FIGURE 3.2: LAND USE LAND COVER MAP OF THE STUDY AREA (10KM RADIUS)



Source: Bhuvan ISRO on LISS III image

FIGURE 3.3: PIE DIAGRAM OF LAND USE LAND COVER



Source: Table 3.2

Interpretation:

Most of the study area is covered by the agriculture land which depends upon the seasonal vegetation. The total mining areas in the 10Km radius is about 0.46% are very small in nature. The proposed mining area is 1.70.0 ha which covers about 1.16 % from the total mining area within the study area which will not have any significant impact on the environmental.

3.1.5 ENVIRONMENTAL FEATURES IN THE STUDY AREA

No major eco-system / biosphere reserves have been identified within the periphery of the project site. Details of the important features along with other sensitive ecological locations in the study area are provided in the following table.

TABLE 3.3: ENVIRONMENTAL SETTINGS OF THE STUDY AREA

S.No	Sensitive ecological features	Name	Arial distance in Km from mine lease boundary
1	National Park –Wild life sanctuaries	None	--
2	Reserve forest	Nedunkuthu reserve forest	4.40Km North
		Vellimalai reserve forest	6.50Km North East
		Karumalai reserve forest	4.20Km North East
		Badugudi reserve forest	700m South East
		Alagar hills reserve forest	11Km South West
		Karandamalai reserve forest	7Km North West
3	Lakes/Reservoir/Dams	Sirugudi Village Tank	800m South West
		Sirugudi Village Tank	850 m North
4	Tiger Reserve/Elephant Reserve	None	Nil within 10Km Radius
5	Core Zone of Biosphere Reserve	None	Nil within 10Km Radius
6	Migratory birds	None	Nil within 10Km Radius
7	Stream/Rivers	None	Nil within 10Km Radius
8	Mangroves	None	Nil within 10Km Radius
9	Mountains/Hills	None	Nil within 10Km Radius
10	Notified Archaeological sites	None	Nil within 10Km Radius
11	Industries/Thermal Power Plants	None	Nil within 10Km Radius
12	Defense Installation	None	Nil within 10Km Radius

Source: Survey of India Toposheet

3.1.6 TOPOGRAPHY:

The area is almost plain terrain. The general slope of the area is towards South. The attitude of the area is 229 m above MSL.

3.1.7 DRAINAGE PATTERN OF THE AREA.

The general drainage pattern of the area is of dendritic and Sub dendritic pattern. No prominent water course or nallah is inferred. During rainy season the surface runoff flows in N to S direction. The drainage pattern of the study area is given in Fig. 3.4.

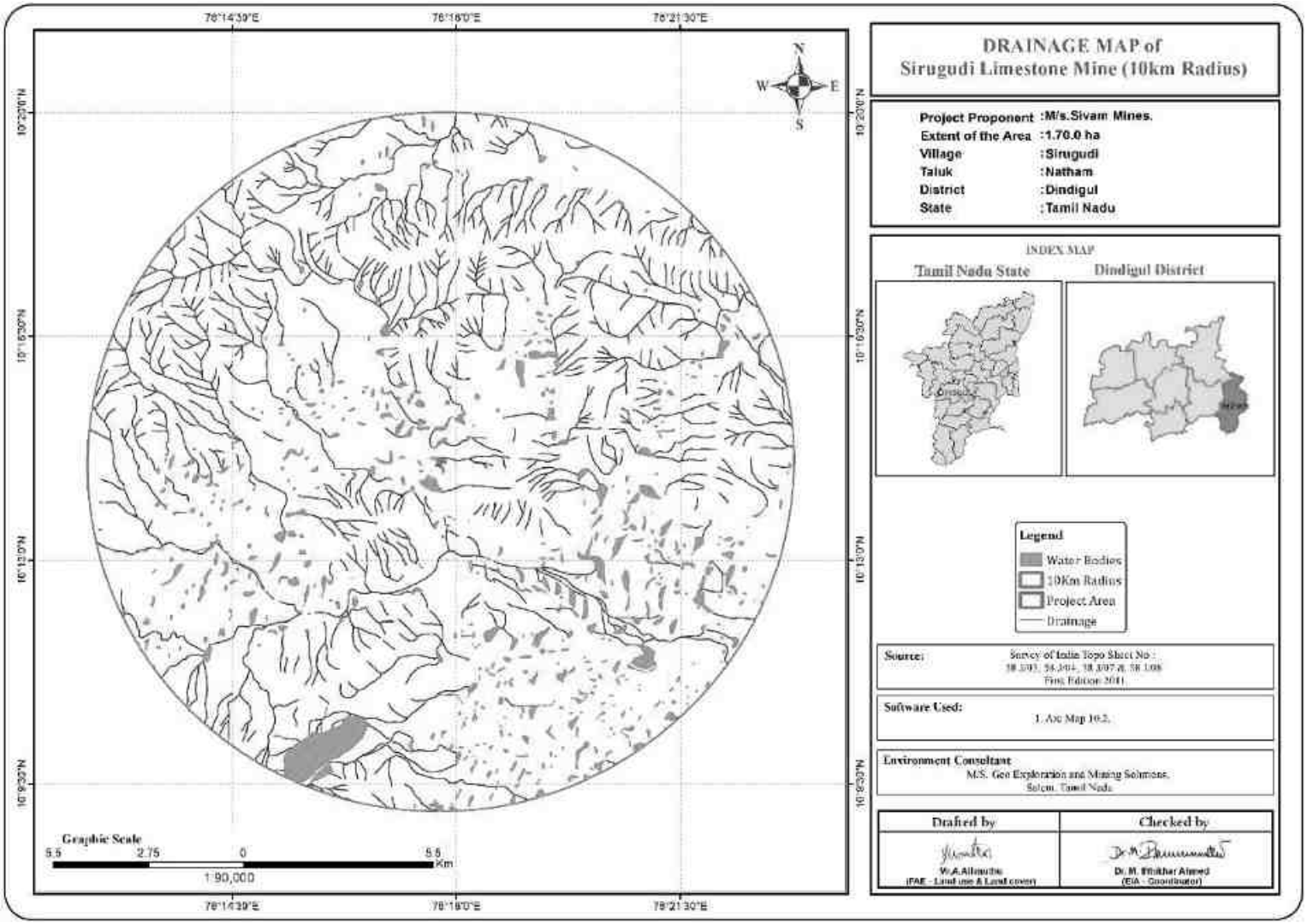
There are no developed surface drainage channels in the ML area. There are no major rivers within the radius of 10Km. The area is studded with numerous tanks that serve as the source of drinking water and also their surplus feeds adjoining tanks. The area is mostly dry in all seasons except rainy seasons.

3.1.8 SEISMIC SENSITIVITY

Zone II, Low Risk Zone (https://moes.gov.in/writereaddata/files/LS_EN_20032020_385.pdf) and no history of such incidents in the area.

The mining lease area falls in the Garnet biotite gneiss on the peninsular shield of south India which is highly stable.

FIGURE 3.4: DRAINAGE MAP OF THE STUDY AREA COVERING 10KM RADIUS



Source: Geographical information system (GIS)

3.1.9 SOIL CHARACTERISTICS:

The soil is developed by the weathering of the rocks present in nature and differentiated into horizons of various heights and characters. The soil is a natural medium for plant growth and supplies the required nutrients to the growing plants. Some soils are very productive that contain adequate amounts of all essential elements in the form readily available to plants. For good plant growth the soil should also be in good physical condition which ensures proper supply of air and water.

The objective of the soil sampling is: -

- To determine the baseline soil characteristics of the study area;
- To determine the impact of proposed activity on soil characteristics and;
- To determine the impact on soil more importantly agriculture production point of view.

The Soil Productive Capacity can be evaluated by determining Physio-Chemical characteristics of the soil. Nine Samples of Soil were collected from different locations for studying soil characteristics in the study area, the location of which is listed in Table 3.4

Methodology of Soil Monitoring –

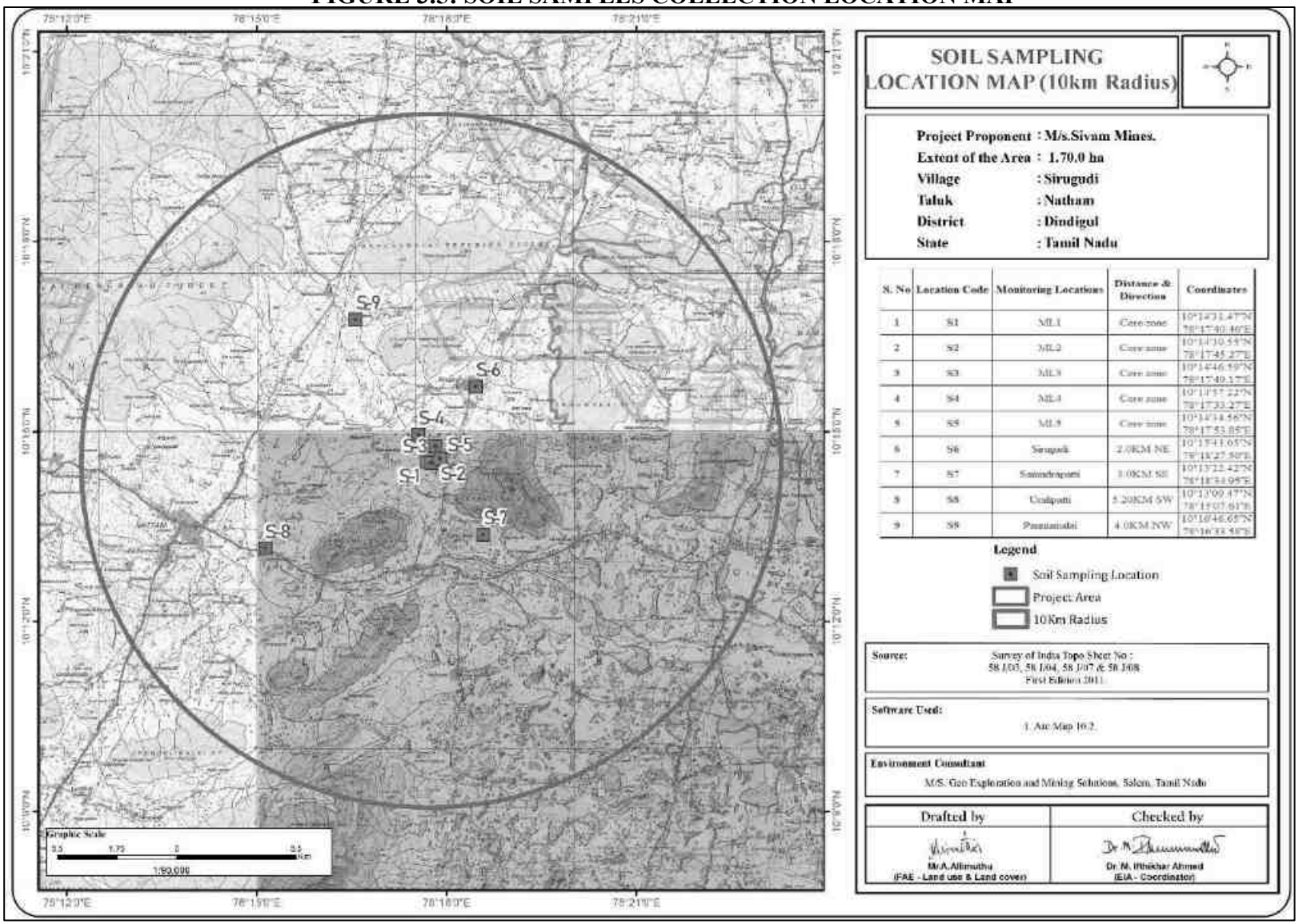
It is most essential to obtain a representative sample of soil from an area in any study. A composite sample of an area is normally preferred. The soil sample was collected from different locations in the month of October 2023 by hand auger boring and from trial pit method up to the depth of 90 cm and transported to the laboratory and was spread for air drying. After proper drying of the soil, large stones and other similar objects were removed and the soil was grounded to break up aggregates and crumbs, and tested as per IS 2720. The results are given in Table 3.5.

TABLE 3.4: DETAILS OF SOIL MONITORING STATIONS

Station No	Location	Co ordinates	Distance and direction	Environmental settings
S1	ML1	10°14'31.47"N78°17'40.46"E	Core zone	Mining Area
S2	ML2	10°14'30.55"N 78°17'45.27"E	Core zone	Mining Area
S3	ML3	10°14'46.59"N 78°17'49.17"E	Core zone	Mining Area
S4	ML4	10°14'57.22"N 78°17'33.27"E	Core zone	Mining Area
S5	ML5	10°14'34.56"N 78°17'53.85"E	Core zone	Mining Area
S6	Sirugudi	10°15'43.05"N78°18'27.50"E	2.0Km NE	Agriculture land
S7	Samudrapatti	10°13'22.42"N78°18'34.95"E	3.0Km SE	Agriculture land
S8	Uralipatti	10°13'09.47"N78°15'07.61"E	5.20Km SW	Agriculture land
S9	Panniamalai	10°16'46.65"N78°16'33.58"E	4.0Km NW	Agriculture land

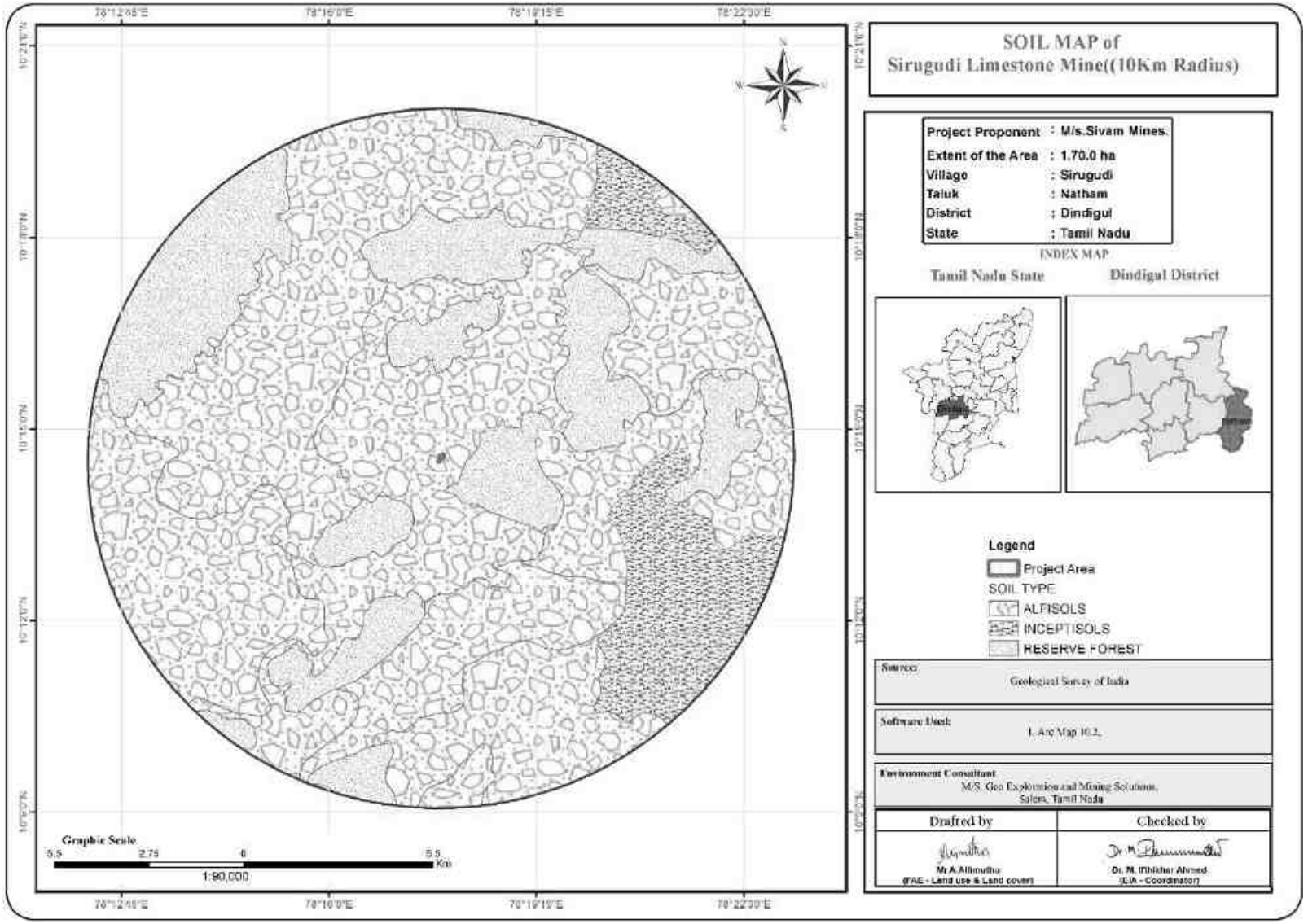
Source: Baseline Monitoring Data at Project Site

FIGURE 3.5: SOIL SAMPLES COLLECTION LOCATION MAP



Source Geological survey of India Topo sheet

FIGURE 3.6: SOIL MAP OF THE STUDY AREA



Source: Geographical information system (GIS).

TABLE 3.5: SOIL QUALITY MONITORING DATA

Sl. No.	Parameter		S1	S2	S3-	S4	S 5	S 6	S 7	S 8	S 9	Desirable Range	Interpretation
1	pH @ 25°C		8.31	8.09	7.98	8.16	8.04	7.85	7.47	8.02	7.68	5.5-9.0	Strongly alkaline
2	Electrical Conductivity @ 25°C, µS/cm		590	624	609	614	628	484	516	534	546	1000 - 2000	Low conductivity
3	Water Content, %		0.89	0.68	0.73	0.64	0.59	1.34	1.25	1.16	1.09	-	--
4	Available Phosphorous, µg/g		55.6	51.4	58.2	50.6	50.1	48.4	51.2	50.8	49.6	15 - 840	Very Low
5	Organic Matter,%		0.7	0.9	1.1	1.8	2.0	1.5	1.2	1.8	1.3	-	--
6	Soluble Calcium as Ca, meq/l		14.0	12.4	10.8	8.8	6.4	3.8	4.4	2.6	1.9	50 - 100	Low
7	Soluble Calcium & Magnesium, meq/l		20.6	20.6	19.5	12.8	10.3	5.4	5.8	3.4	3.2	-	--
8	Chloride as Cl^-, meq/l		12.8	11.7	12.4	11.8	10.1	4.2	3.6	2.8	3.4	0.1 – 0.2	High
9	Soluble Potassium as K, mg/100g		0.8	0.6	0.8	0.9	1.1	1.1	0.9	1.4	0.2	15 - 25	Low
10	Soluble Sodium as Na, mg/100g		4.7	3.6	3.1	3.3	2.9	5.4	3.9	5.8	4.3	-	
11	Sulphate as SO_4^-,mg/100g		18.6	20.4	18.6	16.4	14.6	14.8	12.6	13.4	15.8	0.2 - 1	Low
12	Calcium Carbonate as $CaCO_3$, %		32	34	32	20	28	28	36	34	28	-	--
13	Carbonate and Bicarbonate, meq/l		1.6	1.4	1.8	2.2	1.2	2.2	2.0	1.8	2.0	-	--
14	Total Kjheldal Nitrogen, %		14	14	28	14	14	56	48	14	28	0.15 – 0.25	Very Low
15	Bulk density gm/cc		1.28	1.22	1.26	1.28	1.25	1.52	1.44	1.38	1.30		
16	Water holding capacity %		42	42	48	44	44	44	46	48	44		
17	Porosity %		56	54	60	52	50	60	62	64	66		
18	Texture %	Sand	92	93	90	93	96	40	35	35	40		
		Silt	4	3	4	2	2	25	30	35	30		
		Clay	4	4	6	5	2	35	35	30	30		
19	Soil class		Sand	Sand	Sand	Sand	Sand	Clay Loam	Clay	Clay loam	Clay		

Source: LabAnalysisResults

* Desirable Range for High Production Soil

3.1.10 SOIL STATUS

Interpretation:

It is observed that the pH of the Soil ranging from 7.47 to 8.31 indicating that the soils is strongly Alkaline in nature. The Electrical Conductivity of the Soil ranges from 516 to 628 indicating Low Conductivity. The concentration of Chlorides is ranging from 2.8 to 12.8 which is found to be on the higher side, this is due to the dispersion of chlorides from the limestone to the nearby areas. The soil found in the area is semi fertile soil.

3.2 WATER ENVIRONMENT:

3.2.1 SURFACE WATER:

There is no perennial source (river) of surface water in the study area. Few ponds are present in some villages but are mostly dry before summer. Though the rainfall over the area is low to moderate, the rainwater storage in open wells, trenches is in practice over the area and the stored water acts as source of freshwater for couple of months after rainy season. The overland monsoon season runoff is intercepted and channelized to local open wells to a great extent by local villagers with a view to recharge the subsurface aquifer.

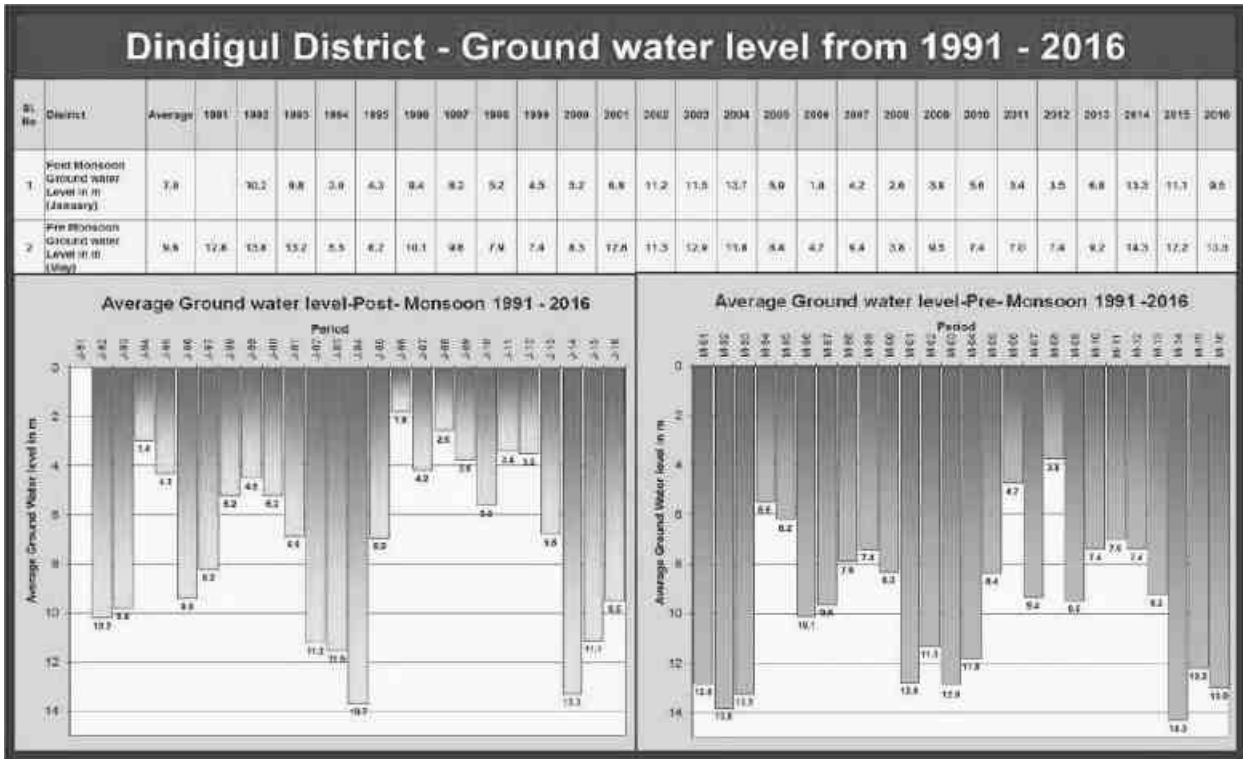
General water level of the area falls between 35m to 30m (35m in summer and 30m in rainy season).

3.2.2 GROUND WATER CONDITIONS:

The district is underlain entirely by Archaean Crystalline formations most of the area's are covered by Recent alluvial deposits. Weathered, fissured and fractured crystalline rocks and the recent alluvial deposits constitute the important aquifer systems in the district. Well irrigation is the highest in Natham block. As per the CGWB records Natham block categorization as semi critical.

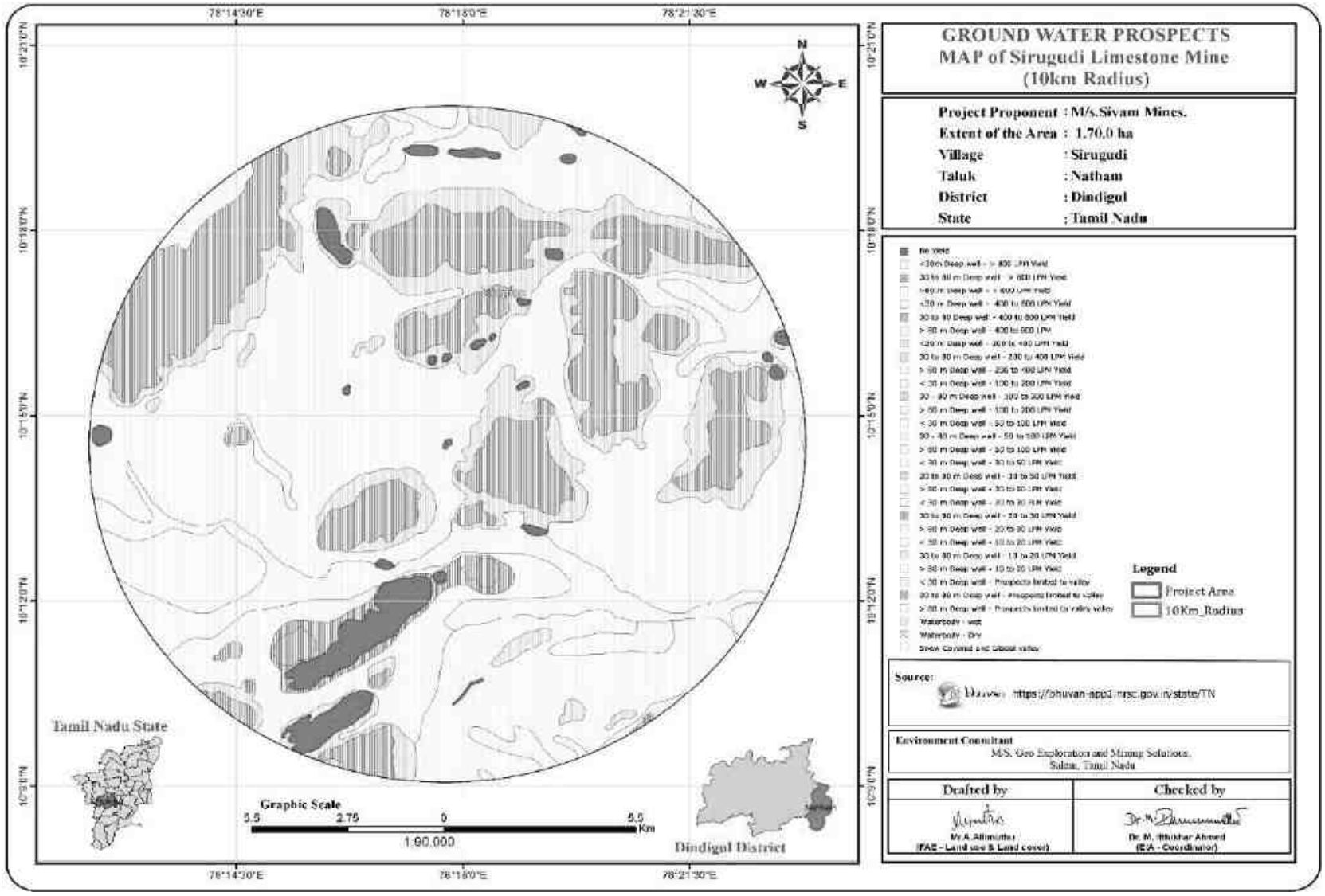
The study area falls in the Natham block which is categorized as Semi Critical (70%-90%) as per G.O. (MS) No 113 dated 09.06.2016.

FIGURE 3.7: DISTRICT GROUND WATER LEVEL CHART



Source:http://www.twadboard.gov.in/twad/dgl_dist.aspx
TWAD BOARDTamilNadu Water Supply and Drainage Board

FIGURE 3.8: GROUND WATER PROSPECTS OF THE STUDY AREA



Source: Bhuvan IRS Liss III Data

3.2.3 WATER ANALYSIS LOCATIONS

Ground water is water located beneath the ground surface in soil pore spaces and in the fractures of lithologic formations. Ground water is also often withdrawn for agriculture, municipal and industrial use by constructing and operating extraction wells. Ground water is naturally replenished by surface water from precipitation, streams and rivers.

Numerous industrial activities deliberately inject untreated effluent directly into the ground, contaminating underground aquifers.

Groundwater has been an important source for catering to the local needs of water consumption for various purposes, mainly domestic usage. Keeping in view the importance of groundwater to the local population, eight water samples was collected from the study area for the monitoring and assessment of groundwater quality. The locations as mentioned in Table 3.6.

All the collected water samples were analyzed by M/s EHS 360 LABS PRIVATE LIMITED Certified & MoEF Recognized Laboratory.

TABLE 3.6: WATER SAMPLING LOCATIONS

Location Code	Location	Co ordinates	Direction with respect to project site	Distance with respect to project site (km)	Type of water
W1	Project Site Lease 1	10°14'27.98"N 78°17'42.80"E	Core zone	Core zone	Mine pit water
W2	Project site Lease 3	10°14'35.66"N 78°17'55.58"E	Core zone	Core zone	Bore water
W3	Project site Lease 4	10°14'43.75"N 78°17'49.77"E	Core zone	Core zone	Pit water
W4	Project site Lease 5	10°14'57.33"N 78°17'34.83"E	Core zone	Core zone	Pit water
W5	Sirugudi	10°15'47.45"N 78°18'26.16"E	NE	3.0	Ground water
W6	Samudrapatti	10°13'20.25"N 78°18'35.50"E	SE	2.60	Ground water
W7	V.Pudur	10°13'31.90"N 78°19'59.29"E	SE	4.30	Ground water
W8	Uralipatti	10°13'2.66"N 78°15'1.61"E	SW	5.50	Ground water
W9	Panniamalai	10°16'46.65"N 78°16'36.79"E	NW	2.75	Ground water
W10	Odugampatti	10°17’12.01”N 78°19’18.76”E	NE	5.18	Ground water
W 11	Avichipatti	10°14'47.39"N 78°16'46.65"E	West	1.64KM	Ground water

Source: Lab Monitoring Data

Methodology for sample collection –

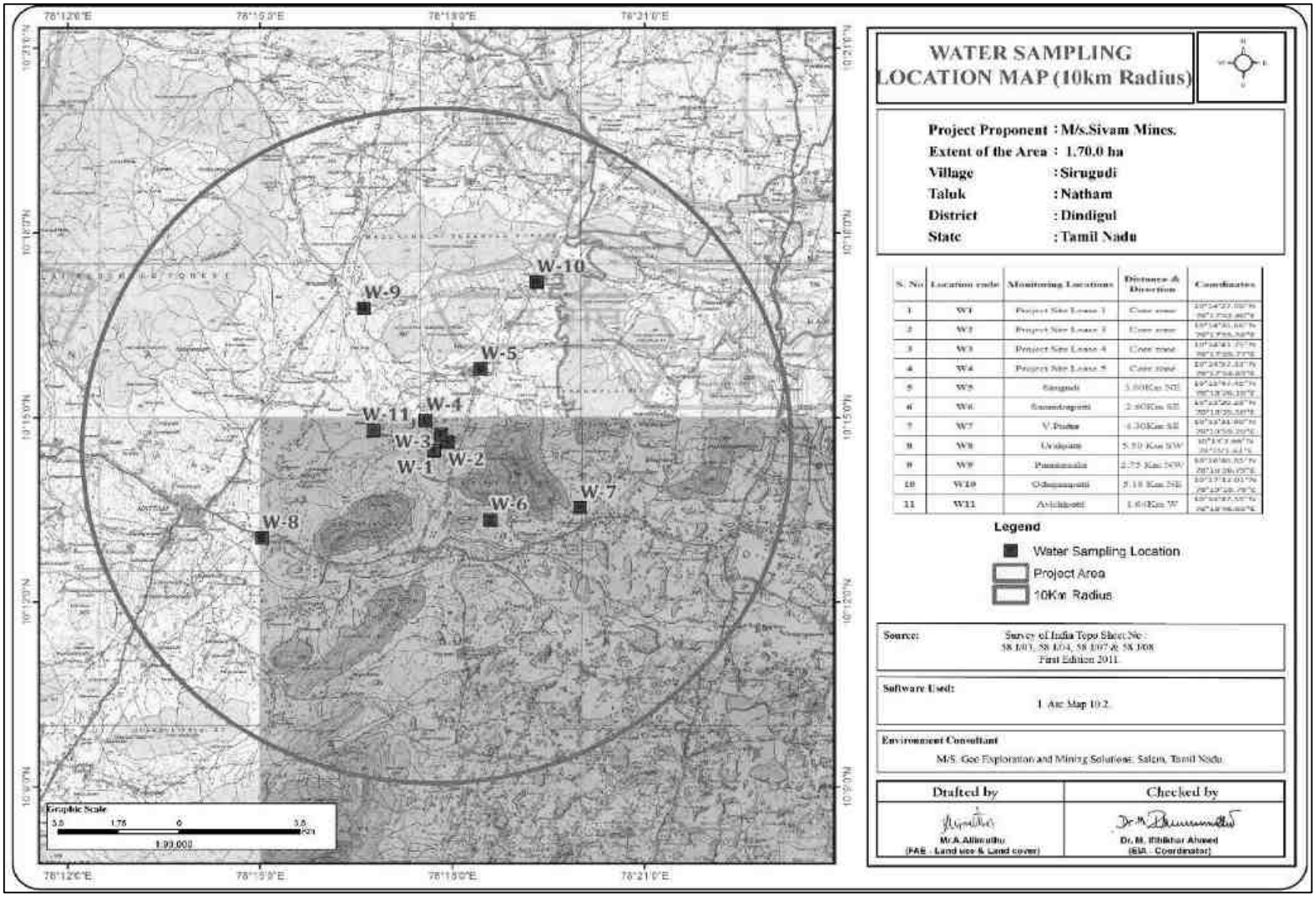
Water sample was collected in the month of November - 2023.

The sample was collected and analyzed as per IS-10500; IS-3025 & IS-2488 (Part 1-5). Grab sample of water was collected. Sample for chemical analysis was collected in polyethylene carboys. Sample for bacteriological analysis was collected in the sterilized bottle. Specified physio-chemical and Bacteriological parameters have been analyzed for projecting the existing water quality status in the study area.

Objective of Water sampling:–

- For rational planning of pollution control strategies and their prioritization.
- To assess nature and extent of pollution control needed in different water bodies or their part.
- To evaluate effectiveness of pollution control measures already in existence.
- To assess assimilative capacity of a water body thereby reducing cost on pollution control.
- To understand the environmental fate of different pollutants.
- To assess fitness of water for different uses.

FIGURE 3.9: WATER QUALITY MONITORINGLOCATIONS



Source: Survey of India Toposheet, 11th Edition, 2011

FIGURE 3.10: WATER SAMPLE COLLECTION IN MINE PITAND PUBLIC WATER TANK

TABLE 3.7: WATER QUALITY DATA

S.NO	Test Parameters	Unit	BW1	BW2	BW3	BW4	BW5	BW6	BW7	BW8	BW9	BW10	BW11	IS:10500 Norms*
1	pH @ 25°C	-	7.72	7.73	7.83	7.63	7.01	7.59	7.4	7.82	7.67	8.23	7.49	-
2	Conductivity@ 25°C	µs/cm	2140	1810	990	1740	1470	1440	2880	1070	1150	1340	610	**1 / 5**
3	Turbidity	NTU	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**6.5 – 8.5**
4	Total Dissolved Solids	mg/l	1391	1177	643	1131	956	936	1872	696	748	871	397	**500 / 2000**
5	Total Alkalinity	mg/l	430	280	310	235	310	288	292	150	154	156	200	
6	Total Hardness as $CaCO_3$	mg/l	563	561	288	581	590	570	501	260	285	292	270	**200 / 600**
7	Calcium as Ca	mg/l	108	99	56	104	104	106	103	56	58	54	72	**200 / 600**
8	Magnesium as Mg	mg/l	71	76	36	68	80	74	59	29	34	38	22	**75 / 200**
9	Chloride as Cl^-	mg/l	260	265	95	192	200	178	125	155	146	155	50	**250 / 1000**
10	Sulphate as SO_4^-	mg/l	120	104	72	110	95	92	94	119	122	138	26	**200 / 400**
11	Sodium as Na	mg/l	164	108	106	136	128	116	209	178	184	205	42	**0.3**
12	Iron as Fe	mg/l	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	-
13	Phosphate as PO_4	mg/l	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	-
14	Silica as SiO_2	mg/l	28.0	26.0	28.0	32.0	31.0	26.0	26.0	22.0	28.0	24.0	14.0	-
15	Total Coliform	mgl	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
16	E.Coli	mgl	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent

Source: LabAnalysisResults

* IS: 10500:2012-Drinking Water Standards; # within the permissible limit as per the WHO Standard. The water can be used for drinking purpose in the absence of alternate sources. Note: SW- Surface water, GW – Ground water.

Interpretation:

The mining operation is restricted above the Ground water table, the average pH value of the samples is 7.64 indicating slightly alkaline in nature. All physic- chemical parameters of the water samples in study area is well within the permissible limits as per IS: 10500.

The quality of the mine pit water does not have any heavy metal concentration, acidic, Sulphur or suspended solid particles hence the water can be used for green belt development and dust suppression. During rainy season the water from the mine will be collected in the mine pit only hence the water regime in the surroundings will not be affected in any manner.

As per the IS: 10500-2012 norms the water in the mine pit is fit for drinking purpose in the absence of alternate sources.

3.3 AIR ENVIRONMENT:

Ambient air quality is considered as background concentration of atmosphere. Monitoring of Ambient air is carried out to establish the impacts of various activities leading to generation of dust which have an impact on ambient air quality. All substances in ambient air exist as particulate matter, gases or vapors.

3.3.1 SELECTION OF AIRQUALITY MONITORING STATIONS LOCATIONS

Ambient air quality monitoring (AAQM) station was set up in eleven locations in study area for sampling –

The baseline status of the ambient air quality has been assessed through a scientifically designed ambient air quality monitoring network based the downwind and up wind direction as curtained through micro meteorological monitoring and wind rose diagrams; Sampler away from source and other interferences (inlet 15 m away from source/ traffic artery).

TABLE 3.8: AMBIENT AIR QUALITY MONITORING STATIONS

S.No	Station code	Location	Coordinates	Distance & Direction
1	AAQ 1	Near Lease 2	10°14'31.42"N78°17'43.09"E	Core zone
2	AAQ 2	Near Lease 1	10°14'32.59"N78°17'46.66"E	Core zone
3	AAQ 3	Near Lease 2	10°14'29.65"N78°17'43.25"E	Core zone
4	AAQ 4	Near Lease 4	10°14'48.60"N78°17'48.60"E	Core zone
5	AAQ 5	Near Lease 4	10°14'46.32"N78°17'49.98"E	Core zone
6	AAQ 6	Near Lease 5	10°14'57.78"N78°17'34.06"E	Core zone
7	AAQ 7	Sirugudi	10°15'46.94"N78°18'29.24"E	3.00Km NE
8	AAQ 8	Samudrapatti	10°13'19.98"N78°18'34.47"E	2.62Km SE
9	AAQ 9	V.Pudur	10°13'30.08"N78°19'59.39"E	4.42Km SE
10	AAQ 10	Uralipatti	10°13'2.82"N78°15'1.28"E	5.40 Km SW
11	AAQ 11	Panniamalai	10°16'45.84"N78°16'36.52"E	3.70Km NW

Source: Lab Monitoring Data

3.3.2 SITE SPECIFIC METEOROLOGY

Site specific meteorology during the study period was recorded by an automated weather station. Wind profile of the area is shown in the form of wind rose diagram given in Figure 3.14. Aeromod software version 9.1 was used to interpretation the air quality analysis.

3.3.3 CLIMATOLOGY:

Dindigul has a tropical climate. The summers are much rainier than the winters in Dindigul. This climate is considered to be Aw according to the Köppen-Geiger climate classification. In Dindigul, the average annual temperature is 27.8 °C. The driest month is March, with 11 mm of rainfall. The greatest amount of precipitation occurs in October, with an average of 180 mm. The warmest month of the year is May, with an average temperature of 30.4 °C. The lowest average temperatures in the year occur in January, when it is around 24.8 °C. The difference in precipitation between the driest month and the wettest month is 169 mm. The variation in temperatures throughout the year is 5.6 °C. The nearest IMD station for the proposed mine project is Karur paramathi - index KPM 43342

Rainfall

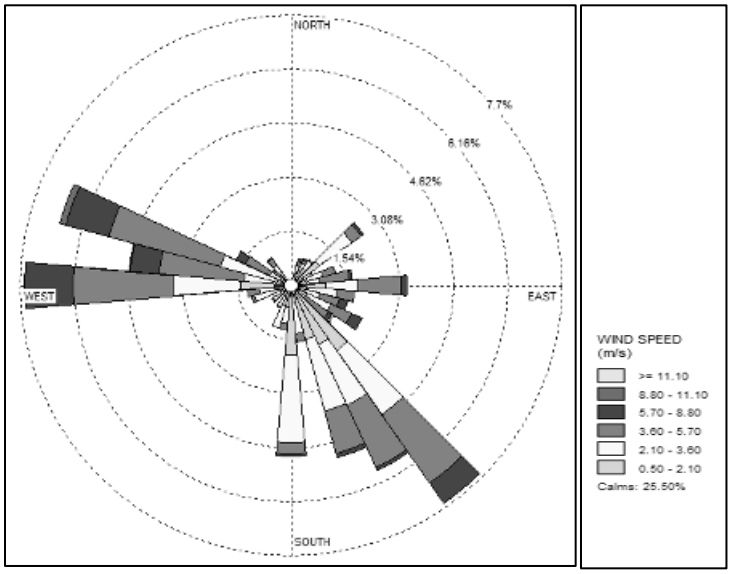
The average annual rainfall and the 5 years rainfall collected from IMD, Chennai is as follows:

TABLE 3.9: LAST FIVE YEARS RAINFALL DATA

Jan 2017	May 2017	Jan 2018	May 2018	Jan 2019	May 2019	Jan 2020	May 2020	Jan 2021	May 2021	5 Years Pre Monsoon Average	5Years Post Monsoon Average
15.2	21.5	10.0	17.0	9.7	16.3	9.6	20.9	9.4	18.9	16.1	9.0

Source: https://www.twadboard.tn.gov.in/content/dindigul

FIGURE 3.11: WIND ROSE DIAGRAM



3.3.4 AMBIENT AIR QUALITY

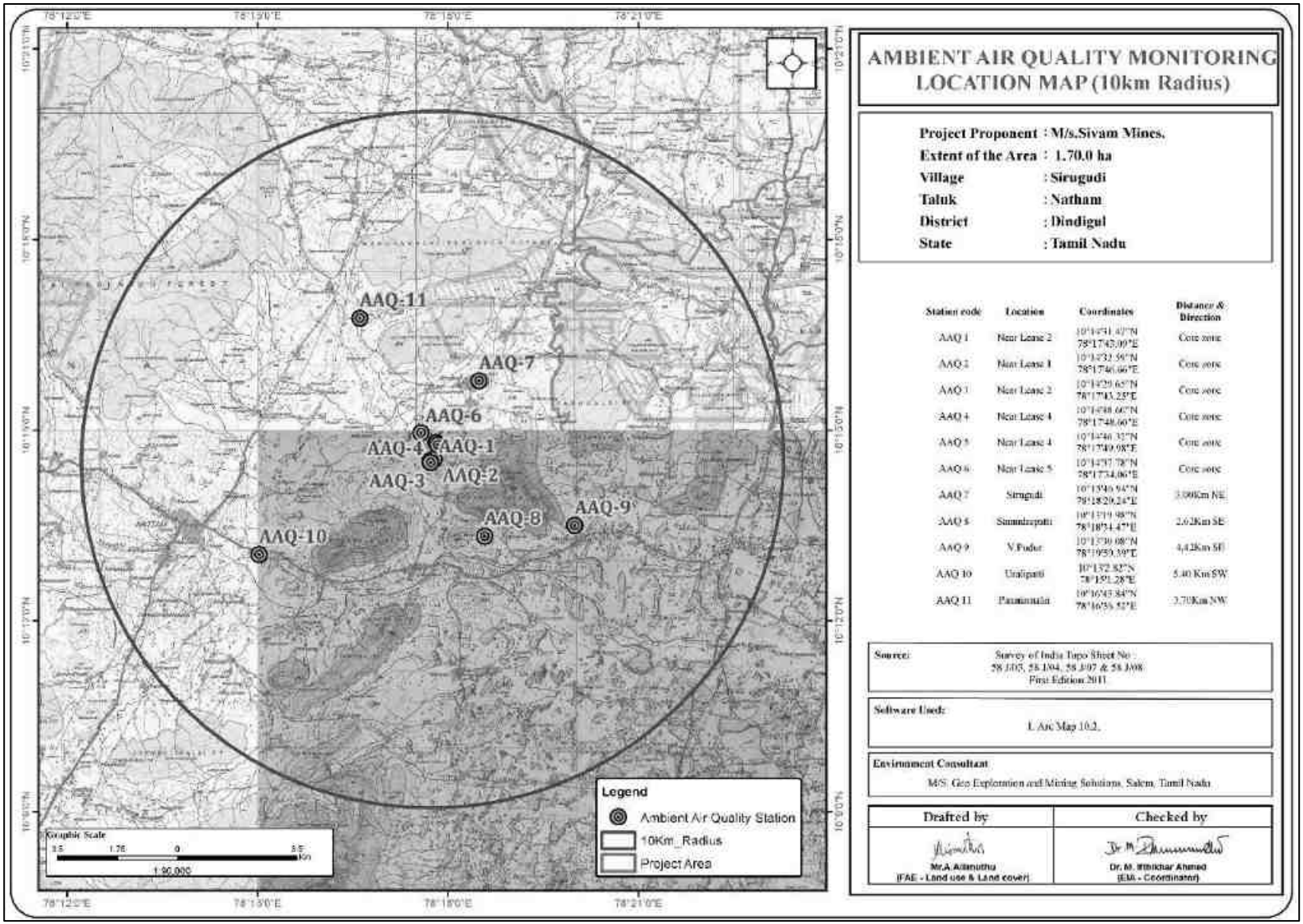
Objectives:–

- The prime objective of the baseline air quality monitoring is to evaluate the existing air quality of the area in conformity to NAAQS (National Ambient Air Quality Standards) 2009.
- To identify specific industrial and other sources of pollution.
- To assess health hazards and potential damage to property.
- To assess the pollution impacts on biotic environment.
- To collect data for formulating and testing air pollution models.

The results of monitoring during the study period (October to December 2023) are presented in the report.

FIGURE 3.12: AMBIENT AIR QUALITY MONITORING PHOTOS

FIGURE 3.13: AIR QUALITY MONITORING LOCATION MAP



Source:Survey of India Toposheet, 11th Edition, 2011

3.3.5 PERIOD OF STUDY

Ambient air quality monitoring was carried out at a frequency of 2 days per week at each location for three months. The baseline data of air environment was generated for the following parameters:

- Sulphur dioxide as SO_2
- Nitrogen dioxide as NO_2
- Particulate Matter(Size Less than 10 µm) as PM_{10}
- Particulate Matter (Size Less than 2.5 µm) as $PM_{2.5}$
- Ozone as O_3
- Lead as Pb,
- Carbon Monoxide as CO
- Ammonia as NH_3
- Benzene as $C_6 H_6$
- Benzo (a) Pyrene as BaP
- Arsenic as As
- Nickel as Ni

3.3.6 INSTRUMENTS USED FOR SAMPLING & ANALYSIS

TABLE 3.10 AMBIENT AIR MONITORING INSTRUMENTS: –

INSTRUMENT	MODEL NO.	RANGE AND SENSITIVITY	
Respirable Dust Sampler (RDS)	APM-450BL	0.40 – 1.5 m^3/min ±0.02 m^3/min (PM_{10})	0 – 3 LPM ± 0.2 LPM (gases)
Fine Particulate Sampler	APM 550	±0.03 DGM m^3 ($PM_{2.5}$)	

Source: Lab Monitoring Data

3.3.7 SAMPLING AND ANALYTICAL TECHNIQUES

TABLE 3.11 TESTING METHOD FOLLOWED FOR AMBIENT AIR QUALITY:–

Particular		Testing Method to be Followed
A	PM_{10}	IS 5182 (Part–23) 2006
B	$PM_{2.5}$	IS 5182 (Part–23) 2006
C	SO_2 (Sulfur Dioxide)	IS 5182 (Part–2) 2001, with Improved West & Gaeke Method
D	NO_x (Oxides of Nitrogen)	Modified Jacobs – Hochheiser Method / Arsenite Method (IS 5182 Part 6) 2011

Source: lab Monitoring Data

The air inlet has a circular symmetry so that air entry is unaffected by wind direction and is designed to keep out rain, insects and very large particles. The inlet section immediately leads to an impactor stage designed to trap particles with an aerodynamic diameter larger than 10 microns (Glass Fiber Filter size is 20.3 x 25.4cm). Thus the air stream in the down tube consists of only medium and fine particulates. The streamlined air flow of the down tube is accelerated through the nozzle of the well-shaped impactor designed to trap medium size particulates with an aerodynamic diameter between 2.5 and 10 microns.

To avoid sampling errors due to the tendency of small particles to bounce off the impaction surface a 37mm diameter GF/A paper immersed in silicone oil is used as an impaction surface. The air stream leaving the WINS impactor consists of microns. These fine particles are collected on a special Teflon membrane filter of 47 mm diameter. Modified West and Gaeke method (IS 5182 part II, 2001) has been adopted for estimation of SO_2 and Arsenite Modified Jacob & Hochheiser has been adopted for estimation of NO_X.NH_3 by Indophenols blue Method, O_3 by Chemical method.

The Particulate Matters (Size less than 10μm) are used to estimate the Mercury, lead, Nickel and Arsenic levels. Filter paper is digested and analyzed for heavy metal as per the method "As per IS 5182 (Part 22): 2004 followed by Atomic Absorption Spectrometer (AAS), Benzene and Benzo(a) Pyrene (BaP) as per method IS 5182 followed by Gas Chromatography (GC&HPLC).

TABLE 3.12: AMBIENT AIR QUALITY – AAQ1

Period: October – December2023 Location: AAQ1- Near lease area Sampling Time: 24-hourly

Monitoring		Particulates, µg/m³		Gaseous Pollutants, µg/m³					Other Pollutants (Particulate Phase) , µg/m³				
Date	Period, hrs.	$PM_{2.5}$	PM_{10}	SO_2	NO_2	NH_3	O_3 (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m³	As, ng/m³	Ni, ng/m³	C_6H_6, ng/m³	BaP, ng/m³
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
06-07.10.2023	07.00-07.00	17.3	35.4	4.1	12.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
07-08.10. 2023	07.15-07.15	18.2	36.7	4.4	12.8	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
13-14.10. 2023	07.00-07.00	17.1	36.1	4.2	13.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
14-15.10. 2023	07.15-07.15	18.4	37.9	4.5	13.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
20-21.10. 2023	07.00-07.00	18.1	35.4	4.2	13.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
21-22.10. 2023	07.15-07.15	19.2	36.7	4.4	13.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
27-28.10. 2023	07.00-07.00	18.4	36.1	4.3	14.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
28-29.10. 2023	07.15-07.15	19.9	37.1	4.5	14.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
03-04.11. 2023	07.00-07.00	17.8	36.4	4.0	12.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
04-05.11. 2023	07.15-07.15	18.4	37.2	4.4	13.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
10-11.11.2023	07.00-07.00	17.3	35.1	4.3	12.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
11-12.11.2023	07.15-07.15	18.4	36.7	4.5	13.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
17-18.11.2023	07.00-07.00	17.4	35.3	4.2	13.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
18-19.11.2023	07.15-07.15	19.1	36.4	4.4	14.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
24-25.11.2023	07.00-07.00	18.3	36.7	4.1	13.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
25-26.11.2023	07.15-07.15	19.4	37.3	4.5	14.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
01-02.12.2023	07.00-07.00	17.3	35.1	4.1	12.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
02-03.12.2023	07.15-07.15	18.4	36.7	4.4	13.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
08-09.12.2023	07.00-07.00	18.1	35.4	4.2	13.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
09-10.12.2023	07.15-07.15	19.4	36.8	4.5	14.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
15-16.12.2023	07.00-07.00	17.3	35.3	4.3	13.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
16-17.12.2023	07.15-07.15	18.4	37.1	4.5	14.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
22-23.12.2023	07.00-07.00	17.2	35.4	4.1	13.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
23-24.12.2023	07.15-07.15	18.7	37.1	4.5	14.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0

Source: Lab Analysis Results

Legend: **PM2.5**-Particulate Matter size less than 2.5 um; **PM10**-Respirable Particulate Matter size less than 10 um; **SO_2-**Sulphur dioxide; **NOx**-Oxides of Nitrogen**; NH_3**-Ammonia; **O_3**-Ozone; **CO**-Carbon monoxide;
Pb-Particulate Lead; **As**-Particulate Arsenic; **Ni**-Particulate Nickel; **C_6H_6**-Benzene &**BaP**- Benzo (a) pyrene in particulate phase.
*** NAAQ Norms-**National Ambient Air Quality Norms-**Revised as per GSR 826(E) dated 16.11.2009** for Industrial, Residential, Rural and other Areas

Status: Within the permissible limit

TABLE 3.13: AMBIENT AIR QUALITY – AAQ2

Period: October – December 2023 Location: AAQ2-Lease 1 Sampling Time: 24-hourly

Monitoring		Particulates, µg/m³		Gaseous Pollutants, µg/m³					Other Pollutants (Particulate Phase) , µg/m³				
Date	Period, hrs.	$PM_{2.5}$	PM_{10}	SO_2	NO_2	NH_3	O_3 (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m³	As, ng/m³	Ni, ng/m³	C_6H_6, ng/m³	BaP, ng/m³
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
06-07.10.2023	07.00-07.00	17.5	35.3	4.1	12.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
07-08.10. 2023	07.15-07.15	18.1	35.9	4.4	12.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
13-14.10. 2023	07.00-07.00	17.1	35.1	4.2	42.5	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
14-15.10. 2023	07.15-07.15	17.9	35.4	4.3	42.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
20-21.10. 2023	07.00-07.00	18.1	35.6	4.1	13.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
21-22.10. 2023	07.15-07.15	18.5	36.1	4.4	13.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
27-28.10. 2023	07.00-07.00	17.6	36.2	4.2	13.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
28-29.10. 2023	07.15-07.15	18.2	36.8	4.5	13.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
03-04.11. 2023	07.00-07.00	17.2	36.2	4.0	12.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
04-05.11. 2023	07.15-07.15	17.8	36.9	4.2	12.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
10-11.11.2023	07.00-07.00	17.3	36.8	4.3	12.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
11-12.11.2023	07.15-07.15	17.9	37.2	4.5	13.0	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
17-18.11.2023	07.00-07.00	18.3	37.3	4.2	13.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
18-19.11.2023	07.15-07.15	19.1	37.4	4.5	13.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
24-25.11.2023	07.00-07.00	18.6	37.4	4.3	13.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
25-26.11.2023	07.15-07.15	19.2	37.9	4.4	13.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
01-02.12.2023	07.00-07.00	18.4	35.3	4.1	13.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
02-03.12.2023	07.15-07.15	18.9	36.1	4.2	13.8	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
08-09.12.2023	07.00-07.00	19.1	35.4	4.3	14.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
09-10.12.2023	07.15-07.15	19.7	36.2	4.4	14.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
15-16.12.2023	07.00-07.00	19.3	35.3	4.2	14.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
16-17.12.2023	07.15-07.15	19.8	36.9	4.5	14.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
22-23.12.2023	07.00-07.00	19.2	36.1	4.3	12.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
23-24.12.2023	07.15-07.15	19.9	36.8	4.4	12.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0

Source: LabAnalysis Results

TABLE 3.14: AMBIENT AIR QUALITY – AAQ3

Period: October – December 2023 Location: AAQ3- Lease 2 Sampling Time: 24-hourly

Monitoring		Particulates, µg/m³		Gaseous Pollutants, µg/m³					Other Pollutants (Particulate Phase) , µg/m³				
Date	Period, hrs.	$PM_{2.5}$	PM_{10}	SO_2	NO_2	NH_3	O_3 (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m³	As, ng/m³	Ni, ng/m³	C_6H_6, ng/m³	BaP, ng/m³
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
06-07.10.2023	07.00-07.00	17.3	35.4	4.2	12.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
07-08.10. 2023	07.15-07.15	17.9	36.1	4.3	12.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
13-14.10. 2023	07.00-07.00	17.2	35.7	4.3	12.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
14-15.10. 2023	07.15-07.15	17.6	36.8	4.5	13.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
20-21.10. 2023	07.00-07.00	18.3	36.1	4.4	13.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
21-22.10. 2023	07.15-07.15	18.6	37.4	4.5	13.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
27-28.10. 2023	07.00-07.00	17.6	36.4	4.1	13.8	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
28-29.10. 2023	07.15-07.15	18.4	37.9	4.2	14.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
03-04.11. 2023	07.00-07.00	18.2	35.3	4.1	14.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
04-05.11. 2023	07.15-07.15	18.8	35.8	4.3	14.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
10-11.11.2023	07.00-07.00	17.4	36.3	4.2	12.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
11-12.11.2023	07.15-07.15	17.9	36.9	4.3	13.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
17-18.11.2023	07.00-07.00	18.4	37.1	4.1	13.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
18-19.11.2023	07.15-07.15	19.2	37.9	4.5	13.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
24-25.11.2023	07.00-07.00	18.7	35.4	4.1	13.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
25-26.11.2023	07.15-07.15	19.3	36.7	4.5	14.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
01-02.12.2023	07.00-07.00	18.5	35.4	4.2	14.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
02-03.12.2023	07.15-07.15	18.7	36.3	4.3	14.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
08-09.12.2023	07.00-07.00	19.2	35.7	4.3	13.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
09-10.12.2023	07.15-07.15	19.6	36.9	4.4	13.8	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
15-16.12.2023	07.00-07.00	19.4	35.8	4.2	12.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
16-17.12.2023	07.15-07.15	19.9	36.4	4.5	12.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
22-23.12.2023	07.00-07.00	18.3	36.7	4.3	12.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
23-24.12.2023	07.15-07.15	18.7	37.9	4.5	12.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0

Source: Lab Analysis Results

TABLE 3.15: AMBIENT AIR QUALITY – AAQ4

Period: October – December 2023 Location: AAQ4-Lease - 4 Sampling Time: 24-hourly

Monitoring		Particulates, µg/m³		Gaseous Pollutants, µg/m³					Other Pollutants (Particulate Phase) , µg/m³				
Date	Period, hrs.	$PM_{2.5}$	PM_{10}	SO_2	NO_2	NH_3	O_3 (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m³	As, ng/m³	Ni, ng/m³	C_6H_6, ng/m³	BaP, ng/m³
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
06-07.10.2023	07.00-07.00	17.1	35.9	4.3	12.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
07-08.10. 2023	07.15-07.15	17.6	36.4	4.5	12.8	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
13-14.10. 2023	07.00-07.00	17.4	36.3	4.4	12.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
14-15.10. 2023	07.15-07.15	17.9	36.9	4.5	13.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
20-21.10. 2023	07.00-07.00	18.4	36.4	4.3	13.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
21-22.10. 2023	07.15-07.15	18.9	36.7	4.4	13.8	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
27-28.10. 2023	07.00-07.00	18.1	37.3	4.2	12.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
28-29.10. 2023	07.15-07.15	18.6	37.9	4.3	12.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
03-04.11. 2023	07.00-07.00	18.3	37.2	4.1	13.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
04-05.11. 2023	07.15-07.15	18.9	37.8	4.2	13.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
10-11.11.2023	07.00-07.00	19.1	37.4	4.2	13.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
11-12.11.2023	07.15-07.15	19.5	38.0	4.4	13.8	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
17-18.11.2023	07.00-07.00	19.3	35.3	4.3	14.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
18-19.11.2023	07.15-07.15	19.9	35.9	4.5	14.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
24-25.11.2023	07.00-07.00	19.4	35.4	4.4	14.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
25-26.11.2023	07.15-07.15	19.8	36.1	4.5	14.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
01-02.12.2023	07.00-07.00	17.3	36.3	4.2	14.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
02-03.12.2023	07.15-07.15	17.9	36.9	4.5	13.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
08-09.12.2023	07.00-07.00	17.4	36.7	4.3	13.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
09-10.12.2023	07.15-07.15	17.8	37.1	4.4	12.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
15-16.12.2023	07.00-07.00	17.6	37.3	4.2	12.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
16-17.12.2023	07.15-07.15	18.2	37.9	4.4	12.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
22-23.12.2023	07.00-07.00	18.3	37.4	4.2	12.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
23-24.12.2023	07.15-07.15	18.4	37.8	4.3	13.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0

Source: LabAnalysis Results

TABLE 3.16: AMBIENT AIR QUALITY – AAQ5

Period: October – December 2023 Location: AAQ5-P. Lease 4 Sampling Time: 24-hourly

Monitoring		Particulates, µg/m³		Gaseous Pollutants, µg/m³					Other Pollutants (Particulate Phase) , µg/m³				
Date	Period, hrs.	$PM_{2.5}$	PM_{10}	SO_2	NO_2	NH_3	O_3 (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m³	As, ng/m³	Ni, ng/m³	C_6H_6, ng/m³	BaP, ng/m³
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
06-07.10.2023	07.00-07.00	18.1	36.1	4.1	13.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
07-08.10. 2023	07.15-07.15	18.5	37.3	4.2	13.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
13-14.10. 2023	07.00-07.00	18.4	36.4	4.2	12.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
14-15.10. 2023	07.15-07.15	18.9	36.9	4.3	13.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
20-21.10. 2023	07.00-07.00	19.1	37.1	4.4	12.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
21-22.10. 2023	07.15-07.15	19.4	37.8	4.2	12.8	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
27-28.10. 2023	07.00-07.00	19.3	35.2	4.3	13.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
28-29.10. 2023	07.15-07.15	19.9	35.9	4.4	13.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
03-04.11. 2023	07.00-07.00	18.4	35.3	4.0	13.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
04-05.11. 2023	07.15-07.15	18.7	35.8	4.1	13.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
10-11.11.2023	07.00-07.00	19.1	36.2	4.1	14.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
11-12.11.2023	07.15-07.15	19.2	36.7	4.2	14.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
17-18.11.2023	07.00-07.00	19.7	36.4	4.3	14.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
18-19.11.2023	07.15-07.15	19.5	37.3	4.5	14.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
24-25.11.2023	07.00-07.00	20.0	37.1	4.3	13.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
25-26.11.2023	07.15-07.15	18.3	37.9	4.5	13.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
01-02.12.2023	07.00-07.00	18.7	36.1	4.1	12.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
02-03.12.2023	07.15-07.15	17.4	36.4	4.3	13.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
08-09.12.2023	07.00-07.00	17.9	36.7	4.3	13.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
09-10.12.2023	07.15-07.15	17.3	37.3	4.3	13.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
15-16.12.2023	07.00-07.00	18.1	35.3	4.4	12.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
16-17.12.2023	07.15-07.15	18.4	35.8	4.0	12.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
22-23.12.2023	07.00-07.00	18.9	35.3	4.1	13.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
23-24.12.2023	07.15-07.15	19.7	35.6	4.8	14.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0

Source: Lab Analysis Results

TABLE 3.17: AMBIENT AIR QUALITY – AAQ6

Period: October – December 2023 Location: AAQ6- Lease 5 Sampling Time: 24-hourly

Monitoring		Particulates, µg/m³		Gaseous Pollutants, µg/m³					Other Pollutants (Particulate Phase) , µg/m³				
Date	Period, hrs.	$PM_{2.5}$	PM_{10}	SO_2	NO_2	NH_3	O_3 (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m³	As, ng/m³	Ni, ng/m³	C_6H_6, ng/m³	BaP, ng/m³
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
06-07.10.2023	07.00-07.00	18.4	35.4	4.4	14.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
07-08.10. 2023	07.15-07.15	18.7	36.3	4.5	14.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
13-14.10. 2023	07.00-07.00	19.3	36.1	4.2	13.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
14-15.10. 2023	07.15-07.15	19.7	36.4	4.3	13.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
20-21.10. 2023	07.00-07.00	19.6	35.7	4.4	13.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
21-22.10. 2023	07.15-07.15	20.0	36.3	4.5	13.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
27-28.10. 2023	07.00-07.00	18.4	35.4	4.3	14.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
28-29.10. 2023	07.15-07.15	18.7	35.9	4.5	14.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
03-04.11. 2023	07.00-07.00	17.4	35.3	4.4	14.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
04-05.11. 2023	07.15-07.15	17.9	35.8	4.5	14.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
10-11.11.2023	07.00-07.00	17.5	36.4	4.3	13.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
11-12.11.2023	07.15-07.15	18.1	36.9	4.4	13.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
17-18.11.2023	07.00-07.00	18.3	37.1	4.0	12.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
18-19.11.2023	07.15-07.15	18.7	37.4	4.1	12.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
24-25.11.2023	07.00-07.00	17.7	36.1	4.2	12.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
25-26.11.2023	07.15-07.15	17.9	36.7	4.5	12.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
01-02.12.2023	07.00-07.00	17.3	35.3	4.1	13.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
02-03.12.2023	07.15-07.15	17.6	35.9	4.4	13.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
08-09.12.2023	07.00-07.00	17.7	36.1	4.3	12.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
09-10.12.2023	07.15-07.15	18.4	36.4	4.5	12.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
15-16.12.2023	07.00-07.00	18.3	.35.3	4.2	14.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
16-17.12.2023	07.15-07.15	18.9	36.7	4.3	14.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
22-23.12.2023	07.00-07.00	19.1	36.6	4..4	13.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
23-24.12.2023	07.15-07.15	19.4	36.9	4.5	13.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0

Source: LabAnalysis Results

TABLE 3.18: AMBIENT AIR QUALITY – AAQ7

Period: October – December 2023 Location: AAQ7- Sirugudi Sampling Time: 24-hourly

Monitoring		Particulates, µg/m³		Gaseous Pollutants, µg/m³					Other Pollutants (Particulate Phase) , µg/m³				
Date	Period, hrs.	$PM_{2.5}$	PM_{10}	SO_2	NO_2	NH_3	O_3 (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m³	As, ng/m³	Ni, ng/m³	C_6H_6, ng/m³	BaP, ng/m³
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
06-07.10.2023	07.15-07.15	20.1	39.4	5.1	16.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
07-08.10. 2023	07.30-07:30	21.3	40.7	5.4	17.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
13-14.10. 2023	07.15-07.15	20.4	41.7	5.2	16.8	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
14-15.10. 2023	07.30-07:30	21.7	42.4	5.5	18.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
20-21.10. 2023	07.15-07.15	21.3	42.7	5.4	18.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
21-22.10. 2023	07.30-07:30	22.4	43.0	5.6	19.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
27-28.10. 2023	07.15-07.15	21.4	41.7	5.5	19.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
28-29.10. 2023	07.30-07:30	22.	42.3	5.9	19.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
03-04.11. 2023	07.15-07.15	22.1	39.1	5.4	16.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
04-05.11. 2023	07.30-07:30	23.7	39.9	5.6	17.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
10-11.11.2023	07.15-07.15	20.4	39.2	5.3	16.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
11-12.11.2023	07.30-07:30	22.3	40.2	5.8	17.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
17-18.11.2023	07.15-07.15	21.7	41.3	5.7	17.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
18-19.11.2023	07.15-07.15	22.4	41.8	6.0	18.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
24-25.11.2023	07.00-07.00	22.3	40.4	5.4	18.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
25-26.11.2023	07.15-07.15	23.7	42.9	5.9	19.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
01-02.12.2023	07.00-07.00	21.4	41.3	5.2	16.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
02-03.12.2023	07.15-07.15	22.7	42.3	5.3	17.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
08-09.12.2023	07.00-07.00	22.1	42.1	5.4	17.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
09-10.12.2023	07.15-07.15	23.9	42.9	5.6	18.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
15-16.12.2023	07.00-07.00	21.4	39.4	5.7	17.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
16-17.12.2023	07.15-07.15	22.3	40.3	5.9	19.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
22-23.12.2023	07.00-07.00	20.4	39.7	5.1	17.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
23-24.12.2023	07.15-07.15	22.7	40.9	5.9	19.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0

Source: LabAnalysis Results

TABLE 3.19: AMBIENT AIR QUALITY – AAQ8

Period: October – December 2023 Location: AAQ8- Samudrapatti Sampling Time: 24-hourly

Monitoring		Particulates, µg/m³		Gaseous Pollutants, µg/m³					Other Pollutants (Particulate Phase) , µg/m³				
Date	Period, hrs.	$PM_{2.5}$	PM_{10}	SO_2	NO_2	NH_3	O_3 (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m³	As, ng/m³	Ni, ng/m³	C_6H_6, ng/m³	BaP, ng/m³
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
06-07.10.2023	07.30-07.30	21.2	39.3	5.3	16.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
07-08.10. 2023	07.45-07:45	22.7	40.2	5.7	17.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
13-14.10. 2023	07.30-07.30	21.4	39.7	5.2	16.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
14-15.10. 2023	07.45-07:45	22.8	40.9	5.6	18.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
20-21.10. 2023	07.30-07.30	20.3	41.2	5.4	17.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
21-22.10. 2023	07.45-07:45	21.7	42.7	5.7	19.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
27-28.10. 2023	07.30-07.30	20.4	41.3	5.4	17.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
28-29.10. 2023	07.45-07:45	22.8	42.9	5.9	19.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
03-04.11. 2023	07.30-07.30	21.7	39.1	5.2	17.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
04-05.11. 2023	07.45-07:45	23.2	40.4	5.4	18.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
10-11.11.2023	07.30-07.30	21.4	40.1	5.3	17.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
11-12.11.2023	07.45-07:45	23.8	41.7	5.7	18.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
17-18.11.2023	07.30-07.30	20.4	41.2	5.4	17.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
18-19.11.2023	07.15-07.15	22.6	42.9	5.6	18.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
24-25.11.2023	07.00-07.00	21.7	40.1	5.5	17.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
25-26.11.2023	07.15-07.15	23.7	42.7	5.7	18.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
01-02.12.2023	07.00-07.00	20.8	39.3	5.3	19.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
02-03.12.2023	07.15-07.15	21.7	40.4	5.7	19.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
08-09.12.2023	07.00-07.00	21.4	39.2	5.4	18.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
09-10.12.2023	07.15-07.15	22.7	41.7	5.7	19.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
15-16.12.2023	07.00-07.00	21.4	40.1	5.3	17.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
16-17.12.2023	07.15-07.15	22.3	42.3	5.8	18.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
22-23.12.2023	07.00-07.00	21.4	42.1	5.2	18.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
23-24.12.2023	07.15-07.15	22.9	40.9	5.9	19.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0

Source: LabAnalysis Results

TABLE 3.20: AMBIENT AIR QUALITY – AAQ9

Period: October – December 2023 Location: AAQ9- V.Pudur Sampling Time: 24-hourly

Monitoring		Particulates, µg/m³		Gaseous Pollutants, µg/m³					Other Pollutants (Particulate Phase) , µg/m³				
Date	Period, hrs.	$PM_{2.5}$	PM_{10}	SO_2	NO_2	NH_3	O_3 (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m³	As, ng/m³	Ni, ng/m³	C_6H_6, ng/m³	BaP, ng/m³
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
06-07.10.2023	07.00-07.00	22.3	39.7	5.1	16.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
07-08.10. 2023	07.15-07:15	23.4	40.9	5.4	17.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
13-14.10. 2023	07.00-07.00	20.9	41.3	5.2	16.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
14-15.10. 2023	07.15-07:15	22.3	42.7	5.7	17.8	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
20-21.10. 2023	07.00-07.00	21.4	40.1	5.3	17.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
21-22.10. 2023	07.15-07:15	23.7	42.7	5.7	18.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
27-28.10. 2023	07.00-07.00	20.7	40.1	5.5	18.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
28-29.10. 2023	07.15-07:15	21.9	42.1	5.9	19.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
03-04.11. 2023	07.00-07.00	22.4	40.1	5.2	18.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
04-05.11. 2023	07.15-07:15	23.7	42.1	5.6	19.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
10-11.11.2023	07.00-07.00	21.4	41.3	5.4	16.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
11-12.11.2023	07.15-07:15	22.9	42.4	5.9	17.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
17-18.11.2023	07.00-07.00	20.9	41.3	5.3	19.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
18-19.11.2023	07.15-07.15	21.4	42.4	5.7	19.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
24-25.11.2023	07.00-07.00	21.7	40.4	5.1	17.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
25-26.11.2023	07.15-07.15	22.4	41.3	5.5	18.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
01-02.12.2023	07.00-07.00	20.7	40.3	5.2	16.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
02-03.12.2023	07.15-07.15	21.7	41.4	5.6	17.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
08-09.12.2023	07.00-07.00	20.8	39.7	5.1	17.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
09-10.12.2023	07.15-07.15	21.8	40.5	5.4	18.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
15-16.12.2023	07.00-07.00	22.7	41.3	5.2	17.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
16-17.12.2023	07.15-07.15	24.0	42.7	5.6	18.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
22-23.12.2023	07.00-07.00	22.3	41.7	5.3	17.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
23-24.12.2023	07.15-07.15	23.8	42.9	5.9	18.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0

Source: LabAnalysis Results

TABLE 3.21: AMBIENT AIR QUALITY – AAQ10

Period: October – December 2023 Location: AAQ10 - Uralipatti Sampling Time: 24-hourly

Monitoring		Particulates, µg/m^3		Gaseous Pollutants, µg/m^3					Other Pollutants (Particulate Phase) , µg/m^3				
Date	Period, hrs.	$PM_{2.5}$	PM_{10}	SO_2	NO_2	NH_3	O_3 (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m^3	As, ng/m^3	Ni, ng/m^3	C_6H_6, ng/m^3	BaP, ng/m^3
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2,000 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5000 (annual)	1.0 (annual)
06-07.10.2023	07:30-07:30	22.8	40.7	5.3	16.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
07-08.10. 2023	07:45-07:45	24.0	41.7	5.4	17.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
13-14.10. 2023	07:30-07:30	23.2	39.3	5.5	16.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
14-15.10. 2023	07:45-07:45	23.9	40.4	5.7	17.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
20-21.10. 2023	07:30-07:30	20.4	39.1	5.6	17.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
21-22.10. 2023	07:45-07:45	22.7	41.7	5.8	18.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
27-28.10. 2023	07:30-07:30	21.3	40.2	.5.4	17.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
28-29.10. 2023	07:45-07:45	22.4	41.3	5.6	18.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
03-04.11. 2023	07:30-07:30	21.3	39.3	5.3	18.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
04-05.11. 2023	07:45-07:45	22.9	40.4	5.7	19.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
10-11.11.2023	07:30-07:30	21.9	39.7	5.4	18.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
11-12.11.2023	07:45-07:45	23.4	41.3	5.8	19.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
17-18.11.2023	07:30-07:30	22.1	40.4	5.2	17.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
18-19.11.2023	07.15-07.15	23.9	42.3	5.9	18.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
24-25.11.2023	07.00-07.00	22.4	41.3	5.1	16.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
25-26.11.2023	07.15-07.15	23.4	42.7	5.5	19.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
01-02.12.2023	07.00-07.00	20.4	40.3	5.1	17.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
02-03.12.2023	07.15-07.15	21.8	42.7	5.5	18.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
08-09.12.2023	07.00-07.00	21.3	41.3	5.2	17.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
09-10.12.2023	07.15-07.15	22.4	42.9	5.6	18.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
15-16.12.2023	07.00-07.00	21.9	42.3	5.4	18.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
16-17.12.2023	07.15-07.15	22.4	42.9	5.8	19.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
22-23.12.2023	07.00-07.00	21.3	40.7	5.2	18.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
23-24.12.2023	07.15-07.15	22.3	42.3	5.6	19.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0

Source: Lab Analysis Results

TABLE 3.22: AMBIENT AIR QUALITY – AAQ11

Period: October – December 2023 Location: AAQ11 - Panniamalai Sampling Time: 24-hourly

Monitoring		Particulates, µg/m³		Gaseous Pollutants, µg/m³					Other Pollutants (Particulate Phase) , µg/m³				
Date	Period, hrs.	$PM_{2.5}$	PM_{10}	SO_2	NO_2	NH_3	O_3 (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m³	As, ng/m³	Ni, ng/m³	C_6H_6, ng/m³	BaP, ng/m³
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2.0 (8hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)
06-07.10.2023	08:00-08:00	22.4	40.1	5.4	16.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
07-08.10. 2023	08:15-08:15	23.7	42.1	5.7	17.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
13-14.10. 2023	08:00-08:00	21.4	41.0	5.5	17.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
14-15.10. 2023	08:15-08:15	22.7	42.3	5.8	18.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
20-21.10. 2023	08:00-08:00	22.4	42.3	5.7	18.6	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
21-22.10. 2023	08:15-08:15	23.7	42.9	5.9	19.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
27-28.10. 2023	08:00-08:00	20.4	40.3	5.3	16.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
28-29.10. 2023	08:15-08:15	21.7	42.3	5.6	17.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
03-04.11. 2023	08:00-08:00	21.4	39.7	5.2	16.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
04-05.11. 2023	08:15-08:15	22.7	40.5	5.4	17.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
10-11.11.2023	08:00-08:00	22.1	41.5	5.3	17.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
11-12.11.2023	08:15-08:15	23.4	42.7	5.6	17.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
17-18.11.2023	08:00-08:00	22.4	41.7	5.4	16.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
18-19.11.2023	07.15-07.15	23.9	42.9	5.8	19.2	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
24-25.11.2023	07.00-07.00	22.4	41.4	5.5	16.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
25-26.11.2023	07.15-07.15	23.9	42.1	5.9	17.3	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
01-02.12.2023	07.00-07.00	20.9	40.1	5.2	16.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
02-03.12.2023	07.15-07.15	22.4	42.3	5.6	17.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
08-09.12.2023	07.00-07.00	21.7	40.4	5.3	16.8	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
09-10.12.2023	07.15-07.15	23.4	42.3	5.7	17.9	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
15-16.12.2023	07.00-07.00	22.4	40.3	5.4	18.1	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
16-17.12.2023	07.15-07.15	23.7	41.3	5.8	19.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
22-23.12.2023	07.00-07.00	21.4	41.2	5.3	17.4	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0
23-24.12.2023	07.15-07.15	28.4	43.0	5.9	19.7	<5	<5	<1.0	<0.01	<5	<3	<1.0	<3.0

Source: Lab Analysis Results

TABLE 3.23: ABSTRACT OF AMBIENT AIR QUALITY DATA – AAQ1& AAQ2

Sl. No.	Parameter	Pollutant Concentration, µg/m³							
		$PM_{2.5}$	PM_{10}	SO_2	NO_2	$PM_{2.5}$	PM_{10}	SO_2	NO_2
		AAQ1- Northeast corner of quarry				AAQ2-Northeast corner of quarry			
1	No. of Observations	24	24	24	24	24	24	24	24
2	10th Percentile Value	17.3	35.3	4.1	17.36	17.36	35.40	4.10	12.33
3	20th Percentile Value	17.3	35.4	4.16	17.72	17.72	35.70	4.20	12.60
4	30th Percentile Value	17.76	35.4	4.2	17.90	17.90	35.80	4.20	12.97
5	40th Percentile Value	18.12	36.16	4.3	18.12	18.12	36.14	4.22	13.20
6	50th Percentile Value	18.35	36.55	4.35	18.35	18.35	36.35	4.30	13.45
7	60th Percentile Value	18.4	36.7	4.4	18.58	18.58	36.64	4.30	13.68
8	70th Percentile Value	18.4	36.71	4.41	19.10	19.10	36.81	4.40	13.81
9	80th Percentile Value	18.86	37.1	4.5	19.20	19.20	36.98	4.40	14.18
10	90th Percentile Value	19.34	37.17	4.5	19.58	19.58	37.75	4.50	14.84
11	95th Percentile Value	19.4	37.285	4.5	19.79	19.79	37.90	4.50	38.36
12	98th Percentile Value	19.67	37.624	4.5	19.85	19.85	37.90	4.50	42.72
13	Arithmetic Mean	**18.45**	**36.49**	**4.36**	**18.69**	**18.69**	36.67	**43.3**	**18.38**
14	Geometric Mean	18.43	36.48	4.35	18.67	18.67	36.66	4.33	16.41
15	Standard Deviation	0.81	0.82	0.15	0.87	0.87	0.89	0.14	11.02
16	NAAQ Norms*	**60**	**100**	**80**	**60**	**100**	**100**	**80**	**60**
17	% Values exceeding Norms*	**0**	**0**	**0**	**0**	**0**	35.40	**0**	**0**

Source: Lab Analysis Results

TABLE 3.24: ABSTRACT OF AMBIENT AIR QUALITY DATA – AAQ3 & AAQ4

Sl. No.	Parameter	Pollutant Concentration, µg/m3							
		PM2.5	PM10	SO2	NO2	PM2.5	PM10	SO2	NO2
		AAQ3 - Southeast corner of quarry				AAQ4 - Northeast corner of quarry			
1	No. of Observations	24	24	24	24	24	24	24	24
2	10th Percentile Value	17.46	35.40	4.10	12.46	17.40	35.90	4.20	12.40
3	20th Percentile Value	17.78	35.70	4.20	12.66	17.60	36.22	4.20	12.64
4	30th Percentile Value	18.17	35.80	4.20	12.88	17.89	36.39	4.29	12.90
5	40th Percentile Value	18.32	36.14	4.30	13.12	18.12	36.70	4.30	13.12
6	50th Percentile Value	18.45	36.35	4.30	13.25	18.30	36.90	4.30	13.25
7	60th Percentile Value	18.68	36.64	4.30	13.68	18.40	37.18	4.40	13.70
8	70th Percentile Value	18.71	36.81	4.40	13.81	18.90	37.31	4.40	13.81
9	80th Percentile Value	19.20	36.98	4.50	14.24	19.18	37.56	4.44	13.98
10	90th Percentile Value	19.37	37.75	4.50	14.58	19.47	37.87	4.50	14.27
11	95th Percentile Value	19.57	37.90	4.50	14.87	19.76	37.90	4.50	14.64
12	98th Percentile Value	19.76	37.90	4.50	14.90	19.85	37.95	4.50	14.81
13	Arithmetic Mean	18.68	36.67	4.35	13.68	18.62	37.08	4.37	13.59
14	Geometric Mean	18.67	36.66	4.34	13.65	18.61	37.07	4.36	13.57
15	Standard Deviation	0.74	0.89	0.14	0.88	0.86	0.72	0.11	0.80
16	NAAQ Norms*	60	100	80	80	60	100	80	80
17	% Values exceeding Norms*	0	0	0	0	0	0	0	0

Source: Lab Analysis Results

TABLE 3.25: ABSTRACT OF AMBIENT AIR QUALITY DATA – AAQ5& AAQ6

Sl. No.	Parameter	Pollutant Concentration, µg/m³							
		$PM_{2.5}$	PM_{10}	SO_2	NO_2	$PM_{2.5}$	PM_{10}	SO_2	NO_2
		AAQ5 – Northeast corner of quarry				AAQ6 - Northeast corner of quarry			
1	No. of Observations	24	24	24	24	24	24	24	24
2	10th Percentile Value	17.96	35.30	4.10	12.49	17.53	35.40	4.12	12.70
3	20th Percentile Value	18.22	35.72	4.10	12.76	17.70	35.74	4.20	12.90
4	30th Percentile Value	18.40	35.89	4.19	13.19	17.90	35.90	4.30	13.19
5	40th Percentile Value	18.54	36.12	4.20	13.30	18.30	36.10	4.30	13.30
6	50th Percentile Value	18.80	36.40	4.30	13.35	18.40	36.30	4.40	13.70
7	60th Percentile Value	19.06	36.64	4.30	13.68	18.64	36.40	4.40	13.86
8	70th Percentile Value	19.21	36.92	4.30	13.72	18.72	36.48	4.44	14.12
9	80th Percentile Value	19.44	37.18	4.40	13.98	19.18	36.70	4.50	14.30
10	90th Percentile Value	19.70	37.30	4.47	14.27	19.54	36.90	4.50	14.61
11	95th Percentile Value	19.87	37.73	4.50	14.39	19.69	37.08	4.50	14.87
12	98th Percentile Value	19.95	37.85	4.66	14.67	19.86	37.27	4.50	14.90
13	Arithmetic Mean	**19.01**	**36.64**	**4.32**	**13.62**	**18.68**	**36.39**	**4.38**	**13.86**
14	Geometric Mean	19.00	36.63	4.32	13.60	18.66	36.38	4.38	13.84
15	Standard Deviation	0.69	0.84	0.18	0.68	0.81	0.58	0.13	0.77
16	NAAQ Norms*	**60**	**100**	**80**	**80**	**60**	**100**	**80**	**80**
17	% Values exceeding Norms*	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Source: Lab Analysis Results

TABLE 3.26: ABSTRACT OF AMBIENT AIR QUALITY DATA – AAQ7& AAQ8

Sl. No.	Parameter	Pollutant Concentration, µg/m³							
		$PM_{2.5}$	PM_{10}	SO_2	NO_2	$PM_{2.5}$	PM_{10}	SO_2	NO_2
		AAQ7 - Sirugudi				AAQ8 - Samudrapatti			
1	No. of Observations	24	24	24	24	24	24	24	24
2	10th Percentile Value	20.4	39.4	5.2	16.52	20.52	39.30	5.23	17.10
3	20th Percentile Value	21.3	39.82	5.3	17.02	21.32	39.94	5.30	17.22
4	30th Percentile Value	21.4	40.29	5.4	17.19	21.40	40.10	5.39	17.40
5	40th Percentile Value	21.7	40.74	5.4	17.42	21.46	40.40	5.40	17.98
6	50th Percentile Value	22.05	41.3	5.5	17.9	21.70	40.90	5.45	18.40
7	60th Percentile Value	22.26	41.7	5.6	18.18	22.18	41.20	5.60	18.40
8	70th Percentile Value	22.31	42.12	5.7	18.4	22.70	41.70	5.70	18.70
9	80th Percentile Value	22.52	42.34	5.84	19.4	22.80	42.18	5.70	19.14
10	90th Percentile Value	23.4	42.84	5.9	19.7	23.11	42.70	5.77	19.58
11	95th Percentile Value	23.7	42.9	5.9	19.7	23.63	42.87	5.89	19.70
12	98th Percentile Value	23.808	42.954	5.954	19.808	23.75	42.90	5.90	19.81
13	Arithmetic Mean	**22.26**	**41.49**	**5.61**	**18.29**	**22.23**	**41.29**	**5.58**	**18.49**
14	Geometric Mean	22.24	41.47	5.60	18.26	22.21	41.27	5.57	18.47
15	Standard Deviation	1.06	1.28	0.27	1.20	1.04	1.27	0.23	0.99
16	NAAQ Norms*	**60**	**100**	**80**	**80**	**60**	**100**	**80**	**80**
17	% Values exceeding Norms*	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Source: Lab Analysis Results

TABLE 3.27: ABSTRACT OF AMBIENT AIR QUALITY DATA – AAQ9& AAQ10

Sl. No.	Parameter	Pollutant Concentration, µg/m³							
		$PM_{2.5}$	PM_{10}	SO_2	NO_2	$PM_{2.5}$	PM_{10}	SO_2	NO_2
		AAQ9 - V.Pudur				AAQ10 - Uralipatti			
1	No. of Observations	24	24	24	24	24	24	24	24
2	10th Percentile Value	20.83	40.10	5.13	16.55	21.30	39.42	5.20	16.61
3	20th Percentile Value	21.20	40.22	5.20	17.10	21.30	40.26	5.24	17.10
4	30th Percentile Value	21.40	40.49	5.29	17.30	21.89	40.40	5.36	17.30
5	40th Percentile Value	21.72	41.30	5.32	17.82	22.14	40.70	5.40	17.94
6	50th Percentile Value	22.10	41.30	5.40	17.90	22.40	41.30	5.50	18.20
7	60th Percentile Value	22.30	41.38	5.50	18.34	22.40	41.30	5.60	18.40
8	70th Percentile Value	22.43	42.10	5.60	18.40	22.81	41.76	5.60	18.70
9	80th Percentile Value	23.10	42.40	5.70	18.70	23.28	42.30	5.70	18.98
10	90th Percentile Value	23.70	42.70	5.84	19.31	23.75	42.70	5.80	19.70
11	95th Percentile Value	23.79	42.70	5.90	19.83	23.90	42.87	5.80	19.87
12	98th Percentile Value	23.91	42.81	5.90	19.90	23.95	42.90	5.86	19.90
13	Arithmetic Mean	**22.41**	**41.59**	**5.53**	**18.29**	**22.65**	**41.45**	**5.55**	**18.43**
14	Geometric Mean	22.38	41.58	5.52	18.26	22.63	41.43	5.55	18.40
15	Standard Deviation	1.09	1.02	0.28	1.09	0.97	1.17	0.23	1.13
16	NAAQ Norms*	**60**	**100**	**80**	**80**	**60**	**100**	**80**	**80**
17	% Values exceeding Norms*	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Source: LabAnalysis Results

TABLE 3.28: ABSTRACT OF AMBIENT AIR QUALITY DATA – AAQ 11

Sl. No.	Parameter	Pollutant Concentration, µg/m³			
		$PM_{2.5}$	PM_{10}	SO_2	NO_2
		AAQ11 - Panniamalai			
1	No. of Observations	24	24	24	24
2	10th Percentile Value	21.40	40.16	5.30	16.40
3	20th Percentile Value	21.58	40.36	5.30	16.40
4	30th Percentile Value	22.06	40.95	5.40	17.07
5	40th Percentile Value	22.40	41.32	5.42	17.30
6	50th Percentile Value	22.40	41.60	5.55	17.40
7	60th Percentile Value	22.64	42.10	5.60	17.90
8	70th Percentile Value	23.40	42.30	5.70	17.92
9	80th Percentile Value	23.70	42.30	5.80	18.64
10	90th Percentile Value	23.84	42.84	5.87	19.55
11	95th Percentile Value	23.90	42.90	5.90	19.70
12	98th Percentile Value	26.33	42.95	5.90	19.70
13	Arithmetic Mean	**23.06**	**41.80**	**5.61**	**18.00**
14	Geometric Mean	23.02	41.79	5.61	17.96
15	Standard Deviation	1.40	1.00	0.24	1.24
16	NAAQ Norms*	**60**	**100**	**80**	**80**
17	% Values exceeding Norms*	**0**	**0**	**0**	**0**

Source: Lab Analysis Results

Legend: $PM_{2.5}$-Particulate Matter size less than 2.5 um; PM_{10}-Respirable Particulate Matter size less than 10 um; SO_2-Sulphur dioxide; NO_x-Oxides of Nitrogen; CO-Carbon monoxide; O_3-Ozone; NH_3-Ammonia; Pb-Particulate Lead; As-Particulate Arsenic; Ni-Particulate Nickel; C_6H_6-Benzene & BaP- Benzo (a) pyrene in particulate phase levels were monitored below their respective detectable limits.

3.3.8 AIR QUALITY MODELLING

Prediction of particulate emissions, ISC-AERMOD View 9.1 model was used to predict changes in air quality i.e., maximum ground level concentration (GLC's) of PM_{10} and $PM_{2.5}$ due to the proposed mining activity. The inputs required for the model is:

- Hourly meteorological data
- Source data
- Receptor data
- Program control parameters

In order to estimate the ground level concentrations due to the emission from the proposed project, EPA approved Industrial Source Complex ISC AERMOD View Model has been employed.
The mathematical model used for predictions on air quality impact in the present study is ISC-AERMOD View 9.1. It is the next generation air dispersion model, which incorporates planetary boundary layer concepts.
The AERMOD is actually a modeling system with three separate components:

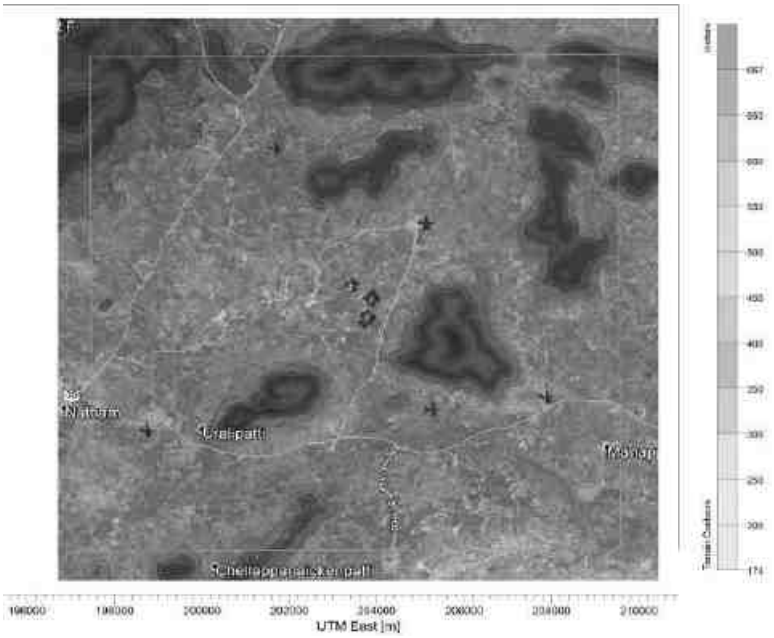
- AERMOD (AERMIC Dispersion Model),
- AERMAP (AERMOD Terrain Preprocessor)
- AERMET (AERMOD Meteorological Preprocessor)

Special features of AERMOD include its ability to treat the vertical in homogeneity of the planetary boundary layer special treatment of surface releases, irregularly shaped area sources, a plume model for the convective boundary layer, limitation of vertical mixing in the stable boundary layer, and fixing the reflecting surface at the stack base.

The AERMET is the meteorological preprocessor for the AERMOD. Input data can come from hourly cloud cover observations, surface meteorological observations and twice-a-day upper air soundings. Output includes surface meteorological observations and parameters and vertical profiles of several atmospheric parameters.

The AERMAP is a terrain preprocessor designed to simplify and standardize the input of terrain data for the AERMOD. Input data include receptor terrain elevation data. Output includes, for each receptor, location and height scale, which are elevations used for the computation of airflow around hills.

FIGURE 3.14 TERRAIN MAP OF THE STUDY AREA



SOURCE CHARACTERIZATION

A detailed listing of all emission sources and their corresponding modelling input release parameters and emission rates is listed this report. A general description of how each source type was treated is presented below.

The emission Sources from the proposed operation are

TABLE 3.29: EMISSION SOURCE

Activity	Process Sources	Fugitive Dust Sources
Mining	Drilling	Blasting
		Loading and Hauling
Transportation		Haul Roads

Point Sources

Point sources for mining operations are typically included dust collectors, hot water heaters, and emergency generator(s). The following sources are anticipated due to this project –

1. Portable Compressors - (400 cfm)
2. Tipper
3. Tractor Mounted - (HMT), Compressor - (45 HP)
4. Drilling and excavation with Accessories

The above machineries are adequate to meet out the simultaneous development and production schedule drawn out in this mining plan.

Volume sources –

A road network was developed to depict the anticipated haul truck routes and truck discharge locations during the mine operations. The anticipated emissions from the road sources and corresponding anticipated impact during the monitoring period of October – December 2023 emissions were estimated. Emissions due to haul road and general plant traffic on the unpaved road network were modelled as volume sources. The model volume source parameter for the haul roads initially utilized USPEA developed emission factors for hauling trucking. The haul road sources utilized source to source spacing of 6 meters along the simulated haul roads. The initial lateral dimension of the sources was set to 3 m were used as an input to replicated a 2 truck travel adjacent for a typical mining scenario.

The parameters considered for the hauling operation include the following

- size of haul trucks commonly used –
- degree of dust control/compaction of permanent haul roads

Other Fugitive Particulate Sources

Other fugitive particulate emission sources that were modelled as volume sources include the following:

- Fugitive emissions from trucks, loading and unloading were represented by single volume sources. The release heights for these sources were set to the actual height of the truck transfer process.
- As the mining area is predominately sedimentary terrain Fugitive emissions due to wind erosion is considered.

Particulate and Gaseous Emissions Due to Blasting

The emissions due to blasting in considered being minimal impact. Since the limestone is sold to needy industries in the raw form boulders ranging from 10cm to 30cm. no grinding is proposed hence the dust due to blasting is minimal.

However, small quantity of explosive like slurry etc., are also used for removing the side burden, toes etc., and bench forming purpose. It is therefore any emissions such blasting operations would be localized and would be cause minor environmental impact occasionally.

TABLE 3.30: EMISSION RATES FOR HEAVY DUTY VEHICLES (AVERAGE)

Pollutant	HDDV (diesel) (grams/mile)	Emission rate assuming Vehicle Travel within the project at 40 km/h(g/s)
NO_X	8.613	0.029906
$Pm_{2.5}$	0.202	0.001403
PM_{10}	0.219	0.002281

FIGURE 3.15: PM_{10} -24 HOUR AVERAGE

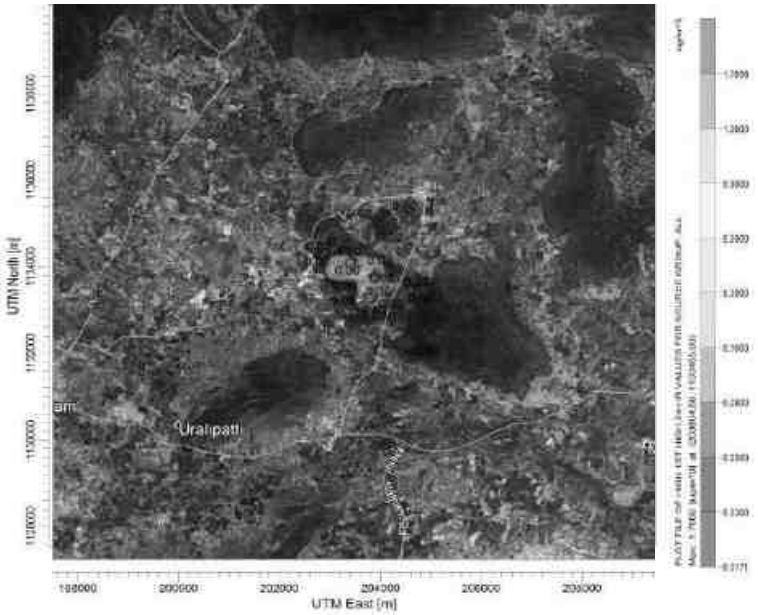


FIGURE 3.16: $PM_{2.5}$ -24 HOUR AVERAGE

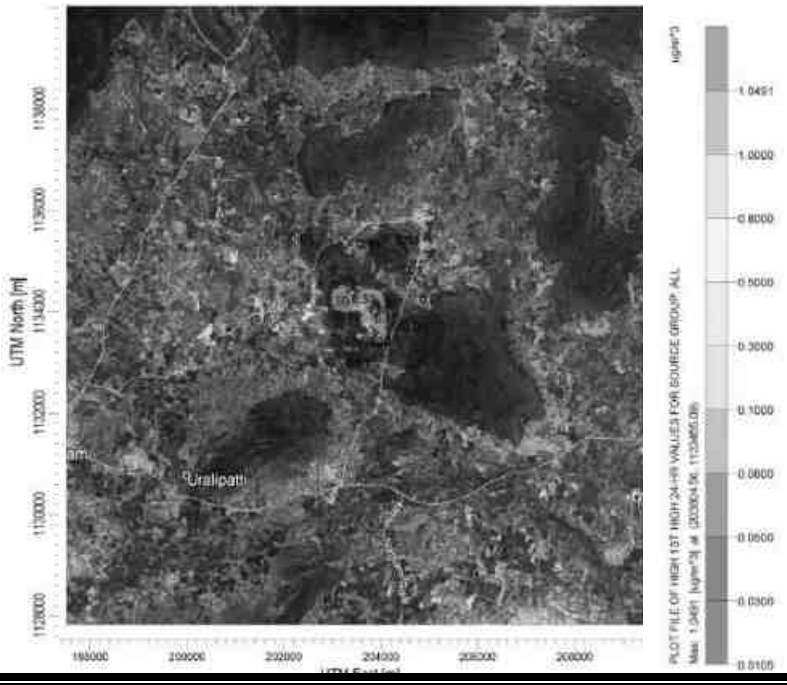
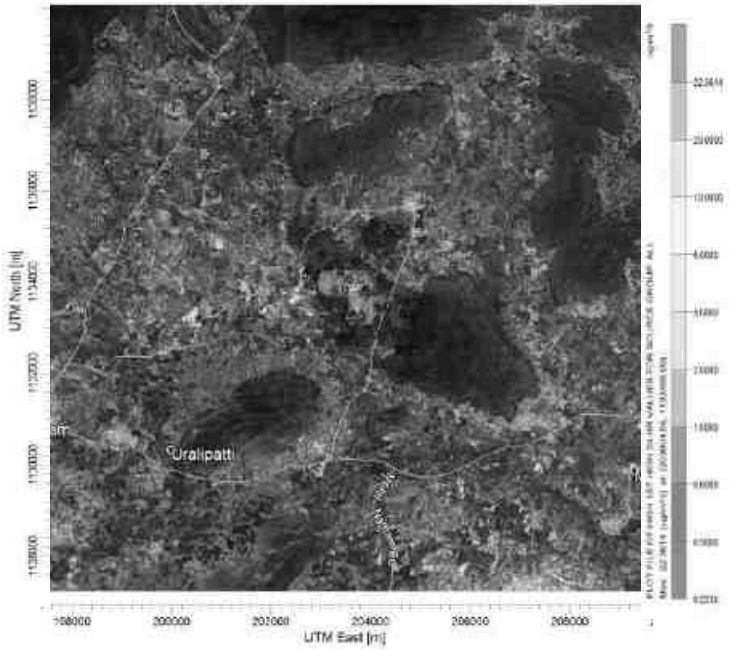


FIGURE 3.17: NO_X – 24 HOUR AVERAGE



RESULTS AND CONCLUSIONS

The ground level concentrations are computed for 24-hr average. The combined ground level concentrations of PM_{10} and NOx from the different mining activities at different nearby locations within the study for study period are given in Table 3.31. The maximum GLC's were falling within the lease area for the given meteorological and topographical conditions.

TABLE 3.31: EXPECTED GROUND LEVEL CONCENTRATIONS

RECEPTOR LOCATIONS	GROUND LEVEL CONCENTRATIONS OF PM_{10} IN µg/m³			
	PREDICTED	BACKGROUND (Max)	TOTAL EXPECTED	CPCB STANDARD
Location: Northeast side of quarry	0.2004	37.62	37.82	100
Location: Northeast side of quarry	1.7055	34.50	36.21	
Location: Southwest side of quarry	0.1772	37.90	38.08	
Location: Northwest corner of quarry	0.5541	37.95	38.50	
Location: Northeast side of quarry	0.2976	37.85	38.14	
Location: Northeast side of quarry	1.3349	37.27	38.60	
Location:Sirugudi	0.0027	42.95	42.95	
Location:Samudrapatti	0.0013	42.90	42.90	
Location:V.Pudur	0.0054	42.81	42.82	
Location:Uralipatti	0.0011	42.90	42.90	
Location: Panniamalai	0.0091	42.95	42.96	
RECEPTOR LOCATIONS	**GROUND LEVEL CONCENTRATIONS OF PM2.5 IN µg/m³**			

	PREDICTED	BACKGROUND (Max)	TOTAL EXPECTED	CPCB STANDARD
Location: Northeast side of quarry	0.1232	19.67	19.79	60
Location: Northeast side of quarry	1.0490	37.67	38.72	
Location: Southwest side of quarry	0.1090	19.76	19.87	
Location: Northwest corner of quarry	0.3408	19.85	20.19	
Location: Northeast side of quarry	0.1830	19.95	20.13	
Location: Northeast side of quarry	0.8210	19.86	20.68	
Location:Sirugudi	0.0016	23.80	23.80	
Location:Samudrapatti	0.0008	23.75	23.75	
Location:V.Pudur	0.0033	23.91	23.91	
Location:Uralipatti	0.0007	23.95	23.95	
Location: Panniamalai	0.0056	26.33	26.34	
RECEPTOR LOCATIONS	**GROUND LEVEL CONCENTRATIONS OF NO_x IN µg/m³**			
	PREDICTED	**BACKGROUND (Max)**	**TOTAL EXPECTED**	**CPCB STANDARD**
Location: Northeast side of quarry	2.6274	19.85	22.48	80
Location: Northeast side of quarry	22.3614	19.85	42.21	
Location: Southwest side of quarry	2.3233	14.90	17.22	
Location: Northwest corner of quarry	7.2658	14.81	22.08	
Location: Northeast side of quarry	3.9023	14.67	18.58	
Location: Northeast side of quarry	17.5021	14.90	32.40	
Location:Sirugudi	0.0355	19.80	19.84	
Location:Samudrapatti	0.0171	19.81	19.83	
Location:V.Pudur	0.0709	19.90	19.97	
Location:Uralipatti	0.0153	19.90	19.92	
Location: Panniamalai	0.1202	19.70	19.82	

Source: LabAnalysis Results & Modelling Data

The ground level concentration will not increase significantly the concentration ofPM_{10},$PM_{2.5}$& NO_x values are well below the standards prescribed by CPCB for ambient air quality.

Controlling NOx Levels

NOx emissions in the mine mainly occur during blasting operations. The main reasons for NOx emissions are:

- Poor quality of explosives having large oxygen imbalance
- Use of expired explosives in which ingredients have disintegrated.

3.3.9 OBSERVATIONS OF RESULTS

PM_{10}: The maximum and minimum concentrations for PM_{10}were recorded as 43.00 µg/m^3 and 35.1 µg/ m^3respectively. The maximum concentration was recorded at the Sirugudi and the minimum concentration was recorded at project site lease 2. The average concentrations were ranged between 38.60 µg/m^3. Consent the CPCB standard of 100 ug/m^3. The maximum PM_{10} values are well within the prescribed limits.

$PM_{2.5}$: The maximum and minimum concentrations for $PM_{2.5}$were recorded as 28.4 µg/$m^3$and 17.1µg/m^3 respectively. The maximum concentration was recorded at the Panniamalai and the minimum concentration was recorded at project site Lease 2. The average concentrations were ranged between 20.161 µg/m^3. Consent the CPCB standard of 60ug/m^3. The maximum $PM_{2.5}$ values are well within the prescribed limits.

SO_2: The maximum and minimum SO_2concentrations were recorded as 6.0 µg/$m^3$and 4.0 µg/m^3. The maximum concentration was recorded at Sirugudi and the minimum concentration was recorded at Project site Lease 2. The average values were observed to be in the range of 4.85 µg/m^3. Consent the CPCB standard of 80ug/m^3. The maximum SO_2 values are well within the prescribed limits.

NO_X: The maximum and minimum NO_X concentrations were recorded as 19.9 µg/m^3 and 11.2 µg/m^3. The maximum concentration was recorded at Sirugudi and the minimum concentration was recorded at Project site. The average values were observed to be in the range of 15.50 µg/m^3.Consent the CPCB standard of 80µg/m^3. The maximum NO_2 values are well within the prescribed limits.

The concentrations of PM_{10}, $PM_{2.5}$, SO_2, NO_X, and Pb are observed to be well within the standards prescribed by Central Pollution Control Board (CPCB) for Industrial, Rural, Residential and Other area. Whereas, the concentration heavy metals like Benzene, Ni, CO and as was observed is below detection limits (BDL).

National Ambient Air Quality Standard: The levels of air quality with an adequate margin of safety, to protect the public health, vegetation and property. Whenever and wherever two consecutive values exceed the limit specified above for the respective category, it would be considered adequate reason to institute regular/continuous monitoring and further investigations:

1. 24-hrs./8-hrs.values should be met 98% of the time in a year; however,2% of the time it may exceed but not on two consecutive days.
2. Annual arithmetic mean of minimum 144 measurements in a year taken twice a week 24-hourly at uniform interval.

Carbon Monoxide (CO) concentrations were monitored <1.0 mg/m^3 at all the monitoring locations against the NAAQ limit value of 4mg/m^3(annual mean).

Ozone (O_3) concentrations were monitored <5µg/m^3 at all the monitoring locations against the NAAQ limit value of 180µg/m^3 (annual mean).

Ammonia (NH_3)concentrations were monitored <5µg/m^3 at all the monitoring locations against the NAAQ limit value of 400 µg/m^3 (annual mean).

Lead (Pb) concentrations were monitored <0.01 µg/m^3 at all the monitoring locations against the NAAQ limit value of 1µg/m^3 (annual mean).

Arsenic (As) concentrations were monitored <5.0ng/m^3 at all the monitoring locations against the NAAQ limit value of 6 ng/m^3 (annual mean).

Nickel (Ni) concentrations were monitored <3.0ng/m^3 at all the monitoring locations against the NAAQ limit value of 20 ng/m^3(annual mean).

Benzene (C_6H_6) concentrations were monitored <1.0 ng/m^3 at all the monitoring locations against the NAAQ limit value of 5.0 ng/m^3 (annual mean).

Benzo(a) Pyrene (BaP) concentrations were monitored <1.0 ng/m^3 at all the monitoring locations against the NAAQ limit value of 1.0 ng/m^3 (annual mean).

Interpretations

While comparing with the **National Ambient Air Quality (NAAQ) Standards revised as per GSR 826(E) dated 16.11.2009**, all monitored values were found to be well within the respective limit values for 24-hourly periods for Industrial, Residential, Rural and other Areas.

3.4 NOISE ENVIRONMENT

Noise is any sound that is undesirable because it interferes with speech and hearing. The environment impact of noise can have several effects varying from noise induced hearing loss to annoyance depending on loudness of noise levels.

The main objective of noise monitoring in the study area is to establish the baseline noise levels and assess the impact of the total noise expected to be generated in the surrounding areas by implementation of the proposed project.

Noise level monitoring has been conducted in the study area once in a season 06, 07, 08 November 2023 to assess the background noise levels in different zones viz., Residential, Industrial, Commercial and Silence zones.

3.4.1 Methodology

Noise level monitoring in the study area was carried out 60minutes during each hour over a period of 24Hours as per the Ambient Noise quality standards under environmental (protection) Act 1986.

Identification of Sampling Locations

Twenty one locations were selected for the noise level monitoring stations based on the population and activities in the study area. The locations of the noise level monitoring stations are as given below as **Table. 3.32**

TABLE 3.32: NOISE LEVEL MONITORING DONE IN THE LOCATION

S.No	Station code	Location	Co ordinates	Distance from the lease
1	N1	Project site Lease 2	10°14'36.12"N 78°17'48.68"E	Core
2	N2	Project site Lease 1	10°14'28.18"N 78°17'46.22"E	Core
3	N3	Project site Lease 1	10°14'29.23"N 78°17'40.64"E	Core
4	N4	Project site Lease 1	10°14'30.42"N 78°17'37.55"E	Core
5	N5	Project site Lease 1	10°14'31.16"N 78°17'41.14"E	Core
6	N6	Project site Lease 2	10°14'34.93"N 78°17'44.41"E	Core
7	N7	Project site Lease 4	10°14'48.75"N 78°17'50.64"E	Core
8	N8	Project site Lease 4	10°14'43.24"N 78°17'47.47"E	Core
9	N9	Project site Lease 4	10°14'45.26"N 78°17'46.02"E	Core
10	N10	Project site Lease 4	10°14'48.42"N 78°17'47.88"E	Core

11	N11	Project site Lease 5	10°14'59.28"N 78°17'33.46"E	Core
12	N12	Project site Lease 5	10°14'58.65"N 78°17'30.67"E	Core
13	N13	Project site Lease 5	10°14'54.52"N 78°17'31.77"E	Core
14	N14	Project site Lease 5	10°14'55.39"N 78°17'35.83"E	Core
15	N15	Project site Lease 3	10°14'35.74"N 78°17'54.64"E	Core
16	N16	Project site Lease 3	10°14'32.79"N 78°17'54.17"E	Core
17	N17	Project site Lease 3	10°14'33.20"N 78°17'52.51"E	Core
18	N 18	Project site Lease 3	10°14'35.93"N 78°17'53.45"E	Core
19	N19	Sirugudi	10°15'46.52"N 78°18'21.14"E	2.10KM NE
20	N20	V.Pudur	10°13'33.25"N 78°19'59.05"E	4.30KM SE
21	N21	Panniamalai	10°16'44.36"N 78°16'34.71"E	3.70KM NW

Source: Lab Monitoring Data

Instrument Used for Monitoring

Noise levels were measured using a sound level meter (LUTRON / SL - 4030). The sound level meter measures the Sound Pressure Level (SPL), the Maximum Sound Pressure Level (max) and the equivalent continuous noise level (Leq) by switching on the corresponding functional modes.

Method of Monitoring

Sound Pressure Level (SPL) measurements were taken at the specified locations, with an interval of 60 minutes per hour over a period of 24 hours as per the Ambient Noise quality standards notified under Environmental (Protection) Act 1986. The noise levels during day time have been monitored between 6 am to 10 pm and night noise levels during 10 pm to 6 am at all the locations covered in the study area.

To obtain noise levels at 8 AM, noise readings, with setting at ‘A’ response - slow mode, were recorded continuously for every 1 hour. All the readings were obtained for 24 hours.

FIGURE 3.18: NOISE LEVEL MONITORING PHOTOS

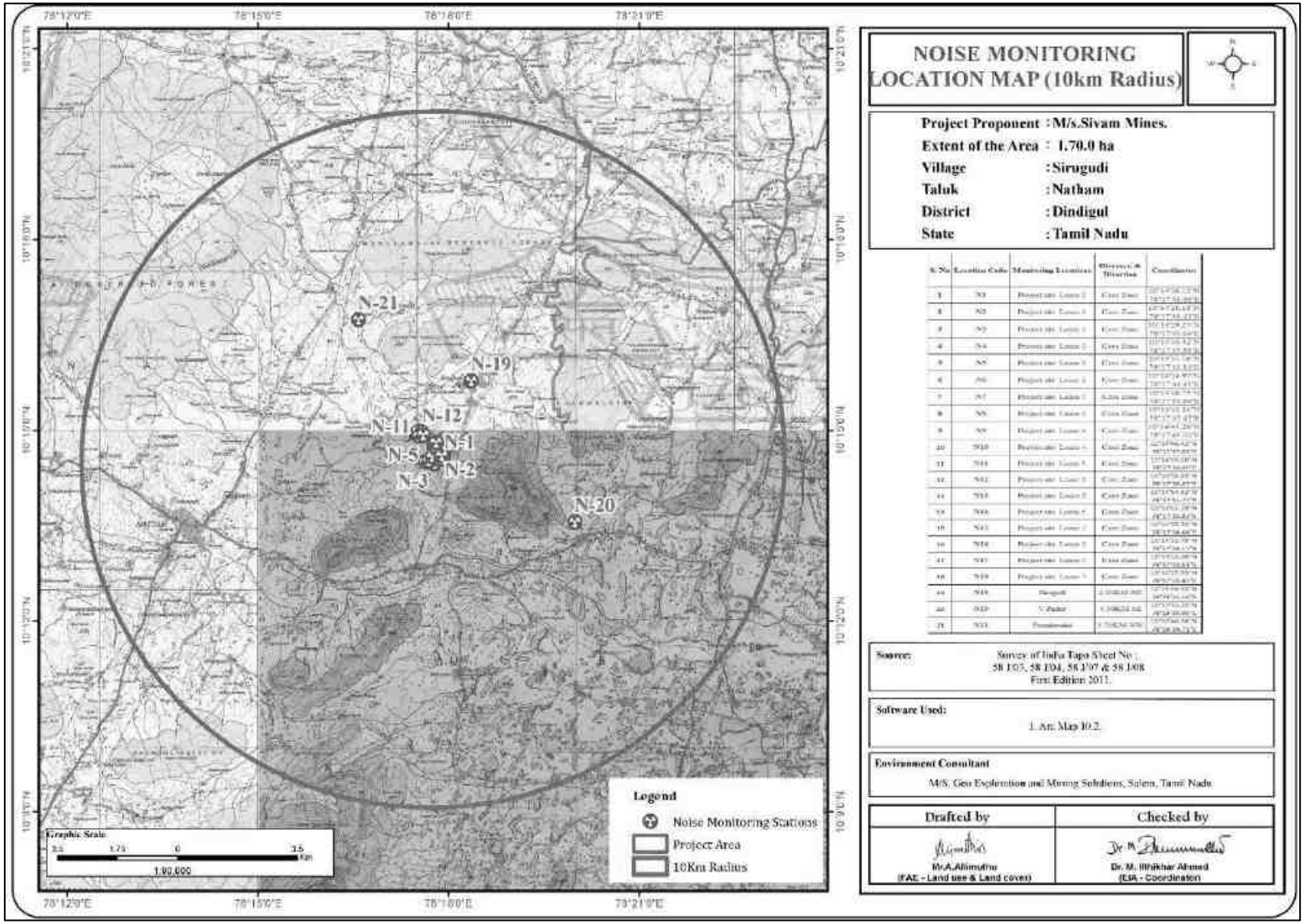
Parameters Measured During Monitoring

For noise levels measured over a given period of time interval, it is possible to derive important features of noise using statistical methods.

L_{day} Average noise levels between 6.00 hours to 22.00 hours.

L_{night} Average noise levels between 22.00 hours to 6.00 hours.

FIGURE 3.19: NOISE MONITORING LOCATION MAP



Source: Survey of India Toposheet, 11th Edition, 2011

3.4.2 Presentation of Results

The summary of computed ambient noise level parameters like L_{day} and L_{night} for all the sampling locations are presented in **Table.3.33** and compared to the standards specified by ANQS under EP Act 1986 as given in **3.33**

Monitoring Date: 06, 07, 08 November 2023

TABLE 3.33: AMBIENT NOISE LEVELS

Sl. No.	Location	Noise Levels, dB(A)					
		Day Time (06:00-22:00 hrs.)			Night Time (22:00-06:00 hrs.)		
		Lmin.	Lmax.	Leq	Lmin.	Lmax.	Leq
1	N1-Project site	40.3	55	**50**	35	44.3	**41.8**
2	N2-Project site	40.3	55	**49.1**	35.1	44.7	**41.5**
3	N3-Project site	40.1	59.3	**49.8**	35.1	44.3	**41.7**
4	N4-Project site	40.3	55	**49.1**	35.3	45.3	**41.6**
5	N5-Project site	37.4	58.9	**49.4**	32.6	48.7	**41.2**
6	N6-Project site	38.7	55	**49.1**	36.1	40.5	**39.9**
7	N7-Project site	41.6	58.1	**48.5**	36.5	41.5	**40.6**
8	N8-Project site	42.7	55.7	**50**	30.2	40.5	**36.3**
9	N9-Project site	38.8	55.1	**48.7**	32.8	38.5	**36**
10	N10-Project site	39.5	59.5	**50.1**	32.9	44.1	**36.9**
11	N11-Project site	18.2	55.3	**49.1**	30.5	41.2	**38.5**
12	N12-Project site	38.3	55.1	**48.3**	31.1	38.6	**38.5**
13	N13–Project site	39.4	58.6	**47.8**	33.7	41.9	**38.8**
14	N14-Project site	39.1	55.3	**47.4**	33.2	39.5	**37.4**
15	N 15-Project site	44	55.8	**50.5**	33.1	44.3	**39.9**
16	N16-Project site	38.5	45.9	**45.1**	32.7	40.5	**38.3**
17	N17–Project site	40.5	59.3	**52.0**	31.8	46.1	**39.3**
18	N18–Project site	37.4	56.2	**48.7**	31.1	39.7	**36.9**
Buffer Zone :							
19	N19-Sirugudi	42.1	58.7	**51.3**	36.4	48.7	**41.5**
20	N20-V.Pudhur	42.5	59.4	**50.8**	35.1	48.9	**43.2**
21	N21-Pannianmalai	43.1	59.8	**51.2**	36.2	48.7	**39.8**
MoEF&CC Norms*		-		**55**	-		**45**

Source: Lab Analysis Results

Interpretation

Ambient noise levels were ranging from 18.2dB(A) to 59.8dB(A) during day times and from 30.2dB(A)to48.9dB (A) during night times on the monitoring day. Average Day Equivalent Noise (Leq-d) level was found to be49.33dB(A) and Night Equivalent Noise (Leq-n) level was 39.50dB(A). While comparing with the MoEF&CC Leq Norms for day and night times, the monitored ambient noise levels were well within the limit values of**<55 dB(A) during day times and <45 dB(A) during night times**, for Residential Areas.

3.5 BIOLOGICAL ENVIRONMENT

Biological environment of any area constitute all living beings of that area, it is an integral part of the environment. Hence, any change in the surrounding environment could cause loss of species or decrease in biodiversity of the area. Therefore, the present study is proposed to assess the impact of the proposed projects on biological environment of the project site and surrounding area within 10km radius. Accordingly, mitigation measures are evolved to sustain the biological diversity. In general biological environment is represented by flora and fauna. Flora constitutes the herbs, shrubs and trees and fauna constitutes the mammals, birds, reptiles, arthropods, amphibians, fishes etc.,

3.5.1 OBJECTIVE OF THE STUDY

The major objectives of the study were:

- To document the diversity of the local flora within core & buffer zone.
- To enlist the major agricultural crops, plantations and cultivated species.
- To document the major fauna both invertebrate and vertebrate occurring in the selected 10Km study area.

3.5.2 STUDY APPROACH & METHODOLOGY ADOPTED

The baseline study for existing ecological environment was carried out during October to December, 2023. A participatory and consultative approach was followed. Field visits were undertaken for survey of the vegetation and animals in the study area. The study area has been divided in to two parts as core area consisting of project site and the buffer area as the 10 km radius of the project site.

3.5.3 SAMPLING METHODOLOGY

Flora Floral status was assessed in different habitat types and project site of the study area. Quantitative data was collected using standard methods of quadrate method. Flora lenumeration was done following standard sampling techniques. Random quadrates were laid in order to quantify the vegetation of the study area. Quadrate size for trees was 100 x 100m, for shrubs it was 5 x 5 m and for herbs it was 1 x 1m. Plots of 1 x 1 m were laid within the tree quadrate at each corner to record grasses. In each of the quadrates, species and their number were recorded.

3.5.4 FLORA & FAUNA AT THE STUDY AREA

3.5.4 FLORA & FAUNA AT THE STUDY AREA

TABLE 3.34: FLORA IN THE CORE ZONE (ML Area)

Sl. No.	Scientific Name	Family	Common Name
1.	*Azadirachta indica*	Meliaceae	Neem (Vembu)
2.	*Borassus flabellifer*	Arecaceae	Palmyra Palm
3	*Abutilon indicum*	Malvaceae	Indian mallow , Thuthi
4	*Solanum torvum*	Solanaceae	Turkey berry, Sundaikkai
5	*Euphorbia hirta*	Euphorbiaceae	Asthma Plant, Ammaan Pachcharisi
6	*Argemone Mexicana*	Papaveraceae	Prickly Poppy, Kudiyotti
7	*Solanum trilobatum*	Solanaceae	Thoothuvalai

TABLE 3.35: FLORA IN THE BUFFER ZONE

S.No	Name of the plant (Scientific)	Family Name	Common Name	Local name
1.	*Cocus nucifera*	Arecaceae	Coconut, Thennai	Thennai
2.	Psidium gujava	*Myrtaceae*	Guava	Koiya
3.	*Musa paradisiaca*	Musaceae	Plantain, Vazhai	Vaalai maram
4.	*Pongamia pinnata*	Fabaceae	Indian Beech,	Pungam
5.	*Azadirachta indica*	Meliaceae	Neem,	Vembu
6.	*Borassus flabellifer*	Arecaceae	Palmyra Palm	*Panaimaram*
7.	*Pithecellobium dulce*	Fabaceae	Kodukkapuli	*Kodukkapuli*
8.	*Prosopis juliflora*	Fabaceae	Algaroba,	Seemaikaruvel
10	*Moringa oleifera*	Moringaceae	Drumstick,	*Murungai*
11	*Tamarindus indica*	Fabaceae	Tamarind,	*Puliyamaram*
12	*Argemone mexicana*	Papaveraceae	Prickly poppy,	Kudiyotti
13	*Calotropis gigantea*	Asclepiadaceae	Crown Flower,	Erukku
14	*Senna auriculata*	Fabaceae	Aavarampoo	Avarampoo
15	*Solanum torvum*	Solanaceae	Turkey berry,	Sundaikkai
16	*Solanum trilobatum*	Solanaceae	Thoodhuvalai	*Thooduvalai*
17	*Adathoda vasica*	Acanthaceae	Vasaca,	Adathodai
18	*Argemone mexicana*	Papaveraceae	Prickly poppy,	Kudiyotti
19	*Oryza sativa*	Poaceae	Rice	Nel
20	*Abutilon indicum*	Malvaceae	Country Mallow, Tutti	Tutti
21	*Agave sisalana*	Agavaceae	Sisal	Kathalai,
22	*Aloe vera*	Liliaceae	Kathalai	Sothu Kathalai
23	*Aristida adscensionis*	Poaceae	Coomon Needle grass	Korai pul
24	*Euphorbia hirta*	Euphorbiaceae	Asthma weed,	Ammam Paccharisi
25	*Tridax procumbens*	Asteraceae	Tridax daisy,	Vettukkaayapoondu
26	*Amaranthus viridis*	Amaranthaceae	slender amaranth	Kuppaikeerai
27	*Oryza sativa*	Poaceae	Rice	Nel
28	*Abutilon indicum*	Malvaceae	Country Mallow, Tutti	Tutti

TABLE 3.36: FAUNA IN THE CORE ZONE (ML Area)

Scientific name	Common name	WPA 1972 Schedule	IUCN Status
funambuluspalmarum	India palm squirrel	IV	Least concern
Corvussplendens	House Crow	IV	Least concern
Acridotherestristis	Common myna	IV	Least concern
Buteobuteo	Common buzzard	IV	Least Concern

TABLE 3.37: FAUNA IN THE BUFFER ZONE

AMPHIBIANS				
S.No	**Scientific Name**	**Common Name**	**WPA 1972 Schedule**	**IUCNStatus**
1	Bufo melanrostictus	*Common Indian Toad*		LC
2	*Euphlyctis cyanophlyctis*	*Skittering frog*		*LC*
REPTILES				
1	Ahaetulla nasuta	*Common Green Whip Snake*		
4	Calotes versicolor	*Common Garden lizard*	*IV*	*LC*
8	Hemidactylus flaviviridis	*House gecko*	*IV*	*LC*
BIRDS				
1	Acridotheres tristicus	*Common myna*	*IV*	*LC*
4	Ardeola grayii	*Pond Heron or Paddy Bird*	*IV*	*LC*
5	Athene brama	*Spotted Owlet*	*IV*	*LC*
6	Bubo bubo	*Indian great horned owl*	*IV*	*LC*
7	Bubulcus ibis	*Cattle egret*	*IV*	*LC*
9	Centropus sinensis	*Crow-Pheasant or coucal*	*IV*	*LC*
15	Corvus splendens	*House Crow*	*IV*	*LC*
34	Passer domesticus	*House Sparrow*	*IV*	*LC*
37	Psittacula krameri	*Rose Ringed Parakeet*	*IV*	*LC*
MAMMALS				
1	Bandicota indica	*Bandicoot*	*IV*	*LC*
2	Atherurus macrourus	*Asiatic Brush tailed porcupine*	*IV*	*LC*
2	Bos indicus	*Cow*	*IV*	*LC*
3	Bubalus bubalis	*Buffalo*	*IV*	*LC*
6	Capra hircus	*Goat*	*IV*	*LC*
9	Funambulus palmarum	*Indian Palm squirrel*	*IV*	*LC*
11	Macaca radiata	*Bonnet macaque*	*IV*	*LC*
INSECTS				
S.No.	**Scientific Name**	**Common Name**	**Picture**	
1.	Agrion sp & Petalura sp	*Dragon fly*	*IV*	*LC*
2.	Apis indica	*Hon ey bee*	*IV*	*LC*
3.	Aranea sp	*Spider*	*IV*	*LC*
4.	Carausius sp	*Stick insect*	*IV*	*LC*
5.	Cicada sp.	*Cicade*	*IV*	*LC*
6.	Coenagrion sp & Ischnura	*Damsel fly*	*IV*	*LC*
7.	Eumenus	*Wasp*	*IV*	*LC*

8.	Hieroglyphus sp	*Grasshopper*	*IV*	*LC*
9.	Mantis religiosa	*Praying mantis*	*IV*	*LC*
10.	Monomorium indicum	*Ant*	*IV*	*LC*
11.	Palamnaeus swammerdam	*Scorpion*	*IV*	*LC*
12.	Scolopendra	*Centipede*	*IV*	*LC*
BUTTERFLIES				
1.	Acraea terpsicore	*Tawny coster*	*IV*	*LC*
2.	Danaus plexipppus	*Striped tiger*	*IV*	*LC*
FISH				
1.	Cirrhinus mrigala	*Mrigal*	*IV*	*LC*
2.	Cyprirus carpio	*Common Carp*	*IV*	*LC*

Among the flora recorded most of them are common residence population and no endangered species in the study area.

Interpretation:

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

3.6 SOCIO-ECONOMIC ENVIRONMENT

To assess the impact on the socio economic environment, it is essential to collect the following data:

- Population surrounding the project site those likely to be targeted receptor of impact
- Employment pattern
- Infrastructure facilities available to the local population such as water supply and sanitation electricity, roads, education and medical facilities.
- Land use pattern.

Information on the Socio economic front has been collected from various secondary sources including 2011 published census data, Government and semi government office.

3.6.1 OBJECTIVES

The objectives of the socio-economic study are as follows:

- To study the socio-economic status of the people living in the study area of the proposed mining project.
- To assess the impact of the project on socio-economic environment in the study area.
- To assess the impact of the project on Quality of life of the people in the study area.
- To evaluate the community development measures proposed to be taken up by the project proponent, if any.
- To recommend Community Development measures needs to be taken up in the study area.

3.6.2 METHODOLOGY ADOPTED FOR THE STUDY

- A mixture of both quantitative and qualitative approach has been adopted in the current socio-economic study.
- The study has been conducted based on primary and secondary data. While primary data has been collected through a sample survey of selected households, the secondary data has been collected from the administrative records of the Government of Tamilnadu, Census 2011 District hand books etc.,
- The details regarding population composition, number of literates, workers etc., have been collected from secondary sources and analyzed. Also village/city/town wise details regarding amenities available in the study area have been collected from secondary sources and analyzed.
- Random Sampling has been adopted to select the sampling units.
- Estimation of various parameters has been made based on sample data and bottom top approach has been adopted.

- The data collected during the above survey was analyzed to evaluate the prevailing socio-economic profile of the area.
- Based on the above data, impacts due to mining operation on the community have been assessed and recommendations for improvement have been made.

3.6.3 DESCRIPTION OF THE STUDY AREA

The study area covers all the villages/ part of villages located in the 10 km radius around the mine lease periphery. In this Limestone mine in an area of 1.70.0 ha at village Sirugudi, the study area is spread over 34 villages. The list of villages along with the population details is given in Table 3.38.

3.6.3.1 REVIEW OF THE STUDY AREA:

The study area is in the Sirugudi village of Natham Taluk, Dindigul District.

Total extent of the study area (10Km Radius)	=	31,802Ha.
Total Population	=	90,008
Total male population	=	45,422
Total female population	=	44,586
Population density per Km^2	=	186person/ Km^2
Sex ratio	=	1001
District headquarters	=	Dindigul

3.6.3.2 DEMOGRAPHYOF SIRUGUDIVILLAGE: (SOURCE: DISTRICT SENSEX HAND BOOK 2011)

Total area	=	1,847ha
Total No of Households	=	2,315
Total population	=	9,524
Male population	=	4,770
Female population	=	4,754
Population density	=	529 per Km^2
Literacy rate	=	63 %

TABLE 3.38: DEMOGRAPHY PROFILE OF THE STUDY AREA

SI.No.	Village Name	Total Population	Male	Female	Total SC Population	Male SC	Female SC	Total ST Population	Male ST	Female ST	Total Literate Population	Male Literate	Female Literate	Total Illiterate Population	Male Illiterate	Female Illiterate
1	Avichchippatti	2325	1169	1156	95	46	49	0	0	0	1489	890	599	836	279	557
2	Ayyapatti	4934	2470	2464	356	170	186	0	0	0	2965	1781	1184	1969	689	1280
3	Budagudi	1425	726	699	93	49	44	0	0	0	941	550	391	484	176	308
4	Chellappanaickenpatti	4876	2435	2441	552	281	271	0	0	0	2986	1708	1278	1890	727	1163
5	Chokkampatti	2789	1325	1464	286	138	148	0	0	0	1684	940	744	1105	385	720
6	Idayapatti	583	295	288	4	1	3	0	0	0	315	183	132	268	112	156
7	Kambur	7925	3998	3927	652	339	313	0	0	0	4442	2663	1779	3483	1335	2148
8	Kesampatti	4607	2274	2333	203	98	105	0	0	0	2580	1540	1040	2027	734	1293
9	Kottaiyur	3925	1993	1932	200	103	97	0	0	0	2452	1413	1039	1473	580	893
10	Kottampatti	5406	2716	2690	1164	608	556	1	0	1	3959	2229	1730	1447	487	960
11	Kunnarampatti	3163	1575	1588	558	285	273	0	0	0	1961	1136	825	1202	439	763
12	Manappachcheri	5441	2716	2725	611	322	289	0	0	0	3557	2073	1484	1884	643	1241
13	Nadumandalam	8830	4495	4335	1960	1002	958	1	0	1	5472	3225	2247	3358	1270	2088
14	Pallapatti	13701	6933	6768	5471	2757	2714	0	0	0	9730	5330	4400	3971	1603	2368
15	Pandangudi	948	459	489	240	119	121	0	0	0	678	381	297	270	78	192
16	Pannimalai	2068	1065	1003	371	186	185	0	0	0	1365	789	576	703	276	427
17	Pannuvarpatti	1218	617	601	622	316	306	0	0	0	778	430	348	440	187	253
18	Pappapatti	7988	3945	4043	3163	1572	1591	2	1	1	963	617	346	396	131	265
19	Pottapatti	3382	1640	1742	415	217	198	0	0	0	2166	1242	924	1216	398	818
20	Punnapatti	7576	3812	3764	988	494	494	0	0	0	4851	2802	2049	2725	1010	1715
21	Samudrapatti	3929	1945	1984	687	341	346	0	0	0	2645	1456	1189	1284	489	795
22	Sattambadi	6210	3221	2989	825	429	396	0	0	0	3845	2311	1534	2365	910	1455
23	Seithur	8222	4135	4087	338	173	165	0	0	0	4789	2790	1999	3433	1345	2088
24	Sekkipatti	4436	2248	2188	1007	530	477	0	0	0	2626	1567	1059	1810	681	1129
25	Sirangattupatti	6717	3361	3356	83	41	42	0	0	0	4276	2417	1859	2441	944	1497
26	Sirugudi	9524	4770	4754	1669	828	841	0	0	0	6002	3435	2567	3522	1335	2187
27	Surappatti	1769	856	913	200	95	105	0	0	0	1131	638	493	638	218	420
28	Tarkakudi	349	171	178	160	80	80	0	0	0	244	135	109	105	36	69
29	Thethur	5906	2996	2910	707	360	347	0	0	0	3804	2155	1649	2102	841	1261
30	Tiruchchunai	1837	946	891	127	70	57	0	0	0	1147	687	460	690	259	431
31	Tondilingapuram	1874	936	938	177	93	84	0	0	0	1152	693	459	722	243	479
32	Uralipatti	3896	1948	1948	333	166	167	1	0	1	2367	1377	990	1529	571	958
33	Valaichcherippatti	1408	685	723	249	131	118	0	0	0	1019	551	468	389	134	255
34	Velanpatti	9873	5025	4848	750	366	384	31	13	18	7290	4019	3271	2583	1006	1577

Source: District primary census handbook 2011.

3.6.4 POPULATION OF THE STUDY AREA

The statistics, regarding the human population and the No of dwelling units of villages in the study area taken from the 34 villages in the buffer zone, while in core zone there is no village. Population, literacy, in the study area are given in **Table 3.38.** This information is taken from the District Census Hand book, Dindigul, 2011. On this basis, the population of the study area is estimated about 1,59,060, i.e. within a 10 km periphery or 318.02 Km^2 area gives a population density of about 500 persons / km^2.

About 60% population depends upon the agriculture, 20 % population depends upon the seasonal agriculture about 10-15% of the population depends upon self-employment like petty shop, small hotels, agro shops etc., about 4% of the population are employed in foreign country both literate and illiterate about 2% of the population relay on self-employment scheme (100 days workers scheme) 8-10 % of the population are employed in Government and private sector companies besides a small amount of population are elderly persons, sick persons, handicap and un employed.

3.6.5 LITERACY:

Of the total population 61.40% belongs to literate category. Amongst this, male and female constitute 57.49% and 42.50% respectively.

3.6.6 WORKERS OCCUPATIONAL PATTERN IN THE STUDY AREA:

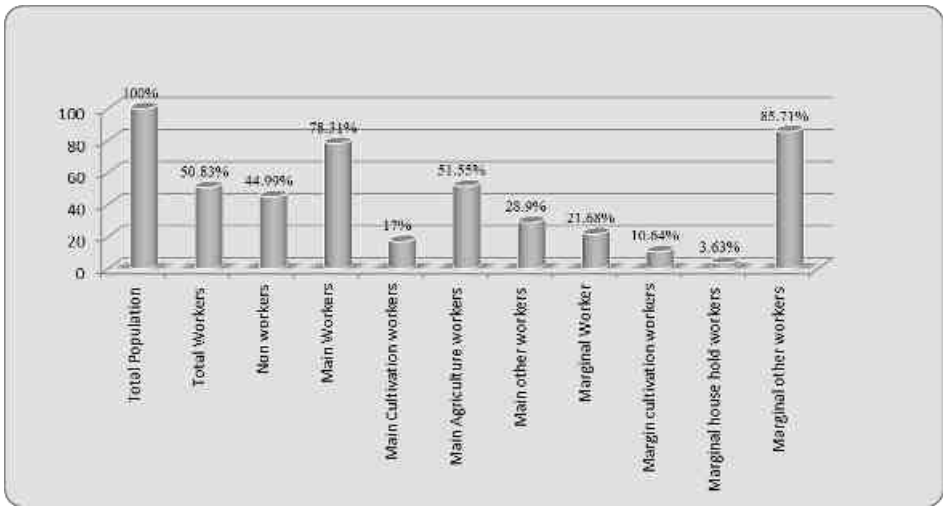
The occupational profile has been classified based on the available 2011 Census classification. A person is treated as main worker if the person has worked for a major part of the year, i.e. 183 days or more. A marginal worker is a person who worked for sometime during the year but not for 183 days. The main workers have been further categorized as cultivators, agricultural labourers, household industry workers and other workers. Household industry relates to production, processing, repairing, making and selling of goods at household level. The other workers include factory employees, plantation workers, persons engaged intrade, commerce, business, transport, mining, construction, social work, entertainment as well as government employees, teachers and priests.

TABLE 3.39: OCCUPATIONAL PATTERN OF THE AREA

S.Nos	Description	No of peoples	Proportion %
1	**Total Population**	**1,59,060**	**100**
2	Total Workers	80,858	50.83
3	Non workers	71,573	44.99
4	**Main Workers**	**63,323**	**78.31**
5	Main Cultivation workers	10,817	17.00
6	Main Agriculture workers	32,649	51.55
7	Main other workers	18,301	28.90
8	**Marginal Worker**	**17,535**	**21.68**
9	Margin cultivation workers	1867	10.64
10	Marginal house hold workers	638	3.63
11	Marginal other workers	15,030	85.71

Source: District primary census handbook 2011

FIGURE 3.20: OCCUPATIONAL PATTERN OF THE STUDY AREA



Source: Table 3.39

3.6.7 EDUCATIONAL FACILITIES

TABLE 3.40: EDUCATION FACILITIES IN THE STUDY AREA

S.No	Name of educational facilities	No of facilities	Government	Private
1	Pre Primary school	42	33	9
2	Primary School	42	33	9
3	Middle school	27	23	4
4	Secondary school	21	15	6
5	Higher secondary school	16	11	5
6	Degree Colleges	2	-	2
7	Engineering college	Nil	-	-
8	Polytechnic college	2	-	2

Source: District primary census handbook 2011.

3.6.8 HEALTH AND MEDICAL FACILITIES

Out of total 34 villages health & medical facilities are available almost in all villages. The statistical data representing the type and number of medical facilities available within the study area is given in Table 3.41 and the same is represented in the form of a bar chart.

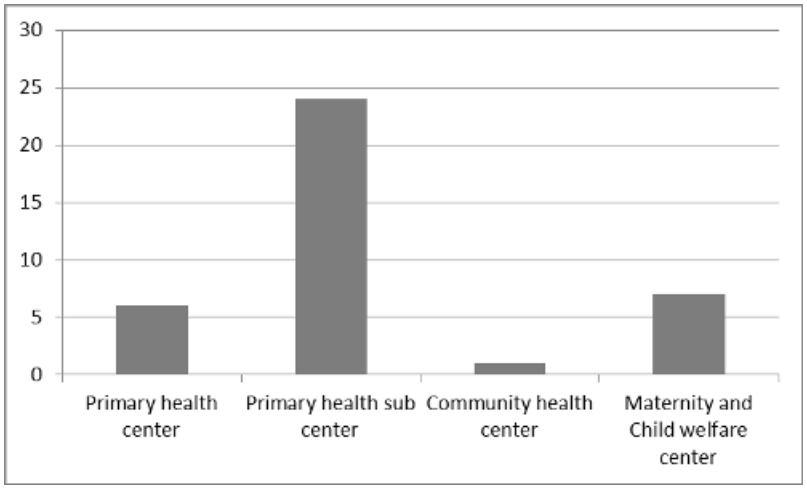
TABLE 3.41: MEDICAL FACILITIES IN THE STUDY AREA

S.No	Type of facility	Number
1	Primary health center	6
2	Primary health sub center	24
3	Community health center	1
4	Maternity and Child welfare center	7

Source: District primary census handbook 2011.

Besides there are plenty of private registered medical practitioners have their dispensaries in most of the villages.

FIGURE 3.21 BAR DIAGRAM SHOWING THE MEDICAL FACILITIES



Source: Table 3.41

3.6.9 SUMMARY OF THE BASELINE STATUS:

The interpretation of the baseline environmental status in the study area is following.

- The monitored Air quality in the mine lease area was found to be in compliance with the NAAQ norms for industrial and residential rural and other areas.
- The noise level Leq during the day and night was found to be well within the ambient noise quality standards notified under Environmental (protection)Act 1986.
- The quality of the surface water and ground water are found well within the prescribed standards of CGWB Norms and drinking water specification IS 10500 and Central Pollution Control Board water quality criteria.
- The soil in the mine area would well support vegetation if preserved suitably. There is no Eco sensitive zone or any Archeological/ historical places found within the vicinity of the mine area.
- There are no endangered species of fauna and the area is thinly populated. All basic facilities like school, hospitals, communication center, transportation center, are available in and around the project area.
- There is sufficient buffer zone for the project with respect to physical and biological environments.
- There is no effluent discharge from the mine to the nearby water bodies.

4. ANTICIPATED ENVIRONMENT IMPACT AND ITS MITIGATION MEASURES

4.0 GENERAL

The Environmental Impacts associated with any activities have significant impacts on the environment.

The purpose of Environmental Impact Assessment (EIA) is to identify and evaluate the potential impacts (beneficial and adverse) of development and projects on the environmental system. It is a useful aid for decision making based on understanding of the environment implications including social, cultural and aesthetic concerns which could be integrated with the analysis of the project costs and benefits. On the basis of the impact analysis, the mitigating action and future monitoring requirement are focused in the Environmental Management Plan for counting or minimizing adverse impacts.

Generally, the environmental impacts can be categorized as either primary or secondary. Primary impacts are those, which are attributed directly by the project, secondary impacts are those, which are indirectly induced and typically include the associated investment and changed pattern of social and economic activities by the proposed action.

The impact has been ascertained for the project assuming that the pollution due to mining activity has been completely spelled out under the baseline environmental status for the entire ROM which is proposed to exploit from the mines.

Several scientific techniques and methodologies are available to predict impacts of physical environment. The following parameters are of significance in the Environmental Impact Assessment and are being discussed in detail.

Various impacts have been studied and are discussed in the subsequent sections.

1. Land Environment
2. Water Environment
3. Air Environment
4. Noise Environment
5. Solid waste
6. Biological
7. Socio-Economic

4.1 LAND ENVIRONMENT:

Topography of the land will be changed according to the Limestone mining operation. The main anticipated impact on the Land Environment due to quarrying operation is change in Landscape, change in Land – use Pattern. Land use pattern of the area is dry barren land, with existing quarry pit. The topography of the area is almost plain terrain having gentle gradient towards south side. Core zone of the area is patta land. No forest land is involved.

As per the approved mine plan at conceptual stage, mined out pit will be converted into rain water harvesting pit and green belt will be developed on the top benches. Hence impact due to change in land use is positive. No discharge of toxic elements. No adverse impact is anticipated on land use of buffer zone associated due to the Limestone quarrying, as all the activities will be confined within the project area.

MITIGATION MEASURES

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

- Top soil generated during the previous period was preserved all along the boundary barrier to facilitate the greenbelt.
- Top Soil generated during mining will be temporarily stacked at designates places and will be used for carrying out greenbelt on the safety zone and top benches of mined out area. Part of the remaining void/ un-reclaimed area at the lower elevation of the pit area will be used as water storage cum ground water recharge pit.
- Construction of garland drains all around the quarry pit and construction of check dam at strategic location in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area.
- Construction of retention walls with weep holes around the waste dump boundary to arrest boulder roll down and silt wash off to avoid discharged to surroundings, particularly agriculture land.
- Green belt development along the boundary within safety zone and reclaimed mined out area. The water stored in the mined out pit will be used for greenbelt development.
- Thick plantation will be carried out on undisturbed area, top benches of mined out pits, on safety barrier, etc.,
- At conceptual stage, the land use of mining area will change into area covered with plantation and water reservoir.
- Proper fencing will be carried out at the conceptual stage to prevent inherent entry of the public and cattle.

4.2 WATER ENVIRONMENT

The impact due to quarrying on the water quality is expected to be insignificant because of no use of chemicals or hazardous substances during quarrying process. The quarrying activity will not intersect ground water table and water table is found at a depth of 35m BGL in summer season.

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

There is no proposal processing or workshop within the project area thus there is no effluent anticipated in the mine.

Detail of water requirements in KLD as given below:

TABLE 4.1: WATER REQUIREMENT

Purpose	Quantity	Source
Dust Suppression	0.8 KLD	Rainwater accumulated in Mine Pit
Green Belt	0.8KLD	Rainwater accumulated in Mine Pit
Domestic &Drinking Purpose	0.4KLD	Approved Water Vendors
Total	**2 KLD**	

Mitigation measures:

- Construction of garland drains to divert surface run-off into the mining area.
- Construction of check dams / gully plugs at strategic places to arrest silt wash off from broken up area.
- Retaining walls with weep hole will be constructed around the external dumps. The storm water will goes to the Garland drains through the weep holes.
- The remaining excavated pits after backfilling will be converted into the water reservoir at the end of mine life. This will help in recharging ground water table by acting as a water harvesting structure.
- Periodic analysis of mine pit water and ground water quality in nearby villages.
- Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits.

4.3 AIR ENVIRONMENT

Mining Operations are carried out by opencast category "A" other than fully mechanized; dust particles are generated due to various activities like Drilling, Blasting, Excavation of mineral, Loading, handling of waste and transportation. The air quality in the mining area depends upon the nature and concentration of emissions and meteorological conditions.

The major air pollutants due to mining activity includes:-

- Particulate Matter (Dust) of various sizes.
- Gases, such as, Sulphur Dioxide, Oxides of Nitrogen, Carbon Monoxide etc., from vehicular exhaust.
- Dust is the single air pollutant observed in the open cast mines. Diesel operating drilling machines, small amount of blasting and movement of machinery/ vehicles produce NO_X, SO_2 and Co emissions, usually at low levels. Dust can be of significant nuisance surrounding land users and potential health risk in some circumstances.

Mitigation Measures

Mitigated measures suggested for air pollution controls are based on the baseline ambient air quality of the area. From the point of view of maintenance of an acceptable ambient air quality in the region, it is desirable that air quality is monitored on a regular basis to check compliance of standards as prescribed by regulatory authorities. In case of non-compliance, appropriate mitigated measures need to be checked. No heavy earth moving machineries are

The following additional measures will also be adopted such as,

- Wet drilling will be carried out to contain the dust.
- Controlled blasting techniques will be adopted.
- Water spraying on haul roads, service roads and overburden dumps will help in reducing considerable dust pollution.
- Proper and regular maintenance of mining equipment's have to be considered.
- Transport of Limestone in trucks covered with tarpaulin.
- The mine pit water can be utilized for dust suppression in and around mine areas.
- Information on wind direction and meteorology will be considered while planning, so that pollutants, which cannot be fully suppressed by engineering technique, will be prevented from reaching the nearby agriculture area.
- Green belt around overburden dumps to be carried out to reduce to fugitive dust emissions in order to create clean and healthy environment.

4.4 NOISE ENVIRONMENT

Noise pollution is mainly due to operation of drilling Machineries and occasional plying of tippers only. Noise due to the movement of Heavy earth moving machineries will not arise. These activities will not cause any problem to the inhabitants of this area because there is no human settlement in close proximity to the lease area. Noise level monitoring has been carried out in the project area. The result indicates that no significant impact to nearby villages.

MITIGATION MEASURES

- Periodic maintenance of machinery, equipment's will be ensured to keep the noise generated at minimum.
- Development of thick green belt around mining area and haul roads to reduce the noise.
- Provision of earplugs to workers exposed to high noise generating activities. Workers and operators at work site will be provided with earmuffs.
- Conducting periodical medical checkup of all workers for any noise related health problems.
- Proper training to personnel to create awareness about adverse noise level effects.
- Periodic noise monitoring at suitable locations in the mining area and nearby habitations to assess efficacy of adopted control measures.
- During the blasting, optimum Spacing, Burden and charging of holes will be made under the supervision of competent qualified mines foreman, Mate as approved by Director of Mines safety.

4.5 BIOLOGICAL ENVIRONMENT

The impact on biodiversity is not anticipated as there is no forest, wild life sanctuaries eco sensitive zone within the radius of 10Km from the mine site. The impact on biodiversity is difficult to quantify because of its diverse and dynamic characteristics.

Mining activities generally result in the deforestation, land degradation, water, air and noise pollution which directly or indirectly affect the faunal and floral status of the project area.

However, occurrence and magnitude of these impacts are entirely dependent upon the project location, mode of operation and technology involved.

MITIGATION MEASURES:

- Development of gap filling plantation in the safety barrier left around the proposed area.
- Carrying out thick plantation with local flora species on the inactive mined out upper benches.
- Development of dense poly-culture plantation using local flora species in the mining area at conceptual stage.
- Adoption of suitable air pollution control measures as suggested above.
- Covered transportation of mineral outside the mining area.
- Construction of garland drains and settling tank to arrest silt wash off from ML area.
- Construction of retention walls around lower boundary of mining area to arrest silt wash off and roll down boulders.
- Retaining walls with weep hole will be constructed around the external dumps to arrest silt wash off and roll down boulders.

4.6 SOCIO ECONOMIC ENVIRONMENT

The socio-economic impacts of mining are many. Impacts of a mine project may be positive or Negative. The adverse impacts attribute to physical displacement due to land acquisition, which is followed by loss of livelihood, mental agony, changes in social structure, and risk to food security etc.,

The villages and their inhabitants in the buffer zone will not be disturbed from their settlements due to the mining operations. There is no inhabitation within the ML area. Therefore neither villages nor any part of village or any hamlet will be disturbed during the entire life of the mine.

Regular medical checkup / eye-camps will be organized for the villagers. Allocation of funds towards public health has been indicated in the CSRCER activities.

The existing project will provide job opportunities to 6 local workers directly and 20 workers indirectly. Earning wages will be as per the minimum wages act applicable for un-skilled, semi-skilled and highly skilled categories.

Lessee will contribute for the development of the area, nearby schools and basic amenities as per the CSR Act 2013. Besides 30% of the royalty as DMF, GST, levis will be given to the concern department for local community development and state/country revenue.

CSR ACTIVITIES CARRIED OUT SO FAR BY THE PROPONENT.

- ❖ Providing note books to the students.
- ❖ Supplying hospital beds to the Sirugudi PHC.

- ❖ Drinking water facility to the government school.
- ❖ Maintenance of public road.
- ❖ Cultural activities for the community.

CSR ACTIVITIES PROPOSED TO BE CARRIED OUT.

With reference to the above subject, the Socio – Economic assessment study was carried out to identify Corporate Social Responsibility (CSR) for M/s. Sivam Mines.

TABLE 4.2 IDENTIFIED CSR ACTIVITIES

S.No	Description	Amount in Rs/ year
1	Conduct annual health camp in Sirugudi village.	Rs 2,00,000/-
	Total	**Rs 2,00,000/-**

4.7 WASTE MANAGEMENT AND MITIGATION MEASURES.

The waste anticipated in the mines is only the Mineral rejects and side burden which is proposed to dump in the pre-determined places approved by Indian Bureau of Mines and proposed to backfill in the conceptual stage followed by greenbelt. Proper terracing with safety slope angles 37^0 - $28^0$are proposed to follow to prevent soil erosion into the mine pit and other areas.

Top soil generated during the previous plan period was preserved all along the boundary barrier to facilitate the greenbelt. The top soil which is stacked separately will be spread in the backfilled area to facilitate greenbelt.

Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits. The small quantity of spilled out and fly rocks of limestone during production will be collected manually and cleared periodically. There is no impact on the surrounding agriculture land or haulage roads.

4.8 MINE CLOSURE AND MITIGATION MEASURES

After complete exploitation of the limestone mineral from the lease areas, the mined out pit will be partially backfilled and partially allowed to collect the rain water which will act as a temporary reservoir, this temporary storage of water will act as an artificial recharge pond which will enhance the near ground water level and the static level of the nearby wells.

Barbed wire fencing will be constructed along the lease boundary to prevent inherent entry of public and cattle's. Watchman will be appointed in the entrance to prevent inherent entries. The water in the remaining mined out pits will used for maintenance of Greenbelt. The temporary mine office complex will be demolished and restored to original ground profile. The soak pits will be filled with sand to avoid degradation. Native species will be planted as much as possible in the left out area during the conceptual stage, as vegetation cover is the best long term method of stabilizing the site.

The closure of the mine will be in accordance to the final mine closure plan approved by the Indian Bureau of Mines. The proponents are instructed to obtain final mine closure certificate from the Indian Bureau of Mines and by the condition stipulated by the MoEF at the end of the life of the mine.

5. ANALYSIS OF ALTERNATIVE (TECHNOLOGY & SITE)

5.0 INTRODUCTION:

The mining project is site specific and no alternate sites are proposed. There is no alternate sites are interlinked projects. There is no ore beneficiation, mineral processing proposed in the project. This is a site specific projects the limestone is sold to the needy customers in the raw form after the grade separation.

No workshops, housing, colonies are proposed within the project area. The workers are being employed from the nearby community villages. Hence there is no impact on selection of alternate.

5.1 ANALYSIS OF ALTERNATIVE TECHNOLOGY

There are no changes in the method of mining and technology using in this mining operation. The methodology is carried out as per the Mining plan, Modified Mining plan and Review of Mining plan approved by the Indian Bureau of Mines, Government of India.

6.ENVIRONMENTAL MONITORING PROGRAMME

6.1 INTRODUCTION

Regular monitoring of environmental parameters is of immense importance to assess the status of environment during project operation. With the knowledge of baseline conditions, the monitoring program will serve as an indicator for any deterioration in environmental conditions due to operation of the project, to enable taking up suitable mitigation steps in time to safeguard the environment.

Monitoring is important to measure the efficiency of control measures. An environmental impact assessment study is carried over for a specified period of time and the data cannot bring out all variations induced by the natural or human activities. Therefore, regular monitoring program of the environmental parameters is essential to take into account the changes in the environmental quality.

TABLE 6.1: PROPOSED ENVIRONMENTAL MONITORING PROGRAM

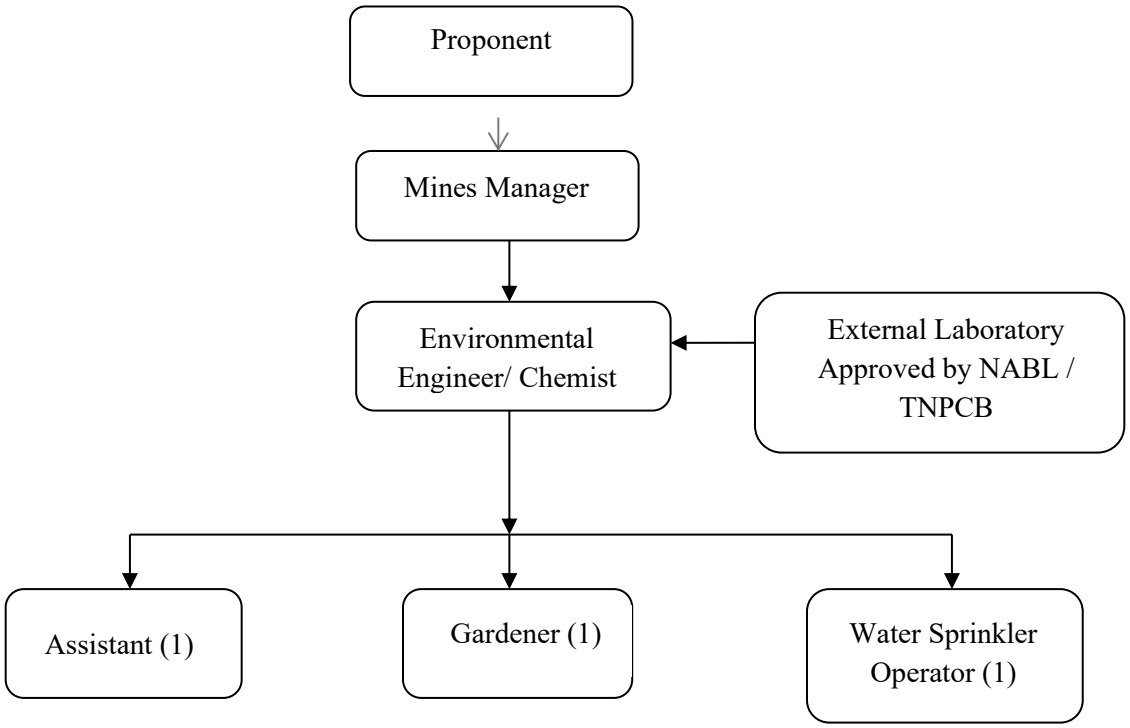
S.No	Activity	Schedule
	Air pollution monitoring	
1	Ambient air monitoring of parameters specified by CPCB in their air consents from time to time within the core zone.	Half yearly once
2	Ambient air monitoring of parameters specified by CPCB in their air consents from time to time at stations outside ie., buffer zone	Half yearly once
	Water quality monitoring	
3	Monitoring water quality from rain water collected in mine pit area. Rain water will be sed for plantation purpose.	Half yearly once
4	Monitoring of one sample of tube well and open well at mine/ nearby location. Parameters are essential parameters as per IS:10500:1991.	Half yearly once
5	Monitoring of water spray requirements	Daily basis
	Noise quality monitoring	
6	Noise in the ambient atmosphere in mining lease& outside	Half yearly once
	Green belt maintenance	
7	Monitor schedule for Greenbelt development as per approved mining plan	Weekly basis

Source: Proposal as per EIA Guidelines

6.2 ENVIRONMENTAL MONITORING CELL

An Environmental Management Cell (EMC) will be established under the control of Proponents and mines manager. A statutory competent qualified will be appointed for looking after the environmental monitoring and compliance with the conditions stipulated in the Environmental clearance for the mines. The environmental monitoring will be carried out by external agency approved by MoEF/TNPCB and NABL for conducting the monitoring. The non-compliance of the condition stipulated in the Environmental clearance will be periodically supervised by the company.

FIGURE 6.1 ENVIRONMENTAL MONITORING CELL STRUCTURE



The responsibilities of EMC will be as follows:

1. Implementation of pollution control measures as suggested in Environmental Management Plan
2. Conducting Environmental monitoring as per EMP through external laboratories approved by MoEF/TNPCB and NABL. Compliance reports will be submitted to respective agencies like Regional Office, MoEF & CC, PCB etc.,
3. Seeking experts guidance, as and when required.
4. Conducting CSR and CER activities in nearby villages.

5. Implementation of training program for occupational health and safety of workers as directed by the Director General of Mines safety.
6. The Environmental Engineer along with statutory persons like mines manager, Mining engineer, Geologist and foreman will be responsible for regular monitoring and the same will be reported to the lessees/proponent.
7. The mining engineer and geologist will be held responsible to carry out the mining operation as per the plan approved by the Indian bureau of mines and to comply with the statutory standards stipulated by the Director of Mines safety, labour enforcement officer, pollution control board and the Department of Geology and Mining.

TABLE 6.2: ENVIRONMENTAL MONITORING PROGRAM PROPOSED

Sl. No.	Environment Aspect	Action to be Followed	Parameters for Monitoring	Frequency of Monitoring	Location
1	Air Emissions	Ambient air quality within mining area and at the nearby habitations.	PM_{10}, $PM_{2.5}$, SO_2, NO_x.	Once in 3 months	One location within mining area & one location at Sirugudi village
		Exhaust from mining machinery to be minimized periodic maintenance	Vehicle logs to be maintained	Quarterly	-
		Prohibition of overloading and adoption of covered transportation of stone	Vehicle logs	Daily records	Main gate
2	Noise	Noise generated from various mining operation like drilling/ blasting/ vehicular movement to be optimized and monitored.	Spot Noise Level recording; L_{eq}(day), L_{eq}(night)	Twice in a year (Noise level in dB (A) for day and night time.	One location within mining area & one location at Sirugudi village
		Generation of vehicular noise	Maintain records of vehicles	Periodic during operation phase	Mine working area
3	Wastewater Discharge	No untreated discharge to be made to surface water, groundwater or soil.	Quality of run-off water from settling tank/pond	Periodic during operation phase	Garland drains, settling ponds

Sl. No.	Environment Aspect	Action to be Followed	Parameters for Monitoring	Frequency of Monitoring	Location
4	Drainage and effluent Management	Ensure drainage system and specific design measures are working effectively. Avoid disturbance to the natural drainage of the area.	Visual inspection of drainage and records thereof	Periodic during operation phase	Surface run-off from ML area during rains. Quality of discharge water, if any.
5	Water Quality and Water Levels	Monitoring of used water quality & groundwater quality and levels	Comprehensive water quality monitoring as per IS 10500 Depth of ground water table	Once in a quarter	Accumulated water in mine pit & ground water monitoring from Mining area and one location at Sirugudi village
6	Emergency preparedness, such as fire fighting	Fire protection and safety measures to take care of fire and explosion hazards, to be assessed and steps taken for their prevention.	Mock drill records, on site emergency plan, evacuation plan	Periodic during operation phase	Explosive van, mine machinery
7	Maintenance of flora and fauna	Vegetation, greenbelt / green cover development	No. of plants, species, survival rate	Periodic during operation phase	Plantation area in mine.
8	Waste Management	Implement waste management plan and the procedures for collection, handling & disposal of each waste generated in the mine.	Records of solid waste generation, treatment and disposal	Periodic during operation phase	Mine lease area
9	Soil quality	Conservation of top soil excavated	Soil fertility, soil contamination	Periodical monitoring	Plantation area, top soil dump
10	Health & Safety	Employees and contractual labour health check ups	All relevant parameters including HIV	Regular check ups	Mine workings

Source: Proposed as per EIA Guidelines

The mines manager will implement the green belt development as per the approved mining plan and besides in consultation with the proponent and will submit periodical status report to

1. MoEF & CC – Half yearly status report
2. TNPCB - Half yearly status report
3. IBM quarterly, half yearly annual reports

Besides the Mines manager or mine agent will submit the periodical reports to

1. Director of mines safety,
2. Labor enforcement officer,
3. Controller of explosives as per the norms stipulated by the department.

6.3 OCCUPATIONAL HEALTH AND SAFETY:

As per the guidelines of the Mine Rules 1955, occupational health safety stipulated by the ILO/WHO. The proponent will take all necessary precautions. Normal sanitary facilities provided within the lease areas. The proponent will carry out periodic health checkup of to the workers.

Occupational hazards involved in mines are related to dust pollution, noise pollution, blasting and injuries from moving machineries & equipment and fall from high places. DGMS has given necessary guidelines for safety against these occupational hazards. The management will strictly follow these guidelines.

All necessary first aid and medical facilities will be provided to the workers. The mine will be well equipped with Personal Protective Equipment (PPE). Further all the necessary protective equipment's such as helmets, safety goggles, earplugs, earmuffs, etc. will be provided to persons working in mines as per Mines Rules. All operators and mechanics will be trained to handle fire-fighting equipment's.

6.4 BUDGETARY PROVISION FOR EMP

The cost in respect of monitoring of environmental attributes, parameter to be monitored, sampling/monitoring locations with frequency and cost provision against each is shown in Table 6.3. Monitoring work will be outsourced to external laboratory approved by NABL / MoEF.

TABLE 6.3 ENVIRONMENT MONITORING BUDGET

Sl.No.	Parameter	Capital Cost	Recurring Cost per annum
1	Air Quality	Rs 46000/-	Rs 46000/-
2	Meteorology		
3	Water Quality		
4	Hydrology		
5	Soil Quality		
6	Noise Quality		
Total		**Rs 46,000/-**	**Rs 46,000/-**

Source: Approved Mining Plan

7. ADDITIONAL STUDIES

7.0 PUBLIC CONSULTATION:

Application to The Member Secretary of the Tamil Nadu Pollution Control Board (TNPCB) to conduct Public Hearing in a systematic, time bound and transparent manner ensuring widest possible public participation at the project site or in its close proximity in the District is submitted along with this Draft EIA / EMP Report and the outcome of public hearing proceedings will be detailed in the Final EIA/EMP Report.

7.1 RISK ASSESSMENT

Risk assessments will help the mine operators to identify high, medium and low risk levels. Risk assessments will help to prioritize risks and provide information on the probability of harm arising and severity of harm by understanding the hazard, combine assessments of probability and severity to produce an assessment of risk and it is used in the assessment of risk as an aid to decision making.

Risk assessment is a process whereby risks are analyzed, 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.

7.1.1 OBJECTIVES OF RISK ASSESSMENT

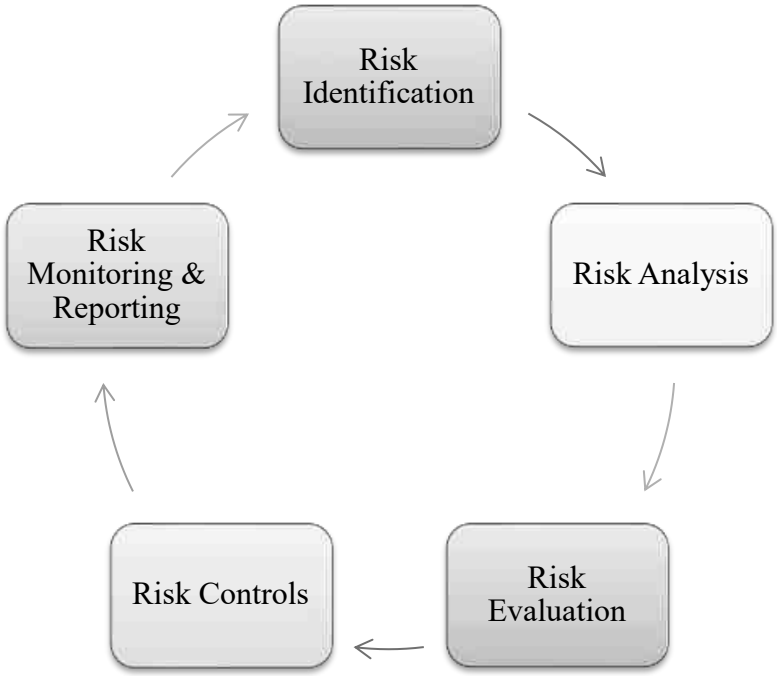
- Review of literature on Hazard Identification and Risk Assessment
- Review of accidents in mines and their analysis.
- Study of risk assessment methodologies.
- Application of Hazard Identification and Risk analysis for improvement of workplace safety in mines.

7.1.2 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
    - Consequence
    - Prioritization of the risks
    - Implementation of control measures
    - Monitoring risk assessment

- Evaluation and correction

FIGURE 7.1 LAYOUT OF RISK ASSESSMENT



Factors of risks involved due to human induced activities in connection with mining operations are

1. Stability of top soil bench
2. Drilling
3. Blasting
4. Excavation of mineral and
5. Transportation of mineral

Other risk factors due to natural activities are

1. Fire due to oil spillage
2. Water inundation and
3. Natural Calamities.

For the various risks, likely to arise, as above, detailed analysis of causes and control measures is given in below:

TABLE 7.1: ANALYSIS OF CAUSES AND CONTROL MEASURES

S.No	factors	Causes of risks	Control measures
1.	Removal of Top Soil	• Top soil bench may slide due to its unconsolidated nature. • Vibration due to movement of vehicles in the benches	The top soil bench is about 1m which will not have any impact.
2.	Drilling	A) due to high air pressure air hoses may burst. b) wear and tear of drill rods.	Periodic Maintenance of worn out accessories of the compressor and drill equipment's will be replaced.
3.	Blasting.	a Fly rock, ground vibration and noise etc., b Improper charging of explosives.	Controlled blasting technique will be implemented.
4.	Excavation of Ore	a Hauling and loading equipment are in such proximity while excavation. b Swinging of bucket over the body of tipper. C Driving of un authorized person.	Operator shall not operate the machine when person & vehicles are in such proximity. Shall not swing the bucket over the cab and operator leaves the machine after ensuring the bucket is on ground. Shall not allow any unauthorized person to operate and maintain the excavator. Induction training specified by the excavators manufacturers will be provided.
5.	Transportation of Ore	aoperating the vehicle nose to all b. Overloading of material c While reversal & overtaking of vehicle	It will be ensured that all these causes will be minimized by giving training to the persons No over loading Audio visual reserve horn will be provided
6.	Fire due to electricity and Oil	a Due to the short circuit of cables & other electrical parts,	Since we propose to operate the mine in day time only, and no illumination is required hence the risk related to electricity will not arise. For Dewatering we propose to use Diesel Drive Pumps.
7.	Water inundation	a Inrush of storm water due to heavy rain. b Unusual seepage of water from river side d Sudden collapse of peripheral bund due to torrential pour	Guard will keep a continuous watch on water level and shall immediately inform to the mine officials when it approaches the danger mark. Withdraw all the persons from the mine via shortest route in an orderly manner Work shall not be resumed except with the prior permission of the Manager unless all the working places are thoroughly examined by a competent person.
8.	Natural calamities	Unexpected happenings like earth quakes/ land slides	There is no record in the past history of any natural calamities.

7.1.3 DISASTER MANAGEMENT PLAN: STRUCTURE

The Disaster Management Plan (DMP) is supposed to be a dynamic, changing, document focusing on continual improvement of emergency response planning and arrangements.

The disaster management plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. For effective implementation of the disaster management plan, it should be widely circulated and personnel training through rehearsals/induction conducted by the respective department from time to time.

7.1.4GENERAL RESPONSIBILITIES OF EMPLOYEES DURING AN EMERGENCY

During an emergency, it becomes more enhanced and pronounced when an emergency warning is raised, the workers in-charge, should adopt safe and emergency shut down and attend any prescribed duty as essential employee. If no such responsibility is assigned, he should adopt a safe course to assembly point and await instructions. He should not resort to spread panic. On the other hand, he must assist emergency personnel towards objectives of DMP.

Co-ordination with Local Authorities:

The mine manager who is responsible for emergency will always keep a jeep ready at site. In case any eventualities the victim will be taken to the nearby hospitals after carrying out the first aid at site. A certified first aid certificate holder will be responsible to carry out the first aid at site. The mine manager should collect and have adequate information of the nearby hospitals, fire station, police station, village panchayat heads, taxy stands, medical shop, district revenue authorities etc., and use them efficiently during the case of emergency.

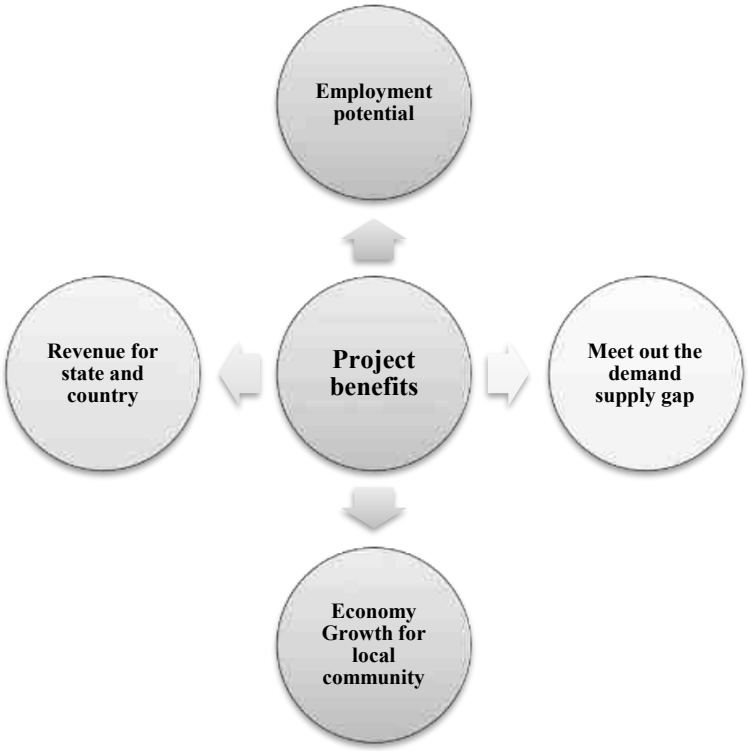
7.2 RECLAMATION AND REHABILITATION

No reclamation and rehabilitation is proposed and neither reclamation nor rehabilitation was carried out during the previous mining activity. Hence reclamation and rehabilitation will not arise.

8. PROJECT BENEFITS

8.1 GENERAL

Various benefits are envisaged for the mining of Limestone at Sirugudi Village. The project will be beneficial and important to the Community, local & regional economy.



This chapter gives a comprehensive description of various advantages and benefits anticipated from the project to the locality, neighborhood, region and nation as a whole. Lime stone is very important chemical mineral and is the principal raw material for the production of soda ash and clinker for cement, etc. The need for mining of the chemical grade limestone from the project (mine lease area) has arisen to meet the current situation of demand supply gap faced by the proponent.

8.2 PROJECT BENEFITS

Physical and Social infrastructure to the Community

- Improved road communication,
- Strengthening of existing community facilities through the existing Community Development Program.

- After complete exploitation of mineral the Mine pits will be converted into rain water reservoir to augment the water availability for greenbelt development consistently.
- Greenbelt has been carried out in the mine area so far and lot many are proposed to mitigate the ill-effects of mining and to improve the vicinity and environment of mine and its surrounding area.
- Awareness program and community activities, like health camps, medical aids, family welfare programs, immunization camp sports & cultural activities, plantation etc.,
- Providing certain facilities for the local schools and primary health centers/eye camps.

8.3 BENEFITS TO LOCAL AND REGIONAL ECONOMY

- It will generate revenue for the State of Tamil Nadu
- Royalty, DMF &GST to the Government
- CER/CSR Activities will be provided as per law
- Direct employment to skilled/unskilled and semiskilled laborers.
- Indirect employment to local people in different activities such as transportation, food points, plantation activities, water tanker supply, hand equipment's etc.
- Generation of self-employment through self-help groups.

8.4 EMPLOYMENT POTENTIAL

The local labors shall be engaged for supervising, sizing of limestone and loading and handling of mineral in mining area, besides, watch and ward and plantation activity with proper maintenance. The total manpower required for material handling and loading works out to 11; including skilled and managerial staff to meet the statutory requirement under MMR 1961 and MCDR 1988. At present, the mine is not functional. The following skilled / unskilled and semi-skilled workers besides managerial and administrative staff shall be employed at the time of re-opening of mine.

8.5 TANGIBLE SOCIAL BENEFITS

There will be positive impact in socio-economic area due to increased economic activities, creation of new employment opportunities, infrastructural development and better educational and health facilities.

Health

The proponent will undertake awareness program and community activities like health, camps, medical aids, family welfare camps, medical awareness program etc., Periodic medical checkups as per Mines Act/ Rules and other social development and promotional activities will be undertaken. All this will assist to lift the general health status and standards of the communities of the area around mines.

9. ENVIRONMENTAL COST BENEFIT ANALYSIS.

Environmental Cost benefit analysis is not recommended.

10. ENVIRONMENT MANAGEMENT PLAN

10.0 GENERAL

The environmental management plan consists of a set of mitigation, management, monitoring and institutional measures to be taken during mining operation.

The main activities in the proposed mining projects involves

- Drilling and blasting (occasionally)
- Excavation,
- Transportation of mineral.

The environmental management plan has been developed with a view to bring down the levels of impacts as discussed as above within limits. In each of the areas of impact, measures have to be taken to reduce potentially significant adverse impacts and where these are beneficial in nature, such impacts are to be enhanced/augmented so that the overall adverse impacts are reduced to as low level as possible. Measures to be taken for each of the impact areas are detailed in the following Para's:

10.1 AIR POLLUTION MANAGEMENT AND CONTROL

TABLE 10.1: AIR POLLUTION MANAGEMENT AND CONTROL

Potential impact	Action	Parameters for monitoring	Timing
Air emission	Topsoil must be removed from the earmarked area to be mined and stored separately for green belt development.	Stock pile monitoring	During pit development and mine movement.
	Use certified drill bits for drilling holes and wet drilling shall be practiced.	Random check of equipment used for drilling	During short hole drilling.
	All equipment's are operated within specified design parameters with trained and qualified operators.	Random checks of equipment logs/ manuals	During mining operation. And maintenance stage
	Vehicle should be loaded optimum loads to minimized to the extent possible	Vehicle logs / optimum capacity of vehicle	During operational phase.
	Ambient air quality within the premises of the proposed unit to be monitored.	The ambient air quality will conform to the standards for SPM, SO_2 and NO_X	As per CPCB and TNPCB requirement.

Controlling of Air Environment

- Wet drilling shall be practiced to control the dust, pits and rods are regularly checked as per the manufacturer's guidelines.
- Overcharging of blast holes avoided to prevent the fly rocks and dust emission.
- Periodically water will be sprinkled in the haul roads to wet the surface.
- Overloading of material is avoided to prevent spillage.
- The material is transported to the needy customers after covering by the tarpaulin to avoid spillage on the haul roads.
- The dumps are designed with optimum heights and slopes between 37^0- 28^0 and plantation on the slope to prevent soil erosion.
- Vehicles will be regularly checked and maintained as per the RTO and TNPCB Norms.

FIGURE 10.1: WATER SPRINKLING ON HAUL ROADS

10.2NOISE AND VIBRATION MITIGATION:

TABLE 10.2: NOISE AND VIBRATION MITIGATION

Potential impact	Action	Parameters for monitoring	Timing
Noise	List of all noise generating machinery onsite along with age to be prepared. Equipment to be maintained in good working order.	Equipment logs, noise reading	During mining operation.
	Implement good working practices (equipment selection and siting) to minimize noise and also reduce its impacts on human health (ear muffs, safe distances and enclosures). Adopt good blasting practices to reduce impact on flora and	Site working practices records, noise reading	During short hole drilling.

	fauna. Muffling will be done at the time of blasting		
	Noise to be monitored in ambient air near blasting shelter and at the lease boundaries.	Noise reading	As per TNPCB/ MoEF & CC norms.
Ground vibration due to blasting	Controlled customized blasting technique will be implemented. With the supervision of qualified blaster.	Vibrations to be Modeled and customized.	At the time of Blasting.

Control of Noise, Vibration and fly rock during blasting:

- Drilling shall be carried out with sharp drill bits, which reduces generation of noise during drilling.
- Controlled Blasting shall be carried out to minimize noise generation.
- No heavy earth moving machineries involved in the mining operation.
- In order to reduce the effect of noise pollution, earmuffs will be provided to all operators and employees working at mining site as a safety measure.
- Proper maintenance, oiling and greasing of machines at regular intervals will be done to reduce generation of noise.
- Periodical monitoring of noise level near vicinity of operating mining machines and at some locations in the surrounding area of mine working will be carried out with the help of Sound level meter & records will be maintained.
- Silencers and mufflers on mining equipment, wherever required, will be properly fitted and maintained.

10.3WATER MANAGEMENT & POLLUTION CONTROL

SURFACE WATER MANAGEMENT

There is no river stream, nallah or any other water body passing through the lease area. During rains some natural drains may form in the area. For that, garland drains all along the quarry surface edge keeping a barrier from the mine surface will be constructed to arrest incoming water to and from the mine. The surface run off during the rainy season will be prevented from entering into the active pits by constructing garland drains.

GROUND WATER MANAGEMENT

The general ground level in the area is 229m RL. The water table in the area is 30m BGL (Below ground level) during pre-monsoon and 35 m BGL (Below ground level) during post monsoon season. The maximum depth is about 17m below ground level. Water table will not be intersected during any stage of mine life; hence contamination of ground water is redundant.

DETAILS OF WATER CONSERVATION MEASURES PROPOSED

The rain water collected in the pits after spell of rain will be used for plantation and dust suppression. At the end of life of mine, excavated area will be used as a water reservoir to facilitate the enhancement of groundwater and for utilization of green belt.

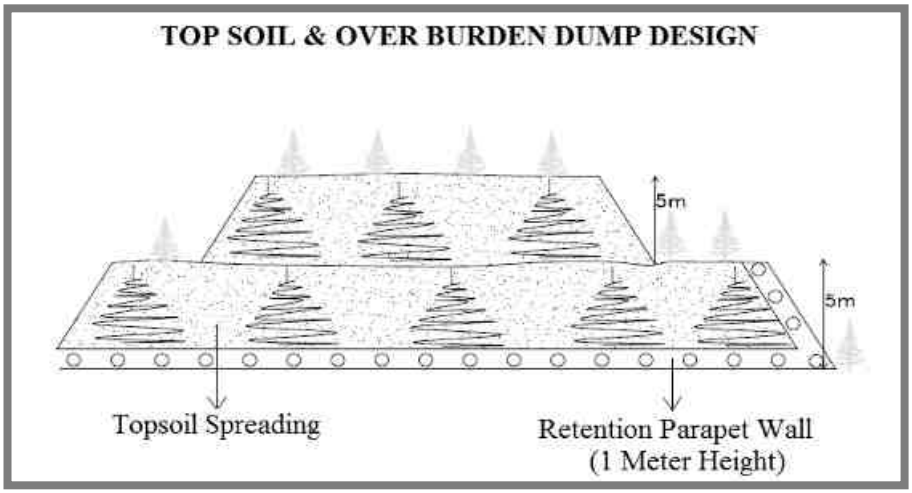
The main aim of greenbelt of mined out areas is to stabilize the land, to protect it from erosion and provide an aesthetic landscape. It is proposed to carry out greenbelt program as per mining plan approved by the Indian Bureau of Mines.

10.4LAND RECLAMATION AND WASTE MANAGEMENT

Details of overburden (OB) removal and stacking –

The top soil thickness is about 1m; total quantity of top sol anticipated in the present plan period is about 360 tonnes. This top soil will be utilized for the greenbelt development. Precautions will be taken to limit the height of the topsoil dump from 4 to 5 meters in order to preserve its fertility and shelf life. It will be suitably protected from soil erosion and infertility by constructing a retaining wall at the foot wall side and by planting fodder grass and leguminous plants during temporary storage.

FIGURE: 10.2 DUMP DESIGN



- Gradation of dump shall be done automatically as coarser materials go to the bottom and finer at the top and therefore drain of rain water flow freely to the bottom without endangering the stability of dump.

- Stabilization of dump with top soil and tree plantation shall make the dump more stable on long.
- 1m height parapet shall be constructed for dumps more than 4m height along the toe to prevent and control wash out from dumps entering into natural system through rain water.
- Garland drainage around dump shall prevent under wash of dump by hydrostatic pressure to be developed by surface water and control wash outs and collapse.
- Dump shall be terraced for every 5m height and stabilized as above.

10.5BIOLOGICAL ENVIRONMENT

Green Belt Development

- A well planned Green Belt with multi rows (Three tiers) preferably with long canopy leaves shall be developed with dense plantations around the boundary and haul rods to prevent air, dust noise propagation to undesired places.

Species Recommended for Plantation

Following points have been considered while recommending the species for plantation:

- Natural growth of existing species and survival rate of various species.
- Suitability of a particular plant species for a particular type of area.
- Creating of bio-diversity.
- Fast growing, thick canopy cover, perennial and evergreen large leaf area,
- Efficient in absorbing pollutants without major effects on natural growth.
- The following species may be considered primarily for plantation best suited for the prevailing climatic condition in the area.

TABLE 10.3: RECOMMENDED SPECIES TO PLANT IN THE GREENBELT

S.No	Name of the plant (Botanical)	Family Name	Common Name
1.	Azadirachta indica	*Meliaceae*	Neem, Vembu
2.	Tamarindus indica	*Fabaceae*	Tamarind, Puliyamaram
3.	Polyalthia longifolia	*Annonaceae*	Indian mast tree, Vansulam (Asoka tree)
4.	Borassus flabellifer	*Arecaceae*	Palmyra Palm

TABLE 10.4: GREENBELT DEVELOPMENT PLAN

Year	Area in sqm	No. of Saplings	Specie	Location	Spacing	Survival Rate
20220-21	200	15	Neem	7.5 Safety Barrier on Eastern Side	3 m * 3 m	80%
2021-22	200	15	Neem		3 m * 3 m	80%
2022-23	200	15	Neem		3 m * 3 m	80%
2023-24	200	15	Neem		3 m * 3 m	80%
2024-25	200	15	Neem		3 m * 3 m	80%

10.6OCCUPATIONAL HEALTH SAFETY

Occupational safety and health are very closely related to productivity and good employer-employee relationship. The main factors of occupational health in limestone mine are fugitive dust and noise. Safety of employees during mining operation and maintenance of mining equipment will be taken care as per Mines Act 1952 and mine rule 29 of Mines rules 1955, to avoid any adverse effect on the health of workers due to dust, heat, noise and vibration sufficient measures have been provided in the mining project. These include:

- Provision of rest shelters for mine workers with amenities like drinking water, fans, toilets etc.,
- Providing of personal protection equipment's to the workers during mining operation.
- Rotation of workers exposed to noisy areas.
- Periodical dust suppression on haul roads to prevent dust emission into the air.
- First-aid facilities in the mining area.

FIGURE10.3: PERSONAL PROTECTIVE EQUIPMENT TO THE MINE WORKERS

Additionally, the health status of workers in the mine shall be regularly monitored under an occupational surveillance program. Under this program, all the employees are subjected to a details medical examination at the time of employment.

The medical examination covers the following tests.

- General Physical Examination and Blood Pressure
- X-ray Chest and ECG
- Sputum Examination
- Detailed Routine Blood and Urine examination

The medical histories of all employees will be maintained in a standard format. Thereafter, the employees will be subject to medical examination on annual basis. The above tests keep upgrading the database of medical history of the employees.

10.7 BUDGETARY PROVISION FOR ENVIRONMENTAL MANAGEMENT PLAN

Adequate budgetary provision has been made by the Company for execution of Environmental Management Plan. The Table 10.5 gives overall investment on the environmental safeguards and recurring expenditure for successful monitoring and implementation of control measures.

TABLE 10.5: EMP BUDGET

Sl.No.	Description	Item	Capital cost(Rs. In Lakhs)	Recurring cost per annum (Rs. in Lakhs)
1	Occupational health & safety	Dust Mask, Safety Shoes, Helmets Ear Plugs, Gloves, Goggles Reflector jacket, Safety Belt, Medical check ups	1.00	0.30
2	Environmental Monitoring	Air, Water, Noise & Vibration, Soil Parameters	0.46	0.46
3	Water & Soil erosion	Garland drains &Settling tanks, check dam/gully plugs, etc	1.00	0.30
4	Haul Road Maintenance		0.30	0.10
5	Green belt Development & Plantation		2.00	0.50
6	Environmental Awareness Programme		0.50	0.10
7	Fencing, Fertilizer, Manure, Manpower, etc.		0.50	0.10
Total			**5.76**	**1.86**

In order to implement the environmental protection measures, an amount of Rs. 5.76 lakhs as capital cost and recurring cost as Rs.1.86 lakhs as recurring cost is proposed considering present market price considering present market scenario.

10.8 CONCLUSION –

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

11. SUMMARY AND CONCLUSIONS

M/s. Sivam Mines is a Partnership Firm. When the Transfer of mining lease was granted in the year 2014, the partners of the firm are Thiru. S.Asaialangaram, Thiru.S.Ilangovan, Thiru. I.Vijay Alangar and Selvi. I.Sempon Manickam, Thiru. S.Ilangovan is the Managing Partner of the firm. The partners of the firm have very good knowledge and experience in Limestone mining for more than three decades

Initially, the mining lease for limestone was granted to Thiru. S.Asaialangaram, Dindigul district vide G.O. Ms.No. 1691, dated: 04.12.1982 for a period of 3 years 28.02.1983 to 27.02.1986. The lease was first renewed for a period of 10 years with effect from 28.02.1986 to 27.02.1996 vide G.O.Ms. No.1439/Inds, dated: 13.12.1990.

As on the date of MoEF & CC Notification S.O. 804 (E) Dated: 14.03.2017, the project had no Environmental Clearance and it was clearly communicated by order to apply for environmental clearance under this notification. Therefore, the project proponent applied for environmental clearance vide online proposal no. IA/TN/MIN/64263/2017 Dated: 29.04.2017 and the mining operations were stopped from 10.01.2017.

Later, as on the date of MoEF & CC Notification S.O. 1030 (E) Dated: 08.03.2018, Violation projects of Category B - the appraisal and approval thereof shall vest with the State or Union territory level Expert Appraisal Committees and State or Union territory Environment Impact Assessment Authorities in different States and Union territories, constituted under sub-section (3) of section 3 of the Environment (Protection) Act, 1986.

Therefore, Online Proposal No: SIA/TN/MIN/23073/2018 Dated 03.04.2018 was transferred to SEIAA – TN for obtaining Environmental Clearance.

ToR was issued vide Lr. No. SEIAA-TN/F.No.6251/TOR-419/2018, Dated 22.05.2018

Proponent applied for the extension for the existing ToR vide online proposal No SIA/TN/MIN/268968/2022 Dated 21.04.2022 The proposals were considered in 335th SEAC – TN Meeting held on 06.12.2022 and issued Terms of Reference (ToR) vide Letter No. SEIAA-TN/F.No.6251/TOR-419/Extn Dated: 21.12.2022. The validity of the Terms of Reference is upto **21.05.2023.**

Environmental monitoring and audit mechanism have been recommended before and after commencement of the project, where necessary, to verify the accuracy of the EIA predictions and the effectiveness of recommended mitigation measures.

The main scope of the EIA study is to quantify the cumulative impact in the study area and formulate the effective mitigation measures. A detailed account of the emission sources, emissions control equipment, background Air quality levels, Meteorological measurements, Dispersion model and all other aspects of pollution like effluent discharge, Dust generation etc., have been discussed in this

report. The baseline monitoring study has been carried out during the months October 2023 to December 2023 for various environmental components so as to assess the anticipated impacts of the quarry project on the environment and suitable mitigation measures for likely adverse impacts due to the proposed project is given under Chapter 10.

The project proponent ensures to obtain necessary clearances and quarrying will be carried out as per rules and regulations. The Mining Activity will be carried out in a phased manner as per the approved mining plan after obtaining EC, CTO from TNPCB, execution of lease deed and obtaining DGMS Permission and working will be carried out under the supervision of Competent Persons employed.

Overall, the EIA report has predicted that the project will comply with all environment standards and legislation after commencement of the project and operational stage mitigation measures are implemented.

Mining operations has positive impact on environment and socio economy such as landscape improvement, water as by-product, economy development and better public services, providing and supply of Limestone as per market demand.

Sustainable and modern mining leads us to see positive impact of mining operation and providing consistent employment for nearly 10 people directly and indirectly around 5 people.

As discussed, it is safe to say that the proposed quarry is not likely to cause any significant impact to the ecology of the area, as adequate preventive measures will be adopted to keep the various pollutants within the permissible limits. Green belt development around the area will also be taken up as an effective pollution mitigate technique, as well as to serve as biological indicators for the pollutants released from the M/s.Sivam Mines Limestone Mine (Extent:1.70.0 ha).

12.0 DISCLOSURE OF CONSULTANTS ENGAGED

M/s. Sivam Mines has engaged M/s Geo Exploration and Mining Solutions, an Accredited Organization under Quality Council of India – National Accreditation Board for Education & Training, New Delhi, for carrying out the EIA Study as per the ToR Issued.

Name and address of the consultancy:
GEO EXPLORATION AND MINING SOLUTIONS
No 17, Advaitha Ashram Road,
Alagapuram, Salem – 636 004
Tamil Nadu, India
Email:infogeoexploration@gmail.com
Web: www.gemssalem.com
Phone: 0427 2431989.

The Accredited Experts and associated members who were engaged for this EIA study as given below –

Sl.No.	Name of the expert	In house/ Empanelled	EIA Coordinator		FAE	
			Sector	Category	Sector	Category
1	**Dr. M. Ifthikhar Ahmed**	**In-house**	**1**	**A**	WP GEO SC	B A A
2	Dr. P. Thangaraju	In-house	-	-	HG GEO	A A
3	Mr. A. Jagannathan	In-house	-	-	AP NV SHW	B A B
4	Mr. N. Senthilkumar	Empanelled	38 28	B B	AQ WP RH	B B A
5	Mrs. Jisha parameswaran	In-house	-	-	SW	B
6	Mr. Govindasamy	In-house	-	-	WP	B
7	Mrs. K. Anitha	In-house	-	-	SE	A
8	Mrs. Amirtham	In-house	-	-	EB	B
9	Mr. Alagappa Moses	Empanelled	-	-	EB	A
10	Mr. A. Allimuthu	In-house	-	-	LU	B
11	Mr. S. Pavel	Empanelled	-	-	RH	B
12	Mr. J. R. Vikram Krishna	Empanelled	-	-	SHW RH	A A

Abbreviations	
EC	EIA Coordinator
AEC	Associate EIA Coordinator
FAE	Functional Area Expert
FAA	Functional Area Associates
TM	Team Member
GEO	Geology
WP	Water pollution monitoring, prevention and control
AP	Air pollution monitoring, prevention and control
LU	Land Use
AQ	Meteorology, air quality modeling, and prediction
EB	Ecology and bio-diversity
NV	Noise and vibration
SE	Socio economics
HG	Hydrology, ground water and water conservation
SC	Soil conservation
RH	Risk assessment and hazard management
SHW	Solid and hazardous wastes
MSW	Municipal Solid Wastes
ISW	Industrial Solid Wastes
HW	Hazardous Wastes

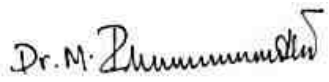
DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA/EMP

Declaration by experts contributing to the EIA/EMP Report for Sirugudi Limestone Mine of M/s. Sivam Mines over an Extent of 1.70.0 ha in Sirugudi Village of Natham Taluk, Dindigul District of Tamil Nadu. It is also certified that information furnished in the above EIA study are true and correct to the best of our Knowledge.

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

Name**:** **Dr. M. Ifthikhar Ahmed**

Designation**:** **EIA Coordinator**

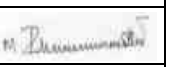
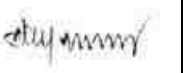
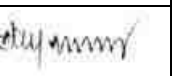
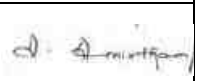
Date & Signature: 

Period of Involvement: **Jan 2017 to till date**

Associated Team Member with EIA Coordinator:

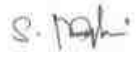
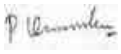
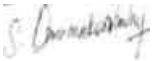
1. **Mr. S. Nagamani**
2. **Mr. P.Viswanathan**
3. **Mr. M.Santhoshkumar**
4. **Mr. S. Ilavarasan**

FUNCTIONAL AREA EXPERTS ENGAGED IN THE PROJECT

Sl. No.	Functional Area	Involvement	Name of the Expert/s	Signature
1	AP	▪ Identification of different sources of air pollution due to the proposed mine activity ▪ Prediction of air pollution and propose mitigation measures / control measures	Mr. A. Jagannathan	
2	WP	▪ Suggesting water treatment systems, drainage facilities ▪ Evaluating probable impacts of effluent/waste water discharges into the receiving environment/water bodies and suggesting control measures.	Dr. M. Ifthikhar Ahmed	
			Mr. N. Senthilkumar	
3	HG	▪ Interpretation of ground water table and predict impact and propose mitigation measures. ▪ Analysis and description of aquifer Characteristics	Dr. P. Thangaraju	
4	GEO	▪ Field Survey for assessing the regional and localgeology of the area. ▪ Preparation of mineral and geological maps. ▪ Geology and Geo morphological analysis/description and Stratigraphy/Lithology.	Dr. M. Ifthikhar Ahmed	
			Dr. P. Thangaraju	
5	SE	▪ Revision in secondary data as per Census ofIndia, 2011. ▪ Impact Assessment & Preventive ManagementPlan ▪ Corporate Environment Responsibility.	Mrs. K. Anitha	
6	EB	▪ Collection of Baseline data of Flora and Fauna. ▪ Identification of species labelled as Rare, Endangered and threatened as per IUCN list. ▪ Impact of the project on flora and fauna. ▪ Suggesting species for greenbelt development.	Mrs. Amirtham	
			Mr. Alagappa Moses	

7	RH	▪ Identification of hazards and hazardous substances ▪ Risks and consequences analysis ▪ Vulnerability assessment ▪ Preparation of Emergency Preparedness Plan ▪ Management plan for safety.	Mr. N. Senthilkumar	
			Mr. S. Pavel	
			Mr. J. R. Vikram Krishna	
8	LU	▪ Construction of Land use Map ▪ Impact of project on surrounding land use ▪ Suggesting post closure sustainable land use and mitigative measures.	Mr. A. Allimuthu	
9	NV	▪ Identify impacts due to noise and vibrations ▪ Suggesting appropriate mitigation measures for EMP.	Mr. A. Jagannathan	
10	AQ	▪ Identifying different source of emissions and propose predictions of incremental GLC using AERMOD. ▪ Recommending mitigations measures for EMP	Mr. N. Senthilkumar	
11	SC	▪ Assessing the impact on soil environment and proposed mitigation measures for soil conservation	Dr. M. Ifthikhar Ahmed	
12	SHW	▪ Identify source of generation of non-hazardous solid waste and hazardous waste. ▪ Suggesting measures for minimization of generation of waste and how it can be reused or recycled.	Mr. A. Jagannathan	
			Mr. J. R. Vikram Krishna	

LIST OF TEAM MEMBERS ENGAGED IN THIS PROJECT

Sl.No.	Name	Functional Area	Involvement	Signature
1	Mr. S. Nagamani	AP; GEO; AQ	▪ Site Visit with FAE ▪ Provide inputs & Assisting FAE with sources of Air Pollution, its impact and suggest control measures ▪ Provide inputs on Geological Aspects ▪ Analyse & provide inputs and assist FAE with meteorological data, emission estimation, AERMOD modelling and suggesting control measures	
2	Mr.P. Viswanathan	AP; WP; LU	▪ Site Visit with FAE ▪ Provide inputs & Assisting FAE with sources of Air Pollution, its impact and suggest control measures ▪ Assisting FAE on sources of water pollution, its impacts and suggest control measures ▪ Assisting FAE in preparation of land use maps	
3	Mr. Santhoshkumar	GEO; SC	▪ Site Visit with FAE ▪ Provide inputs on Geological Aspects ▪ Assist in Resources & Reserve Calculation and preparation of Production Plan & Conceptual Plan ▪ Provide inputs & Assisting FAE with soil conservation methods and identifying impacts	
4	Mr. Umamahesvaran	GEO	▪ Site Visit with FAE ▪ Provide inputs on Geological Aspects ▪ Assist in Resources & Reserve Calculation and preparation of Production Plan & Conceptual Plan	
5	Mr. A. Allimuthu	SE	▪ Site Visit with FAE ▪ Assist FAE with collection of data's	

			▪ Provide inputs by analysing primary and secondary data	
6	Mr. S. Ilavarasan	LU; SC	▪ Site Visit with FAE ▪ Assisting FAE in preparation of land use maps ▪ Provide inputs & Assisting FAE with soil conservation methods and identifying impacts	
7	Mr. E. Vadivel	HG	▪ Site Visit with FAE ▪ Assist FAE & provide inputs on aquifer characteristics, ground water level/table ▪ Assist with methods of ground water recharge and conduct pump test, flow rate	
8	Mr. D. Dinesh	NV	▪ Site Visit with FAE ▪ Assist FAE and provide inputs on impacts due to proposed mine activity and suggest mitigation measures ▪ Assist FAE with prediction modelling	
9	Mr. Panneer Selvam	EB	▪ Site Visit with FAE ▪ Assist FAE with collection of baseline data ▪ Provide inputs and assist with labelling of Flora and Fauna	
10	Mrs. Nathiya	EB	▪ Site Visit with FAE ▪ Assist FAE with collection of baseline data ▪ Provide inputs and assist with labelling of Flora and Fauna	

DECLARATION BY THE HEAD OF THE ACCREDITED CONSULTANT ORGANIZATION

I, Dr. M. Ifthikhar Ahmed, Managing Partner, Geo Exploration and Mining Solutions, hereby, confirm that the above mentioned Functional Area Experts and Team Members prepared the EIA/EMP Report for Sirugudi Limestone Mine of M/s. Sivam Mines over an Extent of 1.70.0 ha in Sirugudi Village of Natham Taluk, Dindigul District of Tamil Nadu. It is also certified that information furnished in the EIA study are true and correct to the best of our Knowledge.

Signature& Date:

Name: **Dr. M. Ifhikhar Ahmed**

Designation: **Managing Partner**

Name of the EIA Consultant Organization: **M/s. Geo Exploration and Mining Solutions**

NABET Certificate No & Issue Date: **NABET/EIA/2225/SA0276 Dated: 20.02.2023**

Valid Up to: **06.08.2025**

13. ASSESSMENT OF ECOLOGICAL DAMAGE, REMEDIATION PLAN AND NATURAL AND COMMUNITY RESOURCE AUGMENTATION PLAN

13.0 BACKGROUND OF THE PROJECT

Initially, the mining lease for limestone mining was granted to Thiru. S.Asaialangaram, Dindigul District vides G.O. Ms.No. 1691, Dated: 04.12.1982 for a period of 3 years28.02.1983 to 27.02.1986. The lease was first renewed for a period of 10 years with effect from 28.02.1986 to27.02.1996 vides G.O.Ms. No.1439/Inds, Dated: 13.12.1990.

Second renewal was granted vide G.O.(3D).No.83, Industries (MMA2) Department, Dated: 09.10.1996 for a period of 20 years from 28.02.1996 to 27.02.2016 and the lease deed was executed on 17.01.1997.

Then the lease was transferred to M/s. Sivam Mines., 6/209, Main Road, Sirugudi Post, Natham (Tk), Dindigul District vide G.O.(D) No.173 Industries (MMA1) Department, Dated: 05.11.2014.

As on the date of MoEF & CC Notification S.O. 804 (E) Dated: 14.03.2017, the project had no Environmental Clearance and it was clearly communicated by order to apply for environmental clearance under this notification. Therefore, the project proponent applied for environmental clearance vide online proposal no. IA/TN/MIN/64263/2017 Dated: 29.04.2017.

MoEF & CC vide notification S.O. 1030 (E) Dated: 08.03.2018, notified that violation projects of Category B – the appraisal and approval there of shall vest with the State or Union territory level Expert Appraisal Committees and State or Union territory Environment Impact Assessment Authorities in different States and Union territories, constituted under sub-section (3) of section 3 of the Environment (Protection) Act, 1986.

Therefore, the online proposal was transferred to SEIAA – TN vides online proposal number SIA/TN/MIN/23073/2018Dated 03.04.2018 and accepted by SEIAA on 11.07.2018.

Now, as per MMDR Amendment Act 2015, the validity of lease period is extended upto 31.03.2030 and the Modified Mining Plan & Progressive Mine Closure Plan was prepared by RQP and Approved by Regional Controller of Mines, Indian Bureau of Mines, Chennai vide Letter No. TN/DGL/MP/LST-1969-MDS Dated: 30.03.2016 (Mining Plan Period – 2015 – 16 to 2019 – 20).

Again, the proposal was placed as TA in 392nd SEAC Meeting held on 14.07.2023 and committee recommended to grant of Environmental Clearance. Subsequently, based on the

SEAC recommendation, the proposal was placed in 642nd SEIAA meeting held on 31.07.2023 asked for additional details.

After submitting the details, the proposal was placed in 440th SEAC meeting held on 11.01.2024 and committee decided to modify the earlier recommendation made by the committee in 392nd SEAC meeting held on 14.07.2023 as:

- Project proponent and the EIA coordinator must submit an explanation for submitting the EIA report without conducting Public Hearing.
- The PP should complete the public hearing and rework the remediation plan as per CPCB guidelines and resubmit the document.

Even though there is no provisions to extent the validity of earlier issued Terms of Reference beyond 4 years, in order to proceed further and bring the proponent under the ambit of EIA Notification, 2006 by regulating the past violations committed, the committee decided that

- SEIAA may write a letter to TNPCB to consider the above-mentioned cases as a special case and shall be requested to conduct public hearing as per the procedure laid down in EIA Notification, 2006 with the updated baseline data along with EIA Report and the same shall be completed within one year from the date of issue of letter.

The proposal was placed in 697th SEIAA meeting held on 15.02.2024 and authority decided that the Member Secretary, SEIAA shall write a letter to TNPCB to consider the above-mentioned cases as a special case and shall be requested to conduct public hearing as per the procedure laid down in EIA Notification, 2006 with the updated baseline data along with EIA Report and the same shall be completed within one year from the date of issue of letter.

In the view of above, Authority decided to request the Member Secretary, SEIAA to communicate the minutes to the project proponent.

As per Gazette Notification S.O. 3977 (E) of 14th August 2018, Mining Projects are classified under two categories i.e. A (> 100 Ha) and B (< 100 Ha), Category-A projects (including expansion and modernization of existing projects) require Environmental Clearance from Central Government (Ministry of Environment, Forests and Climate Change, Government of India, New Delhi) while Category–B projects are considered by State Level Environmental Impact Assessment Authority (SEIAA), constituted by MoEF&CC, New Delhi. If incase, any Category "B" project attracts the "General Condition" given in the EIA Notification, it shall be treated as Category "A" and will be considered at MoEF&CC, New Delhi.

Which in turn redirects to parent notification where there is no categorization of category < 5 ha, and no public hearing clause attracts this category of projects below 5 ha.

This EIA report is prepared for Sirugudi Limestone Mine of M/s. Sivam Mines – Extent 1.70.0 ha with proposed capacity of 42,979 tonnes (ROM + Topsoil) at S.F. No. 693/1, 2, 3, 4 & 7in Sirugudi Village, Natham Taluk, Dindigul District and Tamil Nadu State. The project falls under category "B" and requires Environmental Clearance from SEIAA Tamil Nadu.

The mining operation was commenced in the year of 1983 and the requirement of Environmental Clearance for Major Mineral Mining below 5 ha was not required until based on clarification letter by MoEF & CC Z-11013/24/2017-IA.II (M) Dated: 03.04.2017 regarding Requirement of Environmental Clearance for Major Minerals below 5 hectares, it was communicated that mining leases which continue to operate without obtaining EC after 15.01.2016 shall be considered as violation cases and the same shall be dealt in accordance with the violation policy under Environmental Impact Assessment Notification, 2006 as amended.

The last permit Dated: 10.01.2017 and the quarrying operation were stopped in requirement of Environmental Clearance.

13.1 METHOD OF MINING

OPENCAST MINING –

- Hydraulic Excavator coupled with tippers is deployed for the formation of benches and loading
- Small Dia drilling (Jackhammer) of 35 mm diameter varying in depths from 1.0m to 1.5m are drilled with Jackhammer supported by compressor
- One bench is proposed on the topsoil with 2.0m height and 4.0width with 45°slope.
- In mineral, five benches are proposed with 3m height & 5m width slope maintained as 60° from horizontal.
- Gradient of Haulage Roads are maintained not less than 1:16
- Hydraulic Excavators are deployed for removal of waste
- Manual Labour are engaged for sorting of Limestone
- The Limestone will be loaded into tippers by Excavators attached with bucket
- Spoil waste are loaded into the tippers with the help of hydraulic excavator and are dumped in the earmarked area for the backfilling purpose

13.2 BASED ON SITE SPECIFIC FEATURES AND NATURE OF MINING INVOLVED, THE FOLLOWING ARE ADDRESSED IN THIS CHAPTER

a) Damage Assessment

b) Remediation plan

c) Natural and community resource augmentation

d) Benefits derived out of violation

AIMS AND OBJECTIVES –

The objectives of the study are –

- How to define 'significant damage' to natural resources and a 'minimum level of restoration';
- How, or to what extent, monetary valuation techniques can be used to estimate the economic value of biodiversity damage; and
- How, or to what extent, the valuation of damages to natural resources should be included in a future directive on liability.

In principle, there are three possible options to provide compensation for damages to natural resources:

- Monetary compensation: compensation according to the 'value of damage' caused to natural resources;
- Resource ('in-kind') compensation: investment in resource restoration projects, which could be on-site and/or off-site; and
- Mixture of in-kind compensation (partial restoration) and a monetary payment.

The liability covering damage to natural resources could be framed either as an obligation to pay for the damage incurred in order to compensate via monetary compensation, or as an obligation to compensate through restoration and investment in natural resources, both on-site and off-site (resource compensation).

Damage Assessment and Significance	• Pre-incident resource status • Scale of damage • Impact assessment • Significance of damage
Primary Restoration Options (to restore the initial damage)	• Setting primary restoration targets • Identification and categorisation of technical options • Selection of restoration options • Estimation of interim losses • Cost-effectiveness and cost-benefit analyses
Compensatory Restoration Options (to supplement primary restoration options when these are not sufficient and to compensate for interim losses)	• Objectives of compensatory measures • Monetary compensation and the value of damage • Resource compensation measures • Classification and selection of compensatory measures • Assessing the scale of compensatory measures • Cost-effectiveness and cost-benefit analyses

13.3 SCALE OF DAMAGE / ECOLOGICAL DAMAGE ASSESSMENT –

Based on site specific features and nature of mining involved, the following activities are considered for assessment of ecological damage:

- Damage due to change in Land use/ Land cover
- Damage due to loss of vegetation / Plant cover
- Damage due to Air pollution
- Damage due to exploitation of surface water resources
- Damage due to exploitation of Ground water resources
- Damage due to non-implementation of Environmental Management measures

Damage due to change in Land use / Land Cover:

Mining operations have led to change in land use / land cover (LULC) of the ML area.

TABLE 13.1: DAMAGE DUE TO CHANGE IN LAND USE / LAND COVER

Period	Sl.No.	Land use / Land Cover	Area in ha	Area in %
Mining Plan Period (2015-16 to 2016-17)	1	Area already covered under pits and quarries	0.93.7*	55.11
	2	Infrastructures including, office and labor rest shelter	Nil	Nil
	3	Greenbelt	0.04.0	2.3
	4	Dumps of ores and waste	0.13.3*	7.8

	5	Mine roads	0.03.0*	1.76
	6	Un utilized area	0.56.0	33.03
	Total		**1.70.0**	**100%**

Source: Approved Mining Plan

*area considered as damaged or disturbed

Area disturbed or damaged due to mining operations during 2015-16 to 2016-17 is 1.10.0 ha

Considering compensation @ Rs 30,000/- per hectare of damaged land i.e., 1.10.0 ha * 30,000 = Rs 33,000/-

Damage due to loss of vegetation / Plant cover:

The mining operation is carried out from the year of 1983 with valid Mining Plan, in the year 2015-16 to 2016-17; there is a growth in the area of Plantation, settlement, road and vegetation.

The damage caused due to mining activities from 2016 to 2017 shall be loss of scrubs and tree covers in the damaged area of 1.10.0 ha. Considering option if the damaged land was not subjected to mining and utilized for plantation and considering rate of plantation at 600 trees/plants per ha and Value shall be Rs. 20 per tree/plant for its biomass.

Thus considering effective loss of 600 trees/plants per hectare, the damage cost shall be 600 trees / ha x 1.10.0 ha x Rs 20 per tree = Rs 13,200/-

Damage due to Air pollution:

All the air quality parameters like particulate matters (PM_{10}& $PM_{2.5}$) and SO_2, NO_2 and free silica percentage are found in the permissible limit. There is no visible damage due to air pollution in the core and buffer zone of the mining area.

Damage due to exploitation of surface water resources:

Major water bodies around the project area are Sirugudi Village Tank 800 m South West, Tank 850m North. The Drainage pattern is not affected due to mining activities at the project site. For dealing with the storm water and excess mine water as well as for keeping the low lands free from accumulated water, an intricate drainage system is maintained by the project proponent. The general trend of the drainage pattern is north to south direction and the general drainage pattern is dentritic to sub-dentritic in nature.

Surface water resources were not affected by mining activities as mine water discharge was/will be utilized in internal work like dust suppression, plantation and for domestic use.

The excess water during the rainy season has been drained out to the natural water bodies namely Sirugudi Village Tank 800 m South West, Tank 850m North, theses excess water was discharged only after connecting via settlement traps for collecting silt and contaminations. It is to note-worthy that the rain water accumulated in the pit does not contain

any toxic effluents as there is no dispersion of mineral to the rain water collected. Therefore, no damage observed.

Damage due to exploitation of Ground water resources:

Any ground water table loss if any would have been recouped by the rainfalls in this area.

No water was used for mining activities

Damage due to non-implementation of Environmental Management measures:

The project proponent has obtained mining license as per MMDR Act 1957, Mining plan along with Environmental Management plan is prepared since 1996. The mining operation was carried out as per the Approved Mining plan, Scheme of Mining along with Environmental Management plan; the proponent does not have EMP approved by the MoEF / SEIAA.

Damage assessment has been done considering the measures which M/s. Sivam Mines should have implemented including monitoring during mining operations for protecting various environmental components.

The Environmental safeguards which M/s. Sivam Mines should have taken during the mining operations at various stages are given below:

TABLE 13.2: ENVIRONMENTAL SAFEGUARDS SUPPOSED TO BE IMPLEMENTED

Conceptualization : Preliminary Environmental assessment	Baseline Monitoring studies should have been carried out
Planning: Detailed studies ofEnvironmental impacts and design of safeguards	Impact Assessment should have been carried out and an environmental management plan should have been prepared and implemented Its effectiveness should have been monitored
Execution: Implementation ofenvironmental safetymeasures	Once the mine commences its operations after obtaining EC, all measures should be practiced and implemented immediately.
Operation: Monitoring ofeffectiveness of built-insafeguards	Half yearly compliance monitoring should have been prepared and submitted

Source: Proposed by FAE's & EIA Coordinator

The pollution related activities for which EMP should have been in place during mine operations are extracted from the list provided by MOEF&CC for formulation and implementation of environmental management plan and monitoring of effectiveness of measures during and after commissioning of project.

The resource conservation and pollution abatement versus the damage assessed for not implementing the measures based on applicability are detailed below:

- Liquid Effluents

- Air Pollution
- Solid Wastes
- Noise and Vibration
- Occupational Safety and Health
- Medical check-up
- Prevention, maintenance and operation of Environment Control Systems
- House-Keeping
- Human Settlements
- Recovery-reuse of waste products
- Vegetal Cover
- Emergency Planning
- Environment Management Cell

TABLE 13.3: DAMAGE DUE TO NON-IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT MEASURES

Sl.No.	Resource Conservation/Pollution Abatement Aspect	Applicability	Damage due to Non Implementation of EMP Measures	Damage cost (Rs.)
1	**Liquid Effluents**			
A	Effluents should be treated well to the standards as prescribed by the Central/State Water Pollution Control Boards.	There was no discharge of any effluent from the mine.	No damage observed, however, since labour are employed for mining activities, septic tank followed by soak pit is provided within the lease area	No Damage Cost is involved.
B	Soil permeability studies should be made prior to effluents being discharged into holding tanks or impoundments and steps taken to prevent percolation and ground water contamination.	No discharge of effluent except for domestic waste water in soak pit	There is no damage as there is no effluent discharge leading to percolation and ground water contamination.	No Damage Cost is involved.
C	Effluents containing toxic compounds, oil and grease have been known to cause extensive death of flora & fauna.	Mining activity did not result in release of any toxic compounds. The machineries repair works were carried out in the service centers located in nearby area..	There is no damage as no effluents are generated from the mine leading to toxic compounds or oil and grease release leading to death of flora & fauna. The project area is not foraging ground and sheltering land for Migratory birds. Mine Pit water do not possess any biological species that serve as their food.	No Damage Cost is involved.
D	Deep well burial of toxic effluents should not be resorted to as it can result in resurfacing and ground water contamination. Re-surfacing has been known to cause extensive damage to crop.	No such activity is involved in the subject mine. There is no discharge and no re-surfacing of contaminants is involved leading to damage to crop.	There is no damage as the project area is devoid of crop.	No Damage Cost is involved.
E	In all cases, efforts should be made for re-use of water and its conservation	The water consumption is mainly for dust suppression, plantation and domestic use, which is mostly used from the rain water harvested in the mine pits	There is no damage as there is no scope for reuse of water as it cannot be recovered	No Damage Cost is involved.

F	In order to ascertain the change in water quality in the area, water samples were collected from the mine site and surrounding areas. **Interpretation**: It can be seen from the above that TDS, Chloride in the mine water to the nearby villages' ground water are almost similar and are found well within the limit. As mine water discharge are not sent outside the project area, it does not affect the nearby surface water sources.			
G	Infrastructural facilities should be provided for monitoring water quality.	Though there is no water pollution from the mining activity. Monitoring should have been carried out.	No Monitoring Carried out	Monitoring Cost Rs 10,000/-
2	**Air Pollution**			
A	The emission levels of pollutants should conform to the standards prescribed as per NAAQ.	Mining activity was by opencast method. Mine pit was done in the proper way by taking all steps for dust control by water sprinkling. Hence the dust emission resulting in PM_{10} and $PM_{2.5}$during mining was addressed.	The predicted increment in GLC of all the parameters are within the standards. No damage is caused due to air pollution. It is also evident from the above; there is no impact on the vegetation in the area due to air pollution.	No Damage Cost is involved.
C	Infrastructural facilities should be provided for monitoring ambient air quality.	Though there is no air pollution from the mining activity. Monitoring should have been carried out.	No Monitoring Carried out	Monitoring Cost Rs 10,000/-
	Ambient air quality was monitored within project area and outside the project area. The reports are enclosed. All other parameters are well within the prescribed limits of NAAQ standards			
3	**Solid Wastes**			
A	The site for waste disposal should be checked to verify permeability so that no contaminants percolate into the ground water or river/lake.	Waste dumps are nontoxic in nature.	No damage is there as OB material is a stable material existing and the contamination due to percolation of in situ/disturbed material does not arise	No Damage Cost is involved
B	Reactive materials should be disposed of by immobilizing the reactive materials with suitable additives.	No toxic material/chemicals are found in the OB dump. Rather it contains some percentage of Calcium Carbonate which can be further segregated.	No damage is caused. The product i.e. Limestone are stable material and not reactive Material. No environmental hazard are expected	No Damage Cost is involved
C	Intensive programs of tree plantation on disposal areas should be undertaken.	There is waste (Mineral rejects + side burden) generated from the mine dumped in the nearby lease area in proponent own patta land dump sites are earmarked surrounding which there will be plantation.	Dumps are formed on which plantation was done.	No Damage Cost is involved

D	Infrastructural facilities should be provided for monitoring soil quality.	Though there is no soil erosion / deterioration from the mining activity. Monitoring should have been carried out.	No Monitoring Carried out	Monitoring Cost Rs 10,000/-
4	**Noise and Vibration**			
A	Adequate measures should be taken for control of noise and vibration in the mining area.	This is mechanized mine consisting of opencast mine workings where blasting was done and that can produce some noise and vibration.	The impact due to noise levels/vibrations is felt in core zone on mineworkers. All workers deputed in mine are provided with safety equipment's. a. Helmets b. Gloves c. Goggles d. Shoes e. Dust Masks f. Ear Plug / Ear Muff g. Blasting Shelter	Monitoring Cost Rs 10,000/-
5	**Occupational safety and Health**			
A	Proper precautionary measures for adopting occupational safety and health standards should be taken.	The mining activity involves the occupation risk or safety by inhalation of fine dust during mining and blasting.	All mine workers were provided with following personal protection equipment a. Helmets b. Gloves c. Goggles d. Shoes e. Nose Masks No health issues are reported.	No Damage Cost is involved.
6	**Medical Check-Up**			
A	Proper medical check-up should be carried out	The dust due to wind drift can cause respiratory and other health issues.	However periodical medical check-ups done as per DGMS guidelines.	No Damage Cost is involved.
7	**House –Keeping**			
A	Proper house- keeping and cleanliness should be maintained both inside and outside	Fugitive dust with drifting of wind during movement of vehicular and spill over	The practice of transportation in area with trucks covered with tarpaulin is practiced. Water sprinkling thrice a day on haul roads, working face & admin block.	No Damage Cost is involved.

			Office premises & infrastructural area are well developed by plantation.	
8	**Human Settlements**			
A	Persons who are displaced or have lost agricultural lands as a result should be properly rehabilitated.	The project area is proponent own patta land and free from following since inception of mine operation a. No agricultural lands / crops b. No habitation is present	CSR Activities were carried out and the proponent has spent Rs 10 lakhs till date	No Damage Cost is involved.
9	**Transport systems**			
A	Proper parking places should be provided for the trucks and other vehicles by the lessees to avoid any congestion or blocking of roads	Proper parking place is provided.	Trucks are parked in the open spaces of the project area and no inconvenience is caused to local vehicles. Vehicles possessing Pollution Under Control (PUC) Certificate is only permitted and the same are used.	No Damage Cost is involved.
B	Spillage of materials. Proper road safety signs both inside and outside the project area should be displayed for avoiding road accidents	Signs boards are installed and the proponent participates in yearly safety week celebrations conducted by DGMS	There were no accidental deaths dueto heavy vehicular traffic due to movement of tippers / dumpers from the subject mine	No Damage Cost is involved.
10	**Recovery – Reuse of waste products**			
A	Efforts should be made to recycle or recover the waste materials to the extent possible. The treated liquid effluents can be conveniently and safely used for irrigation of lands, plants and fields for growing nonedible crops.	No recovery of waste products from the mine as no waste is generated in terms of effluent or in terms of solid waste	Not applicable	No Damage Cost is involved.
11	**Greenbelt**			
A	Afforestation should be done in the mine.	Greenbelt development has been carried out since the commencement of mining operation	Greenbelt development has been carried out as per approved mining plan	No Damage Cost is involved.
B	Infrastructural facilities should be provided for monitoring of flora &fauna and green belt.	Monitoring has not been carried out.	Monitoring should have been carried out at least twice a year within the project area and	Monitoring Cost Rs 10,000/-

			outside project area for monitoring of biodiversity index.	
12	**Emergency plan**			
A	Emergency Preparedness plan should be in place for handling unforeseen incidents/natural calamities	Moderate Risk Zone as per BMTPC, Vulnerability Atlas of Seismic zone of India IS: 1893 – 2002	Mine pits filled with water until seepage/ total soaking are likely to result in threat to moving cattle/persons. As per the information obtained no person has died in project area and not even single cattle have fallen in the mine pit of this area.	No Damage Cost is involved.
13	**Environment Management Cell**			
A	PP should identify within its setup a Department/Section/Cell with trained personnel to take up the model responsibility of environmental management as required for planning and implementation of the projects.	Environment Management Cell was not formed officially.	Should carry out an Audit by external personnel having experience in Environment and safety matters to inspect and suggest the measures.	Non-Implementation of supervision on environmental aspects = Rs 10,000/--
14	**CSR Activities**			
A	Community Welfare measures	CSR activities have been carried out.	CSR activities have been carried out.	No Damage Cost is involved.

Source: Proposed by FAE's & EIA Coordinator

TABLE 13.4: TOTAL DAMAGE COST

Activity		Damage cost (Rs.)
Ecological Damage Cost		
Due to change in Land-use/Land cover		Rs 33,000/-
loss of Vegetation /Plant cover		Rs 13,200/-
Damage due to exploitation of Surface water resources		Rs 00/-
Damage due to Non implementation of Environmental Management Measures		
1	Liquid Effluents / water monitoring	Rs 10,000/-
2	Air Pollution	Rs 10,000/-
3	Solid Wastes / Soil	Rs 10,000/-
4	Noise and Vibration	Rs 10,000/-
5	Occupational Safety and Health	Rs 00/-
6	Medical Check-Up	Rs 00/-
7	House – Keeping	Rs 00/-
8	Human Settlements	Rs 00/-
9	Transport Systems	Rs 00/-
10	Recovery –Reuse of Waste Products	Rs 00/-
11	Greenbelt	Rs 10,000/-
12	Emergency Plan	Rs 00/-
13	Environment Management cell	Rs 10,000/-
TOTAL		**Rs 1, 06,200/-**

Source: Proposed by FAE's & EIA Coordinator

Remediation Plan –

TABLE 13.5: REMEDIATION PLAN WITH ACTION PLAN SPECIFIC TO THE REGION ALONG WITH BUDGET

Env. Component	Remediation Measures for Environmental damage	1st Year (in Rs)	2nd Year (in Rs)	3rd Year (in Rs)	Total (Rs.)
Air Environment	water sprinkler in the haul road and mines	10,000			10,000
Water Environment	Renovation of Rain Water Harvesting Pits		10,000		10,000
Land Environment	Renovation of Garland Drains	10,000			10,000
Ecological Environment	Avenue Plantation		10,000		10,000
Socio economic environment	Solar Lighting Facilities along the village roads			10,000	10,000
Total					**50,000**

Source: Proposed by FAE's & EIA Coordinator

TABLE 13.6: YEAR WISE SUMMARY OF REMEDIATION PLAN WITH COST

Environment Component	1st Year	2nd Year	3rd Year	Total (Rs.)
Air Environment	10,000			10,000
Water Environment		10,000		10,000
Land Environment	10,000			10,000
Ecological Environment		10,000		10,000
Socioeconomic environment			10,000	10,000
Total				**50,000**

Source: Proposed by FAE's & EIA Coordinator

Natural Resources Augmentation –

TABLE 13.7: NATURAL RESOURCE AUGMENTATION PLAN SPECIFIC TO THE REGION ALONG WITH ACTION PLAN

Environmental components	Natural Resource Augmentation	1st Year	2nd Year	3rd Year	Total (Rs.)
Water Environment	Rain water harvesting structures at prominent place in the Sirugudi village	10,000			10,000
Air Environment	Providing trees in three tier system around project area as air barrier	10,000			10,000
Land / Soil Environment	Providing Agricultural needs for 2 families	10,000			10,000
TOTAL					**30,000**

Source: Proposed by FAE's & EIA Coordinator

Community Resource Development (augmentation) Plan –

TABLE 13.8: THE COMMUNITY RESOURCES DEVELOPMENT PLAN SPECIFIC TO THE REGION ALONG WITH ACTION PLAN

Sl.No	Community Resource Development	1st Year	2nd Year	3rd Year	Total (Rs.)
1	Improving Sanitation Facilities at Sirugudi Village Government School	**26,500**	**-**	**-**	**26,500**
TOTAL					**26,500**

Source: Proposed by FAE's & EIA Coordinator

Budget for remediation plan, natural resource augmentation plan and community resource augmentation plan, the total damage cost as computed above shall be Rs 53,500/-. The summary of amounts which will be spent for Remediation Plan, Natural Resource Augmentation Plan and Community Resource Augmentation Plan is given below –

TABLE 13.9: SUMMARY OF AMOUNTS WHICH WILL BE SPENT FOR REMEDIATION PLAN, NATURAL RESOURCE AUGMENTATION PLAN AND COMMUNITY RESOURCE AUGMENTATION PLAN

Sl. No.	Description	Estimated cost in Rs
1	Remediation Plan	50,000/-
2	Natural Resources Augmentation Plan	30,000/-
3	Community Resources Augmentation Plan	26,500/-
Total Budgetary Provision		1, 06,500/-

Source: Proposed by FAE's & EIA Coordinator

Calculation of bank guarantee amount as per Notification No. S.O. 804(E) Dated: 14-.03.2017 shall be **Rs.1, 06,500/-** as per details given here in above.

ANNEXURES

FOR

M/s. Sivam Mines,
Represented By – Thiru. S. Ilangovan (Managing Partner)
6/209, Main Road, Sirugudi Post,
Natham (Tk), Dindigul District.

SIRUGUDI LIMESTONE MINE

Mine Lease Area – 1.70.0ha

S.F.Nos 693/1, 2, 3, 4 & 7

Sirugudi Village, Natham Taluk, Dindigul District

List of Annexure:

S.No	Description	Annexure Nos	Page Nos
1	Terms of Reference (ToR)	I	1A – 23A
2	Extension Terms of Reference (ToR)	IA	1 AA - 5 AA
3	Copy of Proceeding Letter	II	24A – 25A
4	Approval Letter – Review of Mining plan	V	26A – 27A
5	Approved Review of Mining Plan	VI	28A – 192A
6	Baseline Studies	VII	193A-217A
7	Copy of NABET Certificate	VIII	218A

THIRU A.V. VENKATACHALAM,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.6251 /TOR- 419/2018 Dated: 22.05.2018

To

M/s. Sivam Mines,

6/209, Main Road, Sirugudi Post,

Natham Taluk,

Dindigul District

Sir / Madam,

Sub: SEIAA, Tamilnadu – Terms of Reference (ToR) under violation for the Existing Limestone quarry over an extent of 1.70.0 Ha at S.F. No. 693/1, 693/2, 693/3, 693/4 & 693/7, Sirugudi Village, Natham Taluk, Dindigul District by M/s. Sivam Mines under project category – B and Schedule S.No. 1(a) – TOR issued for the preparation of EIA report, EMP report, ecological damage assessment, remediation plan, natural resource augmentation and community resource augmentation –Regarding.

Ref: 1. MoEF&CC Notification S.O. 804 (E) dated 14.03.2017
2. MoEF&CC Notification S.O.1030 (E) dated 08.03.2018
3. Online Proposal No.SIA/TN/MIN/23073/2018 dated: 03.04.2018 (under violation)
4. Minutes of the 110th SEAC Meeting held on 04.05.2018
5. Minutes of the 303rd SEIAA Meeting held on 22.05.2018

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

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY * PANAGAL MALIGAI, SAIDAPET, CHENNAI-15 * 22 MAY 2018

MEMBER SECRETARY
SEIAA-TN
22/05/18

1 A

The proponent of M/s. Sivam Mines, submitted application for Terms of Reference on 03.04.2018, in Form-I, Pre- Feasibility report for the existing Limestone quarry over an extent of 1.70.0 Ha at S.F. No. 693/1, 693/2, 693/3, 693/4 & 693/7, Sirugudi Village, Natham Taluk, Dindigul District, Tamilnadu seeking ToR under the MoEF & CC Notification cited under reference 1nd & 2nd.

The proposal seeking ToR was placed before the 110th SEAC meeting held on 04.05.2018. Based on the document furnished, the Committee observed that the project falls under the category B1 and schedule 1(a) of the EIA Notification, 2006. The SEAC recommends the Terms of Reference for the project for assessment of Ecological damage, remediation plan and natural & community resource augmentation plan to be prepared as an independent chapter in the Environment Impact Assessment report by the Accredited consultant and also with collection and analysis of data for the assessment of ecological damage, preparation of remediation plan and natural & community resource augmentation plan to be done by an Environmental laboratory duly notified under the Environment (Protection) Act, 1986, accredited by NABET or a laboratory of council of Scientific and Industrial research Institutions working in the field of Environment. Three months data relating to the ecological parameters is to be submitted with analysis.

The project proponent besides above has to also submit the No Objection certificate (NOC) from State Mines and Geology Department. The NOC should also indicate whether the mine was operated.

- Without Environmental Clearance (EC) or in excess of quantity approved in EC.
- Without consent to Operate (CTO) or in excess of quantity approved in CTO.
- Without mining plan/scheme of mining or in excess of quantity approved in mining plan/scheme of mining.
- Without Forest clearance
- Any other violation such as excess quantity mined during the mining period to assess the ecological and other damages.

The proposal was considered as recommended by SEAC in 303rd SEIAA meeting held on 22.05.2018 and after detailed discussion, the authority decided to issue ToR for

22 MAY 2018

MEMBER SECRETARY
SEIAA-TN
22/05/18

considering the mining period from 2018-19 onwards only for the preparation of EIA report along with the **additional ToR** as prescribed by SEAC in addition to the following:

1. Excess quantity mined during the mining period shall be furnished to assess the ecological and other damages from the Department of Mining & Geology.
2. The EIA study report shall provide details of proposed and actual mined quantity for the entire mining plan period

Additional TOR specified by the SEAC to deal with the violation aspects of the mining projects

SECTION A

As per the MoEF & CC Notification S.O. 1030 (E) dated: 08.03.2018,

1. "The cases of violations will be appraised by the Expert Appraisal Committee at the Central level or State or Union territory level Expert Appraisal Committee constituted under sub-section (3) of section 3 of the Environment (Protection) Act, 1986 with a view to assess that the project has been constructed at a site which under prevailing laws is permissible and expansion has been done which can run sustainably under compliance of environmental norms with adequate environmental safeguards, and in case, where the findings of Expert Appraisal Committee for projects under category A or State or Union territory level Expert Appraisal Committee for projects under category B is negative, closure of the project will be recommended along with other actions under the law.
2. In case, where the findings of the Expert Appraisal Committee or State or Union territory level Expert Appraisal Committee on point at sub-paragraph (4) above are affirmative, the projects will be granted the appropriate Terms of Reference for undertaking Environment Impact Assessment and preparation of Environment Management Plan and the Expert Appraisal Committee or State or Union territory level Expert Appraisal Committee, will prescribe specific Terms of Reference for the project on assessment of ecological damage, remediation plan and natural and community resource augmentation plan and it shall be prepared as an independent chapter in the environment impact assessment report by the accredited

22 MAY 2018

MEMBER SECRETARY
SEIAA-TN
22/05/18

consultants, and the collection and analysis of data for assessment of ecological damage, preparation of remediation plan and natural and community resource augmentation plan shall be done by an environmental laboratory duly notified under the Environment (Protection) Act, 1986, or a environmental laboratory accredited by the National Accreditation Board for Testing and Calibration Laboratories, or a laboratory of the Council of Scientific and Industrial Research institution working in the field of environment."

After the appraisal of the project, the SEAC decided that the Para No.2 stated above is applicable to the project. Hence, the proponent is directed to prepare appropriate reports as contained in the Para 2.

While complying with the specific aspects of the MoEF & CC directions as stated in the Para 2 above, the following steps should be followed:

Step 1: Enumerate the aspects of Violation:

a) The proponent should enumerate the violations as applicable to the project.
b) Furnish a description of each violation with quantitative and qualitative data.
c) Violation categories are to be decided taking into consideration the stage at which the project execution stands.

Step 2: Ecological Damage Assessment:

a) For each aspect of violation enumerated in step (1), identify the resultant environmental damage that may have been caused.
b) Furnish a description of the environmental damages with quantitative and qualitative data.

Step 3: Remediation Plan:

a) For the Environmental damage(s) identified in the step (2) above, prepare the remediation plan for the each or combination of damages.
b) The remediation plan should essentially consists of problem statement, target to be achieved (quantity), standards, technology/procedure for remediation, equipment and machinery to be

22 MAY 2018

MEMBER SECRETARY
SEIAA-TN
22/05/18

4 A

used, time schedule and remediation cost(direct and indirect cost, capital as well as O&M costs).

SECTION B

1. Natural resource Augmentation:

   a) The resources that should be considered for augmentation should essentially consist of land, biota, air, water and other resources as applicable.

   b) Proponent may choose one or more of the resource augmentation as applicable and provide a description of the augmentation proposal in detail for each resource.

   c) The proponent should also furnish the cost for each augmentation scheme.

2. Community resource Augmentation:

   a) The proponent should prepare a plan of action for addressing the needs of the community in terms of resources in the sectors of education, health and sports primarily and other such resources as applicable to the community in the vicinity of the project.

   b) The community resource augmentation plan should consist of rehabilitation of houses and people, budget allocation and time schedule for completing the activity.

SECTION C

The proponent should prepare content for the ecological damage assessment, remediation plan, natural resource augmentation and community resource augmentation separately in a chapter and include in the EIA / EMP report.

SECTION D

a) After the appraisal of the EIA / EMP report submitted by the proponent, the SEAC will make a judgement of the quality of the content in the EIA / EMP report specifically with reference to the chapter covering the ecological damage assessment, remediation plan, natural resource augmentation and community resource augmentation.

22 MAY 2018

MEMBER SECRETARY
SEIAA-TN

22/05/18

5 A

b) In the judgement of SEAC, if the quality of the content in the chapter is not satisfactory, the SEAC may direct the proponent to further revise the chapter and resubmit the EIA/EMP report.

c) If SEAC concludes that the technical part is satisfactory and the costing aspect is not satisfactory then the SEAC may revert to legal provisions, MoEF & CC guidelines and similar expert committee recommendations for finalizing the cost aspects or the SEAC may use its own expertise and experience in finalizing the cost.

SECTION E

The proponent is directed to furnish data as per the questionnaire appended in Annexure I. It will help the SEAC in arriving the ecological damage and the associated cost.

SECTION F

In compliance with the Supreme Court order stated in MoEF & CC letter F.No. 3-50/2017 IA.III-pt dated: 05th January 2018, the proponent is required to submit the No Objection Certificate obtained from the Department of Geology and Mining, Government of Tamil Nadu regarding payment of 100% cost of illegally mined mineral under section 21(5) of MMDR Act 1957 which would account for mining operations in violation of the following:

a) Without Environmental Clearance (EC), or in excess of the quantity approved in EC

b) Without Consent to Operate (CTO) or in excess of the quantity approved in CTO and

c) Without mining plan/scheme of mining or in excess of the quantity approved in mining plan / scheme of mining

d) Without Forest Clearance

e) Any other violation

List out the details of reserve forest and wildlife sanctuary nearby the project site (the details should also include other districts which are nearby the project site)

22 MAY 2018

MEMBER SECRETARY
SEIAA-TN
22/05/18

and also furnish the detail of distance between the project site and reserve forests/wildlife sanctuary.

Whether the project site attracts the HACA clearance? If so, also furnish the HACA clearance for the mining from the competent authority.

The EIA study report shall provide the details of proposed and actual mined during the entire mining period.

The proponent is instructed to fill in the form contained in **Annexure 1** to work out the details of the ecological damage during the violation period.

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/ toposheet, 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.
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

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY-TN
22 MAY 2018

MEMBER SECRETARY
SEIAA-TN
22/05/18

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) A 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.

22 MAY 2018

MEMBER SECRETARY
SEIAA-TN

22/05/18

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

22 MAY 2018

MEMBER SECRETARY
22/05/18 SEIAA-TN

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 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).

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

22 MAY 2018

MEMBER SECRETARY
SEIAA-TN

22/05/18

10 A

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 (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

22 MAY 2018

MEMBER SECRETARY
SEIAA-TN
22/05/18

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

22 MAY 2018

MEMBER SECRETARY
SEIAA-TN

22/05/18

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

22 MAY 2018

MEMBER SECRETARY
SEIAA-TN
22/05/18

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) Products and capacities. If expansion proposal then existing products with capacities and reference to earlier EC.
3) Requirement of land, raw material, water, power, fuel, with source of supply (Quantitative)
4) Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
5) Measures for mitigating the impact on the environment and mode of discharge or disposal.
6) Capital cost of the project, estimated time of completion.
7) 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)
8) Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population

22 MAY 2018

MEMBER SECRETARY
SEIAA-TN

22/05/18

9) Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
10) Likely impact of the project on air, water, land, flora-fauna and nearby population
11) Emergency preparedness plan in case of natural or in plant emergencies
12) Issues raised during public hearing (if applicable) and response given
13) CSR plan with proposed expenditure.
14) Occupational Health Measures
15) Post project monitoring 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. Copy of permission related to Port facility, Desalination plant, wind mill /solar power plant from competent Authority.
d. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.
e. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF 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.
f. 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,

22 MAY 2018

MEMBER SECRETARY
SEIAA-TN
22/05/18

15 A

the proponent will take 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 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.

The receipt of this letter may be acknowledged.

MEMBER SECRETARY
SEIAA-TN

Copy to:

1. The Principal Secretary to Government, Environment & Forests Dept, Govt. of Tamil Nadu, Fort St. George, Chennai - 9.

2. The Chairman, Central Pollution Control Board, PariveshBhavan, 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, Ministry of Environment & Forest (SZ), 34, HEPC Building, 1st & 2nd Floor, Cathedral Garden Road,Nungampakkam,Chennai -34.

5. Monitoring Cell, I A Division, Ministry of Environment & Forests, ParyavaranBhavan, CGO Complex, New Delhi 110003

6. Stock File.

22 MAY 2018

MEMBER SECRETARY
SEIAA-TN
22/05/18

Annexure 1

Additional information for considering EC for mining projects

S.No.	Details to be provided	Page no.
1)	Name of the project lease & owner	
2)	Lease Extent	
3)	Lease Validity	
4)	Approved Mining Plan/Scheme – Review a) Specify whether DSR is provided (applicable in case of minor minerals only)	
5)	Specify - Nature and type of violation I. Without EC or in excess of quantity approved in EC II. Without CTO or in excess of quantity approved in CTO III. Without mining plan/Scheme of mining or in excess of quantity approved in Mining plan/Scheme of mining. IV. Without forest Clearance V. Any other violation	
6)	Violation period I. Number of months II. Number of Years	
7)	Exploitation/Excavation quantity- Reserves proved through exploration by drilling	
8)	Give details of production from the date of execution of the lease deed / since 1994	

Year and quantity	2010-11*		2011-12*		2012-13*	
	Planned	Actual	Planned	Actual	Planned	Actual
Ore/mineral /granite						

22 MAY 2018

MEMBER SECRETARY
SEIAA-TN

22/05/18

	blocks (tonnes)							
	Waste (tonnes/cu. m)							
	* year of mining operation							

9) Quantity mined out during the violation period & if, yes indicate the violated quantity, in term of % of consented quantity.

Year and quantity mined out during the violation period	2010-11		2011-12		2012-13	
	Planned	Actual	Planned	Actual	Planned	Actual
Ore/mineral/granite blocks (tonnes)						
Waste excavation (tonnes/cu.m)						

10) State illegal mining/encroachments outside the lease boundary? Percentage of quantity mined out outside the lease boundary.

11) Method of working

I. Category type: (a) Mechanised (b) Semi – Mechanised (c) Manual

II. Construction and design of haul roads

a) Dimension as per the statutory requirements which were followed or otherwise

b) Number of vehicles plying on the main haul roads inside the mine and the approach road to the pit located outside the mine, if any.

c) Are any measures taken to minimise fugitive dust

22 MAY 2018

MEMBER SECRETARY
SEIAA-TN
22/05/18

	generated form mine haul roads? Does it comply with the CPCB/PCB Guidelines?	
	d) Is there a possibility that air pollutants emitted from the project area that do not comply with air quality standards as per CPCB/PCB?	
12)	Mechanized / Semi – Mechanized Method of Mining	
	(i) Number of loading / excavating equipments as per approved mining plan and capacity.	
	(ii) Number of loading / excavating equipments actually being deployed and capacity.	
	(iii) Type and number of transporting equipments.	
	(iv) Type of transporting system used – (a) trucks (b) Any other mode	
	(v) Capacity and Number of trucks used as per approved mining plan	
	(vi) Capacity and Number of trucks used actually in the mine.	
	(vii) Number and capacity of loading equipments and trucks used not in line with approved mining plan.	

	Capacity (m^3)	Numbers
Excavator		
Trucks		

	(viii) Impact of excess deployment of loading equipments (excavators) and transporting equipments on environment. (a) Air pollutants (b) Water Quality (c) Land Quality (d) Noise level
	(ix) Does the deployment of loading equipments (excavators) and trucks fulfil the statutory requirements as per MMR 1961, with

22 MAY 2018

MEMBER SECRETARY
SEIAA-TN
22/05/18

	respect to the site conditions?	
13)	Method of Rock Breaking/Material preparation for the excavation:	
	(i) Methodology adopted –	
	a) Drilling and blasting	
	b) Rock breakers	
	c) Rippers	
	d) Surface miners	
	e) Direct mucking by excavators	
	f) Manual means	
	g) Any other methods or combination of above	
	(ii) In case of drilling and blasting method:	
	(a) Type of blasting: short hole or deep hole	
	(b) Whether controlled blasting technique adopted? If yes, specify the technique with details of study, year of study	
	(c) Impacts due to blasting defined as per the studies, if any carried out previously as indicated	
	(d) Dust pollution	
	(e) Noise level (dB(A))	
	(f) Ground vibration studies and Fly rock projection	
	(iii) Impact of preparation of Ore and waste on environment-	
	a) Air Pollution	
	b) Noise Pollution	
	c) Water Pollution	
	d) Safety standards	
	e) Traffic density	
	f) Road Condition (vulnerability)	
14)	Construction and Design of Dumps.	
	a) Place/Location	
	b) Approach to Dump form the mine distance and safety	

22 MAY 2018

MEMBER SECRETARY
SEIAA-TN
22/05/18

	standards.	
	c) Area of extent occupied	
	d) Dimension of Dump and No. of terrace with heights (benches)	
	e) Vegetation covered : If yes, specify the details of plants	
15)	Construction and Design of Waste Dumps	
	(i) Numbers and Location of Dumps as per approved Mining Plan	
	(ii) Specify whether reject dumps are located within or outside mining lease	
	(iii) Area occupied in excess of the approval mining plan.	
	(iv) Dimension of Terracing, Light, shapes, etc., Dump as per approved Mining Plan	
	(v) Fresh/Existing Dimension Height, shape, width, etc., of Dumps in the mine.	
	(vi) Volume/Quantity added to Waste/Dump during the violated period.	
	(vii) Approach to the Dump-Dimension, distance.	
	(viii) Number of and type of equipments deployed in Dump.	
	(ix) Provision of Garland drains around the Dumps.	
	(x) Any vegetation made on the slopes.	
	(xi) Provision of safety standards.	
	(xii) Impact of Waste/Dumps on environment.	
	a) Air pollution	
	b) Water pollution	
	c) Dust pollution	
	d) Noise pollution	
	(xiii) Terracing	
16)	Construction and Design of Ore and sub grade ore/mineral Stacks:-	
	(i) Number and Location of Ore stacks.	
	(ii) Dimension of Ore/sub grade Stacks as per the Approved Mining Plan	
	(iii)Volume/Quantity added during the violation period.	
	(iv)Any Screening plant or any other loading equipment engaged during the	

22 MAY 2018

MEMBER SECRETARY
SEIAA-TN
22/05/18

	violated period.	
	(v) Approach to Ore / sub grade stack –Distance, hazards.	
	(vi)Safety standards adopted while operation.	
	(vii) Impact of ore/sub grade on environment	
	a. Air pollution	
	b. Water pollution	
	c. Dust pollution	
	d. Noise pollution	
17)	Mine Pit Water	
	(i) Intersection of Ground water table, specify the measures taken.	
	(ii) Ground water table as per hydro geological Studies (Pumping test).	
	(iii) Provision of Garland drains around pit and dumps	
	(iv) Water pollution	
	(v) Management of mine water.	
	(vi) Ultimate pit limit. w.r.t Ground water intersection and management of drainage of ground water.	
18)	Diversion of General Drainage/River/Nallah course for mining	
19)	Clearing of vegetation before the commencement of mining operation- Number of trees (species wise)	
20)	Man Power	
	(a) Statutory management	
	(b) Regular (Non –statutory) Manpower	
21)	Occupational Health and Safety.	
	(a) Periodical monitoring of health standards of persons employed as per Mine Act, 1952.	
	(b) Failure to inform statutory bodies periodically, if any	
22)	Population (Nearby Habitation)	
	(i) Population/Significant Population/Dense Population within the buffer zone of 10 Kms.	
	(ii) People displacement due to mining activities	

22 MAY 2018

MEMBER SECRETARY
SEIAA-TN
22/05/18

	(iii) Location/ Existence of habitation near the river or any other historical/sensitive/ forest distance.	
	(iv)Impact of mining on Surrounding and habitation-Air, Water, Noise, Pollution.	
	(v) Socio Economic aspects of mining.	
23)	CSR	
	(a) Field ground Activities or studies. Actual amount spent towards CSR and the future proposal.	
24)	NOC from DMG for quantity clarification in respect of settlement of all the amount payable against identified violation.	
25)	For the Clearance of EC, Public Hearing is mandated as per MoEF & CC Notification. Give reason for exemption of public hearing.	
26)	Conceptual post mining land use/restoration	
27)	Litigation/court cases, if any pending	
28)	Disaster management plan for the mine	

22 MAY 2018

MEMBER SECRETARY
SEIAA-TN

22/05/18

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

TERM OF REFERENCE-EXTENSION

Letter No.SEIAA-TN/F.No.6251/ToR-419/Ext/2018/ dated: 21.12.2022

To

M/s. Sivam Mines,
6/209, Main Road, Sirugudi Post,
Natham Taluk,
Dindigul District - 624 404.

Sir/Madam,

Sub: SEIAA-TN – Extension of validity of the Terms of Reference with Public Hearing under Violation category for the Existing Limestone mine lease over an extent of 1.70.0 Ha located at S.F.No. 693/1,2,3,4 & 7, Sirugudi Village, Natham Taluk, Dindigul District, Tamil Nadu by M/s. Sivam Mines – Issued – Regarding.

Ref:
1. Earlier ToR issued by SEIAA-TN vide Lr No.SEIAA-TN/F.No.6251/ToR-419/2018, dated: 22.05.2018
2. Earlier ToR Amendment issued by SEIAA-TN vide Letter No. SEIAA-TN/F – 6251/SEAC- CXVIII/TOR- 419 (A)/2018 Dt.30.07.2018
3. Earlier ToR Extension issued by SEIAA-TN vide Lr. No.SEIAA-TN/F.No. 6251/TOR- 419/A/ dated: 30.10.2021
4. MoEF&CC Office Memorandum dated: 29.08.2017
5. MoEF&CC Notification S.O. 221(E) dated: 18.01.2021
6. Online Proposal No. SIA/TN/MIN/268968/2022 dated: 21.04.2022
7. Your Application for Extension of Validity of Terms of Reference dated:26.04.2022

MEMBER SECRETARY
SEIAA-TN

1 AA

8. Minutes of the 335th SEAC meeting held on 06.12.2022
9. Minutes of the 580th SEIAA meeting held on 21.12.2022

In the reference 1st cited above, the Terms of Reference under Violation category was accorded to M/s. Sivam Mines for the Existing Limestone mine lease over an extent of 1.70.0 Ha located at S.F.No. 693/1,2,3,4 & 7, Sirugudi Village, Natham Taluk, Dindigul District, Tamil Nadu. Subsequently, Amendment for ToR with Public hearing was issued vide reference 2nd cited as per Hon'ble High Court Order Dt:13.10.2017 in W.P No.11189 of 2017. Further, Extension of validity of ToR was issued vide reference 3rd cited.

Now the Project Proponent has again applied for Extension of validity of Terms of Reference vide reference 6th cited.

SEAC Remarks:

Existing Limestone mine Lease over an extent of 1.70.0 Ha at S.F.No.693/1,2,3,4 & 7, Sirugudi Village, Natham Taluk, Dindigul District, Tamil Nadu by M/s Sivam Mines for Extension of validity for the Terms of References "Under Violation".

(SIA/TN/MIN/268968/2022 dated: 21.04.2022)

The proposal was placed in this 335th Meeting of SEAC held on 06.12.2022. 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, **M/s Sivam Mines** has applied for Extension of validity for the Terms of References for the Existing Limestone mine Lease over an extent of 1.70.0 Ha at S.F.No.693/1,2,3,4 & 7, Sirugudi Village, Natham Taluk, Dindigul District, Tamil Nadu.
2. The proposed quarry/activity is covered under Category "B" – "Under Violation" of Item 1(a) "Mining Projects" of the Schedule to the EIA Notification, 2006.
3. ToR under violation issued vide SEIAA Lr No.SEIAA-TN/F.No.6251/ToR-419/2018, dated: 22.05.2018.
4. As per MoEF&CC O.M Dt:29.08.2017, the validity of ToR shall be 4 years for all the projects/activities and 5 years for River Valley and HEP Projects.
5. As per MoEF&CC Notification S.O. 221(E), dated the 18 January, 2021, the period from the 1st April, 2020 to the 31st March, 2021 shall not be considered for the purpose of

MEMBER SECRETARY
SEIAA-TN

2 AA

calculation of the period of validity of Prior Environmental Clearances granted under the provisions of this notification in view of outbreak of Corona Virus (COVID-19) and subsequent lockdowns (total or partial) declared for its control, however, all activities undertaken during this period in respect of the Environmental Clearance granted shall be treated as valid.".

In view of the above, SEAC after detailed discussion decided to confirm that the ToR issued is (deemed to be) valid upto 21.05.2023. Hence, the project proponent is requested to submit public hearing minutes, EIA/EMP report along with details of i) aspects of violation, Ecological Damage assessment, Remediation Plan, Natural Resource Augmentation Plan, Community Resource Augmentation plan. 2) The PP obtain letter 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.

SEIAA Remarks:

The proposal was placed in the 580th Authority meeting held on 21.12.2022. SEAC has furnished its recommendations to the Authority for **granting extension of validity of the Terms of Reference issued to the Project** subject to the conditions stated therein. After detailed discussion, The Authority accepted the recommendation of 335th SEAC minutes held on 6.12.2022 with a validity of the ToR issued is valid up to 21.05.2023 as per the MoEF Notification dated 18.01.2021.

Therefore, the project proponent is requested to submit Public Hearing minutes, EIA/EMP report along with required details on the following.

I. facets of violation,
II. assessment of ecological damage, remediation plan and natural and community resource augmentation plan which shall be prepared as an independent chapter in the environment impact assessment report.
III. The compliance report on the violation ToR issued earlier.

Along with this, additionally the Project Proponent will study in detail the following:

1. The limestone quarry involves raw material extraction, transportation and comminution. Therefore, large quantity of diesel and electricity are supposed to be consumed in the production. The diesel fuel and electricity to be consumed to be furnished.

MEMBER SECRETARY
SEIAA-TN

3 AA

2. What are the green mining technologies to be adopted for reducing GHG/Co2 emissions and lowering the carbon footprint in the limestone mining.
3. Strategies adopted for safety and healthy mining operations.
4. What are the transparency and accountability system in place during the operation and post-operation period of the project.
5. What are the In-House environmental performance and evaluation tools to understand negative impacts of mining.
6. Detailed study to be made on material flow analysis and Life Cycle Assessment (LCA) in the process of production.
7. Through a chart Illustration, clarify the cradle to grave approach for extraction of limestone and anticipated emissions, environmental threats in every stage and mitigation strategy at every stage.
8. Project Proponent to study impacts on human health viz respiratory impacts, toxicity impacts and radiation impacts.
9. Study to be made on aquatic, terrestrial toxicity, aquatic eutrophication including detailed terrestrial toxicity and their impacts of wildlife and biodiversity.
10. What is the total water withdrawal consumption, likely temperature rises and climate change impacts.
11. What are the chemical exposures in the limestone mining and risks anticipated to environmental and human health.

MEMBER SECRETARY
SEIAA-TN

Copy to:

1. The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
2. The Additional Chief Secretary to Government, Environment, Climate Change and Forests Department, Tamil Nadu.
3. The Additional Chief Secretary to Government, Industries, Investment Promotion & Commerce Department, Tamil Nadu.

4 AA

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 Chairman, TNPC Board, 76, Mount Salai, Guindy, Chennai-32.
7. The District Collector, Dindigul District.
8. The Commissioner of Geology and Mines, Guindy, Chennai-32.
9. EI Division, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
10. Spare.

5 AA

ANNEXURE- II

ABSTRACT

Industries – Mines and Minerals – Limestone – Dindigul District – Natham Taluk – Sirugudi Village – S.F. Nos. 693/1, 2, 3, 4 and 7 over an extent of 1.70.0 hectares of patta land – Transfer of mining lease granted to Thiru. S. Asai Alangaram to M/s. Sivam Mines – Orders - Issued.

INDUSTRIES (MMA.1) DEPARTMENT

G.O. (D) No. 173

Dated: 05.11.2014
திருவள்ளுவர் ஆண்டு 2045
ஐய வருடம், ஐப்பசி திங்கள் 19

Read:

1. G.O. (3D) No.83, Industries (MMA.2) Department, dated: 09.10.1996.
2. Representation of Thriu. S. Asai Alangaram, dated: 25.1.2010.
3. From the District Collector, Dindigul, Roc.No. 52/2010/Mines, dated: 3.3.2010.
4. From the Commissioner of Geology and Mining, Letter Rc. No. 3256/MM4/2010, dated: 9.4.2010 and 31.12.2013.

-0-

ORDER

In the Government Order first read above, orders have been issued granting second renewal of mining lease in favour of Thiru S. Asai Alangaram, Dindigul District for mining limestone over an extent of 1.70.0 hectares in S.F. Nos. 693/1, 2, 3, 4 and 7 of patta land of Sirugudi Village, Natham Taluk, Dindigul District for a period of 20 years. The lease period is from 28.02.1996 to 27.02.2016.

2. In his letter second read above Thiru. S. Asai Alangaram has stated that he is willing to develop the mines in a scientific manner using scientific methods and hence he and his brother Thiru. S. Ilangovan have agreed to transfer their leases to partnership concern under rule 37 of Mineral Concession Rules, 1960 in the name and style of "M/s. Sivam Mines" having its registered office at 6/209, Pudupatti, Sirugudi Village, Natham Taluk, Dindigul District and requested to transfer the lease granted in the name of Thiru. S. Asai Alangaram to the above said partnership firm M/s. Sivam Mines.

3. The District Collector, Dindigul in his letter third read above has stated that on perusing the records based on rule 37 of the Mineral Concession Rules, 1960, it was found that both the transferor and transferee have submitted the affidavit towards income-tax, mining dues, and also details about the mining lease in the State of Tamil Nadu. Further, the lessee has also produced no mining dues certificate in respect of Dindigul District and transferee firm have also produced the affidavit to bear the liabilities of the lessee and the partnership firm has been registered on 25.01.2010 by the Registrar of Firms, Dindigul. The District Collector, Dindigul has recommended the application for name transfer from Thiru. S. Asai Alangaram to the partnership concern that is in the name of "M/s. Sivam Mines".

4 Based on the recommendation of the District Collector, Dindigul, the Commissioner of Geology and Mining in his letter fourth read above has stated that Thiru. S. Asai Alangaram has furnished the mining due clearance certificate issued by the District Collector, Dindigul for the year 2012-2013 and recommended the application preferred by Thiru. S. Asai Alangaram for transfer of second renewal of mining lease granted to him for mining limestone over an extent of 1.70.0 hectares of patta lands in S.F. Nos. 693/1, 2, 3, 4 and 7 of Sirugudi Village, Natham Taluk, Dindigul District for a period of 20 years from 28.02.1996 to 27.02.2016. in the Government Order first read above in the name of M/s. Sivam Mines subject to the condition that the transferee should scrupulously follow the Mining Plan/Scheme of Mining approved by Indian Bureau of Mines in respect of the said lease hold area as provided under rule 37 of Mineral Concession Rules, 1960.

5. After careful examination, the Government have decided to accept the recommendation of the District Collector, Dindigul and the Commissioner of Geology and Mining. Accordingly, the second renewal of mining lease granted in the Government Order first read above for limestone over an extent of 1.70.0 hectares of patta lands in S.F. Nos. 693/1, 2, 3, 4 and 7 of Sirugudi Village, Natham Taluk, Dindigul District for a period of 20 years is transferred from Thiru S.Asai Alangaram to M/s. Sivam Mines upto the valid lease period (i.e. 28.02.1996 to 27.02.2016.) subject to the condition that the transferee should scrupulously follow the Mining Plan/Scheme of Mining approved by Indian Bureau of Mines in respect of the said lease hold area as provided under rule 37 of Mineral Concession Rules, 1960.

6. The District Collector, Dindigul is requested to take further action and collect the latest mining dues if any pending from the transferee. The original application of transfer of second renewal of mining lease is returned herewith for follow up action.

(BY ORDER OF THE GOVERNOR)

C.V. SANKAR
PRINCIPAL SECRETARY TO GOVERNMENT

To
The Commissioner of Geology and Mining,
Guindy, Chennai-600 032.
The District Collector, Dindigul. (w.e.)
The Controller General, Indian Bureau of Mines,
New Secretariat Buildings,Nagpur.
The Regional Controller of Mines,
Indian Bureau of Mines, 29,Vijayaragava Road,
T.Nagar, Chennai-600 017.
Thriu. S. Asai Alangaram, S/o. K.A. Semban Chettiar,
Sirugudi (PO), Natham Taluk, Dindigul District–624 404.
M/s. Sivam Mines, 6/209, Pudupatti,
Sirugudi Village, Natham Taluk, Dindigul District.
Copy to:
Office of the Hon'ble Minister (Industries), Chennai-600 009.
Industries (OP.II) Department, Chennai-600 009.,
SF/SCs.

// Forwarded / By order //

Section Officer

25 A

Email / Speed post

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES
OFFICE OF THE REGIONAL CONTROLLER OF MINES

Telephone no.: 044-2491/4461/1570
Telefax no. 044-24911295
Email ID: ro.chennai@ibm.gov.in

C-4-A Rajaji Bhavan
CGO complex, Besant Nagar
Chennai – 600 090.

No. TN/DGL/LST/ROMP-1584.MDS

Dated : 10. .1.2020

To :
M/s. Sivam Mines
6/209 Main Road
Sirugudi Post, Natham Taluk
Dindigul – 624404.

Sub. : Approval of Review of Mining Plan (including Progressive Mine Closure Plan) for Sirugudi Limestone Mine over an extent of 1.70.0 hectares in SF.Nos. 693/1, 2, 3, 4 & 7 in Sirugudi Village, Natham Taluk, Dindigul District, Tamilnadu submitted by M/s Sivam Mines under Rule 17(1) of MCR, 2016.

Ref. : Qualified person letter no. Nil dated 02.01.2020.

Sir,

In exercise of the powers delegated to me under Rule 16 of Minerals (Other than Atomic & Hydro Carbon Energy Minerals) Concession Rules, 2016 vide Gazette Notification No. S.O. 1857(E) dated 13.5.2016 issued by the Controller General, Indian Bureau of Mines under F.No. T-43004/CGBM/MM(DR)/2015, I hereby approve the above said Review of Mining Plan for **Limestone** mineral only. This approval is subject to the following conditions.

1) That the Review of Mining Plan (including Progressive Mine Closure Plan) is approved without prejudice to any other law applicable to the mine/area from time to time whether made by the Central Government, State Government or any other authority.
2) That this approval of the Review of Mining Plan (including Progressive Mine Closure Plan) does not in any way imply the approval of the Government in terms of any other provision of the Mines & Mineral (Development & Regulation) Act, 2015 or the Mineral Concession Rules, 2016 or any other law including Forest (Conservation) Act, 1980, Environment Protection Act, 1986 and the rules made there under.
3) That this Review of Mining Plan (including Progressive Mine Closure Plan) is approved without prejudice to any other order or direction from any court of competent jurisdiction.
4) Provisions of the Mines Act, 1952 and Rules & Regulations made thereunder including submission of notice of opening, appointment of manager and other statutory officials as required by the Mines Act, 1952 shall be complied with.
5) The Provisions made under MM(D&R) Act, 2015 (Amended) and Rules made thereunder shall be complied with.
6) The contents of circular No. 2/2010 issued by the Chief Controller of Mines, IBM, Nagpur vide his letter No. 11013/3/MP/90-CCOM Vol. VII dated 06.04.2010 shall be complied with.
7) The execution of Mining Plan / Review of Mining Plan shall be subjected to vacation of prohibitory orders / notices, if any.
8) This approval of mining operations and associated activities is restricted to the mining lease area only. The mining lease area is as shown on the statutory plans under rule 32 of Mineral Conservation and Development Rules, 2017, by the lessee. Indian Bureau of Mines does not take any responsibility regarding correctness of the boundaries of the lease shown on the ground with reference to the lease map and other plans furnished by the lessee.
9) The Environmental Monitoring Cell of the Company shall continue monitoring ambient air quality, dust fall rate, water quality, soil sample analysis and noise level measurements on various stations established for the purpose both in the core zone and buffer zone, as per Department of Environment guidelines and keeping in view IBM's Circular No.3/92, season-wise every year or by engaging preferably the services of an Environmental laboratory approved by MOEF/CPCB. The data so generated shall be maintained in a bound paged register kept for the purpose and the same shall be made available to the inspecting officer on demand.

10) If anything is found to be concealed as required by the Mines Act in the contents of Review of Mining Plan and proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.
11) Yearly report as required under Rule 26(2) of MCDR,2017setting for the extent of protection and rehabilitation works carried out as envisaged in the approved progressive mine closure plan and if there is any deviations, reasons thereof shall be submitted before 1st July of every year to the regional office, IBM , Chennai.
12) The Review of Mining Plan is approved for the proposals contained therein and as applicable from 01.04.2020 for the mining activities to be carried out within the mining leasehold. The earlier instances of irregular mining/illegal mining, if any, shall not be regularized through the approval of this document.
13) The financial assurance submitted should be renewed before expiry of the same.
14) In case mining lease falls within a radius of 10 kms. of National Park/Sanctuary, recommendations of NBWL have to be obtained as per the orders of the Hon'ble Supreme Court in I.A. No. 460/2004.
15) This approval is subject to the mining operations as per the proposals shall be carried out only after obtaining necessary clearances from MOEF, Pollution Control Board, Forest Department etc
16) This approval is subjected to the extension of the validity of the mining lease by the State government as per MMDR Act, 2015 (Amended).
17) This approval is subject to submission of DGPS Plan duly authenticated by the State Government and submission of modifications in the approved Mining Plan if, consequent to the authentication of DGPS Survey Plan, any change in mining lease area is accepted by the State Government.

Yours faithfully,

Encl. Copy of approved Review of Mining Plan
(including Progressive Mine Closure Plan)

(V. Jaya Krishna Babu)
Regional Controller of Mines

Copy for information to:-

1. Shri A. Jagannathan, Qualified person, Old No.260-B, New No.17, Advaitha Ashram Road, Alagapuram, Salem – 636 004.
2. The Commissioner of Geology & Mining, Government of Tamilnadu, Guindy, Chennai – 600 032 along with copy of the approved Review of Mining Plan.

10/1/2020

Encl : As above.

(V. Jaya Krishna Babu)
Regional Controller of Mines

REVIEW OF MINING PLAN & PROGRESSIVE MINE CLOSURE PLAN FOR SIRUGUDI LIMESTONE MINE

(PRIVATE /"A" CATEGORY /ROMP & PMCP /NON-FOREST/ PATTA LAND/ CAPTIVE USE)

REVIEW OF MINING PLAN PERIOD – [2020-21 to 2024-25]
[Lease period: 20 Years (Second Renewal) (from 28.02.1996 to 27.02.2016)]

(As per MMDR Amendment Act 2015, the period of Mining Lease is 50 years from grant of Mining Lease)

Mine Code: 38TMN06007

(SUBMITTED UNDER RULE 17(1) OF MCR, 2016 AND RULE 23 OF MCDR, 2017)

Registration Number Under Rule 45 – IBM /5284/2011, Dated: 25.11.2011.

LOCATION OF THE MINE

EXTENT : 1.70.0 HA.
S.F.NOS : 693/1, 2, 3, 4 & 7
VILLAGE : SIRUGUDI
TALUK : NATHAM
DISTRICT : DINDIGUL
STATE : TAMILNADU

MINE OWNER/LESSEE

M/s. Sivam Mines.,
6/209, Main Road,
Sirugudi Post, Natham (Tk),
Dindigul District.

PREPARED BY

A.Jagannathan, B.E., F.C.C., M.M.E.A., M.I.E.,
Qualified Person

Old.No.260-B, New No: 17,
Advaitha Ashram Road, Alagapuram, Salem – 636 004.
Cell: 94433 56539.
E-mail: geothangam@gmail.com

LIST OF CONTENTS

S.NO	DESCRIPTION		PAGE.NO
	INTRODUCTORY NOTES		1
1.0	GENERAL		3
2.0	LOCATION AND ACCESSIBILITY		4
3.0	DETAILS OF APPROVED MINING PLAN/SCHEME OF MINING (IF ANY)		6
	PART - A		
	1.0	GEOLOGY AND EXPLORATION	11
	2.0	MINING	18
		A. OPENCAST MINING	18
		B. UNDERGROUND MINING	27
	3.0	MINE DRAINAGE	28
	4.0	STACKING OF MINERAL REJECT/SUB GRADE MATERIAL AND DISPOSAL OF WASTE	28
	5.0	USE OF MINERAL AND MINERAL REJECT	29
	6.0	PROCESSING OF ROM AND MINERAL REJECT	31
	7.0	OTHER	31
	8.0	PROGRESSIVE MINE CLOSURE PLAN-UNDER RULE 23 OF MCDR'2017	31
		PART -B	
	9.0	Certificates /Undertakings/Consents	
		A. Consent Letter/Undertaking/ Certificate From The Lessee	44-45
		Certificate From QP	46

LIST OF ANNEXURES

SL.No.	Description	Annexure no.	Page no.
1.	FEASIBILITY REPORT OF SIRUGUDI LIMESTONE MINE	I	47-61
2.	RESOURCES AND RESERVES BY UNFC SYSTEM	IA	62-84
3.	PHOTOS WORK OF THE MINE	IB	85
4.	COPY OF G.O.Ms. NO. 173.	II	86-87
5.	COPY OF FMB COPY OF PATTA COPY OF ADANGAL COPY OF 'A' REGISTER	III IIIA IIIB IIIC	88 89 90 91-95
6.	COPY OF COMBINED SKETCH	IV	96
7.	COPY OF CHEMICAL ANALYSIS REPORTS	V & V-A	97-98
8.	COPY OF TRANSFER OF MINING LEASE	VI	99-102
9.	COPY OF ID PROOF	VII	103
10.	COPY OF RENEWAL MINING LEASE APPLICATION WITH ACKNOWLEDGEMENT	VIII	104-111
11.	COPY OF PARTNERSHIP DEED	IX	112-118
12.	COPY OF MP APPROVAL LETTER FROM IBM	X	119-120
13.	COPY OF EXTENSION OF MINING LEASE LETTER	XI	121
14.	COPY OF FORM-I & J	XII	122-126
15.	COPY OF SMALL SCALE INDUSTRIAL UNIT REGISTRATION CERTIFICATE	XII-A	127-137
16.	COPY OF QP CERTIFICATE	XIII	138-141
17.	COPY OF BANK GUARANTEE	XIV	142-144

PART-B
10.0 LIST OF PLANS AND SECTIONS

SL.NO.	DESCRIPTION	SCALE	PLATE NO.
1.	LOCATION PLAN	Not to Scale	I
2.	ROUTE MAP	Not to Scale	IA
3.	KEY PLAN	1:50,000	IB
4.	MINE LEASE PLAN	1:1000	II
5.	SURFACE PLAN	1:1000	III
6.	GEOLOGICAL PLAN AND SECTIONS	Plan: 1:1000 Section : HOR-1:1000 VER:1:1000	IV
7.	YEARWISE DEVELOPMENT & PRODUCTION PLAN	Plan: 1:1000 Section : HOR-1:1000 VER:1:1000	V-A to V-E
8.	MINE LAYOUT, LAND USE & AFFORESTATION PLAN	1:1000	VI
9.	FINANCIAL AREA ASSURANCE PLAN	1:1000	VII
10.	ENVIRONMENT PLAN	1:5000	VIII
11.	CONCEPTUAL PLAN AND SECTIONS	Plan: 1:1000 Section : HOR-1:1000 VER:1:1000	IX

REVIEW OF MINING PLAN AND PROGRESSIVE MINE CLOSURE PLAN FOR SIRUGUDI LIMESTONE MINE

OVER AN EXTENT OF 1.70.0 HA IN S.F.NOS. 693/1, 2, 3, 4 & 7 IN SIRUGUDI VILLAGE, NATHAM TALUK, DINDIGUL DISTRICT

Review of Mining plan period – [2020-21 to 2024-25]

(PRIVATE/"A" CATEGORY/ NON-FOREST /PATTA LAND/ CAPTIVE USE)

(SUBMITTED UNDER RULE 17(1) OF MCR, 2016 AND RULE 23 OF MCDR, 2017)
Registration Number under Rule 45: IBM /5284/2011, Dated: 25.11.2011.

Mine Code: 38TMN06007

INTRODUCTION

This Review of Mining Plan and Progressive Mine Closure Plan for Sirugudi Limestone Mine, over an extent of 1.70.0 hectares in S.F. Nos: 693/1, 2, 3, 4 & 7 in Sirugudi Village, Natham Taluk, Dindigul District, Tamilnadu State, has been prepared for M/s. Sivam Mines., 6/209, Main Road, Sirugudi Post, Natham (Tk), Dindigul District, Tamilnadu.

M/s. Sivam Mines is a Partnership Firm. When the Transfer of mining lease was granted in the year 2014, the partners of the firm are Thiru. S.Asaialangaram, Thiru. S.Ilangovan, Thiru. I.Vijay Alangar and Selvi. I.Sempon manickam. Thiru. S. Ilangovan is the Managing Partner of the firm. The partners of the firm have very good knowledge and experience in Limestone mining for more than three decades. (Please refer Annexure No.VIII).

Initially, the mining lease for limestone was granted to Thiru. S.Asaialangaram, Dindigul district vide G.O. Ms.No. 1691, dated: 04.12.1982 for a period of 3 years 28.02.1983 to 27.02.1986.

The lease was first renewed for a period of 10 years with effect from 28.02.1986 to 27.02.1996 vide G.O.Ms. No.1439/Inds, dated: 13.12.1990.

Second renewal was granted vide G.O.(3D).No.83 Inds (MMA2) Dept., dated: 09.10.1996 for a period of 20 years from 28.02.1996 to 27.02.2016 and the lease deed was executed on 17.01.1997.

Then the lease was transferred to M/s. Sivam Mines., 6/209, Main Road, Sirugudi Post, Natham (Tk), Dindigul District vide G.O.(D) No.173 Inds (MMA1) dept., dated: 05.11.2014. (Please refer Annexure No.II & VI).

The mining plan for renewal of mining lease was approved by Indian Bureau of Mines vide letter no. TN/D-Anna/MP/LST-825-MDS, dated: 12.07.1995.

The first scheme of mining was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS/114/Mds, dated: 14.02.2002.

The second scheme of mining was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS-457-Mds, dated: 10.09.2007.

The final scheme of mining (2012-13 to 2015-16) was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS-776.Mds, dated: 28.03.2013.

As the lease period is going to get expired on 27.02.2016. The lessee has decided to renew the mining lease for a further period of Thirty years. Copy of renewal application form with acknowledgement from State Government is enclosed as Annexure No.VIII.

Simultaneously, Modified Mining Plan along with Progressive Mine Closure Plan [2015-16 (from 28.02.2016) to 2019-20] was prepared, submitted under Rule 22(6), MCR, 1960 and Rule 23(B) of MCDR, 1988 and got approved by Indian Bureau of Mines vide letter no. TN/DGL/MP/LST-1969.Mds, dated: 30.03.2016. Copy of mining plan approval letter is enclosed as Annexure No.X.

The lease granted before 2015 for a period of 20 years is deemed to have been granted for fifty years as per latest MMDR amendment Act 2015. A letter for extension of Mining Lease was submitted by the lessee to the State Government, but the lessee has not received any letter from the Government for extension of Mining lease. Copy of the letter for extension of Mining Lease is enclosed as annexure no.XI.

Hence, this Review of Mining Plan along with Progressive Mine Closure Plan **[2020-21 to 2024-25]** is being prepared now & submitted under Rule 17(1) of MCR, 2016 and Rule 23 of MCDR, 2017.

Proposals were given to work under "B Category" in the previous approved Scheme of Mining, but this present Review of Mining plan is prepared under "A" category method by deploying machineries for development of benches to meet the demand in the market.

Particulars of number of state wise leases already held by the lessee:

The lessee has another four mining leases held by the lessee in Tamilnadu is given below.

Table - 1

Sl No	Lease reference no. & date	Area in Ha	Location	Type of mineral	Working/ Non-Working	Status of approval of MP/MS/ROMP	Date of execution & Date of expiry	Remarks
1.	G.O.(D).No.174 , dated 05.11.2014	0.24.29 Ha.	Sirugudi Village, Natham Taluk, Dindigul District	Limeston e	Working	MP-TN/DGL/MP/ LST-1971.MDS dated, 30.03.2016	17.04.1996 & 16.04.2016	Period of 20 years
2.	G.O.(D).No.141 , dated 22.09.2014	0.94.5 Ha.	Sirugudi Village, Natham Taluk, Dindigul District	Limeston e	Working	MP-TN/DGL/MP/ LST-1970.MDS dated, 30.03.2016	17.04.1996 & 16.04.2016	Period of 20 years
3.	G.O.(D).No.171 , dated 03.11.2014	2.53.0 Ha.	Sirugudi Village, Natham Taluk, Dindigul District	Limeston e	Working	ROMP-TN/DGL/LST/ ROMP-1464.MDS dated, 19.12.2017	27.11.1997 & 26.11.2017	Period of 20 years
4.	G.O.(D).No.170 , dated 03.11.2014	0.94.0 Ha.	Sirugudi Village, Natham Taluk, Dindigul District	Limeston e	Working	ROMP-TN/DGL/LST/ ROMP-1407.MDS dated, 17.03.2017	27.11.1997 & 26.11.2017	Period of 20 years

1.0 GENERAL

a) **Name of applicant /lessee/Rule 45 registration no**.

Name of the lessee : M/s. Sivam Mines.,
(Thiru. S. Ilangovan, B.E., Managing Partner)
Address : 6/209, Main Road, Sirugudi Post,
Natham (Tk),
Dindigul District.
District : Dindigul
State : Tamilnadu.
Pin code : 624 404
Telephone : 04544-267632
Mobile No. : 94430 67632
Email id. : ilangovanmadhavi4.9@gmail.com
Rule 45 registration no. : **IBM /5284/2011**

Copy of ID proof is enclosed as Annexure No. VII.

b) Status of applicant/lessee

M/s. Sivam Mines is a Partnership Firm. When the Transfer of mining lease was granted in the year 2014, the partners of the firm are Thiru. S.Asaialangaram, Thiru.S.Ilangovan, Thiru. I.Vijay Alangar and Selvi. I.Sempon Manickam. Thiru. S.Ilangovan is the Managing Partner of the firm. The partners of the firm have very good knowledge and experience in Limestone mining for more than three decades. (Please refer Annexure No.VIII).

The details of the partners are given below:

Table-2

Sl. No.	Name & Address	Designation	Cell no.	e-mail address
1.	Thiru. S. Ilangovan, S/o. K.A. Semban chettiar, Door No.6/208, Main Road, Sirugudi post, Natham Taluk, Dindigul District.	Managing Partner	94430 67632	ilangovanmadhavi4.9@gmail.com
2.	Thiru. S. Asaialangaram, S/o. K.A. Semban chettiar, Door No.1/174, Main Road, Sirugudi post, Natham Taluk, Dindigul District.	Partner	94430 67632	vijayalangar@gmail.com
3.	Thiru. I.Vijay Alangar, S/o. S.Ilangovan, Door No.6/208, Main Road, Sirugudi post, Natham Taluk, Dindigul District.	Partner	94430 67632	vijayalangar@gmail.com
4.	Selvi. I.Sempon Manickam, D/o. S.Ilangovan, Door No.6/208, Main Road, Sirugudi post, Natham Taluk, Dindigul District.	Partner	94430 67632	ilangovanmadhavi4.9@gmail.com

c) Mineral(s) which is / are included in the prospecting license (For Fresh grant)

Not applicable.

d) Mineral(s) which is / are included in the letter of Intent / lease deed

Limestone.

e) Mineral(s) which is the applicant /lessee intends to mine:

The mining lease was granted for Limestone only and the lessee intends to mine only limestone.

f) Name of Qualified Person under rule 22C of MCR,1960 or a Person employed under clause (c) of Sub rule (1) of rule 42 of MCDR, 1988 (Applicable for Review of Mining Plan only) preparing Mining Plan

Name	:	A.Jagannathan, B.E., F.C.C., M.M.E.A., M.I.E., Qualified Person
Address	:	Old.No.260-B, New No: 17, Advaitha Ashram Road, Alagapuram, Salem – 636 004.
Tele Fax	:	0427- 2431989 (Office)
Cell Phone Nos	:	94433 56539 & 94422 78601.

2.0 LOCATION AND ACCESSIBILITY

a) Lease Details (Existing Mine)

Name of the Mine : Sirugudi Limestone Mine
Lat/long of boundary point : 10^0 14'29.27''N, 78^0 17'41.99"E
Date of grant of lease : 04.12.1982
Period/Expiry Date : 3 years with effect from 28.02.1983 (i.e., from 28.02.1983 to 27.02.1986)

Date of grant of Lease (First Renewal): 13.12.1990
Period/Expiry Date : 10 years with effect from 28.02.1986 (i.e., from 28.02.1986 to 27.02.1996) Please refer Annexure No-II, VI.

Date of grant of lease (Second Renewal) : 09.10.1996
Period/Expiry Date : 20 years with effect from 28.02.1996 (i.e. from 28.02.1996 to 27.02.2016)

Third renewal application submitted on : 20.02.2015
Period for which renewal
(Third renewal) of mining lease is applied : 30 years.

The lease granted before 2015 for a period of 20 years is deemed to have been granted for fifty years as per latest MMDR amendment Act 2015. A letter for extension of Mining Lease was submitted by the lessee to the State Government, but the lessee has not received any letter from the Government for extension of Mining lease. Copy of the letter for extension of Mining Lease is enclosed as annexure no.XI.

Name of the leaseholder	:	M/s. Sivam Mines., (Thiru. S.Ilangovan, B.E., Managing Partner)
Address	:	6/209, Main Road, Sirugudi Post, Natham (Tk), Dindigul District.
District	:	Dindigul
State	:	Tamilnadu
Pin code	:	624 404
Telephone	:	04544-267632
Mobile No.	:	94430 67632
Email id.	:	ilangovanmadhavi4.9@gmail.com

Table-3

b) Details of applied /lease area with location map (fresh area /mine)

Forest		**Non-forest**	
Forest (specify)	Area (ha) Nil	i). **Waste land** ✓ ii).Grazing land iii).Agriculture land iv).Other (specify)	Area (ha) 1.70.0Ha

Table-4

District & State	Village & Taluk	S.F.No.	Extent in hectares
Dindigul & Tamilnadu	Sirugudi & Natham	693/1 693/2 693/3 693/4 693/7	0.37.5 0.29.0 0.24.0 0.57.0 0.22.5
Total			**1.70.0 Ha**

Whether the area falls under Coastal Regulation Zone(CRZ)?

Not applicable.

Existence of public road/railway line, if any nearby and approximate distance

The lease area is located at a distance of about 3.0 km SW from Sirugudi. The area is located at a distance of about 3.0km north from Kottampatty – Natham Road (SH-35). The area is located at a distance of about 10km west from Trichy – Madurai Road (NH-45B) (Please refer Key Map-IB for the location of the lease area).

Table-5

S.No	Particulars	Location	Direction	Approximate Distance in Km
1	Nearest Post office	Sirugudi	NE	3.0
2	Nearest Town(D.H)	Dindigul	NW	38
3	Nearest Police Station	Natham	SW	7.5
4	Nearest Govt. Hospital	Sirugudi	NE	3.0
5	Nearest School	Thethampatti	NE	1.0
6	Nearest DSP Office	Dindigul	NW	40
7	Nearest Railway Station	Dindigul	NW	38
8	Nearest Airport	Madurai	SW	43
9	Nearest Seaport	Tuticorin	S	167

Please refer Location plan (Plate No.I), Route Map (Plate No.IA), Key plan (Plate No.IB)

Drinking Water, rest shed, store room, public convenience and mines office are proposed to be constructed in temporary semi permanent structure within the lease area. Please refer Plate No. VI.

Toposheet No. with latitude & longitude of all corner boundary point/pillar

The Area falls in Toposheet no.58-J/08 of Geological Survey of India.

Table-6

BOUNDARY CO-ORDINATES on WGS-84 from SW Corner					
S.No.	**Latitude**	**Longitude**	**S.No.**	**Latitude**	**Longitude**
1	$10^0$14′29.27″N	$78^0$17′41.99″E	11	$10^0$14′35.01″N	$78^0$17′46.10″E
2	$10^0$14′30.55″N	$78^0$17′42.20″E	12	$10^0$14′35.63″N	$78^0$17′46.67″E
3	$10^0$14′30.40″N	$78^0$17′43.81″E	13	$10^0$14′35.71″N	$78^0$17′48.29″E
4	$10^0$14′31.02″N	$78^0$17′44.25″E	14	$10^0$14′34.76″N	$78^0$17′48.54″E
5	$10^0$14′31.09″N	$78^0$17′43.60″E	15	$10^0$14′33.43″N	$78^0$17′48.48″E
6	$10^0$14′32.65″N	$78^0$17′43.58″E	16	$10^0$14′32.70″N	$78^0$17′48.28″E
7	$10^0$14′32.85″N	$78^0$17′43.32″E	17	$10^0$14′32.83″N	$78^0$17′46.17″E
8	$10^0$14′33.89″N	$78^0$17′43.79″E	18	$10^0$14′32.12″N	$78^0$17′45.27″E
9	$10^0$14′34.93″N	$78^0$17′43.80″E	19	$10^0$14′29.42″N	$78^0$17′44.12″E
10	$10^0$14′35.25″N	$78^0$17′44.27″E	20	$10^0$14′29.14″N	$78^0$17′44.13″E

Please refer Mine Lease Plan - Plate No.II.

c). Attach a general location map showing area and access routes. It is preferred that the area be marked on a Survey of India topographical map or a cadastral map or forest map as the case may be. However, if none of these are available, the area may be shown on an administrative map.

Please refer Location plan (Plate No.I).

3.0 DETAILS OF APPROVED MINING PLAN / SCHEME OF MINING (if any)

3.1 Date and reference of earlier approved MP/SOM

Table-6A

Sl.No.	Mining plan/Modified Mining plan /SOM along with PMCP	Approval Letter No & date
1.	Mining Plan for Renewal of Mining lease	TN/D-Anna/MP/LST-825-MDS, dated: 12.07.1995.
2.	First Scheme of Mining & PMCP	TN/DGL/LST/MS/114/Mds, dated: 14.02.2002.
3.	Second Scheme of Mining & PMCP	TN/DGL/LST/MS-457-Mds, dated: 10.09.2007.
4.	Final Scheme of Mining & PMCP (2012-13 to 2015-16)	TN/DGL/LST/MS-776.Mds, dated: 28.03.2013.
5.	Modified Mining plan & PMCP [2015-16 (from 28.02.2016) to 2019-20]	TN/DGL/MP/LST-1969.Mds, dated: 30.03.2016.

Copy of mining plan approval letter is enclosed as Annexure No.X.

Hence, this Review of Mining Plan along with Progressive Mine Closure Plan **[2020-21 to 2024-25]** is being prepared now & submitted under Rule 17(1) of MCR, 2016 and Rule 23 of MCDR, 2017.

3.2 Details of last modifications if any (for the previous approved period) of approved MP/SOM, indicating date of approval, reason for modification.

Not Applicable.

3.3 Give review of earlier approved proposal (if any) in respect of exploration, excavation, reclamation etc.

i. Exploration:

During the previous approved scheme period (2012-13 to 2015-16), three boreholes upto 17m depth was carried out by the lessee.

In the previous approved plan period [2015-16 (from 28.02.2016) to 2019-20] no exploration programme was proposed but the lessee has carried out two core drills (DCD1 to DCD2) of 18m depth in the year 2019, to find out the grade of limestone, lateral variations and vertical in homogenities of the limestone formation and depth persistence. At Present there are two existing pits and its dimension is given below.

Existing Pit Geometry:

Table-7

Pit No.	Length In Meter	Width In Meter	Depth In Meter	Area In Ha.	Dip°	Strike
1.	160 (max)	50 (avg)	14 (max)	0.89.6	$S40^0W$	$N30^0W– S30^0E$
2.	48 (max)	20 (max)	12 (max)			

With the datas analyzed from the drilled boreholes and existing pit, the deposit has been proved upto 17m depth with an average of 2m topsoil. The boreholes logging datas are furnished below.

Litho log of drilled boreholes carried out in the previous approved scheme period (2012-13 to 2015-16):

Table-8

No. of bore holes	Depth of boreholes (m)	Depth of deposition of Limestone	Strata
DBH-1	16.9	228.9m-214.8m	Mined out
		214.8m-212.0m	Limestone
DBH-2	17.0	229.0m-220.2m	Mined out
		220.2m-212.0m	Limestone
DBH-3	16.8	228.8m-216.7m	Mined out
		216.7m-212.0m	Limestone

Litho log of drilled core drills carried out in the previous approved scheme period [2015-16 (from 28.02.2016) to 2019-20] in the year 2019:

Table-8A

No. of core drills	Latitude	Longitude	Depth of core drills (m)	Depth of deposition of Limestone in (RL)	Strata
DCD 1	10^0 14' 33.86"N	78^0 17' 45.72"E	18.0	225.0m – 207.0m	Limestone
DCD 2	10^0 14' 34.34"N	78^0 17' 47.26"E	8.0	215.0m – 207.0m	Limestone

Copy of Form –I & J is enclosed as Annexure no.XII.

Locations of drilled boreholes and core drills are marked in the geological plan and sections and year wise plan and sections (Refer Plate No.IV & V-A).

The lessee with his consultant geological team thoroughly studied the area and demarcated the attitude of the band. It is inferred that the limestone is cement grade and in the form of band running from $N30^0W– S30^0E$ direction with dipping $S40^0W$.

Regular sampling and analysis during the past mining activities has revealed that the limestone mineral is of cement grade (the mineral was also analyzed in NABL laboratory as per the circular issued by the CCOM, Nagpur). The recovery of 60% was discussed in the previous approved plan period and the same 60% recovery was achieved by the lessee during the previous approved plan period.

Based on the latest core drill exploration programme has carried out by the lessee in the lease area for find out the grade of limestone, lateral variations and vertical in homogeneities of the limestone formation and depth persistence, the samples were collected from the latest core log for NABL laboratory for testing and analysis and to find out the chemical and physical properties of the limestone mineral. It is concluded that the grade of limestone is found to be of cement grade & Chemical Industrial grade and the recovery percentage of limestone mineral is 80% (i.e. 60% High Grade Limestone + 20% Low grade Limestone) and the bulk density is 2.6.

During the recent periods there is a huge demand for low grade limestone for cement industry and chemical industry. By the growth of technology and latest inventions of cement processing machineries it is now feasible to blend the low grade limestone to high grade limestone which can be used for cement industry, Hence the recovery percentage for the high grade mineral is 60% from the ROM, 20% recovery from the ROM is low grade mineral and remaining 20% recovery from the ROM is considered as Mineral Rejects is discussed during the present Review of Mining plan period.

The past mining experience gained by the lessee from the limestone mining is sufficient for calculating the mineral reserves and resources related to G1, F1, E1 Axis of United Nations Framework Classification Systems and to satisfy the latest circular No. 4/2009 dated 21.10.2009 issued by the CCOM, Nagpur.

The mine has reached maximum 14m depth and based on the existing pit and drilled core drills the depth of the mineralization has been proved upto 22m depth with an average of 2m topsoil in Centre & Eastern portion of the area and upto 17m depth with an average of 2m topsoil in the west and south western portion of the area. Hence, the reserves and resources are estimated as given below during the present plan period.

Table-9

Depth of estimation of the reserves and resources during the present Mining plan period [2020-21 to 2024-25]

22m [2m topsoil + 20m limestone (proved 111)]	Centre & East
22m [2m topsoil + 15m limestone (proved 111)] + 5m limestone (probable 222)]	West
17m [2m topsoil + 15m limestone (proved 111)]	Southwest

Besides, to confirm the characteristics features of limestone band, lateral variations and to find out the further depth persistence of the mineralization, three core drills (PCD1- PCD3) of 30m depth are proposed from the existing floor level @ 50m grid interval, for future exploration during the present plan period in the year 2020-21. Locations of the proposed core drills are marked in the geological plan and yearwise plan (Refer Plate Nos.IV & V-A).

ii. Mine development:

During the time of previous approved plan period [2015-16 (from 28.02.2016) to 2019-20], mining operation was proposed to be carried out in the western portion of the lease area in Northeast - Southwest direction, to a depth of about 17m. The mining operation was carried out in centre portion of the lease area. At present there are two existing pits and its dimension are Pit-I [160m (max) x 50m (avg) x 14m (d) (max)] and Pit-II [48m (max) x 20m (max) x 12m (d) (max)].

Handling of waste and ore & Places of working:

The wastes include mineral rejects and Topsoil. The mineral rejects is 40% of ROM which includes rock fragments, impurities etc. The mineral rejects are generated during the previous plan period was dumped in the western portion of the area. The generation of topsoil during the previous plan period was stored separately and was also utilized for afforestation purposes.

iii. Exploitation:

Proposed and actual production as per previous approved mining plan period [2015-16 (from 28.02.2016) to 2019-20]:

Table -10

	Proposal (Tonnes)			Actual (Tonnes)		
Year	Rom	Limestone (60%) Ts	Mineral Rejects (40%) Ts	ROM (Ts)	Limestone Ts	Mineral Rejects Ts
2015-16	8923	5354	3569	5483	3290	2193
2016-17	8518	5111	3407	5387	3232	2155
2017-18	8923	5354	3569	-	-	-
2018-19	8970	5382	3588	-	-	-
2019-20	7285	4371	2914	-	-	-
Total	**42619**	**25572**	**17048**	**10870**	**6522**	**4348**

The reason for deviation in production of ROM:

Production during the previous scheme period was lower than the anticipated; the reason was due to non availability of labours and Bottleneck of limestone market.

iv.Reserves estimated in the earlier approved mining plan [2015-16 (from 28.02.2016) to 2019-20] with grade.

During the previous approved mining plan period [2015-16 (from 28.02.2016) to 2019-20], the reserves were estimated upto 17.0m depth with an average of 2.0m topsoil.

The grade of the limestone is of cement grade. The bulk density of the mineral was taken as 2.6.

Table-11

Reserves estimated in the earlier approved mining plan period [2015-16 (from 28.02.2016) to 2019-20]

Description of reserves	ROM (tones)	Limestone (60%)Recovery (Ts)	Category	UNFC Code	Grade
Geological Resources (insitu)	336819	202091	Proved & Probable	111 & 221	Cement Grade Limestone
Mineable reserves	52759	31656	Proved	111	

Depletion of Reserves

The insitu reserve depleted during the previous approved plan period [2015-16 (from 28.02.2016) to 2019-20]:

Table –12

Year	ROM in Ts	Limestone in Ts
2015-16	5483	3290
2016-17	5387	3232
2017-18	-	-
2018-19	-	-
2019-20	-	-
Total	**10870**	**6522**

Total Mineable reserves as per the previous approved plan period [2015-16 (from 28.02.2016) to 2019-20] @ 60% recovery = 31,656 Ts

Reserves depleted during the previous approved plan period [2015-16 (from 28.02.2016) to 2019-20] @ 60% recovery = 6,522 Ts

The reason for deviation in production of ROM:

Production during the previous plan period was lower than the anticipated and the reason was due to non availability of labours and Bottleneck of limestone market.

v. Afforestation programme:

During the previous plan period, it was proposed to plant 15 neem saplings covering an area of 200 sq.m with 70% survival rate every year in the northern boundary barrier of the lease area. Afforestation was carried out and the survival rate of the plants was about 20%, due to poor rainfall.

Table-13

Year	Name of the Species	No. of trees Planned	Expected Survival Rate % & No.		Actual Survival Rate % & No.	
2015-16	Neem	15	70	11	26	4
2016-17	Neem	15	70	11	20	3
2017-18	Neem	15	70	11	20	3
2018-19	Neem	15	70	11	26	4
2019-20	Neem	15	70	11	20	3

vi. Reclamation & rehabilitation:

No reclamation and rehabilitation was proposed and hence neither reclamation nor rehabilitation was carried out during the previous approved plan period. The mineral rejects are generated during the previous plan period was dumped in the western portion of the area. The generation of topsoil during the previous plan period was stored separately and was also utilized for afforestation purposes.

vii. Control of dust & viii. Noise & ground vibrations:

The Atmospheric air in the area is quite fresh, the method of mining is by opencast manual method and the excavation is not made by the system of deep hole blasting along with heavy earth moving machinery. The shot hole with shallow depth is performed for hard strata in related to wind direction. Hence, the dust was minimal well within the prescribed limits.

3.4 Give status of compliance of violations pointed out by IBM

As per the lessee statement, no Violation was pointed by the IBM.

3.5 Indicate and give details of any suspension /closure/ prohibitory order issued by any Government agency under any rule or Court of law

No suspension /closure/ prohibitory order was issued by any Government agency under any rule or Court of law.

3.6 In case the MP/SOM is submitted under rules 9 and 10 of the MCDR'88 or under rule 22(6) of the MCR'1960 for approval of modification, specify reason and justification for modification under these rules.

No MP/SOM was submitted under rules 9 and 10 of the MCDR'88 or under rule 22(6) of the MCR'1960 for approval of modification.

PART – A

1.0 GEOLOGY AND EXPLORATION:

a) Briefly describe the topography, drainage pattern, vegetation, climate, rainfall data of the area applied/mining lease area.

The area is almost plain terrain. The general drainage pattern of the area is of sub-dendritic and dentritic pattern. Only seasonal cultivation is done. In some areas agriculture is done with lift irrigation. The main crops are groundnut, paddy etc. There is no thick vegetation. Water table is found at a depth of 40m during summer and 35m during rainy season. The area exhibits a tropical climate and the temperature goes upto 36^0C in summer and falls down to 25^0C in December – January. The wind direction is NE-SW and vice-versa. Average annual rainfall is about 930.54 mm.

b) Brief descriptions of Regional Geology with reference to location of lease/applied area.

The area comprises crystalline Archaean rocks of deep seated metamorphic origin which include mainly calc-gneiss, cordierite-sillimanite Gneiss, Biotite gneiss and granite gneiss. The gneisses appear to have resulted by migratizations of the pre existing sediments by intrusive of high grade metamorphism viz. High temperatures and pressures. In addition, younger intrusive such as granites, pegmatites and quartz veins are found within the limestone. The above said different types of metamorphosed rocks occur in the form of long, narrow, parallel bands which are traceable over a long distance. Limestone, band is noticed with prominent outcrops.

The area was surveyed in detail to prepare a Geological map in the scale of 1:1000 showing the various formations and attitude of the deposit. It is inferred that the Limestone mineral is of cement and chemical industrial grade and in form Band running $N30^0W$ – $S30^0E$ with dipping $S40^0W$. Reddish soil cover upto a depth in about 2.0m. Recovery of minerals is estimated as 80% (i.e. 60% High Grade Limestone + 20% Low grade Limestone) of the total excavation of the ore body. The recovery percentage is calculated based on the knowledge gained from the latest core drill datas and adjacent working mine in this region, by the field tests carried out in the lease area and analysis done in NABL Laboratories.

The general geological sequence of the limestone deposits is as follows:

Order of Super position:

AGE		ROCKFORMATION
Recent	-	Reddish Soil
Archaean	-	Crystalline Limestone
	-	Calc-gneiss.

The physical attitude of the limestone band is demarked as follows:

Strike length (m)	: 144
Width (m)	: 96
Depth (m) Proved	: 22 (max)
Strike direction	: $N30^0W$ – $S30^0E$
Dip amount and direction	: $S40^0W$.

The deposit is covered by 2.0m thickness of topsoil followed by 20m thickness of Limestone band.

c) Detailed description of geology of the lease area such as shape and size of the mineral/ore deposit, disposition various litho-units indicating structural features if any etc. (Applicable for Mining Plan for grant & renewal and not for Scheme of Mining/Modifications in the approved mining plan/scheme of Mining).

Not applicable.

d) (i) Name of prospecting /exploration agency

Name : M/s. Geo Exploration and Mining Solutions

(ii) Address : Old.No.260-B, New No: 17,
Advaitha Ashram Road, Alagapuram,
Salem – 636 004.

(iii) Email id & Phone No.:

Email id : geothangam@gmail.com, ifthiahmed@gmail.com
Tele Fax : 0427- 2431989 (Office)
Cell Phone Nos : 94433 56539 & 94422 78601

e) Details of prospecting/exploration already carried out :

(i) Number of pits and trenches indicating dimensions, spacing etc along and across the strike/foliation with reference to geological plan.

Nil.

(*ii). Number of boreholes indicating type (Core/RC/DTH), diameter, spacing, inclination, Collar level, depth etc with standard borehole logs duly marking on geological plan/sections.

Table-14

Year	Boreholes No	Type	Diameter	Spacing	inclination	Strike/foliation
2015	3 nos. of Boreholes (DBh1 to DBh-3)	DTH	110 mm	50m grid interval	Vertical	$N30^0W–S30^0E$
2019	2 nos. of Core drills (DCD1 to DCD-2)	Core	89 mm			

(iii). Details of samples analysis:

Grade of Limestone:

Samples were collected from the recent core drill log for NABL laboratory for testing and analysis and to find out the chemical and physical properties of the limestone mineral. It was concluded that the grade of limestone is found to be of cement grade and the recovery percentage of limestone mineral is 80% (i.e. 60% High Grade Limestone + 20% Low grade Limestone) and the bulk density is 2.6. The average analysis of the limestone from the lease area is given below.

Table – 15

LIMESTONE		Low grade limestone
Parameter	Composition %	Composition %
Calcium Oxides (CaO)	46.72	31.27
Magnesium Oxides (MgO)	1.23	3.74
Iron (Fe_2O_3)	0.18	0.32
Alumina as (Al_2O_3)	0.36	0.41
Silica (SiO_2)	7.25	26.21
Loss of Ignition (LOI)	44.23	36.15
Sodium di-oxide (Na_2O)	-	0.43
Potassium di-oxide (K_2O)	-	0.61

The quality of Limestone ranges between 46.0 to 48 of CaO, 7.5 to 8.5 of SiO_2 and 0.5 to 1.0% of Fe_2O_3. As analyzed by NABL laboratory, Limestone which has more than 70-85% of $CaCO_3$ is best suited for cement industries, the grade below 40% of $CaCO_3$ are now considered as low-grade mineral, the grade below 20% of $CaCO_3$ and contaminations with calc gneiss waste are considered as Mineral rejects in these particular formations. Chemical analysis report of the limestone and low grade limestone are enclosed as Annexure – V & VA.

The grade of the limestone is of cement and chemical industrial grade.

Nowadays both low and high grade limestone are used in cement industries by suitable blending.

(iv) Expenditure incurred in various prospecting operations.

Total expenditure incurred for the exploration already carried out during the scheme period is given below:

During the year: 2015

Table-16

Total length of the hole/pit shaft :	3 hole [upto 17m depth] - DTH drill DBh-1 – 16.9m DBh-2 – 17.0m DBh-3 – 16.8m **Total meterage – 50.7 m**
Total operating expenditure incurred :	DTH drills – Rs. 400/m. 50.7m x Rs. 400) = Rs.20,280/-

During the year: 2019

Table-16A

Total length of the hole/pit shaft :	Of 18 metres depth [2 Core Drills – of 18.0 metres (maximum)] from working pit level. DCD-1 –18.0m DCD-2 – 8.0m **Total meterage – 26.0m**
Total operating expenditure incurred :	Core drills – Rs. 1200/m (26 m x Rs. 1200) = Rs.31,200/-

f) The surface plan of the lease area may be prepared on a scale of 1: 1000 or 1: 2000 with contour interval of maximum of 10 m depending upon the topography and size of the area duly marked by grid lines showing all features indicated under Rule 32(1)(a) of MCDR 2017.

Please refer to the Surface Plan - Plate No. III.

g) For preparation of geological plan, surface plan prepared on a scale of 1: 1000 or 1: 2000 scale specified under para 1.0 (f) of Part A of the format may be taken as the base plan. The details of exploration already carried out along with supporting data for existence of mineral, locations proposed exploration, various litho units along with structural features, mineralized/ore zone with grade variation if any may be marked on the geological plan along with other features indicated under Rule 32 (1)(b) of MCDR 2017.

The mining lease area is a plain terrain and the mining operations were carried out for more than 3 decade.

The Geological plan and sections were prepared in 1:1000 scale considering all the geological parameters of the formation including the strike of the formation. This geological plan is based on the surface plan, which was prepared in 1:1000 scale with help of total station survey instrument and relevant software. Please refer to the surface plan and geological plan in Plate No. III & IV.

h) Geological sections may be prepared on natural scale of geological plan at suitable interval across the lease area from boundary to boundary.

The longitudinal and traverse section of the limestone is clearly marked in the geological plan and sections (Plate No.IV) and yearwise development and production plans (Plate Nos.V-A to V-E), the proposed production for the next five years **[2020-21 to 2024-25]** are also marked with dimensions and different colours for the easy understanding.

i) Broadly indicate the future programme of exploration with due justification(duly marking on Geological plan year wise location in different colours) taking into consideration the future tentative excavation programme planned in next five years:

To confirm the characteristics features of limestone band, lateral variations and to find out the further depth persistence of the mineralization, three core drills (PCD1-PCD3) of 30m depth are proposed from the existing floor level @ 50m grid interval, for future exploration during the present plan period in the year 2020-21.

Table-17

Year	No. of boreholes (core / RC/ DTH)	Grid Interval	Total meterage	No. of Pits dimensions and volume	No. of Trenches dimensions and volume
2020-21	Core drill	50m	Of each 30m depth (3 X 30m =90m	-	-

Locations of the proposed core drills are marked in the geological plan and yearwise plan (Refer Plate No.IV & V-A).

j) Reserves and Resources as per UNFC with respect to the threshold value notified by IBM may be furnished in a tabular form as given below: (Area explored under different level of exploration may be marked on the geological plan and UNFC code for area considered for different categories of reserve/resources estimation may also be marked on geological cross sections).

The grade of the limestone is of cement and chemical industrial grade.

Reassessed Mineral Reserves and Resources as per UNFC System as on 20.12.2019

Table-18

Summary of Reserves & Resources

Description	Section	ROM (Ts)	Limestone @ 60% recovery (Ts)	Low grade Limestone @20% (Ts)	Mineral Rejects @20% (Ts)	Top Soil (Ts)
A. Mineral Reserves (111)	X2Y2-CD	7774	4664	1555	1555	2496
	X3Y3-CD	35729	21438	7146	7146	80
	X4Y4-CD	30774	18464	6155	6155	-
	Total	**74277**	**44566**	**14855**	**14855**	**2576**
B. Mineral Resources (222)	X2Y2-CD	19175	-	-	-	-
C. Mineral Resources locked up in benches (221)		167716	100629	33543	33543	-
D. Mineral Resources locked in 7.5m safety barrier (221)		268697	161218	53739	53739	22432

Please refer Geological Plan & Sections - Plate No. IV.

k) Furnish detailed calculation of reserves/resources section wise (When the mine is fully mechanized and deposit is of complex nature with variation of size, shape of mineralized zones, grade due to intrusion within ore zone etc, an attempt may be made to estimate reserves/resources by slice plan method). In case of deposits where underground mining is proposed, reserve/resources may be estimated by level plan method, as applicable, as per the proposed mining parameters.

The 60% recovery of limestone was discussed in the previous approved plan period, but based on the latest core drill exploration programme has carried out by the lessee in the lease area for find out the grade of limestone, lateral variations and vertical in homogeneities of the limestone formation and depth persistence, the samples were collected from the latest core log for NABL laboratory for testing and analysis and to find out the chemical and physical properties of the limestone mineral. It is concluded that the grade of limestone is found to be of cement grade & Chemical Industrial grade and the recovery percentage of limestone mineral is 80% (i.e. 60% High Grade Limestone + 20% Low grade Limestone) and the bulk density is 2.6. Hence the same 80% recovery (i.e. 60% High Grade Limestone + 20% Low grade Limestone) is discussed during the present plan period.

Copy of Form–I & J is enclosed as Annexure No.XII and Copy of Chemical analysis report are enclosed as Annexure No. V & VA.

The estimation of mineral reserves is done by cross sections method. For Reserve calculation the length and width of the deposit is shown in the Geological plan & cross sections. (Please Ref. IV).

As analyzed by NABL laboratories limestone which has more than 60% $CaCO_3$ is best suited for cement industries, the grade below 40% of $CaCO_3$ is best suited for lime based industries, the grade below 20% of $CaCO_3$ with contaminations of calc gneiss waste are considered as mineral rejects in these particular formations. These mineral rejects does not have any commercial value and is considered as waste.

Table-19

Depth of estimation of the reserves and resources during the present Mining plan period [2020-21 to 2024-25]

22m [2m topsoil + 20m limestone (proved 111)]	Centre & East
22m [2m topsoil + 15m limestone (proved 111)] + 5m limestone (probable 222)]	West
17m [2m topsoil + 15m limestone (proved 111)]	Southwest

Besides, to confirm the characteristics features of limestone band, lateral variations and to find out the further depth persistence of the mineralization, three core drills (PCD1- PCD3) of 30m depth are proposed from the existing floor level @ 50m grid interval, for future exploration during the present plan period in the year 2020-21. Locations of the proposed core drills are marked in the geological plan and yearwise plan (Refer Plate Nos.IV & V-A).

Reassessed Mineral Reserves and Resources as per UNFC System as on 20.12.2019

Table-20

A. Mineral Reserves (111)

Section	Bench	Dimension				Bulk density	ROM (Ts)	Limestone @60% Recovery (Ts)	Low Grade Limestone @20% Recovery (Ts)	Mineral Rejects @20% (Ts)	Top Soil (Ts)
		L(m)	W(m)	D(m)	Volume (cum)						
X2Y2-CD	I	26	24	2	1248	2	-	-	-	-	2496
	II	23	19	2	874	2.6	2272	1363	454	454	-
	II	32	19	2	1216	2.6	3162	1897	632	632	-
	III	25	9	4	900	2.6	2340	1404	468	468	-
	Total						**7774**	**4664**	**1555**	**1555**	**2496**
X3Y3-CD	I	1	20	2	40	2	-	-	-	-	80
	II	49	22	2	2156	2.6	5606	3363	1121	1121	-
	II	49	45	2	4410	2.6	11466	6880	2293	2293	-
	III	29	46	4	5336	2.6	13874	8324	2775	2775	-
	IV	10	46	4	1840	2.6	4784	2870	957	957	-
	Total						**35729**	**21438**	**7146**	**7146**	**80**
X4Y4-CD	V	44	50	4	8800	2.6	22880	13728	4576	4576	-
	VI	23	33	4	3036	2.6	7894	4736	1579	1579	-
	Total						**30774**	**18464**	**6155**	**6155**	**-**
Grand Total							**74277**	**44566**	**14855**	**14855**	**2576**

Table-20A

B. Mineral Resources (222)

Section	Bench	Dimension			Volume (cum)	Bulk density	ROM (Ts)
		L (m)	W(m)	D(m)			
X2Y2-CD	V	59	25	1	1475	2.6	3835
	VI	59	25	4	5900	2.6	15340
	Total						**19175**

Table-21

C. Mineral Resources locked up in benches (221)

Section	Bench	Dimension			Volume (cum)	Bulk density	ROM (Ts)	Limestone @60% Recovery (Ts)	Low Grade Limestone @20% Recovery (Ts)	Mineral Rejects @20% (Ts)
		L (m)	W(m)	D(m)						
X1Y1-AB	II	6	9	4	216	2.6	562	337	112	112
	III	10	13	4	520	2.6	1352	811	270	270
	IV	12	17	2	408	2.6	1061	636	212	212
	IV	29	41	2	2378	2.6	6183	3710	1237	1237
	V	29	41	3	3567	2.6	9274	5565	1855	1855
	Total						**18431**	**11059**	**3686**	**3686**
X2Y2-CD	II	9	6	4	216	2.6	562	337	112	112
	III	21	16	4	1344	2.6	3494	2097	699	699
	IV	59	25	4	5900	2.6	15340	9204	3068	3068
	V	59	25	3	4425	2.6	11505	6903	2301	2301
	Total						**30901**	**18541**	**6180**	**6180**
X3Y3-CD	II	10	1	4	40	2.6	104	62	21	21
	III	36	1	4	144	2.6	374	225	75	75
	IV	55	1	4	220	2.6	572	343	114	114
	V	65	53	4	13780	2.6	35828	21497	7166	7166
	VI	65	53	4	13780	2.6	35828	21497	7166	7166
	Total						**72706**	**43624**	**14541**	**14541**

X4Y4-CD	II	15	4	4	240	2.6	624	374	125	125
	III	22	15	4	1320	2.6	3432	2059	686	686
	IV	26	17	4	1768	2.6	4597	2758	919	919
	V	40	26	4	4160	2.6	10816	6490	2163	2163
	VI	60	42	4	10080	2.6	26208	15725	5242	5242
	Total						**45677**	**27406**	**9135**	**9135**
Grand Total							**167716**	**100629**	**33543**	**33543**

Table-22

D. Mineral Resources locked in 7.5m safety barrier (221)

Area in S.qm	Depth in (m)	Volume (cum)	Bulk Density	ROM (Ts)	Limestone @ 60% recovery (Ts)	Low grade Limestone @20% (Ts)	Mineral Rejects @20% (Ts)	Top soil (Ts)
3845	2	7690	2	-	-	-	-	15380
3845	20	76900	2.6	199940	119964	39988	39988	-
1763	2	3526	2	-	-	-	-	7052
1763	15	26445	2.6	68757	41254	13751	13751	-
Total				**268697**	**161218**	**53739**	**53739**	**22432**

Table-23

Summary of Reserves & Resources

Description	Section	ROM (Ts)	Limestone @ 60% recovery (Ts)	Low grade Limestone @20% (Ts)	Mineral Rejects @20% (Ts)	Top Soil (Ts)
A. Mineral Reserves (111)	X2Y2-CD	7774	4664	1555	1555	2496
	X3Y3-CD	35729	21438	7146	7146	80
	X4Y4-CD	30774	18464	6155	6155	-
	Total	**74277**	**44566**	**14855**	**14855**	**2576**
B. Mineral Resources (222)	X2Y2-CD	19175	**-**	**-**	**-**	**-**
C. Mineral Resources locked up in benches (221)		167716	100629	33543	33543	**-**
D. Mineral Resources locked in 7.5m safety barrier (221)		268697	161218	53739	53739	22432

The Mineral reserves still available in this mine would be 74,277 tonnes from ROM, 44,566 tonnes of Limestone (60% from ROM) and 14,855 tonnes of Low grade Limestone (20% from ROM).

I) Mineral Reserves/Resources:

Mineral Resources: (Mineral resources may be estimated purely based on level of exploration, with reference to the threshold value of minerals declared by IBM)

Table-24

Level of exploration	Resources in Million tons	Grade
G1 – Detailed exploration	0.5107	Cement and Chemical industrial grade
G2 – General Exploration	0.0192	-
G3 – Prospecting	-	-
G4 – Reconnaissance	-	-

Table-25

	UNFC code	Quantity in million tons	Grade
A.Total Mineral Reserve			
Proved Mineral Reserve	111	0.0743	Cement and Chemical industrial grade
Probable Mineral Reserve	121and 122	-	-
B.Total Remaining Resources			
Feasibility mineral Resource	211	-	-
Prefeasibility mineral resource	221 and 222	0.4556	Cement and Chemical industrial grade
Measured mineral resource	331	-	-
Indicated mineral resource	332	-	-
Inferred mineral resource	333	-	-
Reconnaissance mineral resource	334	-	-
Total Reserves + Resources		**0.5299**	**Cement and Chemical industrial grade**

2.0 MINING

A. OPEN CAST MINING:

a). Briefly describe the existing as well as proposed method for excavation with all design parameters indicating on plans /sections.

Proposals was given to work under "B Category" in the previous approved Scheme period, but this present Review of Mining plan period is prepared under "A" category method by deploying machineries for development of benches to meet the demand in the market.

The method of mining is by open cast "A" Category method; excavator will be deployed for the formation of benches and loading. Excavator attached with rock breaker will be deployed for breaking and fragmentation to avoid blasting as the strata is medium hard in nature. Jackhammers with compressors will be deployed for drilling. Manual labours will be engaged for jackhammer drilling, sorting of waste and for loading the limestone into trucks, occasionally excavator will also be used. Blasting will be carried out occasionally with controlled initiation system.

Drilling and Blasting:

Drilling Source:-

Jack hammer operated by the compressed air from tractor mounted compressor or Portable compressors.

Drilling parameters:-

Burden 0.9m spacing 1.0m depth 1.65m

Charge pattern:-

Charge 0.4 to 0.6kgs per hole. Stemming is 1/3 and explosives 2/3.The stemming material is moisture clay/pyroxenite mixed waste.

Initiation System:-

Bottom initiation system with safety fuses and ordinary or /plain electric detonators.

No of blast hole:

Number of the hole required per day is 13, based on the above said parameters.

Powder factor:

Powder factor is reported as 6 tonnes per kg of explosives.

Explosive required:

As stated above, the ROM requirements are 44 tons/day, based on the past experience the Powder factor is 6 tonnes/kg of explosive inclusive of blasting.

Hence the daily requirement of explosives is 44/6 = 7.5 kg/day.

Secondary Blasting:

Secondary Blasting is not needed, since the primary blasting itself will take care of the required fragmentation of Waste rock and mineral body.

Storage of explosives:

No Portable magazine is available for storing explosives. Agreement is made with explosive authorized dealer for supply of explosives under Form-22 at mine site and blasting will be done by the qualified blaster. Hence question for storage of Explosives does not arise.

Explosive Van:

The authorised explosive supplier will bring our requirements of explosive in his approved van and take away the balance explosive after blasting if any.

Mining:

There are two existing pits and their dimension is pit-1 [160m (max) x 50m (avg) x 14m (d) (max)] and pit-2 [48m (max) x 20m x 12m (d) (max)].

One bench is proposed on the topsoil with 2.0m height and 2.0m width with 45° slope.

In mineral, five benches are proposed with 4.0m height & 6.0m width slope maintained as 60° from horizontal.

Footpaths and roads are suitably formed for easy movement of men and materials for manual workings.

During the present plan period [2020-21 to 2024-25], the mine working is proposed to be carried out in the centre portion of the mining lease area, in West - East direction, to a depth of about 18m from RL 229.0m to RL 211.0m. Please refer plate nos.V-A to V-E.

The lessee assures to carry out the detailed Exploration as per the UNFC Norms in the year 2020-21 itself. If the Resource & Reserves are enhanced considerably, a modified Mining plan will be prepared and submitted to IBM for subsequent clearance & approval.

The proposed average annual production ROM will be about 13,277 tonnes with 300 working days in a year.

The mineral rejects that would be generated during the previous approved plan period was dumped on the Western side the lease area, the same will be removed and proposed to be backfill in the old pit situated in the southwestern side of the lease area, where the area is very narrow for recovering the deposit in systematic operation.

The generation of mineral rejects during the present plan period is proposed to be backfill in the old pit situated in the southwestern side of the lease area.

The generation of topsoil during the present plan period is proposed to be utilized for Afforestation purposes and also the formation of earthen bund along the north and western boundary barrier of the lease area.

Afforestation is proposed in the 7.5m boundary barrier. Nearly 200sq.m/year is proposed for afforestation on the Eastern boundary barrier of the lease area.

The waste will be loaded manually into tippers and occasionally loaded by excavators for transporting it to the backfill area. Labors will be provided with mine helmet, safety shoes and respirator. During rainy seasons mine workings will be restricted in the top benches, the seepage water and rain water will be drained by 5HP portable pumps.

The working is planned in such a way that after complete exploitation of limestone, the excavation will be partially filled and partially allowed to collect rain water which will act as a temporary aquifer.

Haul roads will be conformed to statuary standards for smooth transport of mineral and waste.

The sequence of working proposed for next five years is indicated in Plate Nos. V-A to V-E. If there is any change in the system of mining, the same will be intimated to Indian Bureau of Mines and the mining plan will be suitably modified for subsequent clearance and approval.

The year wise production and development schedule proposed for the present plan period under (UNFC 111) is tabulated below.

Table-26

Proposed yearwise [2020-21 to 2024-25]

Year	Section	Bench	Topsoil in m^3					ROM Mineral					Production (Ts)		Mineral Rejects @ 20% (Ts)	Location of advancement	Ore to waste ratio
			L(m)	W(m)	H(m)	Volume (m^3)	Quantity (t)	L(m)	W(m)	H(m)	Volume (m^3)	Quantity (t)	Lime-stone @ 60% (Ts)	Low grade Lime-stone @ 20% (Ts)			
2020-21	X3Y3-CD	I	1	20	2	40	80	-	-	-	-	-	-	-	-		
		II	-	-	-	-	-	49	15	2	1470	3822	2293	764	764		1;0.25
		III	-	-	-	-	-	49	37	2	3626	9428	5657	1886	1886		
2021-22	X3Y3-CD	II	-	-	-	-	-	49	7	2	686	1784	1070	357	357		
		II	-	-	-	-	-	49	8	2	784	2038	1223	408	408		
		III	-	-	-	-	-	29	6	4	696	1810	1086	362	362		
	X2Y2-CD	I	26	24	2	1248	2496	-	-	-	-	-	-	-	-		1;0.25
		II	-	-	-	-	-	23	19	2	874	2272	1363	454	454		
		II	-	-	-	-	-	32	19	2	1216	3162	1897	632	632	West-East	
		III	-	-	-	-	-	25	9	4	900	2340	1404	468	468		
2022-23	X3Y3-CD	III	-	-	-	-	-	29	40	4	4640	12064	7238	2413	2413		
		IV	-	-	-	-	-	10	12	4	480	1248	749	250	250		1;0.25
2023-24	X3Y3-CD	IV	-	-	-	-	-	10	34	4	1360	3536	2122	707	707		
	X4Y4-CD	V	-	-	-	-	-	44	21	4	3696	9610	5766	1922	1922		1;0.25
2024-25	X4Y4-CD	V	-	-	-	-	-	44	29	4	5104	13270	7962	2654	2654		1;0.25
Total							**2576**					**66383**	**39830**	**13277**	**13277**		**1;0.25**

Note: Bulk density of Mineral -2.6, Topsoil-2.0, W-West, E-East

Table-27

Summary of Yearwise [2020-21 to 2024-25]

Year	ROM(Ts)	Limestone @ 60% (Ts)	Low grade Limestone @ 20% (Ts)	Mineral Rejects @ 20% (Ts)	Topsoil (Ts)	Ore waste ratio
2020-21	13250	7950	2650	2650	80	1;0.25
2021-22	13406	8043	2681	2681	2496	1;0.25
2022-23	13312	7987	2662	2662	-	1;0.25
2023-24	13146	7887	2629	2629	-	1;0.25
2024-25	13270	7962	2654	2654	-	1;0.25
Total	**66383**	**39830**	**13277**	**13277**	**2576**	**1;0.25**

b).Indicate year-wise tentative Excavation in Cubic Meters indicating development, ROM, pit wise as in table below.

I. Insitu Tentative Excavation

Table-28

Year	Pit No.	Total tentative excavation [cum]	Topsoil [cum]	OB/SB/IB [cum]	ROM			Total Waste (mineral reject @ 20%) (cum)	ROM / waste Ratio
					Limestone @ 60% Recovery (cum)	Low grade Limestone @ 20% Recovery (cum)	Mineral Reject @ 20% (cum)		
1	2	3	4	5	6	7	8	9	10
2020-21	1	5096	40	-	3058	1019	1019	1019	1;0.25
2021-22		5156	1248	-	3094	1031	1031	1031	1;0.25
2022-23		5120	-	-	3072	1024	1024	1024	1;0.25
2023-24		5056	-	-	3034	1011	1011	1011	1;0.25
2024-25		5104	-	-	3062	1021	1021	1021	1;0.25
Total		**25532**	**1288**	**-**	**15319**	**5106**	**5106**	**5106**	**1;0.25**

II. Dump re-handling (for the purpose of recovery of mineral):

Estimated available material (Cum)

Table-29

Dump Identification / No.	Yearwise handling of mineral reject (Cum)		Estimated recovery of saleable Material (Cum) 80% (limestone & Low grade limestone)	Reject (Cum) 20%
	Year	Cum		
Existing Mineral reject temporary dump 45m X 27m X 5m(h) (west)	2020-21	6075	Nil	Nil
			Removed and proposed to be backfill in the old pit situated in the southwestern side of the lease area	

The yearwise production proposals for the present plan period [2020-21 to 2024-25] are given in the western portion of the lease area where the Existing Mineral reject dump of dimension (45m x 27m x 5m (h) is situated. Hence, the dump will be removed and proposed to backfill in the old pit situated in the southwestern side of the lease area, where the area is very narrow for recovering the deposit in systematic operation and then the mineral will be removed. The yearwise proposal to rehandle the waste/mineral reject is given in table no.29.

c) Enclose Individual year wise development plans and sections showing pit layouts, dumps, stacks of mineral reject, if any, etc in case of 'A' category mines. Composite development plans showing pit layouts, dumps, stacks of mineral reject, if any, etc. and year wise sections in case of 'B' category mines.

Please refer Plate Nos.V-A to V-E.

d) Describe briefly giving salient features of the proposed method of working indicating Category of mine.

The method of mining is proposed by open cast "A" category method; excavator will be deployed for the formation of benches and loading. Excavator attached with rock breaker will be deployed for breaking and fragmentation to avoid blasting as the strata is medium hard in nature. Jackhammers with compressors will be deployed for drilling. Manual labours will be engaged for jackhammer drilling, sorting of waste and for loading the limestone into trucks, occasionally excavator will also be used. Blasting will be carried out occasionally with controlled initiation system.

Extent of mechanization

The mine will be worked by "A" category.

Drilling machines:

Labours will be engaged for jackhammer drilling, sorting of limestone and for loading the limestone into trucks. Blasting will be carried out occasionally when hard strata encounters.

Table – 30

Type	No of Jack Hammer	Dia. Of hole	Compressor Capacity	Make	Motive power	H.P
Tractor mounted compressor	2	32mm	140cfm	Atlas copco	Diesel	45
Portable Compressor	2	32 mm	250/150	Elga	Diesel	200

Excavation and Loading Equipment:

Excavator attached with rock breaker will be deployed for breaking and fragmentation to avoid blasting as the strata is medium hard in nature. Manual labours will be engaged with the help of spades and axes for removing the ROM and hand sorting and loading of Limestone is proposed to be carried out with the help of hydraulic excavators with 1.1 cbm capacity.

Table - 31

Type	Nos.	Bucket capacity in Cu.m	Make	Motive Power	H.P.
Excavator attached with Rock breaker	1	Rock breaker attachment	TATA Ex-210	Diesel	900
Excavator	2	1.1 cbm			

Haulage and transport equipment:

Limestone will be transported within the lease area through comet tippers of 10 tonnes capacity. Crossing platforms will be provided and other safety precautions will be observed as per statue.

a. Haulage within mining lease holds:

The tippers are used for loading the mineral from the working site to the temporary stock yard and then loaded by excavators to the tipper to destination.

Transport from pithead to destination:

The Limestone mineral will be transported from pithead to plant/sale points by hired trucks of 10/20 tonnes capacity.

Details of hauling/transport equipment:

Table – 31A

Type	Nos.	Size/Capacity	Make	Motive power	H.P.
Tipper-Taurus	2	10tonnes	Ashok Leyland	Diesel	90

Miscellaneous:

There is no other miscellaneous operation worth mentioning. Blasting will be carried out occasionally when hard strata encounters, development and loading will be carried out with the help of hydraulic excavators to the tippers, transportation of mineral from the pithead to destination will be carried out by hired trucks of 10/20 tons capacity.

e).Describe briefly the layout of mine workings, pit road layout, the layout of faces and sites for disposal of overburden/waste along with ground preparation prior to disposal of waste, reject etc. A reference to the plans and sections may be given. UPL or ultimate size of the pit is to be shown for identification of the suitable dumping site.

Layout of mine workings:

Since it is an active mine, land utilization proposed to be carried out for next five years and end of life of mine is given below:

Table-32

S.No	Description	Present Area (Ha)	Additional Area required during the present MP Period (Ha) [2020-21 to 2024-25]	Area at the end of life of Mine (Ha)
1.	Area under Mining	0.89.6	0.16.0	1.05.6
2.	Waste dump	0.12.1	Nil*	Nil*
3.	Earthen Bund	Nil	0.13.0	0.13.0
4.	Office & infrastructure	Nil	0.01.0	0.01.0
5.	Processing plant	-	-	-
6.	Mineral stack processing yard	-	-	-
7.	Sub grade mineral stacks	-	-	-
8.	Mine roads	0.02.0	Nil	0.02.0
9.	Areas under plantation	0.04.0	0.10.0	0.14.0
10.	Un utilized area	0.62.3	0.34.4	0.34.4
12.	Total	**1.70.0**		**1.70.0**

* Dump will be backfill

The area granted for mining lease is being used for mining, waste dumping, afforestation and other mining related purpose. Layout of mine workings, for next five years end of life of mine is shown in Plate No VI.

f) Conceptual Mine planning upto the end of lease period taking into consideration the present available reserves and resources describing the excavation, recovery of ROM, Disposal of waste, backfilling of voids, reclamation and rehabilitation showing on a plan with few relevant sections.

i). Excavation

Detailed exploration including geological mapping, geophysical prospecting, geochemical prospecting and technological prospecting and periodical sampling has been carried out by lessee and consulting Geological Team to establish the Mineral Reserves and resources under UNFC systems.

The mine has reached maximum 14m depth and based on the existing pit and drilled core drills the depth of the mineralization has been proved upto 22m depth with an average of 2m topsoil in Centre & Eastern portion of the area and upto 17m depth with an average of 2m topsoil in the west and south western portion of the area. Hence, the reserves and resources are estimated as given below during the present plan period.

Table-33

Depth of estimation of the reserves and resources during the present Mining plan period [2020-21 to 2024-25]

22m [2m topsoil + 20m limestone (proved 111)]	Centre & East
22m [2m topsoil + 15m limestone (proved 111)] + 5m limestone (probable 222)]	West
17m [2m topsoil + 15m limestone (proved 111)]	Southwest

Besides, to confirm the characteristics features of limestone band, lateral variations and to find out the further depth persistence of the mineralization, three core drills (PCD1- PCD3) of 30m depth are proposed from the existing floor level @ 50m grid interval, for future exploration during the present plan period in the year 2020-21. Locations of the proposed core drills are marked in the geological plan and yearwise plan (Refer Plate Nos.IV & V-A).

There are two existing pits and their dimension is pit-1 [160m (max) x 50m (avg) x 14m (d) (max)] and pit-2 [48m (max) x 20m x 12m (d) (max)].

One bench is proposed on the topsoil with 2.0m height and 2.0m width with 45° slope.

In mineral, five benches are proposed with 4.0m height & 6.0m width slope maintained as 60° from horizontal.

Footpaths and roads are suitably formed for easy movement of men and materials for manual workings.

During the present plan period [2020-21 to 2024-25], the mine working is proposed to be carried out in the centre portion of the mining lease area, in West - East direction, to a depth of about 18m from RL 229.0m to RL 211.0m. Please refer plate nos.V-A to V-E.

ii).Recovery of ROM

The mining lease area consists of 1.70.0Ha, after leaving 7.5m boundary barrier only 1.16.5 Ha could be mined. Out of this only 0.75.5 Ha is proposed for an optimum depth of maximum 18m from RL 229.0m to RL 211.0m has been taken into consideration for the utilization of the mineral in the present plan period, keeping in the view of mineral conservation, preservation and development. Anticipating the market demand this present quantity of exploitation is proposed during the present plan period.

Available mineral reserves ROM	
UNFC 111 (re-assessed on 20.12.2019)	= 74277 tonnes
Proposed annual production ROM	= 13277 tonnes
Anticipated life of the mine	= 74277 /13277
	= 5.6 years
No. of working days in a year	= 300 days
Average Monthly production	= 13277/ 12
	= 1106 tonnes
Anticipated Daily production	= 1106/25
	= 44 tonnes
No. of working hours per day	= 8.00 AM to 5.00 PM with 1 hour lunch interval
Total no. of labours to be engaged	= 10

$$\text{OMS} = \frac{\text{Daily production}}{\text{No. of workers}} = 44/10 = 4.4 \text{ tonnes}$$

Geological plans and sections:

The mining lease area is the part of crystalline formation of Sirugudi limestone mine. The area is almost a plain terrain. Geological plan and sections in the scale of 1:1000 was prepared based on the surface plan (which was carried out with help of total station survey 1:1000 scale) to attribute all the geological parameters. Please refer plate No. IV) for geological plan and sections.

The ultimate pit dimensions will be as under:

Table -34

Dimensions	Present size of pit		Size of pit after five years (end of present MP Period)		Ultimate Pit Dimension at the end of life of mine	
	Pit-1	Pit-2	Pit-1	Pit-2	Pit-1	Pit-2 *
Length (m)	160 (max)	48 (max)	160 (max)	48 (max)	160 (max)	48 (max)
Width (m)	50 (avg)	20 (max)	60 (avg)	20 (max)	60 (avg)	20 (max)
Depth (m)	14 (max)	12 (max)	18 (max)	12 (max)	22 (max)	12 (max)

* The pit will be backfilled. Please refer Plate No. IX.

iii).Disposal of waste

There is no sub grade mineral in the mine. The anticipated waste during the present plan period is about 13,277 tonnes (20% mineral rejects) and topsoil is about 2,576 Ts.

The mineral rejects that would be generated during the previous approved plan period was dumped on the Western side the lease area, the same will be removed and proposed to be backfill in the old pit situated in the southwestern side of the lease area, where the area is very narrow for recovering the deposit in systematic operation.

The generation of mineral rejects during the present plan period is proposed to be backfill in the old pit situated in the southwestern side of the lease area.

The generation of topsoil during the present plan period is proposed to be utilized for Afforestation purposes and also the formation of earthen bund along the north and western boundary barrier of the lease area.

This aspect has been considered and accordingly Conceptual Mining Plan is drawn.

Proposed generation of waste for next five years [2020-21 to 2024-25]

Table-35

Year	ROM(Ts)	Mineral Rejects @ 20% (Ts)	Topsoil (Ts)	Ore waste ratio
2020-21	13250	2650	80	1;0.25
2021-22	13406	2681	2496	1;0.25
2022-23	13312	2662	-	1;0.25
2023-24	13146	2629	-	1;0.25
2024-25	13270	2654	-	1;0.25
Total	**66383**	**13277**	**2576**	**1;0.25**

Dimension of the waste dumps during the end of present mining plan period:

Dimension of the dumps at the end of the year 2020-21

Table –36

Proposed backfilling (Existing & Proposed Mineral reject) in Pit-2	48m X 20m X 7.4m(h)	Southwest

Dimension of the dumps at the end of the year 2021-22

Table –36A

Proposed backfilling (Existing & Proposed Mineral reject) in Pit-2	48m X 20m X 8.5m(h)	Southwest
Proposed Earthen Bund	260Sqm X 5m (w) X 2m(h)	North & Western Boundary

Dimension of the dumps at the end of the year 2022-23

Table –36B

Proposed backfilling (Existing & Proposed Mineral reject) in Pit-2	48m X 20m X 9.5m(h)	Southwest
Proposed Earthen Bund	260Sqm X 5m (w) X 2m(h)	North & Western Boundary

Dimension of the dumps at the end of the year 2023-24

Table –36C

Proposed backfilling (Existing & Proposed Mineral reject) in Pit-2	48m X 20m X 10.5m(h)	Southwest
Proposed Earthen Bund	260Sqm X 5m (w) X 2m(h)	North & Western Boundary

Dimension of the dumps at the end of the year 2024-25

Table –36D

Proposed backfilling (Existing & Proposed Mineral reject) in Pit-2	48m X 20m X 11.5m(h)	Southwest
Proposed Earthen Bund	260Sqm X 5m (w) X 2m(h)	North & Western Boundary

The quantities of generation of wastes at the end of the mine life of the mine

Table – 37

Category	ROM (Ts)	Mineral Rejects @20% (Ts)	Topsoil (Ts)
Proved 111	74277	14855	2576

Dimension of dumps during the end of the life of the mine

Table -38

Proposed backfilling (Existing & Proposed Mineral reject) in Pit-2	48m X 20m X 12.3m(h)	Southwest
Proposed Earthen Bund	260Sqm X 5m (w) X 2m(h)	North & Western Boundary

The waste does not consists any toxic substance in the form of solid, liquid and gas.

iv).Backfilling of voids

The backfill is proposed in the southwestern portion of the lease area in this plan period, where the area is very narrow for recovering the deposit in systematic operation. The Proposed backfilling area is 48m X 20m X 11.5m (h).

v).Reclamation and rehabilitation

No reclamation and rehabilitation was proposed during the previous plan period. During the present plan period. Backfilling is proposed in Southwestern side of the lease area in this plan period.

After complete exploitation of the mineral upto economic limit, the mined out pit will be fenced and allowed to collect the rain water which will act as a temporary aquifer, this temporary storage of water will act as an artificial recharge pond which will enhance the near ground water level and the static level of the nearby wells at the end of the Mining lease period and also will be utilized for maintaining the afforestation all along the lease boundaries. The area will be reclamated for four seasons and then the rehabilitation process will be carried out. After, due approval from the IBM officers the land will be used for green belt development by planting suitable species.

B. UNDERGROUND MINING

Not applicable.

3. MINE DRAINAGE

a) Minimum and maximum depth of water table based on observations from nearby wells and water bodies

The area receives rains only during North-East monsoon. The average annual rainfall in and around this area is 930.54 mm. There would not be any serious problem due to inundation. The water table is found at a depth of 35m in rainy season and at 40m in summer. The depth of water table fluctuation is verified by observing the water levels in the above seasons in the nearby wells.

Since the water table is below 35m, the mining activity will not have any impact on drainage. However, in the rainy season, there may be seepage of water. To pump-out the seepage and rain water, a 5 HP Diesel Pump will be kept ready. This pump will be provided at the deepest level (sump) of the working face to collect the water. Suitable earthen bunds will be formed around the area to protect the entry of rain water from outside.

b) Indicate maximum and minimum depth of Workings.

The mine has reached maximum 14m depth. It is proposed to carry out the mining operations to a depth of about only 18m from RL 229.0m to RL 211.0m. The water table in this area is found at the depth of 35m during rainy seasons.

Depth of the mine at present (maximum) : 14m
Average Depth proposed during the plan period : 18m [from RL 229.0m to RL 211.0m]

c) Quantity and quality of water likely to be encountered, the pumping arrangements and places where the mine water is finally proposed to be discharged

The mining operation for the plan period is proposed to restrict well above the water table. Hence, the water is not likely to encounter during the course of mining operations. The water table is found at the depth of 35m in the rainy season and 40m in the summer. The water table fluctuation is verified by observing the water level in the nearby wells.

d) Describe regional and local drainage pattern. Also indicate annual rain fall, catchments area, and likely quantity of rain water to flow through the lease area, arrangement for arresting solid wash off etc.

The rain water flow towards catchment area is not flowing through the lease area as garland drains are made around the lease area. Hence, solid wash off will not occur.

4.0 STACKING OF MINERAL REJECT /SUB GRADE MATERIAL AND DISPOSAL OF WASTE

a) Indicate briefly the nature and quantity of top soil, overburden / waste and Mineral Reject to be disposed off.

(i) Nature and quality of Topsoil

The topsoil is red gravelly earth. It occurs to a depth of 2.0m. About 2,576 Ts of top soil that would be generated during the present plan period is proposed to be utilized for afforestation purposes and also the formation of earthen bund along the north and western boundary barrier of the lease area.

(ii) Nature of Overburden

Topsoil is the only overburden found in the lease area.

(iii) Mineral waste likely to be generated during the plan period:

There is no wasteful sub grade mineral in the mine. The anticipated waste during the present plan period is about 13,277 tonnes (20% mineral rejects) and topsoil is about 2,576 Ts.

The mineral rejects that would be generated during the previous approved plan period was dumped on the Western side the lease area, the same will be removed and proposed to be backfill in the old pit situated in the southwestern side of the lease area, where the area is very narrow for recovering the deposit in systematic operation.

The generation of mineral rejects during the present plan period is proposed to be backfill in the old pit situated in the southwestern side of the lease area.

The generation of topsoil during the present plan period is proposed to be utilized for Afforestation purposes and also the formation of earthen bund along the north and western boundary barrier of the lease area.

Table-39

Year	Topsoil (cum)		Mineral rejects (cum)			
	Reuse / spreading	Storage	Backfilling	Storage	Blending	Beneficial
2020-21	-	40	1019	-	-	-
2021-22	-	1248	1031	-	-	-
2022-23	-	-	1024	-	-	-
2023-24	-	-	1011	-	-	-
2024-25	-	-	1021	-	-	-
Total	**-**	**1288**	**5106**	-	**-**	**-**

(iv) Low grade Limestone likely to be generated during the plan period:

About 13,277 ts (i.e.@ 20% recovery from ROM) of low grade limestone that would be generated during the present plan period is being sold to the nearby cement and lime based industries.

b) The proposed dumping ground within the lease area be proved for presence or absence of mineral and be outside the UPL unless simultaneous backfilling is proposed or purely temporary dumping for a short period is proposed in mineralized area with technical constraints & justification.

The yearwise production proposals for the present plan period [2020-21 to 2024-25] are given in the western portion of the lease area where the Existing Mineral reject dump of dimension (45m x 27m x 5m (h) is situated. Hence, the dump will be removed and shifted to backfill in the old pit situated in the southwestern side of the lease area and then the mineral will be removed.

c) Attach a note indicating the manner of disposal of waste, configuration and sequence of year wise build up of dumps along with the proposals for protective measures.

The waste generated during the present plan period will be loaded manually into tippers and occasionally loaded by excavators for transporting it to the backfill area. The slope of the dump is always maintained below 30°. Proper haul roads and slopes are maintained in the dump for the transportation of vehicles. The proposed year wise dumps are marked in the year wise development production plan plate Nos. V-A to V-E.

5.0 USE OF MINERAL AND MINERAL REJECT

a).Describe briefly the requirement of end-use industry specifically in terms of physical and chemical composition.

The mined out mineral is used for its own captive plant in the name of M/s. Air Mineral Enterprises which is located in Sirugudi, 3.0kms from mining lease area for grinding the mineral in different mesh size ranging from 80 mesh to fine mesh i.e upto 10 microns and supplied to paints, rubber, PVC Compounding, fertilizer, feed industries and Coffee and tea plantations and also sold to the nearby cement and lime based industries which are located within a radius of 35Km from the mine site.

Cost of production of mineral

The viability may vary, since the market of Limestone depends upon the grade and requirement of cement, which are governed the market demand. The economically viability at present market conditions tabulated below:

Table – 40

S.No.	Particulars	Cost of production Per ton
1.	Labour charges	Rs.65
2.	Royalty paid to Mines & Geology	Rs.80
3.	National Mineral Exploration Trust	Rs.2
4.	District Mineral Foundation (DMF)	Rs.24
5.	Excavation expenses	Rs.25
6.	Drilling & Blasting expenses	Rs. 20
7.	Transport from mine head to Stockyard (loading & unloading)	Rs.60
	Total	**Rs.276**
8.	Miscellaneous and over heads	Rs.24
	Total	**Rs.300**
9.	**Sale value of the Limestone for commercial cement and chemical industrial grade**	**Rs. 400**

The cost of production is Rs. 300/ton and selling prize for cement and chemical industrial grade is Rs.400/ton. Hence, the mining is economically viable at present market conditions.

b).Give brief requirement of intermediate industries involved in upgradation of mineral before its end-use.

No up gradation is done.

c).Give detail requirements for other industries, captive consumption, export, associated industrial use etc.

It is not exported to any foreign countries. The mined out mineral is used for its own captive plant in the name of M/s. Air Mineral Enterprises which is located in Sirugudi, 3.0kms from mining lease area for grinding the mineral in different mesh size ranging from 80 mesh to fine mesh i.e upto 10 microns and supplied to paints, rubber, PVC Compounding, fertilizer, feed industries and Coffee and tea plantations and also sold to the nearby cement and lime based industries which are located within a radius of 35Km from the mine site.

d).Indicate precise physical and chemical specification stipulated by buyers

Chemical specifications:

CaO : 40 to 50%
MgO : 4.0 to 4.5%

Physical specification:

Colour : Creamy White
Size : 100 mesh

e).Give details of processes adopted to upgrade the ROM to suit the user requirements.

No up gradation is done.

6.0 PROCESSING OF ROM AND MINERAL REJECT

Except hand sorting, no other method is proposed for beneficiation. Hence, this chapter is not applicable.

7.0 OTHER

Describe briefly the following:

a).Site services :

Infrastructure facilities in the form of office, storeroom, first aid room, restroom, toilet etc. are proposed to be constructed in temporary semi permanent structure within the lease area. Please refer Plate No. VI.

b) Employment potential:

The details of employment are given below.

Mining is carried out by opencast method. 300 days in a year are assumed as effective working days.

Table -41

Present Employment position		**Additional requirements during the MP period**
Mining Engineer	-	1
Geologist	-	1
Skilled labour		-
Foreman	1	-
Mate cum Blaster	1	-
Mines Office Clerk(full time)	1	-
Supervisor	1	-
Semi-Skilled		
Driver	1	-
Un skilled Labour	5	-
Total	**10**	**2**

The proposed output per man shift:

Table-42

Average ROM Production expected per year for the next five years		13,277 Ts	
No. of days likely to be worked		300 days	
Average ROM production per day under UNFC 111 for insitu deposit		44 Ts	
OMS =	Daily Production	44	=4.4 Ts
	No. of Workers	10	

8.0 PROGRESSIVE MINE CLOSURE PLAN UNDER RULE 23 OF MCDR'2017

8.1 Environment Base line information: Attach a note on the status of baseline information with regard to the following.

i) Existing Land Use Pattern

The lease area is an existing mine. The land use pattern in and around the mine have no adverse effect in the environment changes. Excavator will be deployed for the formation of benches and loading. Excavator attached with rock breaker will be deployed for breaking and fragmentation to avoid blasting as the strata is medium hard in nature.Jackhammers with compressors will be deployed for drilling. Manual labours will be engaged for jackhammer drilling, sorting of waste and for loading the limestone into trucks, occasionally excavator will also be used. Blasting is carried out occasionally with controlled initiation system. An Environment Management Plan will be prepared if required.

The present land use pattern is as under:

Table -43

S.No	Description	Present Area (Ha)
1	Mining (Quarry)	0.89.6
2.	Waste dump	0.12.1
3.	Office & infrastructure	Nil
4.	Earthen Bund	-
5.	Processing plant	-
6.	Mineral stack processing yard	-
7.	Sub grade mineral stacks	-
8.	Mine roads	0.02.0
9.	Areas under plantation	0.04.0
10.	Un utilized area	0.62.3
11.	Total	**1.70.0**

ii).Water Regime

The water table is found at 35m in rainy season and 40m in dry season the area receives rainfall during north-east monsoon, the average being 930.54mm. Tanks are situated on the North, West & southern side of the lease area within 500m radius. There is no other Nullah, lake, reservoir or river nearby. The water is found to be potable and good for drinking it is available in the nearby community wells. Water samples are collected and analyzed as per statutory norms of IBM.

iii).Air Quality

The Atmospheric air in the area is quite fresh; the mining operation is carried out with opencast method. Excavator attached with rock breaker will be deployed for breaking and fragmentation to avoid blasting as the strata is medium hard in nature, axes and crow bars are used for picking fragmentation of limestone and the collection of the mineral stacked to temporary stockyard and carried out by hand shovel, pick-axes and cane baskets. Hence, the change in air quality will be minimal well within the prescribed limits.

The generation of the dust will be suppressed by means of water sprinkler then and there by mechanical means. The generation of dust during the course of drilling is suppressed at source by means of wet drilling or dust extractors.

The periodical environmental monitoring test is proposed to carry out by accredited laboratories as per the guidelines issued by the IBM.

iv).Noise Level & Vibration Levels (Due To Blasting)

The mining operation does not produce any adverse environmental impacts. Excavator attached with rock breaker will be deployed for breaking and fragmentation to avoid blasting as the strata is medium hard in nature, manual labours will be engaged for sorting and for loading the limestone into trucks, occasionally excavator will also be used.

The mining operations involve with minimum shot hole drilling, having 1.5 meter depth, and controlled blasting technique will be adopted with class 2 slurry explosives. Hence, the noise & vibration is minimal, below the norms as prescribed in the MMR, 1961 and their amendments. The operational area lies away from the human settlement. No ground vibration noticed in and around the lease area during the course of mining operations.

v) Flora and Fauna:

The lease area is an existing mine. Only mining activity is being carried out in and around the area. In some areas agriculture is done with lift irrigation. The main crops being ground nut, paddy etc. are grown as seasonal crops. There is no Forest or Animal Sanctuaries near the area.

vi) Climatic Conditions

The area exhibits a subtropical climate and the temperature that goes upto 36^0C in summer and falls down to 25^0C in December – January. The wind direction is NE-SW and vice-versa.

vii) Human Settlement

Basic amenities and local administrative office are found in Sirugudi village which is about 3.0kms NE from the lease area. The villages depend upon seasonal vegetation and most of the people are employed. The details regarding nearest hamlets and their population along with distance and direction from the lease area is furnished below:

Table - 44

S.NO	Name of Hamlets	Distance in Km	Approx. Population	Direction
1	Sirugudi	3.0	9550	Northeast
2	Samudrapatty	3.0	3980	Southeast
3	Uralipatti	4.5	3900	Southwest
4	Avichchipatti	3.5	2380	West

viii) Public Building, Places of worship and Monuments:

There are no Public Buildings or Places or National Monuments near the area.

ix). Indicate any sanctuary is located in the vicinity of leasehold

There are no sanctuaries near the area.

8.2 Impact Assessment: Attach an Environmental Impact Assessment Statement describing the impact of mining and beneficiation on environment on the following:

i) Land area indicating the area likely to be degraded due to quarrying, dumping, roads, workshop, processing plant, tailing pond/dam, township etc.

The present and post mining land use pattern is as under

Table-45

S.No	Description	Present Area (Ha)	Additional Area required during the present MP Period (Ha) [2020-21 to 2024-25]	Area at the end of life of Mine (Ha)
1.	Area under Mining	0.89.6	0.16.0	1.05.6
2.	Waste dump	0.12.1	Nil*	Nil*
3.	Earthen Bund	Nil	0.13.0	0.13.0
4.	Office & infrastructure	Nil	0.01.0	0.01.0
5.	Processing plant	-	-	-
6.	Mineral stack processing yard	-	-	-
7.	Sub grade mineral stacks	-	-	-
8.	Mine roads	0.02.0	Nil	0.02.0
9.	Areas under plantation	0.04.0	0.10.0	0.14.0
10.	Un utilized area	0.62.3	0.34.4	0.34.4
12.	Total	**1.70.0**		**1.70.0**

* Dump will be backfilled

ii) Air quality

The Atmospheric air in the area is quite fresh; the mining operation is carried out with opencast method. Excavator attached with rock breaker will be deployed for breaking and fragmentation to avoid blasting as the strata is medium hard in nature, axes and crow bars are used for picking fragmentation of limestone and the collection of the mineral stacked to temporary stockyard and carried out by hand shovel, pick-axes and cane baskets. Hence, the change in air quality will be minimal well within the prescribed limits.

The generation of the dust will be suppressed by means of water sprinkler then and there by mechanical means. The generation of dust during the course of drilling is suppressed at source by means of wet drilling or dust extractors. The periodical environmental monitoring test is proposed to carry out by accredited laboratories as per the guidelines issued by the IBM.

iii) Water quality

There will be no toxic effluent generated due to mining operation in the form of solid liquid or gas. The water will not be contaminated by the limestone mining by any means. Since the limestone occurrence is below 1.0m depth and there will be no problem to the ground water. The mine waste will not produce any toxic effluent. However, minor pollutant may occur during mining operation and it will be within the permissible limits. Periodically water samples will be collected and analyzed as per statutory norms of IBM.

iv) & v). Noise Level & Vibration Levels (Due To Blasting)

The mining operation does not produce any adverse environmental impacts. Excavators are deployed for the formation of benches and loading. Excavator attached with rock breaker will be deployed for fragmentation to avoid secondary blasting as the strata are medium hard in nature. Jackhammers with compressors are deployed for drilling. Manual labours are engaged for jackhammer drilling, sorting of waste and for loading the limestone into trucks.

Blasting is carried out occasionally with controlled initiation system. Hence, the noise & vibration is minimal, below the norms as prescribed in the MMR, 1961 and their amendments. The operational area lies away from the human settlement. Besides, noise and ground vibration monitoring will be carried out as per the statutory standards.

vi) Water regime

The water table is found at 35m in rainy season and 40m in dry season the area receives rainfall during north-east monsoon, the average being 930.54mm. Tanks are situated on the North, West & southern side of the lease area within 500m radius. There is no other Nullah, lake, reservoir or river nearby. The water is found to be potable and good for drinking it is available in the nearby community wells.

vii) Acid mine drainage

Does not arise.

viii) Surface subsidence

Not Applicable.

vii) Socio-economics

The mining operation will create awareness for the importance of minerals and of their value in the market. It will create an urge to search and prospect for the same or different minerals in the other areas. Mining, whether it is small or big is an avenue of employment. It will improve the standard of living and will change the life style of village habitants.

viii) Historical monuments etc.

There are no places of historical monuments near the area.

8.3 Progressive reclamation Plan:

8.3.1. Mined-Out Land:

a) Area covered by existing pit : 0.89.6Ha

b) Additional Area covered in next five years of Mining plan period : 0.16.0Ha

During the end of the life of the mine, when the mine reaches its ultimate pit limit, the pit will be partially backfilled and partially act as a good storage for water. The spring water and seepage water will prove to be a viable source for water supply to agriculture lands nearby.

Along the permanent roads and vacant places, afforestation is being carried out at present. Before closure of the mine, a parapet wall will be constructed to prevent inadvertent entry of cattle and human beings.

The dumps will be vegetated to prevent slitting and always maintained at 45-degree slope. After closure of the mine, the pit will be allowed to collect seepage and rainwater which will help to charge the nearby agricultural wells.

Reclamation:

No reclamation and rehabilitation was proposed during the previous plan period. During the present plan period backfilling is proposed in the southwestern portion of the lease area in this plan period, where the area is very narrow for recovering the deposit in systematic operation.

A watchman (Security guard) will be posted around the clock to prevent inherent entry of public and cattle which are growing in and around the area.

The accumulated/stagnated water will be pumped out by means of temporary electric source with 5 hp motor and the water will be utilized for afforestation program.

Table-46

Area proposed for reclamation during the end of present plan period [2020-21 to 2024-25]	Area to be reclaimed at the end of life of mine
Nil	1.05.6 Ha

Please refer to the mine layout and afforestation plan (Plate No. VI & VIII).

8.3.2 Topsoil Management:

The topsoil is red gravelly earth. It occurs to a depth of 2.0m. About 2,576 Ts of top soil that would be generated during the present plan period is proposed to be utilized for afforestation purposes and also the formation of earthen bund along the north and western boundary barrier of the lease area.

8.3.3 Tailings Dam Management:

There is no proposal of tailing dam in the mine. The mining operation is carried out by opencast mining with 4m bench height with 6m bench width, the mining operation for the proposed mining plan period is restricted to a depth of about 18m from RL 229.0m to RL 211.0m, the water table in the area is around 35m – 40m. Hence, the question of tailing dam management does arise.

8.3.4 Acid mine drainage, if any and its mitigative measures.

Does not arise.

8.3.5 Surface subsidence mitigation measures through backfilling of mine voids or by any other means and its monitoring mechanism.

The information on protective measures for reclamation and rehabilitation works during the period [2020-21].

Summary of Yearwise Proposal

Table-47

Items	Details	Proposed	Actual	Remarks
Dump Management	Area afforested (ha)	The backfilling is proposed in Southwestern portion the lease area during the present plan period. The proposed backfilling area is 48m X 20m X 7.4m (h). Once the complete backfilled area is reached its original level, reclamation and rehabilitation will be done.		
	No of saplings planted			
	Cumulative no of plants			
	Cost including watch and care during the year			
Management of worked out benches	Area available for rehabilitation (ha)			
	Afforestation done(ha)			
	No of saplings planted in the year			
	Cumulative no of plants			
	Any other method of rehabilitation (specify)			
	Cost including watch and care during the year			
Reclamation and Rehabili-tation by backfilling	Void available for Backfilling (L x B x D) pit wise /stope wise			
	Void filled by waste /tailings			
	Afforestaion on the backfilled area			
	Rehabilitation by making water reservoir			
	Any other means (specify)			
Rehabili-tation of waste land within lease	Area available (ha)			
	Area rehabilitated			
	Method of rehabilitation	Afforestation (Green land building) 200 sq.m-20neem saplings	Will be Carried out as per proposal	Afforestation cost including maintenance Rs.2000/-
Others (specify)	-	-	-	-

Environmental monitoring (core zone & buffer zone)

Table-48

Air quality (Rs. / sample)	Water quality (Rs. / sample)	Noise (Rs. / area)	Ground vibration (Rs. / area)
1500	850	900	750

The information on protective measures for reclamation and rehabilitation works during the period [2021-22].

Summary of Yearwise Proposal

Table-49

Items	Details	Proposed	Actual	Remarks
Dump Management	Area afforested (ha)	The backfilling is proposed in Southwestern portion the lease area during the present plan period. The proposed backfilling area is 48m X 20m X 1.1m (h). Once the complete backfilled area is reached its original level, reclamation and rehabilitation will be done.		
	No of saplings planted			
	Cumulative no of plants			
	Cost including watch and care during the year			
Management of worked out benches	Area available for rehabilitation (ha)			
	Afforestation done(ha)			
	No of saplings planted in the year			
	Cumulative no of plants			
	Any other method of rehabilitation (specify)			
	Cost including watch and care during the year			
Reclamation and Rehabili-tation by backfilling	Void available for Backfilling (L x B x D) pit wise /stope wise			
	Void filled by waste /tailings			
	Afforestaion on the backfilled area			
	Rehabilitation by making water reservoir			
	Any other means (specify)			
Rehabili-tation of waste land within lease	Area available (ha)			
	Area rehabilitated			
	Method of rehabilitation	Afforestation (Green land building) 200 sq.m-20neem saplings	Will be Carried out as per proposal	Afforestation cost including maintenance Rs.2000/-
Others (specify)	-	-	-	-

Environmental monitoring (core zone & buffer zone)

Table-50

Air quality (Rs. / sample)	Water quality (Rs. / sample)	Noise (Rs. / area)	Ground vibration (Rs. / area)
1500	850	900	750

The information on protective measures for reclamation and rehabilitation works during the period [2022-23].

Summary of Yearwise Proposal

Table-51

<table>
<tr><th>Items</th><th>Details</th><th>Proposed</th><th>Actual</th><th>Remarks</th></tr>
<tr><td rowspan="4">Dump Management</td><td>Area afforested (ha)</td><td rowspan="15" colspan="3">The backfilling is proposed in Southwestern portion the lease area during the present plan period. The proposed backfilling area is 48m X 20m X 1.0m (h).
Once the complete backfilled area is reached its original level, reclamation and rehabilitation will be done.</td></tr>
<tr><td>No of saplings planted</td></tr>
<tr><td>Cumulative no of plants</td></tr>
<tr><td>Cost including watch and care during the year</td></tr>
<tr><td rowspan="6">Management of worked out benches</td><td>Area available for rehabilitation (ha)</td></tr>
<tr><td>Afforestation done(ha)</td></tr>
<tr><td>No of saplings planted in the year</td></tr>
<tr><td>Cumulative no of plants</td></tr>
<tr><td>Any other method of rehabilitation (specify)</td></tr>
<tr><td>Cost including watch and care during the year</td></tr>
<tr><td rowspan="6">Reclamation and Rehabili-tation by backfilling</td><td>Void available for Backfilling (L x B x D) pit wise /stope wise</td></tr>
<tr><td>Void filled by waste /tailings</td></tr>
<tr><td>Afforestaion on the backfilled area</td></tr>
<tr><td>Rehabilitation by making water reservoir</td></tr>
<tr><td>Any other means (specify)</td></tr>
<tr><td rowspan="3">Rehabili-tation of waste land within lease</td><td>Area available (ha)</td></tr>
<tr><td>Area rehabilitated</td></tr>
<tr><td>Method of rehabilitation</td><td>Afforestation (Green land building) 200 sq.m-20neem saplings</td><td>Will be Carried out as per proposal</td><td>Afforestation cost including maintenance Rs.2000/-</td></tr>
<tr><td>Others (specify)</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
</table>

Environmental monitoring (core zone & buffer zone)

Table-52

Air quality (Rs. / sample)	Water quality (Rs. / sample)	Noise (Rs. / area)	Ground vibration (Rs. / area)
1500	850	900	750

The information on protective measures for reclamation and rehabilitation works during the period [2023-24].

Summary of Yearwise Proposal

Table-53

Items	Details	Proposed	Actual	Remarks
Dump Management	Area afforested (ha)	The backfilling is proposed in Southwestern portion the lease area during the present plan period. The proposed backfilling area is 48m X 20m X 1.0m (h). Once the complete backfilled area is reached its original level, reclamation and rehabilitation will be done.		
	No of saplings planted			
	Cumulative no of plants			
	Cost including watch and care during the year			
Management of worked out benches	Area available for rehabilitation (ha)			
	Afforestation done(ha)			
	No of saplings planted in the year			
	Cumulative no of plants			
	Any other method of rehabilitation (specify)			
	Cost including watch and care during the year			
Reclamation and Rehabili-tation by backfilling	Void available for Backfilling (L x B x D) pit wise /stope wise			
	Void filled by waste /tailings			
	Afforestaion on the backfilled area			
	Rehabilitation by making water reservoir			
	Any other means (specify)			
Rehabili-tation of waste land within lease	Area available (ha)			
	Area rehabilitated			
	Method of rehabilitation	Afforestation (Green land building) 200 sq.m-20neem saplings	Will be Carried out as per proposal	Afforestation cost including maintenance Rs.2000/-
Others (specify)	-	-	-	-

Environmental monitoring (core zone & buffer zone)

Table-54

Air quality (Rs. / sample)	Water quality (Rs. / sample)	Noise (Rs. / area)	Ground vibration (Rs. / area)
1500	850	900	750

The information on protective measures for reclamation and rehabilitation works during the period [2024-25].

Summary of Yearwise Proposal

Table-55

Items	Details	Proposed	Actual	Remarks
Dump Management	Area afforested (ha)	The backfilling is proposed in Southwestern portion the lease area during the present plan period. The proposed backfilling area is 48m X 20m X 1.0m (h). Once the complete backfilled area is reached its original level, reclamation and rehabilitation will be done.		
	No of saplings planted			
	Cumulative no of plants			
	Cost including watch and care during the year			
Management of worked out benches	Area available for rehabilitation (ha)			
	Afforestation done(ha)			
	No of saplings planted in the year			
	Cumulative no of plants			
	Any other method of rehabilitation (specify)			
	Cost including watch and care during the year			
Reclamation and Rehabili-tation by backfilling	Void available for Backfilling (L x B x D) pit wise /stope wise			
	Void filled by waste /tailings			
	Afforestaion on the backfilled area			
	Rehabilitation by making water reservoir			
	Any other means (specify)			
Rehabili-tation of waste land within lease	Area available (ha)			
	Area rehabilitated			
	Method of rehabilitation	Afforestation (Green land building) 200 sq.m-20neem saplings	Will be Carried out as per proposal	Afforestation cost including maintenance Rs.2000/-
Others (specify)	-	-	-	-

Environmental monitoring (core zone & buffer zone)

Table-56

Air quality (Rs. / sample)	Water quality (Rs. / sample)	Noise (Rs. / area)	Ground vibration (Rs. / area)
1500	850	900	750

Summary of information on target and achievement proposals as per Rule 23(E)2 made of protective measures undertaken for environmental protection during the period [*2020-21 to 2024-25*]

Table-57

ITEMS		DETAILS		AREA (Ha)	QUANTITY	EXPENDITURE (Rs.)
				Proposal	Proposal	Proposal
A)	Reclamation & Rehabilitation of mined out area	The backfilling is proposed in Southwestern portion the lease area during the present plan period. The proposed backfilling area is 48m X 20m X 11.5m (h). Once the complete backfilled area is reached its original level, reclamation and rehabilitation will be done.				
B)	Stabilisation & Rehabilitation of dumps	There is no proposal for Stabilisation & Rehabilitation of dumps				
C)	Rehabilitation of barren area within lease	i)	Afforestation (Green land building on boundary barrier)	1200 Sq.m	100 saplings	Rs.10000/-
		ii)	Others - watchman	Nil		

Table-58

Air quality (Rs. / sample)	Water quality (Rs. / sample)	Noise (Rs. / area)	Ground vibration (Rs. / area)
7500 x 2 (Core+ buffer zone)	4250 x 2 (Core+ buffer zone)	4500 x 2 (Core+ buffer zone)	3750 x 2 (Core+ buffer zone)

Budget Provision for the present plan period

Afforestation cost	=	Rs. 10000/-
Air Quality Sampling	=	Rs. 15000/-
Water Quality Sampling	=	Rs. 8500/-
Noise Monitoring	=	Rs. 9000/-
Ground vibration test	=	Rs. 7500/-
Total Cost	=	Rs. 48000/-

a. Disaster Management and Risk Assessment:

Disaster might occur only due to natural climates' like earth quake, excessive rains and flooding etc. To overcome such risks, help/aid would be sought from emergency services providers like Police station, fire station, Hospital, Ambulance services from the authorities in the vicinity of the mine site. Their contact telephone numbers and communication facilities are provided and displayed on the board at the mine office as well as mine site. Responsibility of coordinating rescue activities is entrusted to Mine-in- charge at the Mine site in addition to Mine-in-charge is also looking after statutory obligatory under Mines Act,1952.

Thiru. S.Ilangovan, B.E., Managing Partner of M/s. Sivam Mines., is in charge for disaster management and monitors all activities related to disaster management/risk assessment in case of any such situations.

The name and postal address of the person in charge for disaster management is as under.

Name	:	M/s. Sivam Mines., (Thiru. S.Ilangovan, B.E., Managing Partner)
Address	:	6/209, Main Road, Sirugudi Post, Natham (Tk), Dindigul District.
State	:	Tamilnadu.
Cell No.	:	94430 67632

Copy of ID proof is enclosed as annexure – VII.

8.5 Care and maintenance during temporary discontinuance:

In case, of any temporary closure or discontinuous of mining operations, the following steps are proposed.

a. Notice to be served to all concerned authority.
b. The mining pit area shall be covered by temporary fencing.
c. Watchman will be posted round the clock to prevent any unauthorized or inadvertent entry of public.
d. Works on stabilization of dumps to provided vegetal cover would be taken up.
e. Construction of garland or retaining walls around the dumps will be attempted.
f. Watering of plants in the afforested area will be considered.
g. All safety precautions shall be taken care off as per rule.

8.6 Financial Assurance:

Table indicating the break-up of areas in the Mining Lease for calculation of Financial Assurance under Rule 27 of MCDR-2017.

Table-59

Sl. No.	Head	Area put on use at start of Plan (ha)	Additional requirement during this plan period (ha)	Total Area (ha)	Area considered as fully reclaimed & rehabilitated (ha)	Net area considered for calculation (ha)
1.	Area under mining	0.89.6	0.16.0	1.05.6	-	1.05.6
2.	Storage for top soil	-	-	-	-	-
3.	Waste dump site	0.12.1	Nil*	Nil*	-	Nil*
4.	Earthen Bund	-	0.13.0	0.13.0	-	0.13.0
5.	Mineral storage	-	-	-		-
6.	Infrastructure – workshop, administrative building etc.	-	0.01.0	0.01.0	-	0.01.0
		-	-	-	-	-
		-	-	-	-	-
		-	-	-	-	-
7.	Roads	0.02.0	-	0.02.0	-	0.02.0
8.	Railways	-	-	-	-	-
9.	Tailing pond	-	-	-	-	-
10.	Effluent Treatment Plane	-	-	-	-	-
11.	Mineral Separation Plane	-	-	-	-	-
12.	Township area	-	-	-	-	-
13.	Others (to specify) Green belt	0.04.0	0.10.0	0.14.0	-	0.14.0
Grand total		**1.07.7**	**0.40.0**	**1.35.6**	**-**	**1.35.6**

* Dump will be backfilled

The Mining lease area put to use for mining and allied activities is about 1.35.6 Ha. The financial assurance for 1.35.6 hectares at the rate of Rs. 3,00,000/- per ha works out to Rs. 4,06,800/-.

Hence, the financial assurance in the form of Minimum Bank Guarantee for A-Category mines of Rs. 10,00,000/- is enclosed as Annexure No.XIV.

Certificate:

The above mentioned actions have been taken to be stated clearly in the mine closure plan. A certificate duly signed by the lessee to the effect that said closure plan complies all statutory rules, regulations, orders made by the Central or State Government, statutory organisations, court etc. have been taken into consideration and wherever any specific permission is required the lessee will approach the concerned authorities. The lessee may also give an undertaking to the effect that all the measures proposed in this closure plan will be implemented in a time bound manner as proposed.

Plan and Sections:

The Following plans and sections are enclosed.

1. Location plan (Plate No.I)
2. Route Map (Plate No.IA)
3. Key plan (Plate No.IB)
4. Mine lease Plan (Plate No.II)
5. Surface plan (Plate No.III)
6. Geological plan and Sections (Plate No.IV)
7. Year wise development & production plan and sections(Plate Nos.V-A to V-E)
8. Mine layout, land use and afforestation plan (Plate No.VI)
9. Financial area Assurance Plan. (Plate No.VII)
10. Environment plan (Plate No.VIII)
11. Conceptual plan and sections (Plate No.IX)

Signature of the Qualified Person

A.Jagannathan, B.E., F.C.C., M.M.E.A., M.I.E.,

Place: Salem
Date: 02.01.2020

PART-B		
9.0	**Certificates/ Undertakings/Consents**	
	A.	**CONSENT LETTER/ UNDERTAKING/ CERTIFICATE FROM THE APPLICANT**

M/s. Sivam Mines.,
6/209, Main Road, Sirugudi Post,
Natham (Tk), Dindigul District.

1.	The Review of Mining Plan in respect of Sirugudi Limestone Mine over an area of 1.70.0Ha, in Sirugudi Village, Sirugudi Post Office, Dindigul District, Tamilnadu, under Rule 17(1) of MCR 2016 & 23 of MCDR, 2017 has been prepared by A.Jagannathan, B.E., F.C.C., M.M.E.A., M.I.E., This is to request the Regional Controller of Mines, Indian Bureau of Mines Chennai, to make any further correspondence regarding any correction of the Review of Mining Plan with the said Qualified Person at his address below: A.Jagannathan, B.E., F.C.C., M.M.E.A., M.I.E., Old.No.260-B, New No: 17, Advaitha Ashram Road, Alagapuram, Salem – 636 004. We hereby undertake that all modification/updating as made in the said Review of Mining Plan by the said Qualified Person may be deemed to have been made with our knowledge and consent and shall be acceptable on us and binding in all respects.
2.	It is certified that the CCOM Circular No-2/2010 will be implemented and complied with when any authorized agency is approved by the State Government.
3.	It is certified that the Progressive Mine Closure Plan of Sirugudi Limestone Mine of M/s. Sivam Mines., over an area of 1.70.0Ha. complies with all Statutory rules, Regulations, Orders made by the Central or State Government, Statuary organization, court etc. which have been taken into consideration and wherever any specific permission is required the lessee will approach the concerned authorities. The information furnished in the Progressive Mine Closure Plan is true and correct to the best of our knowledge and records.
4.	"The provisions of Mines Act, Rules and Regulations made there under have been observed in the Review of Mining Plan over an area of 1.70.0Ha in Dindigul District in Tamilnadu State belonging to Sirugudi Limestone Mine, and where specific permissions are required, the lessee will approach the D.G.M.S. Further, standards prescribed by D.G.M.S. in respect of miners' health will be strictly implemented".

5.	I Shri. S.Ilangovan, (Managing Partner of M/s. Sivam Mines.,) Owner of the Mining Lease G.O. (D) No.173 Industries (MMA.1) Department, dated: 05.11.2014 for a period of twenty years (i.e from 28.02.1996 to 27.02.2016) of the Mining Lease in Sirugudi Village, Natham Taluk, Dindigul District, Tamil Nadu State, over an extent of 1.70.0Ha. for Limestone mineral hereby undertake that no matter is pending against the said lease/ applied mining lease area on the following issues. a) Issues related to illegal mining with State Government. b) Royalty and revision matter with the State Government. c) Safety & Environment issues of General Public Concern. d) Public interest litigation (PIL) and court cases, etc. If anything is found wrong in the declaration and found incorrect during the period of document, suitable action may be initiated including withdrawal of the approval of the document. Signature of Lessee For M/s. Sivam Mines., For M/S SIVAM MINES Managing Partner S.Ilangovan, B.E., (Managing Partner) Place: Dindigul Date : 11.09.2019

A.Jagannathan, B.E., F.C.C., M.M.E.A., M.I.E.,
Old.No.260-B, New No: 17,
Advaitha Ashram Road, Alagapuram,
Salem – 636 004.

CERTIFICATE FROM THE QUALIFIED PERSON

The provisions of the Mineral Conservation and Development Rules, 2017 have been observed in the preparation of the Review of Mining Plan for Sirugudi Limestone Mine over an area of 1.70.0Ha of M/s. Sivam Mines., in Sirugudi Village, Sirugudi Post Office, Dindigul District of Tamilnadu State and whenever specific permission are required, the lessee will approach the concerned authorities of Indian bureau of Mines.

The information furnished in the Review of Mining Plan is true and corrected to the best of our Knowledge.

Signature of the Qualified Person

A.Jagannathan, B.E., F.C.C., M.M.E.A., M.I.E.,

Place: Salem
Date: 02.01.2020

Annexure – I

FEASIBILITY REPORT OF SIRUGUDI LIMESTONE MINE

PREAMBLE:

This abstract of feasibility report is Sirugudi Limestone Mine, over an extent of 1.70.0 hectares in S.F. Nos: 693/1, 2, 3, 4 & 7 in Sirugudi Village, Natham Taluk, Dindigul District, Tamilnadu State of M/s. Sivam Mines., 6/209, Main Road, Sirugudi Post, Natham (Tk), Dindigul District, Tamilnadu, to estimate the resources and reserves of limestone mineral in Patta land by U.N.F.C system.

Initially, the mining lease for limestone was granted to Thiru. S.Asaialangaram, Dindigul district vide G.O. Ms.No. 1691, dated: 04.12.1982 for a period of 3 years 28.02.1983 to 27.02.1986.

The lease was first renewed for a period of 10 years with effect from 28.02.1986 to 27.02.1996 vide G.O.Ms. No.1439/Inds, dated: 13.12.1990.

Second renewal was granted vide G.O.(3D).No.83 Inds (MMA2) Dept., dated: 09.10.1996 for a period of 20 years from 28.02.1996 to 27.02.2016 and the lease deed was executed on 17.01.1997.

Then the lease was transferred to M/s. Sivam Mines., 6/209, Main Road, Sirugudi Post, Natham (Tk), Dindigul District vide G.O.(D) No.173 Inds (MMA1) dept., dated: 05.11.2014. (Please refer Annexure No.II & VI).

The mining plan for renewal of mining lease was approved by Indian Bureau of Mines vide letter no. TN/D-Anna/MP/LST-825-MDS, dated: 12.07.1995.

The first scheme of mining was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS/114/Mds, dated: 14.02.2002.

The second scheme of mining was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS-457-Mds, dated: 10.09.2007.

The final scheme of mining (2012-13 to 2015-16) was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS-776.Mds, dated: 28.03.2013.

As the lease period is going to get expired on 27.02.2016. The lessee has decided to renew the mining lease for a further period of Thirty years. Copy of renewal application form with acknowledgement from State Government is enclosed as Annexure No.VIII.

Simultaneously, Modified Mining Plan along with Progressive Mine Closure Plan [2015-16 (from 28.02.2016) to 2019-20] was prepared, submitted under Rule 22(6), MCR, 1960 and Rule 23(B) of MCDR, 1988 and got approved by Indian Bureau of Mines vide letter no. TN/DGL/MP/LST-1969.Mds, dated: 30.03.2016. Copy of mining plan approval letter is enclosed as Annexure No.X.

The lease granted before 2015 for a period of 20 years is deemed to have been granted for fifty years as per latest MMDR amendment Act 2015. A letter for extension of Mining Lease was submitted by the lessee to the State Government, but the lessee has not received any letter from the Government for extension of Mining lease. Copy of the letter for extension of Mining Lease is enclosed as annexure no.XI.

Hence, this Review of Mining Plan along with Progressive Mine Closure Plan **[2020-21 to 2024-25]** is being prepared now & submitted under Rule 17(1) of MCR, 2016 and Rule 23 of MCDR, 2017.

1.0 General Mine Description

Name of the lessee	:	M/s. Sivam Mines., (Thiru. S. Ilangovan, B.E., Managing Partner)
Address	:	6/209, Main Road, Sirugudi Post, Natham (Tk), Dindigul District.
District	:	Dindigul
State	:	Tamilnadu.
Pin code	:	624 404
Telephone	:	04544-267632
Mobile No.	:	94430 67632
Email id.	:	ilangovanmadhavi4.9@gmail.com
Rule 45 registration no.	:	**IBM /5284/2011**

Copy of ID proof is enclosed as Annexure No. VII.

Status of the lessee:

M/s. Sivam Mines is a Partnership Firm. When the Transfer of mining lease was granted in the year 2014, the partners of the firm are Thiru. S.Asaialangaram, Thiru. S.Ilangovan, Thiru.I.Vijay Alangar and Selvi. I.Sempon Manickam. Thiru. S. Ilangovan is the Managing Partner of the firm. The partners of the firm have very good knowledge and experience in Limestone mining for more than three decades. (Please refer Annexure No.VIII).

The details of the partners are given below:

Table-1

Sl.No.	Name & Address	Designation	Cell no.	e-mail address
1.	Thiru. S. Ilangovan, S/o. K.A. Semban chettiar, Door No.6/208, Main Road, Sirugudi post, Natham Taluk, Dindigul District.	Managing Partner	94430 67632	ilangovanmadhavi4.9@gmail.com
2.	Thiru. S. Asaialangaram, S/o. K.A. Semban chettiar, Door No.1/174, Main Road, Sirugudi post, Natham Taluk, Dindigul District.	Partner	94430 67632	vijayalangar@gmail.com
3.	Thiru. I.Vijay Alangar, S/o. S.Ilangovan, Door No.6/208, Main Road, Sirugudi post, Natham Taluk, Dindigul District.	Partner	94430 67632	vijayalangar@gmail.com
4.	Selvi. I.Sempon Manickam, D/o. S.Ilangovan, Door No.6/208, Main Road, Sirugudi post, Natham Taluk, Dindigul District.	Partner	94430 67632	ilangovanmadhavi4.9@gmail.com

2.0 Exploration:

During the previous approved scheme period (2012-13 to 2015-16), three boreholes upto 17m depth was carried out by the lessee.

In the previous approved plan period [2015-16 (from 28.02.2016) to 2019-20] no exploration programme was proposed but the lessee has carried out two core drills (DCD1 to DCD2) of 18m depth in the year 2019, to find out the grade of limestone, lateral variations and vertical in homogenities of the limestone formation and depth persistence. At Present there are two existing pits and its dimension is given below.

Existing Pit Geometry:

Table-2

Pit No.	Length In Meter	Width In Meter	Depth In Meter	Area In Ha.	Dip°	Strike
1.	160 (max)	50 (avg)	14 (max)	0.89.6	$S40^0W$	$N30^0W– S30^0E$
2.	48 (max)	20 (max)	12 (max)			

With the datas analyzed from the drilled boreholes and existing pit, the deposit has been proved upto 17m depth with an average of 2m topsoil. The boreholes logging datas are furnished below.

Litho log of drilled boreholes carried out in the previous approved scheme period (2012-13 to 2015-16):

Table-3

No. of bore holes	Depth of boreholes (m)	Depth of deposition of Limestone	Strata
DBH-1	16.9	228.9m-214.8m	Mined out
		214.8m-212.0m	Limestone
DBH-2	17.0	229.0m-220.2m	Mined out
		220.2m-212.0m	Limestone
DBH-3	16.8	228.8m-216.7m	Mined out
		216.7m-212.0m	Limestone

Litho log of drilled core drills carried out in the previous approved scheme period [2015-16 (from 28.02.2016) to 2019-20] in the year 2019:

Table-3A

No. of core drills	Latitude	Longitude	Depth of core drills (m)	Depth of deposition of Limestone in (RL)	Strata
DCD 1	10^0 14' 33.86"N	78^0 17' 45.72"E	18.0	225.0m – 207.0m	Limestone
DCD 2	10^0 14' 34.34"N	78^0 17' 47.26"E	8.0	215.0m – 207.0m	Limestone

Copy of Form –I & J is enclosed as Annexure no.XII.

Locations of drilled boreholes and core drills are marked in the geological plan and sections and year wise plan and sections (Refer Plate No.IV & V-A).

The lessee with his consultant geological team thoroughly studied the area and demarcated the attitude of the band. It is inferred that the limestone is cement grade and in the form of band running from $N30^0W– S30^0E$ direction with dipping $S40^0W$.

Regular sampling and analysis during the past mining activities has revealed that the limestone mineral is of cement grade (the mineral was also analyzed in NABL laboratory as per the circular issued by the CCOM, Nagpur). The recovery of 60% was discussed in the previous approved plan period and the same 60% recovery was achieved by the lessee during the previous approved plan period.

Based on the latest core drill exploration programme has carried out by the lessee in the lease area for find out the grade of limestone, lateral variations and vertical in homogeneities of the limestone formation and depth persistence, the samples were collected from the latest core log for NABL laboratory for testing and analysis and to find out the chemical and physical properties of the limestone mineral.

It is concluded that the grade of limestone is found to be of cement grade & Chemical Industrial grade and the recovery percentage of limestone mineral is 80% (i.e. 60% High Grade Limestone + 20% Low grade Limestone) and the bulk density is 2.6.

During the recent periods there is a huge demand for low grade limestone for cement industry and chemical industry. By the growth of technology and latest inventions of cement processing machineries it is now feasible to blend the low grade limestone to high grade limestone which can be used for cement industry, Hence the recovery percentage for the high grade mineral is 60% from the ROM, 20% recovery from the ROM is low grade mineral and remaining 20% recovery from the ROM is considered as Mineral Rejects is discussed during the present Review of Mining plan period.

The past mining experience gained by the lessee from the limestone mining is sufficient for calculating the mineral reserves and resources related to G1, F1, E1 Axis of United Nations Framework Classification Systems and to satisfy the latest circular No. 4/2009 dated 21.10.2009 issued by the CCOM, Nagpur.

The mine has reached maximum 14m depth and based on the existing pit and drilled core drills the depth of the mineralization has been proved upto 22m depth with an average of 2m topsoil in Centre & Eastern portion of the area and upto 17m depth with an average of 2m topsoil in the west and south western portion of the area. Hence, the reserves and resources are estimated as given below during the present plan period.

Table-4

Depth of estimation of the reserves and resources during the present Mining plan period [2020-21 to 2024-25]

22m [2m topsoil + 20m limestone (proved 111)]	Centre & East
22m [2m topsoil + 15m limestone (proved 111)] + 5m limestone (probable 222)]	West
17m [2m topsoil + 15m limestone (proved 111)]	Southwest

Besides, to confirm the characteristics features of limestone band, lateral variations and to find out the further depth persistence of the mineralization, two core drills (PCD1- PCD3) of 30m depth are proposed from the existing floor level @ 50m grid interval, for future exploration during the present plan period in the year 2020-21. Locations of the proposed core drills are marked in the geological plan and yearwise plan (Refer Plate Nos.IV & V-A).

a. Geological Mapping (Topographical and Contour map in 1: 1000 Scale)

The area was surveyed in detail by total station survey instrument with relevant software for preparation of geological map in the scale of 1:1000 showing the various formations, attitude of the deposits and the reserve position.

b. Geo-Physical Prospecting in the way of Vertical Electrical Sounding

Geophysical survey in the form of vertical electrical sounding (VES), was conducted in the lease area to assess the lateral variations, vertical in homogeneities and the sub surface geology with respect to the availability of resources and reserves of limestone deposits.

c. Geo-Chemical Prospecting

Samples were collected from the existing mining pit for NABL laboratory for testing and analysis and to find out the chemical and physical properties of the limestone mineral. It was inferred that the grade of Limestone is found to be of cement and chemical industrial grade and the recovery percentage of limestone mineral is 80% (i.e. 60% High Grade Limestone + 20% Low grade Limestone) and the bulk density is 2.6.

Grade of Limestone:

The average analysis of Limestone as analyzed in the NABL laboratory is tabulated below and Chemical analysis report is enclosed.

Table – 5

LIMESTONE		Low grade limestone
Parameter	Composition %	Composition %
Calcium Oxides (CaO)	46.72	31.27
Magnesium Oxides (MgO)	1.23	3.74
Iron (Fe_2O_3)	0.18	0.32
Alumina as (Al_2O_3)	0.36	0.41
Silica (SiO_2)	7.25	26.21
Loss of Ignition (LOI)	44.23	36.15
Sodium di-oxide (Na_2O)	-	0.43
Potassium di-oxide (K_2O)	-	0.61

The quality of Limestone ranges between 46.0 to 48 of CaO, 7.5 to 8.5 of SiO_2 and 0.5 to 1.0% of Fe_2O_3. As analyzed by NABL laboratory, Limestone which has more than 70-85% of $CaCO_3$ is best suited for cement industries, the grade below 40% of $CaCO_3$ are now considered as low-grade mineral, the grade below 20% of $CaCO_3$ and contaminations with calc gneiss waste are considered as Mineral rejects in these particular formations. Chemical analysis report of the limestone and low grade limestone are enclosed as Annexure – V & VA.

d. Technological Prospecting

Pitting:

Since the mine is active and the depth of the mine has already reached about maximum 14m, there is no additional formation of pits in the existing mine and the depth of the mineralization has been already proved upto 22m depth with an average of 2m topsoil based on existing pit and drilled core drills. The mining pit indicates the limestone deposit and direction of the band.

To confirm the characteristics features of limestone band, lateral variations and to find out the further depth persistence of the mineralization, three core drills (PCD1-PCD3) of 30m depth each are proposed from the existing floor level @ 50m grid interval, for future exploration during the present plan period in the year 2020-21. Locations of the proposed core drills are marked in the geological plan and yearwise plan (Refer Plate Nos.IV & V-A).

Trenching

As discussed above, there is no requirement of trenching in the existing mine. The existing pits evidences sufficient data's required for the occurrence and distribution of limestone.

Drilling

The mine has reached maximum 14m depth and the depth of the mineralization has been already proved upto 22m depth with an average of 2m topsoil based on existing pit and drilled core drills.

There is no additional formation of pits in the existing mine. The mining pit indicates the limestone bed deposit and direction of the band. To confirm the characteristics features of limestone band, lateral variations and to find out the further depth persistence of the mineralization, three core drills (PCD1- PCD3) of 30m depth each are proposed from the existing floor level @ 50m grid interval, for future exploration during the present plan period in the year 2020-21. Locations of the proposed core drills are marked in the geological plan and yearwise plan (Refer Plate Nos.IV & V-A).

3.0 Reserves Assessment

The U.N.F.C consists of three-dimensional system with the following three axes.

1. GEOLOGICAL Axis (G1- Detailed exploration)
2. FEASIBILITY Axis (F1- Feasibility Study)
3. ECONOMIC Axis (E1- Economics)

The reserves and resources under UNFC system of classification, is DESCRIBED IN DETAIL IN ANNEXURE 1A.

4.0 Production Schedule:

The year wise production and development schedule proposed for the present plan period under (UNFC 111) is tabulated below.

Table-6

Proposed yearwise [2020-21 to 2024-25]

Year	Section	Bench	Topsoil in m^3					ROM Mineral					Production (Ts)		Mineral Rejects @ 20% (Ts)	Location of advancement	Ore to waste ratio
			L(m)	W(m)	H(m)	Volume (m^3)	Quantity (t)	L(m)	W(m)	H(m)	Volume (m^3)	Quantity (t)	Lime-stone @ 60% (Ts)	Low grade Lime-stone @ 20% (Ts)			
2020-21	X3Y3-CD	I	1	20	2	40	80	-	-	-	-	-	-	-	-		
		II	-	-	-	-	-	49	15	2	1470	3822	2293	764	764		1;0.25
		III	-	-	-	-	-	49	37	2	3626	9428	5657	1886	1886		
2021-22	X3Y3-CD	II	-	-	-	-	-	49	7	2	686	1784	1070	357	357		
		II	-	-	-	-	-	49	8	2	784	2038	1223	408	408		
		III	-	-	-	-	-	29	6	4	696	1810	1086	362	362		
	X2Y2-CD	I	26	24	2	1248	2496	-	-	-	-	-	-	-	-		1;0.25
		II	-	-	-	-	-	23	19	2	874	2272	1363	454	454		
		II	-	-	-	-	-	32	19	2	1216	3162	1897	632	632		
		III	-	-	-	-	-	25	9	4	900	2340	1404	468	468		
2022-23	X3Y3-CD	III	-	-	-	-	-	29	40	4	4640	12064	7238	2413	2413		
		IV	-	-	-	-	-	10	12	4	480	1248	749	250	250		1;0.25
2023-24	X3Y3-CD	IV	-	-	-	-	-	10	34	4	1360	3536	2122	707	707		
	X4Y4-CD	V	-	-	-	-	-	44	21	4	3696	9610	5766	1922	1922		1;0.25
2024-25	X4Y4-CD	V	-	-	-	-	-	44	29	4	5104	13270	7962	2654	2654		1;0.25
Total							**2576**					**66383**	**39830**	**13277**	**13277**		**1;0.25**

Note: Bulk density of Mineral -2.6, Topsoil-2.0, W-West, E-East

5.0 Mining Method:

Proposals was given to work under "B Category" in the previous approved Scheme period, but this present Review of Mining plan period is prepared under "A" category method by deploying machineries for development of benches to meet the demand in the market.

The method of mining is by open cast "A" Category method; excavator will be deployed for the formation of benches and loading. Excavator attached with rock breaker will be deployed for breaking and fragmentation to avoid blasting as the strata is medium hard in nature. Jackhammers with compressors will be deployed for drilling. Manual labours will be engaged for jackhammer drilling, sorting of waste and for loading the limestone into trucks, occasionally excavator will also be used. Blasting will be carried out occasionally with controlled initiation system.

Drilling and Blasting:

Drilling Source:-

Jack hammer operated by the compressed air from tractor mounted compressor or Portable compressors.

Drilling parameters:-

Burden 0.9m spacing 1.0m depth 1.65m

Charge pattern:-

Charge 0.4 to 0.6kgs per hole. Stemming is 1/3 and explosives 2/3.The stemming material is moisture clay/pyroxenite mixed waste.

Initiation System:-

Bottom initiation system with safety fuses and ordinary or /plain electric detonators.

No of blast hole:

Number of the hole required per day is 13, based on the above said parameters.

Powder factor:

Powder factor is reported as 6 tonnes per kg of explosives.

Explosive required:

As stated above, the ROM requirements are 44 tons/day, based on the past experience the Powder factor is 6 tonnes/kg of explosive inclusive of blasting.

Hence the daily requirement of explosives is 44/6 = 7.5 kg/day.

Secondary Blasting:

Secondary Blasting is not needed, since the primary blasting itself will take care of the required fragmentation of Waste rock and mineral body.

Storage of explosives:

No Portable magazine is available for storing explosives. Agreement is made with explosive authorized dealer for supply of explosives under Form-22 at mine site and blasting will be done by the qualified blaster. Hence question for storage of Explosives does not arise.

Explosive Van:

The authorised explosive supplier will bring our requirements of explosive in his approved van and take away the balance explosive after blasting if any.

Mining:

There are two existing pits and their dimension is pit-1 [160m (max) x 50m (avg) x 14m (d) (max)] and pit-2 [48m (max) x 20m x 12m (d) (max)].

One bench is proposed on the topsoil with 2.0m height and 2.0m width with 45° slope.

In mineral, five benches are proposed with 4.0m height & 6.0m width slope maintained as 60° from horizontal.

Footpaths and roads are suitably formed for easy movement of men and materials for manual workings.

During the present plan period [2020-21 to 2024-25], the mine working is proposed to be carried out in the centre portion of the mining lease area, in West - East direction, to a depth of about 18m from RL 229.0m to RL 211.0m. Please refer plate nos.V-A to V-E.

The lessee assures to carry out the detailed Exploration as per the UNFC Norms in the year 2020-21 itself. If the Resource & Reserves are enhanced considerably, a modified Mining plan will be prepared and submitted to IBM for subsequent clearance & approval.

The proposed average annual production ROM will be about 13,277 tonnes with 300 working days in a year.

The mineral rejects that would be generated during the previous approved plan period was dumped on the Western side the lease area, the same will be removed and proposed to be backfill in the old pit situated in the southwestern side of the lease area, where the area is very narrow for recovering the deposit in systematic operation.

The generation of mineral rejects during the present plan period is proposed to be backfill in the old pit situated in the southwestern side of the lease area.

The generation of topsoil during the present plan period is proposed to be utilized for Afforestation purposes and also the formation of earthen bund along the north and western boundary barrier of the lease area.

Afforestation is proposed in the 7.5m boundary barrier. Nearly 200sq.m/year is proposed for afforestation on the Eastern boundary barrier of the lease area.

The waste will be loaded manually into tippers and occasionally loaded by excavators for transporting it to the backfill area. Labors will be provided with mine helmet, safety shoes and respirator. During rainy seasons mine workings will be restricted in the top benches, the seepage water and rain water will be drained by 5HP portable pumps.

The working is planned in such a way that after complete exploitation of limestone, the excavation will be partially filled and partially allowed to collect rain water which will act as a temporary aquifer.

Haul roads will be conformed to statuary standards for smooth transport of mineral and waste.

The sequence of working proposed for next five years is indicated in Plate Nos. V-A to V-E. If there is any change in the system of mining, the same will be intimated to Indian Bureau of Mines and the mining plan will be suitably modified for subsequent clearance and approval.

6.0 Mineral Beneficiation:

Except hand sorting of limestone mineral, no other process is involved.

7.0 Marketing Type:

The mined out mineral is used for its own captive plant in the name of M/s. Air Mineral Enterprises which is located in Sirugudi, 3.0kms from mining lease area for grinding the mineral in different mesh size ranging from 80 mesh to fine mesh i.e upto 10 microns and supplied to paints, rubber, PVC Compounding, fertilizer, feed industries and Coffee and tea plantations and also sold to the nearby cement and lime based industries which are located within a radius of 35Km from the mine site, hence specific market aspects does not arise.

The viability may vary, since the market of Limestone depends upon the grade and requirement of cement, which are governed by the market demand. The economically viability at present market conditions are tabulated below:

Table –7

S.No.	Particulars	Cost of production Per ton
1.	Labour charges	Rs.65
2.	Royalty paid to Mines & Geology	Rs.80
3.	National Mineral Exploration Trust	Rs.2
4.	District Mineral Foundation (DMF)	Rs.24
5.	Excavation expenses	Rs.25
6.	Drilling & Blasting expenses	Rs. 20
7.	Transport from mine head to Stockyard (loading & unloading)	Rs.60
	Total	**Rs.276**
8.	Miscellaneous and over heads	Rs.24
	Total	**Rs.300**
9.	**Sale value of the Limestone for commercial cement and chemical industrial grade**	**Rs. 400**

The cost of production is Rs. 300/ton and selling prize for cement and chemical industrial grade is Rs.400/ton. Hence, the mining is economically viable at present market conditions.

8.0 INFRASTRUCTURE:

The lease area is located at a distance of about 3.0 km SW from Sirugudi. The area is located at a distance of about 3.0km north from Kottampatty – Natham Road (SH-35). The area is located at a distance of about 10km west from Trichy – Madurai Road (NH-45B) (Please refer Key Map-IB for the location of the lease area).

Table-8

S.No	Particulars	Location	Direction	Approximate Distance in Km
1	Nearest Post office	Sirugudi	NE	3.0
2	Nearest Town(D.H)	Dindigul	NW	37
3	Nearest Police Station	Natham	SW	7.5
4	Nearest Govt. Hospital	Sirugudi	NE	3.0
5	Nearest School	Thethampatti	NE	1.0
6	Nearest DSP Office	Dindigul	NW	37
7	Nearest Railway Station	Dindigul	NW	36
8	Nearest Airport	Madurai	SW	50
9	Nearest Seaport	Tuticorin	S	166

Please refer Location plan (Plate No.I), Route Map (Plate No.IA), Key plan (Plate No.IB).

Drinking Water, rest shed, store room, public convenience and mines office are available in temporary semi permanent structure within the lease area. Please refer Plate No. VI.

9.0 ENVIRONMENTAL REQUIREMENTS:

Environmental impact assessment (EIA) studies / environmental (EMP) including socio-economic impacts;

ENVIRONMENT IMPACT ASSESSMENT/ STATEMENT:

The opencast mining operation adopted here does not cause any impact to the forest or agricultural land. It does not produce any harmful effluent in the form of gas or liquid. The mined out pit will be partially backfilled or partially allowed to collect the rain water which will act as a temporary aquifer, this temporary storage of water will act as an artificial recharge pond which will enhance the near ground water level and the static level of the nearby wells at the end of the life of the mine, when the mine reaches its ultimate pit limit. No beneficiation is done for limestone mineral. As such, mining operation will not have any impact on environment both biotic and abiotic.

Existing Land Use Pattern

The lease area is an existing mine. The land use pattern in and around the mine have no adverse effect in the environment changes. Excavator will be deployed for the formation of benches and loading. Excavator attached with rock breaker will be deployed for breaking and fragmentation to avoid blasting as the strata is medium hard in nature. Jackhammers with compressors will be deployed for drilling. Manual labours will be engaged for jackhammer drilling, sorting of waste and for loading the limestone into trucks, occasionally excavator will also be used. Blasting is carried out occasionally with controlled initiation system. An Environment Management Plan will be prepared if required.

Air Quality

The Atmospheric air in the area is quite fresh; the mining operation is carried out with opencast method. Excavator attached with rock breaker will be deployed for breaking and fragmentation to avoid blasting as the strata is medium hard in nature, axes and crow bars are used for picking fragmentation of limestone and the collection of the mineral stacked to temporary stockyard and carried out by hand shovel, pick-axes and cane baskets. Hence, the change in air quality will be minimal well within the prescribed limits.

The generation of the dust will be suppressed by means of water sprinkler then and there by mechanical means. The generation of dust during the course of drilling is suppressed at source by means of wet drilling or dust extractors. The periodical environmental monitoring test is proposed to carry out by accredited laboratories as per the guidelines issued by the IBM.

Water Quality

There will be no toxic effluent generated due to mining operation in the form of solid liquid or gas. The water will not be contaminated by the limestone mining by any means. Since the limestone occurrence is below 2m depth and there will be no problem to the ground water. The mine waste will not produce any toxic effluent. However, minor pollutant may occur during mining operation and it will be within the permissible limits. Periodically water samples will be collected and analyzed as per statutory norms of IBM.

Noise Level & Ground Vibration

The mining operation does not produce any adverse environmental impacts. Excavator attached with rock breaker will be deployed for breaking and fragmentation to avoid blasting as the strata is medium hard in nature, manual labours will be engaged for sorting and for loading the limestone into trucks, occasionally excavator will also be used.

The mining operations involve with minimum shot hole drilling, having 1.5 meter depth, and controlled blasting technique will be adopted with class 2 slurry explosives. Hence, the noise & vibration is minimal, below the norms as prescribed in the MMR, 1961 and their amendments. The operational area lies away from the human settlement. Besides, noise and ground vibration monitoring will be carried out as per the statutory standards.

Water Regime

The water table is found at 35m in rainy season and 40m in dry season the area receives rainfall during north-east monsoon, the average being 930.54mm. Tanks are situated on the North, West & southern side of the lease area within 500m radius. There is no other Nullah, lake, reservoir or river nearby. The water is found to be potable and good for drinking it is available in the nearby community wells.

Socio-Economics

The mining operation will create awareness for the importance of minerals and of their value in the market. It will create an urge to search and prospect for the same or different minerals in the other areas. Mining, whether it is small or big is an avenue of employment. It will improve the standard of living and will change the life style of village habitants.

Public Buildings, Places and Historical Monuments

There are no public buildings or places of historical monuments near the area.

ENVIRONMENT MANAGEMENT PLAN:

Temporary storage and utilization of Overburden

The topsoil is red gravelly earth. It occurs to a depth of 2.0m. About 2,576 Ts of top soil that would be generated during the present plan period is proposed to be utilized for afforestation purposes and also the formation of earthen bund along the north and western boundary barrier of the lease area.

Year wise proposal for reclamation of land affected by mining activities during and at the end of mining lease:

Mining operation during the present plan period is proposed for a maximum depth of about 18m with an average of 2m topsoil from RL 229.0m to RL 211.0m in centre portion of the lease area, depending upon the depth persistence of the limestone, the Mineral depth may slightly increase. The mined out pit will be partially backfilled and partially allowed to collect the rain water which will act as a temporary aquifer, this temporary storage of water will act as an artificial recharge pond which will enhance the near ground water level and the static level of the nearby wells at the end of the life of the mine, when the mine reaches its ultimate pit limit.

Abandonment of quarries:

It is an existing mining lease area. Hence, there is no proposal at present plan period to abandon the mine. After complete exploitation of the mineral from the lease area, the mined out pit will be partially backfilled and partially allowed to collect the rain water which will act as a temporary aquifer, this temporary storage of water will act as an artificial recharge pond which will enhance the near ground water level and the static level of the nearby wells.

Programme of afforestation:

During the present plan period it is proposed to plant 20 neem saplings/ year in the eastern boundary of the lease area. The plantation is shown in the table below.

Table-9

Year	Area to be covered (sq.m)	No of saplings	Type of saplings	Location	Space between saplings	Survival rate %
2020-21	200	20	Neem	7.5m safety distance on the Eastern boundary	3mx3m	80%
2021-22	200	20			3mx3m	80%
2022-23	200	20			3mx3m	80%
2023-24	200	20			3mx3m	80%
2024-25	200	20			3mx3m	80%

Please refer Mine layout & Environmental Plan (Plate No: VI & VIII).

Stabilization and vegetation of dumps:

The dump will be stabilized in such a manner that the slopes are always maintained below 30^0. These dumps will be cleared and utilized for backfilling the mined out pit at the end of the life of the mine when the mine reaches its ultimate pit limit. Afforestation is proposed in the 7.5m boundary barrier on the Eastern boundary of the lease area. Nearly 1000sq.m is proposed for afforestation during the present plan period.

Treatment and disposal of waste from mine:

Since mining operation does not generate any harmful waste, question of treatment does not arise.

Measures for Adverse Effects of Mining on Water Regime:

The water table in the lease area is around 40m below the ground level. The mine has reached maximum 14m depth. The maximum depth proposed for mining is about 18m from RL 229.0m to RL 211.0m, hence the water table will not encounter during the course of mining activity. There will be seepage of ground water during the rainy season; the same will be pumped out with the help of 5HP motor pumps when there is a considerable accumulation of seepage water. Mining operation or mineral rejects does not produce any harmful effluent in the form of liquid, which will affect the water regime.

Measures for minimizing adverse effects on water regime

Does not arise.

Protective measures for ground vibrations/air blast caused by blasting

The method of mining is open cast method. Machineries like excavators are used for formation of benches and loading and jackhammers are proposed for drilling, tippers are used for the movement inside the mine for handling the waste and ROM. Blasting will be carried out occasionally with controlled initiation system. Hence, during blasting ground vibration will be minimal well within the prescribed standards. Besides, noise and ground vibration will be carried out as per the statutory standards.

a) Row of trees with thick flora will be planned to act as acoustic barriers along the road side and mine periphery.

b) Ear muffs/ear plugs will be provided to workers at noise prone zone.

c) A noise data will be maintained in future for all noise prone activities and noise exposure records of the workers.

d) Measures For Protecting Historical Monuments

There are no public buildings or places of historical monuments near the area. Hence protecting measures does not arise.

The human settlement is away from the mine lease area in the 1.0km Radius. Hence protecting measures does not arise.

Socio economic benefits arising out of mining:

Since it is an open cast mining**,** it is not applicable. No adverse changes are visualized on the traditional way on the habitants in the nearby villages.

Monitoring schedules for different environmental components:

Periodical Environment Monitoring, at least for one season, will be carried out for the following

a. Air

Weather parameters like Temperature, Wind Direction, Relative Humidity and Rainfall will be monitored regularly.

b. Noise

Using sound pressure level meter, the sound level will be monitored once in a month to check that it is within the prescribed limits and efforts will be taken to keep it as low as possible.

c. Water

There is no effluent generation in the form of liquid or solid from the mines. Tanks are situated on the North, West & southern side of the lease area within 500m radius. There is no other Nullah, lake, reservoir or river nearby.

d. Land

Since mineral rejects is the only solid waste generated and that too will be utilized for backfilling purposes during the end of the life of the mine when the mine reaches its ultimate pit limit and the land will not get degraded at all. Once in a season samples will be collected and analyzed for monitoring. Afforestation will be carried out as discussed earlier. The green belt development will be closely monitored using parameters like species of trees, soil quality, growth rate etc.

e. Monitoring Cell

Environmental monitoring of Air Quality, Air pollution source, Water quality, Impact of noise, Impact of soil, Impact on flora and fauna, Degradation of land, Impact on health, safety and solid waste, Rehabilitation and Afforestation, Socio-economic factors etc., will be monitored by the Mines Manager/permit manager. He will keep a close watch on the performance of the pollution control equipment, emissions from the source and the quality of surrounding environment in accordance with the monitoring programme. He will also be responsible for the development and maintenance of green belt.

10.0 Legal Factors:

The lease area is a patta land and it is not covered under forest of any category. Therefore, the lessee has surface rights over the lease area.

Tribal issues, national monuments, etc,

There is no Tribal Issues, Public Building, Places of Worship, National Monuments or Places of Archaeological interest near the area.

11.0. Economic Evaluation:

The lease area is a Patta land

The cost of land/Ha. is given below:

The cost of land/Ha (as per Govt. Guideline Value)
for S.F.No. 693/1 is Rs.1,49,500 X 0.37.5 ha = Rs. 56,063/-

The cost of land/Ha (as per Govt. Guideline Value)
for S.F.Nos. 693/2, 3, 4 & 7 is Rs.4,72,500 X 1.32.5 ha = Rs.6,26,063/-

Total land cost is Rs.6,82,126/-

The total cost production/ton is Rs. 300.

Total Mineral reserves (proved 111) @ 60% recovery of limestone will be **44,566 Ts.**

Total Mineral reserves (proved 111) @ 20% recovery Low grade limestone will be **14,855 Ts.**

The mined out mineral is used for its own captive plant in the name of M/s. Air Mineral Enterprises which is located in Sirugudi, 3.0kms from mining lease area for grinding the mineral in different mesh size ranging from 80 mesh to fine mesh i.e upto 10 microns and supplied to paints, rubber, PVC Compounding, fertilizer, feed industries and Coffee and tea plantations and also sold to the nearby cement and lime based industries which are located within a radius of 35Km from the mine site.

Signature of the Qualified Person

A.Jagannathan, B.E., F.C.C., M.M.E.A., M.I.E.,

Place: Salem
Date: 02.01.2020

Annexure-IA

RESOURCES AND RESERVES BY UNFC SYSTEM

THE RESERVES AND RESOURCES WERE ASSESSED BASED ON THE UNITED NATIONS FRAME WORK CLASSIFICATIONS AS AMENDED IN THE MINERAL CONSERVATION AND DEVELOPMENT RULES (SECOND AMENDMENT)RULE 2003 AND IN EXERCISE OF THE POWERS CONFERRED BY SECTION 18 OF THE MINES AND MINERALS (DEVELOPMENT AND REGULATIONS) ACT 1957(67 OF 1957) AND SUBSEQUENTLY TO THE CCOM CIRCULAR NO.4 2009 DATED 21.10.2009.

- In order to implement UNFC System, Mineral Deposits are classified into **SEVEN** types and accordingly exploration norms/field guidance have been formulated to assign different level of Geological codes.
- The Seven types of deposit classification proposed in UNFC is intended to assist in finding reasonable degree of detail of exploration of mineral deposits by providing clear definitions of individual categories of reserves/resources according to the criteria accepted.

I. STRATIFORM, STRATA BOUND AND TABULAR DEPOSITS OF IRREGULAR HABIT

Characteristics of deposits

Of irregular habit and/or with faults of large measures, shear zones, solution cavities, irregular erosion and weathering (oxidation) features, partings and bifurcations, igneous intrusive, facies changes, etc.

Principal kinds of minerals

Coal seams, lignite beds, iron ore formations and cappings, manganese horizons in Sedimentary limestone *and* ***meta-Crystalline limestone*** *sequences, thick bauxite cappings, regional chromite lodes in large ultramtics,* **limestone**, *dolomite, barites, gypsum, evaporates including polash and saltbelts, chalk and fireclay, fullers earth, gold in banded iron formation, platinum group of elements in chromite or in chromite bearing rocks and molybdenum in shear – controlled zones.*

UNFC IN A NUTSHELL

UNFC designed as an umbrella system, which is internationally applicable and acceptable to harmonize existing different terminologies and definitions by using 3 Digit numerical codification system. This has resulted improvements in the comparability of mineral statistics and ultimately facilitate National Mineral Inventory, international trade and provide efficient link between market economy.

The U.N.F.C consists of three-dimensional system with the following three axes.

1. GEOLOGICAL Axis (G1- Detailed exploration)
2. FEASIBILITY Axis (F1- Feasibility Study)
3. ECONOMIC Axis (E1- Economics)

GEOLOGICAL AXIS (G1)

(Detailed Exploration)

Initially, the mining lease for limestone was granted to Thiru. S.Asaialangaram, Dindigul district vide G.O. Ms.No. 1691, dated 04.12.1982 for a period of 3 years 28.02.1983 to 27.02.1986.

The lease was first renewed for a period of 10 years with effect from 28.02.1986 to 27.02.1996 vide G.O.Ms. No.1439/Inds, dated: 13.12.1990.

Second renewal was granted vide G.O.(3D).No.83 Inds (MMA2) Dept., dated: 09.10.1996 for a period of 20 years from 28.02.1996 to 27.02.2016 and the lease deed was executed on 17.01.1997.

Then the lease was transferred to M/s. Sivam Mines., 6/209, Main Road, Sirugudi Post, Natham (Tk), Dindigul District vide G.O.(D) No.173 Inds (MMA1) dept., dated: 05.11.2014. (Please refer Annexure No.II & VI).

The mining plan for renewal of mining lease was approved by Indian Bureau of Mines vide letter no. TN/D-Anna/MP/LST-825-MDS, dated: 12.07.1995.

The first scheme of mining was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS/114/Mds, dated: 14.02.2002.

The second scheme of mining was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS-457-Mds, dated: 10.09.2007.

The final scheme of mining (2012-13 to 2015-16) was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS-776.Mds, dated: 28.03.2013.

As the lease period is going to get expired on 27.02.2016. The lessee has decided to renew the mining lease for a further period of Thirty years. Copy of renewal application form with acknowledgement from State Government is enclosed as Annexure No.VIII.

Simultaneously, Modified Mining Plan along with Progressive Mine Closure Plan [2015-16 (from 28.02.2016) to 2019-20] was prepared, submitted under Rule 22(6), MCR, 1960 and Rule 23(B) of MCDR, 1988 and got approved by Indian Bureau of Mines vide letter no. TN/DGL/MP/LST-1969.Mds, dated: 30.03.2016. Copy of mining plan approval letter is enclosed as Annexure No.X.

The lease granted before 2015 for a period of 20 years is deemed to have been granted for fifty years as per latest MMDR amendment Act 2015. A letter for extension of Mining Lease was submitted by the lessee to the State Government, but the lessee has not received any letter from the Government for extension of Mining lease. Copy of the letter for extension of Mining Lease is enclosed as annexure no.XI.

Hence, this Review of Mining Plan along with Progressive Mine Closure Plan **[2020-21 to 2024-25]** is being prepared now & submitted under Rule 17(1) of MCR, 2016 and Rule 23 of MCDR, 2017.

The lessee with his consultant geological team carried out the detailed exploration to ascertain the reserves and resources and all the parameters required under UNFC System.

1. Geological survey:

(i) Mapping *a) coal - 1:5000 b) For other minerals - 1:1000 or larger scale;*

Geological Mapping (1:1000 Scale)

The geological mapping deals with surface geology; existing features of vegetation cover, soil cover etc. such as study of the detailed geological mapping in the scale of 1:1,000 has been prepared.

ii) Topography:

The Toposheet map is correlated with the mapping carried out by the lessee's consultant geological team in the local map scale 1:1000 with help of total station survey and micro station software, to prepare the Topographical cum geological plan of Sirugudi Limestone Mine (S.F. Nos: 693/1, 2, 3, 4 & 7, 1.70.0Ha.) Natham Taluk and Dindigul District. This map reflects the topographical features, geological features and surface features of the area such as surface exposures, structural features, existing pit, exploratory boreholes, contour of the area. Please refer plate No.III (Surface plan) and plate No. IV (Geological plan and sections).

2. Geochemical survey:

Detailed litho geochemical analysis.

The lessee collected samples from the drilled core drills and after coning and quartering one representative sample was sent to NABL laboratory for testing and analysis to find out the chemical and physical properties of the limestone mineral.

Grade of Limestone:

The grade of Limestone is found to be of cement grade and chemical industrial grade the recovery percentage of limestone mineral is 80% (i.e. 60% High Grade Limestone + 20% Low grade Limestone) and the bulk density is 2.6. The average analysis of Limestone as analyzed in the NABL laboratory is tabulated below:

Table – 1

LIMESTONE		Low grade limestone
Parameter	Composition %	Composition %
Calcium Oxides (CaO)	46.72	31.27
Magnesium Oxides (MgO)	1.23	3.74
Iron (Fe_2O_3)	0.18	0.32
Alumina as (Al_2O_3)	0.36	0.41
Silica (SiO_2)	7.25	26.21
Loss of Ignition (LOI)	44.23	36.15
Sodium di-oxide (Na_2O)	-	0.43
Potassium di-oxide (K_2O)	-	0.61

The quality of Limestone ranges between 46.0 to 48 of CaO, 7.5 to 8.5 of SiO_2 and 0.5 to 1.0% of Fe_2O_3. As analyzed by NABL laboratory, Limestone which has more than 70-85% of $CaCO_3$ is best suited for cement industries, the grade below 40% of $CaCO_3$ are now considered as low-grade mineral, the grade below 20% of $CaCO_3$ and contaminations with calc gneiss waste are considered as Mineral rejects in these particular formations. Chemical analysis report of the limestone and low grade limestone are enclosed as Annexure – V & VA.

3. Geophysical survey:

Geophysical prospecting in the form of vertical electrical sounding (VES), was conducted in the lease area to ascertain the lateral variations, vertical in homogeneities and the sub surface geology with respect to the availability of resources and reserves of limestone deposits. Based on the results obtain by the geophysical prospecting i.e. electric resistivity testing and the depth persistence of each station were formulated with the help of total station survey.

4. Technological:

Pitting:

Since the mine is active and the depth of the mine has already reached about maximum 14m, there is no additional formation of pits in the existing mine and the depth of the mineralization has been already proved upto 22m depth with an average of 2m topsoil based on existing pit and drilled core drills. The mining pit indicates the limestone deposit and direction of the band.

To confirm the characteristics features of limestone band, lateral variations and to find out the further depth persistence of the mineralization, three core drills (PCD1-PCD3) of 30m depth each are proposed from the existing floor level @ 50m grid interval, for future exploration during the present plan period in the year 2020-21. Locations of the proposed core drills are marked in the geological plan and yearwise plan (Refer Plate Nos.IV & V-A).

Trenching

As discussed above, there is no requirement of trenching in the existing mine. The existing pits evidences sufficient data's required for the occurrence and distribution of limestone.

Drilling

The mine has reached maximum 14m depth and the depth of the mineralization has been already proved upto 22m depth with an average of 2m topsoil based on existing pit and drilled core drills.

There is no additional formation of pits in the existing mine. The mining pit indicates the limestone bed deposit and direction of the band. To confirm the characteristics features of limestone band, lateral variations and to find out the further depth persistence of the mineralization, three core drills (PCD1- PCD3) of 30m depth each are proposed from the existing floor level @ 50m grid interval, for future exploration during the present plan period in the year 2020-21. Locations of the proposed core drills are marked in the geological plan and yearwise plan (Refer Plate Nos.IV & V-A).

Sampling- Core and sludge, pits samples for grade analysis or beneficiation, bulk samples for laboratory scale / pilot plant investigation;

SAMPLING TECHNIQUE:

Sampling is done to ascertain the grade of mineral values that vary in proportion from one place to another. One single sample taken from one part of the ore body generally does not provide a representative picture of the grade of the entire mineral deposits. A large number of well-spaced samples are required for ascertaining the average grade with an acceptable amount of accuracy.

Normally, no amount of sampling will give a truly representative picture of the mineral deposits. There is always some degree of error between the actual value and the value computed from the samples.

The aim of sampling is only to reduce the error to the minimum possible level.

In addition to know the grade of the mineral, sampling also reveals the pattern of mineralization within the ore body. A systematic mine sampling program can demarcate the richer and leaner mineral deposits. Similarly, the limits of mineralization towards both the hanging and footwall contacts can also be precisely defined by careful sampling.

Sampling is also necessary to determine the processing and extractability characteristics of the mineral. For this purpose, bulk/grab representative/simulated samples representing the quality and type of material to be treated is collected.

More than 10 samplings were collected from the existing pit and drilled boreholes and core drills to ascertain the quality of Limestone. All the samples collected from the existing pit and drilled core holes had been packed carefully and taken to the investigation site of office.

These samples are gathered to for (Coning and Quartering which is as follows).

First the material is thoroughly mixed, then it is heaped by pouring the material at one single point which will ultimately be the center of the heap for this it will be helpful if a tall peg is fixed into the plate on which sampling is done, so that the material is always poured down all round the top of the peg to obtain uniform distribution when all the material is heaped top of the cone in flattened gently by a plate. Then the top is divided into four quarters as shown. Now, the opposite quarters are scooped out and rejected. The remaining portion represents approximately one-half of the original samples. (A basic technique used for sampling).

Again, it is passed through control sorting, mixing and the sample sent to the NABL laboratory for calculating the parameters required for mineral assemblages. This sampling technique was adopted to find out the concentration of calcium carbonate in the crystalline limestone deposit.

Grade of Limestone

Composite samples were taken from the mining lease area and after coning and quartering one representative sample were analyzed in the NABL laboratory.

The grade of Limestone is found to be of cement grade and chemical industrial grade the recovery percentage of limestone mineral is 80% (i.e. 60% High Grade Limestone + 20% Low grade Limestone) and the bulk density is 2.6. The average analysis of Limestone as analyzed in the NABL laboratory is tabulated below:

Table – 2

LIMESTONE		Low grade limestone
Parameter	Composition %	Composition %
Calcium Oxides (CaO)	46.72	31.27
Magnesium Oxides (MgO)	1.23	3.74
Iron (Fe_2O_3)	0.18	0.32
Alumina as (Al_2O_3)	0.36	0.41
Silica (SiO_2)	7.25	26.21
Loss of Ignition (LOI)	44.23	36.15
Sodium di-oxide (Na_2O)	-	0.43
Potassium di-oxide (K_2O)	-	0.61

The quality of Limestone ranges between 46.0 to 48 of CaO, 7.5 to 8.5 of SiO_2 and 0.5 to 1.0% of Fe_2O_3. As analyzed by NABL laboratory, Limestone which has more than 70-85% of $CaCO_3$ is best suited for cement industries, the grade below 40% of $CaCO_3$ are now considered as low-grade mineral, the grade below 20% of $CaCO_3$ and contaminations with calc gneiss waste are considered as Mineral rejects in these particular formations. Chemical analysis report of the limestone and low grade limestone are enclosed as Annexure – V & VA.

Beneficiation:

No beneficiation of ore is necessary for this mine.

Pilot plant:

The mined out mineral is used for its own captive plant in the name of M/s. Air Mineral Enterprises which is located in Sirugudi, 3.0kms from mining lease area for grinding the mineral in different mesh size ranging from 80 mesh to fine mesh i.e upto 10 microns and supplied to paints, rubber, PVC Compounding, fertilizer, feed industries and Coffee and tea plantations and also sold to the nearby cement and lime based industries which are located within a radius of 35Km from the mine site.

(v)Collection of abiotic geo- environmental data – its further refining and analysis

The lessee with his consulting geological team carried out the abiotic environmental data like collecting of flora and identify the fauna around the mining lease area, besides also conducting the geo hydrological studies, water analysis, air quality monitoring etc., which is required for the environmental management plan and environmental impact assessment (This chapter is discuss in detail in feasibility report which is enclosed annexure – I).

5. Petrographic:

Study of petrographic characters of rock and study of useful minerals

The area forms part of Archean complex of peninsular gneiss. The geological formations consist of Biotite-Schist and Crystalline limestone intruded by younger granites. The Biotite – Schist and Crystalline Limestone represent ancient calcareous sediments, which have suffered repeated metamorphism, intrusion by granites and folding during Archean. The regional trend of the band in the area is $N30^0W$ – $S30^0E$ with Dip $S40^oW$. The limestone in Sirugudi is a band, which is fine-grained crystalline limestone, and is mainly made-up of aggregates of calcite with sub – ordinate amount of Limestone and silicate minerals. The depositional sequence of the crystalline limestone is very well inferred by the adjacent limestone mine.

6. Geostatistical analysis of borehole data thickness of ore waste encountered in holes, assay values of samples if considered necessary.

More than 10 samplings were collected in the existing mining pit and drilled boreholes to ascertain the quality and grade of Limestone. The mine has reached maximum 14m depth and based on the existing pit the depth of the mineralization has been proved upto 22m depth with an average of 2m topsoil.

There is no additional formation of pits in the existing mine. The mining pit indicates the limestone band deposit and direction of the band. To confirm the characteristics features of limestone band, lateral variations and to find out the further depth persistence of the mineralization, three core drills (PCD1- PCD3) of 30m depth each are proposed from the existing floor level @ 50m grid interval, for future exploration during the present plan period in the year 2020-21. Locations of the proposed core drills are marked in the geological plan and yearwise plan (Refer Plate Nos.IV & V-A).

FEASIBILITY AXIS

F1

(Feasibility Study)

1. Geology:

Geology of area and project, detailed exploration, closed spaced drilling; ore body modeling, bulk samples for beneficiation, geotechnical and ground water & surface waters studies.

Geology of the area

The area comprises crystalline Archaean rocks of deep seated metamorphic origin which include mainly calc-gneiss, cordierite-sillimanite Gneiss, Biotite gneiss and granite gneiss. The gneisses appear to have resulted by migratizations of the pre existing sediments by intrusive of high grade metamorphism viz. High temperatures and pressures. In addition, younger intrusive such as granites, pegmatites and quartz veins are found within the limestone. The above said different types of metamorphosed rocks occur in the form of long, narrow, parallel bands which are traceable over a long distance. Limestone, band is noticed with prominent outcrops.

The area was surveyed in detail to prepare a Geological map in the scale of 1:1000 showing the various formations and attitude of the deposit. It is inferred that the Limestone mineral is of cement and chemical industrial grade and in form Band running $N30^0W$ – $S30^0E$ with dipping $S40^0W$. Reddish soil cover upto a depth in about 2.0m. Recovery of minerals is estimated as 80% (i.e. 60% High Grade Limestone + 20% Low grade Limestone) of the total excavation of the ore body. The recovery percentage is calculated based on the knowledge gained from the latest core drill datas and adjacent working mine in this region, by the field tests carried out in the lease area and analysis done in NABL Laboratories.

The general geological sequence of the limestone deposits is as follows:

Order of Super position:

AGE		ROCKFORMATION
Recent	-	Reddish Soil
Archaean	-	Crystalline Limestone
	-	Calc-gneiss.

The physical attitude of the limestone band is demarked as follows:

Strike length (m)	: 144
Width (m)	: 96
Depth (m) Proved	: 22 (max)
Strike direction	: $N30^0W$ – $S30^0E$
Dip amount and direction	: $S40^0W$.

The deposit is covered by 2.0m thickness of topsoil followed by 20m thickness of Limestone band.

Grade of Limestone

Composite samples were taken from the mining lease area and after coning and quartering one representative sample were analyzed in the NABL laboratory.

The grade of Limestone is found to be of cement grade and chemical industrial grade the recovery percentage of limestone mineral is 80% (i.e. 60% High Grade Limestone + 20% Low grade Limestone) and the bulk density is 2.6. The average analysis of Limestone as analyzed in the NABL laboratory is tabulated below:

Table – 3

LIMESTONE		Low grade limestone
Parameter	Composition %	Composition %
Calcium Oxides (CaO)	46.72	31.27
Magnesium Oxides (MgO)	1.23	3.74
Iron (Fe_2O_3)	0.18	0.32
Alumina as (Al_2O_3)	0.36	0.41
Silica (SiO_2)	7.25	26.21
Loss of Ignition (LOI)	44.23	36.15
Sodium di-oxide (Na_2O)	-	0.43
Potassium di-oxide (K_2O)	-	0.61

The quality of Limestone ranges between 46.0 to 48 of CaO, 7.5 to 8.5 of SiO_2 and 0.5 to 1.0% of Fe_2O_3. As analyzed by NABL laboratory, Limestone which has more than 70-85% of $CaCO_3$ is best suited for cement industries, the grade below 40% of $CaCO_3$ are now considered as low-grade mineral, the grade below 20% of $CaCO_3$ and contaminations with calc gneiss waste are considered as Mineral rejects in these particular formations. Chemical analysis report of the limestone and low grade limestone are enclosed as Annexure – V & VA.

Ground water & surface waters studies:

The area is dry for most part of the year and receives rainfall during the NE monsoon period from October- December. There are no major monsoon river courses in the area. Water table is found at a depth of 40m during summer and 35m depth during rainy season and the maximum depth proposed for mining is 18m from RL 229.0m to RL 211.0m. During the rainy season, which would not pose any problem for mining operations.

Suitable earth bunds will be formed around the area to protect the entry of rain water from outside. A small portable 5 HP diesel pump will be maintained and kept ready for de-watering the mine after the monsoon season period and as when it's required.

There will be no toxic effluent generated due to mining operation in the form of solid liquid or gas. The water will not be contaminated by the Limestone mining by any means. Since the Limestone occurrence is below 2.0m and there will be no problem to the ground water. The mine waste will not produce any toxic effluent. But, minor pollutant may occur during the mining operation and it will be within the permissible limits. Periodically water samples will be collected and analyzed as per statutory norms of IBM.

2. Mining:

Methods with special emphasis on detailed geotechnical test work/site characterization studies, safely measures; mining plan, mine recoveries and efficiency with variability due to structural complexities like close folds and faults; detailed estimates of manpower.

Proposals was given to work under "B Category" in the previous approved Scheme period, but this present Review of Mining plan period is prepared under "A" category method by deploying machineries for development of benches to meet the demand in the market.

The method of mining is by open cast "A" Category method; excavator will be deployed for the formation of benches and loading. Excavator attached with rock breaker will be deployed for breaking and fragmentation to avoid blasting as the strata is medium hard in nature. Jackhammers with compressors will be deployed for drilling. Manual labours will be engaged for jackhammer drilling, sorting of waste and for loading the limestone into trucks, occasionally excavator will also be used. Blasting will be carried out occasionally with controlled initiation system.

Drilling and Blasting:

Drilling Source:-

Jack hammer operated by the compressed air from tractor mounted compressor or Portable compressors.

Drilling parameters:-

Burden 0.9m spacing 1.0m depth 1.65m

Charge pattern:-

Charge 0.4 to 0.6kgs per hole. Stemming is 1/3 and explosives 2/3.The stemming material is moisture clay/pyroxenite mixed waste.

Initiation System:-

Bottom initiation system with safety fuses and ordinary or /plain electric detonators.

No of blast hole:

Number of the hole required per day is 13, based on the above said parameters.

Powder factor:

Powder factor is reported as 6 tonnes per kg of explosives.

Explosive required:

As stated above, the ROM requirements are 44 tons/day, based on the past experience the Powder factor is 6 tonnes/kg of explosive inclusive of blasting.

Hence the daily requirement of explosives is 44/6 = 7.5 kg/day.

Secondary Blasting:

Secondary Blasting is not needed, since the primary blasting itself will take care of the required fragmentation of Waste rock and mineral body.

Storage of explosives:

No Portable magazine is available for storing explosives. Agreement is made with explosive authorized dealer for supply of explosives under Form-22 at mine site and blasting will be done by the qualified blaster. Hence question for storage of Explosives does not arise.

Explosive Van:

The authorised explosive supplier will bring our requirements of explosive in his approved van and take away the balance explosive after blasting if any.

Mining:

There are two existing pits and their dimension is pit-1 [160m (max) x 50m (avg) x 14m (d) (max)] and pit-2 [48m (max) x 20m x 12m (d) (max)].

One bench is proposed on the topsoil with 2.0m height and 2.0m width with 45° slope.

In mineral, five benches are proposed with 4.0m height & 6.0m width slope maintained as 60° from horizontal.

Footpaths and roads are suitably formed for easy movement of men and materials for manual workings.

During the present plan period [2020-21 to 2024-25], the mine working is proposed to be carried out in the centre portion of the mining lease area, in West - East direction, to a depth of about 18m from RL 229.0m to RL 211.0m. Please refer plate nos.V-A to V-E.

The lessee assures to carry out the detailed Exploration as per the UNFC Norms in the year 2020-21 itself. If the Resource & Reserves are enhanced considerably, a modified Mining plan will be prepared and submitted to IBM for subsequent clearance & approval.

The proposed average annual production ROM will be about 13,277 tonnes with 300 working days in a year.

The mineral rejects that would be generated during the previous approved plan period was dumped on the Western side the lease area, the same will be removed and proposed to be backfill in the old pit situated in the southwestern side of the lease area, where the area is very narrow for recovering the deposit in systematic operation.

The generation of mineral rejects during the present plan period is proposed to be backfill in the old pit situated in the southwestern side of the lease area.

The generation of topsoil during the present plan period is proposed to be utilized for Afforestation purposes and also the formation of earthen bund along the north and western boundary barrier of the lease area.

Afforestation is proposed in the 7.5m boundary barrier. Nearly 200sq.m/year is proposed for afforestation on the Eastern boundary barrier of the lease area.

The waste will be loaded manually into tippers and occasionally loaded by excavators for transporting it to the backfill area. Labors will be provided with mine helmet, safety shoes and respirator. During rainy seasons mine workings will be restricted in the top benches, the seepage water and rain water will be drained by 5HP portable pumps.

The working is planned in such a way that after complete exploitation of limestone, the excavation will be partially filled and partially allowed to collect rain water which will act as a temporary aquifer.

Haul roads will be conformed to statuary standards for smooth transport of mineral and waste.

The sequence of working proposed for next five years is indicated in Plate Nos. V-A to V-E. If there is any change in the system of mining, the same will be intimated to Indian Bureau of Mines and the mining plan will be suitably modified for subsequent clearance and approval.

3. Environmental:

(i) *Environmental impact assessment (EIA) studies/environmental(EMP) including socio-economic impacts;*

Please refer para 9.0 in Annexure No.I.

(ii) *Rehabilitation of project affected persons, and waste disposal/ reclaimation ; detailed land use data.*

Topsoil:-

The topsoil is red gravelly earth. It occurs to a depth of 2.0m. About 2,576 Ts of top soil that would be generated during the present plan period is proposed to be utilized for afforestation purposes and also the formation of earthen bund along the north and western boundary barrier of the lease area.

Mined Waste:

There is no wasteful sub grade mineral in the mine. The anticipated waste during the present plan period is about 13,277 tonnes (20% mineral rejects) and topsoil is about 2,576 Ts.

The mineral rejects that would be generated during the previous approved plan period was dumped on the Western side the lease area, the same will be removed and proposed to be backfill in the old pit situated in the southwestern side of the lease area, where the area is very narrow for recovering the deposit in systematic operation.

The generation of mineral rejects during the present plan period is proposed to be backfill in the old pit situated in the southwestern side of the lease area.

The generation of topsoil during the present plan period is proposed to be utilized for Afforestation purposes and also the formation of earthen bund along the north and western boundary barrier of the lease area.

This aspect has been considered and accordingly Conceptual Mining Plan is drawn.

Proposed generation of waste for next five years [2020-21 to 2024-25]

Table-4

Year	ROM(Ts)	Mineral Rejects @ 20% (Ts)	Topsoil (Ts)	Ore waste ratio
2020-21	13250	2650	80	1;0.25
2021-22	13406	2681	2496	1;0.25
2022-23	13312	2662	-	1;0.25
2023-24	13146	2629	-	1;0.25
2024-25	13270	2654	-	1;0.25
Total	**66383**	**13277**	**2576**	**1;0.25**

The quantities of generation of wastes at the end of the mine life of the mine

Table –5

Category	ROM (Ts)	Mineral Rejects @20% (Ts)	Topsoil (Ts)
Proved 111	74277	14855	2576

Land chosen for disposal of waste:

The mineral rejects will be backfilled over the area ear-marked for the purpose. Please refer Plate Nos. VI, VII and VIII.

Manner of disposal of waste:

The waste handed by manual method in to the backfill area.

The size of the dumps for next five years will be as follows:

Dimension of the dumps at the end of the year 2020-21

Table–6

Proposed backfilling (Existing & Proposed Mineral reject) in Pit-2	48m X 20m X 7.4m(h)	Southwest

Dimension of the dumps at the end of the year 2021-22

Table–6A

Proposed backfilling (Existing & Proposed Mineral reject) in Pit-2	48m X 20m X 8.5m(h)	Southwest
Proposed Earthen Bund	260Sqm X 5m (w) X 2m(h)	North & Western Boundary

Dimension of the dumps at the end of the year 2022-23

Table–6B

Proposed backfilling (Existing & Proposed Mineral reject) in Pit-2	48m X 20m X 9.5m(h)	Southwest
Proposed Earthen Bund	260Sqm X 5m (w) X 2m(h)	North & Western Boundary

Dimension of the dumps at the end of the year 2023-24

Table–6C

Proposed backfilling (Existing & Proposed Mineral reject) in Pit-2	48m X 20m X 10.5m(h)	Southwest
Proposed Earthen Bund	260Sqm X 5m (w) X 2m(h)	North & Western Boundary

Dimension of the dumps at the end of the year 2024-25

Table–6D

Proposed backfilling (Existing & Proposed Mineral reject) in Pit-2	48m X 20m X 11.5m(h)	Southwest
Proposed Earthen Bund	260Sqm X 5m (w) X 2m(h)	North & Western Boundary

Table – 7

Dimensions of the waste dumps during the end of the life of the mine

Proposed backfilling (Existing & Proposed Mineral reject) in Pit-2	48m X 20m X 12.3m(h)	Southwest
Proposed Earthen Bund	260Sqm X 5m (w) X 2m(h)	North & Western Boundary

There is a proposal for backfilling the mined out pit in the southwestern portion of the lease area in this plan period, where the area is very narrow for recovering the deposit in systematic operation. The waste does not consists any toxic substance in the form of solid, liquid and gas. The waste is only the contamination of secondary minerals in the limestone mineral which cannot be separated.

4. Processing:

Details of proven pilot plant scale/ industrial scale investigations, appended with layout design, equipment list fuel/power consumption, specification for product/ by-product, disposal of tailings, effluent and future remedical measures.

No mineral processing is proposed during the mining plan period. The mined out mineral is used for its own captive plant in the name of M/s. Air Mineral Enterprises which is located in Sirugudi, 3.0kms from mining lease area for grinding the mineral in different mesh size ranging from 80 mesh to fine mesh i.e upto 10 microns and supplied to paints, rubber, PVC Compounding, fertilizer, feed industries and Coffee and tea plantations and also sold to the nearby cement and lime based industries which are located within a radius of 35Km from the mine site.

5. Infrastructure and services and construction activities: Full details.

The lease area is about 3.0 km SW from Sirugudi. The area is located at a distance of about 3.0km north from Kottampatty – Natham Road (SH-35). The area is located at a distance of about 10km west from Trichy – Madurai Road (NH-45B) (Please refer Key Map-IB for the location of the lease area).

Table-8

S.No	Particulars	Location	Direction	Approximate Distance in Km
1	Nearest Post office	Sirugudi	NE	3.0
2	Nearest Town(D.H)	Dindigul	NW	37
3	Nearest Police Station	Natham	SW	7.5
4	Nearest Govt. Hospital	Sirugudi	NE	3.0
5	Nearest School	Thethampatti	NE	1.0
6	Nearest DSP Office	Dindigul	NW	37
7	Nearest Railway Station	Dindigul	NW	36
8	Nearest Airport	Madurai	SW	50
9	Nearest Seaport	Tuticorin	S	166

Please refer Location plan (Plate No.I), Route Map (Plate No.IA), Key plan (Plate No.IB)

Drinking Water, rest shed, store room, public convenience and mines office are available in temporary semi permanent structure within the lease area. Please refer Plate No. VI.

6. Costing:

Detailed breakup of capital and operating costs details of working capital

It is proposed to carry out the mining operations with jackhammers drilling with compressors and excavators are used for the development of benches and loading. Since it is an opencast mining, spades, axes, shovels and loose tools are engaged.

Rental cost of excavators per month 1 No.	:	Rs.2,00,000/-
Rental cost of tippers per month 2 Nos.	:	Rs.40,000/-
Rental cost of compressor per month 2 Nos.	:	Rs.2,00,000/-
Jackhammer cost 6 Nos.	:	Rs.3,00,000/-
Loose tools	:	Rs.75,000/-

The capital cost will be around Rs.8,15,000/- and the working capital will not exceed more than Rs.2,00,000/-.

7. Marketing:

Overview, specific market aspects.

The mined out mineral is used for its own captive plant in the name of M/s. Air Mineral Enterprises which is located in Sirugudi, 3.0kms from mining lease area for grinding the mineral in different mesh size ranging from 80 mesh to fine mesh i.e upto 10 microns and supplied to paints, rubber, PVC Compounding, fertilizer, feed industries and Coffee and tea plantations and also sold to the nearby cement and lime based industries which are located within a radius of 35Km from the mine site.

8. Economic viability:

Cash flow forecast, inflation effects, sensitivity studies.

The viability may vary, since the market of Limestone depends upon the grade and requirement of cement, which are governed by the market demand. The economically viability at present market conditions are tabulated below:

Table –9

S.No.	Particulars	Cost of production Per ton
1.	Labour charges	Rs.65
2.	Royalty paid to Mines & Geology	Rs.80
3.	National Mineral Exploration Trust	Rs.2
4.	District Mineral Foundation (DMF)	Rs.24
5.	Excavation expenses	Rs.25
6.	Drilling & Blasting expenses	Rs. 20
7.	Transport from mine head to Stockyard (loading & unloading)	Rs.60
	Total	**Rs.276**
8.	Miscellaneous and over heads	Rs.24
	Total	**Rs.300**
9.	**Sale value of the Limestone for commercial cement grade**	**Rs. 400**

The cost of production is Rs. 300/ton and selling prize for cement grade is Rs.400/ton. Hence, the mining is economically viable at present market conditions.

9. Other factors:

Statutory provisions (labour, land, mining, taxation etc).

Since the mining lease area falls on the backward village of Dindigul district were the agricultural activities mainly depend upon the rainfall plenty of labours and land is available. The mine is proposed to be carried out by opencast method. The taxes for the wages and mineral will be paid as per government norms.

ECONOMIC AXIS

E1

(Economic)

1. Detailed exploration.

During the previous approved scheme period (2012-13 to 2015-16), three boreholes upto 17m depth was carried out by the lessee.

In the previous approved plan period [2015-16 (from 28.02.2016) to 2019-20] no exploration programme was proposed but the lessee has carried out two core drills (DCD1 to DCD2) of 18m depth in the year 2019, to find out the grade of limestone, lateral variations and vertical in homogenities of the limestone formation and depth persistence. At Present there are two existing pits and its dimension is given below.

Existing Pit Geometry:

Table-10

Pit No.	Length In Meter	Width In Meter	Depth In Meter	Area In Ha.	Dip°	Strike
1.	160 (max)	50 (avg)	14 (max)	0.89.6	$S40^0W$	$N30^0W– S30^0E$
2.	48 (max)	20 (max)	12 (max)			

With the datas analyzed from the drilled boreholes and existing pit, the deposit has been proved upto 17m depth with an average of 2m topsoil. The boreholes logging datas are furnished below.

Litho log of drilled boreholes carried out in the previous approved scheme period (2012-13 to 2015-16):

Table-11

No. of bore holes	Depth of boreholes (m)	Depth of deposition of Limestone	Strata
DBH-1	16.9	228.9m-214.8m	Mined out
		214.8m-212.0m	Limestone
DBH-2	17.0	229.0m-220.2m	Mined out
		220.2m-212.0m	Limestone
DBH-3	16.8	228.8m-216.7m	Mined out
		216.7m-212.0m	Limestone

Litho log of drilled core drills carried out in the previous approved scheme period [2015-16 (from 28.02.2016) to 2019-20] in the year 2019:

Table-11A

No. of core drills	Latitude	Longitude	Depth of core drills (m)	Depth of deposition of Limestone in (RL)	Strata
DCD 1	10^0 14' 33.86"N	78^0 17' 45.72"E	18.0	225.0m – 207.0m	Limestone
DCD 2	10^0 14' 34.34"N	78^0 17' 47.26"E	8.0	215.0m – 207.0m	Limestone

Copy of Form –I & J is enclosed as Annexure no.XII.

Locations of drilled boreholes and core drills are marked in the geological plan and sections and year wise plan and sections (Refer Plate No.IV & V-A).

The lessee with his consultant geological team thoroughly studied the area and demarcated the attitude of the band. It is inferred that the limestone is cement grade and in the form of band running from $N30^0W– S30^0E$ direction with dipping $S40^0W$.

Regular sampling and analysis during the past mining activities has revealed that the limestone mineral is of cement grade (the mineral was also analyzed in NABL laboratory as per the circular issued by the CCOM, Nagpur). The recovery of 60% was discussed in the previous approved plan period and the same 60% recovery was achieved by the lessee during the previous approved plan period.

Based on the latest core drill exploration programme has carried out by the lessee in the lease area for find out the grade of limestone, lateral variations and vertical in homogeneities of the limestone formation and depth persistence, the samples were collected from the latest core log for NABL laboratory for testing and analysis and to find out the chemical and physical properties of the limestone mineral. It is concluded that the grade of limestone is found to be of cement grade & Chemical Industrial grade and the recovery percentage of limestone mineral is 80% (i.e. 60% High Grade Limestone + 20% Low grade Limestone) and the bulk density is 2.6.

During the recent periods there is a huge demand for low grade limestone for cement industry and chemical industry. By the growth of technology and latest inventions of cement processing machineries it is now feasible to blend the low grade limestone to high grade limestone which can be used for cement industry, Hence the recovery percentage for the high grade mineral is 60% from the ROM, 20% recovery from the ROM is low grade mineral and remaining 20% recovery from the ROM is considered as Mineral Rejects is discussed during the present Review of Mining plan period.

The past mining experience gained by the lessee from the limestone mining is sufficient for calculating the mineral reserves and resources related to G1, F1, E1 Axis of United Nations Framework Classification Systems and to satisfy the latest circular No. 4/2009 dated 21.10.2009 issued by the CCOM, Nagpur.

The mine has reached maximum 14m depth and based on the existing pit and drilled core drills the depth of the mineralization has been proved upto 22m depth with an average of 2m topsoil in Centre & Eastern portion of the area and upto 17m depth with an average of 2m topsoil in the west and south western portion of the area. Hence, the reserves and resources are estimated as given below during the present plan period.

Table-12

Depth of estimation of the reserves and resources during the present Mining plan period [2020-21 to 2024-25]

22m [2m topsoil + 20m limestone (proved 111)]	Centre & East
22m [2m topsoil + 15m limestone (proved 111)] + 5m limestone (probable 222)]	West
17m [2m topsoil + 15m limestone (proved 111)]	Southwest

Besides, to confirm the characteristics features of limestone band, lateral variations and to find out the further depth persistence of the mineralization, three core drills (PCD1- PCD3) of 30m depth are proposed from the existing floor level @ 50m grid interval, for future exploration during the present plan period in the year 2020-21. Locations of the proposed core drills are marked in the geological plan and yearwise plan (Refer Plate Nos.IV & V-A).

a. Geological Mapping (Topographical and Contour map in 1: 1000 Scale)

The area was surveyed in detail by total station survey instrument with relevant software for preparation of geological map in the scale of 1:1000 showing the various formations, attitude of the deposits and the reserve position.

b. Geo-Physical Prospecting in the way of Vertical Electrical Sounding

Geophysical survey in the form of vertical electrical sounding (VES), was conducted in the lease area to assess the lateral variations, vertical in homogeneities and the sub surface geology with respect to the availability of resources and reserves of limestone deposits.

c. Geo-Chemical Prospecting

Samples were collected from the drilled core drill for NABL laboratory for testing and analysis and to find out the chemical and physical properties of the limestone mineral. It was inferred that the grade of Limestone is found to be of cement grade and chemical industrial grade the recovery percentage of limestone mineral is 80% (i.e. 60% High Grade Limestone + 20% Low grade Limestone) and the bulk density is 2.6.

Grade of Limestone:

The average analysis of Limestone as analyzed in the NABL laboratory is tabulated below and Chemical analysis report is enclosed as Annexure Nos.V & VA.

Table – 13

LIMESTONE		Low grade limestone
Parameter	Composition %	Composition %
Calcium Oxides (CaO)	46.72	31.27
Magnesium Oxides (MgO)	1.23	3.74
Iron (Fe_2O_3)	0.18	0.32
Alumina as (Al_2O_3)	0.36	0.41
Silica (SiO_2)	7.25	26.21
Loss of Ignition (LOI)	44.23	36.15
Sodium di-oxide (Na_2O)	-	0.43
Potassium di-oxide (K_2O)	-	0.61

The quality of Limestone ranges between 46.0 to 48 of CaO, 7.5 to 8.5 of SiO_2 and 0.5 to 1.0% of Fe_2O_3. As analyzed by NABL laboratory, Limestone which has more than 70-85% of $CaCO_3$ is best suited for cement industries, the grade below 40% of $CaCO_3$ are now considered as low-grade mineral, the grade below 20% of $CaCO_3$ and contaminations with calc gneiss waste are considered as Mineral rejects in these particular formations.

d. Technological Prospecting

Pitting:

Since the mine is active and the depth of the mine has already reached about maximum 14m, there is no additional formation of pits in the existing mine and the depth of the mineralization has been already proved upto 22m depth with an average of 2m topsoil based on existing pit and drilled core drills. The mining pit indicates the limestone deposit and direction of the band.

To confirm the characteristics features of limestone band, lateral variations and to find out the further depth persistence of the mineralization, three core drills (PCD1-PCD3) of 30m depth each are proposed from the existing floor level @ 50m grid interval, for future exploration during the present plan period in the year 2020-21. Locations of the proposed core drills are marked in the geological plan and yearwise plan (Refer Plate Nos.IV & V-A).

Trenching

As discussed above, there is no requirement of trenching in the existing mine. The existing pits evidences sufficient data's required for the occurrence and distribution of limestone.

Drilling

The mine has reached maximum 14m depth and the depth of the mineralization has been already proved upto 22m depth with an average of 2m topsoil based on existing pit and drilled core drills.

There is no additional formation of pits in the existing mine. The mining pit indicates the limestone bed deposit and direction of the band. To confirm the characteristics features of limestone band, lateral variations and to find out the further depth persistence of the mineralization, three core drills (PCD1- PCD3) of 30m depth each are proposed from the existing floor level @ 50m grid interval, for future exploration during the present plan period in the year 2020-21. Locations of the proposed core drills are marked in the geological plan and yearwise plan (Refer Plate Nos.IV & V-A).

The mined out mineral is used for its own captive plant in the name of M/s. Air Mineral Enterprises which is located in Sirugudi, 3.0kms from mining lease area for grinding the mineral in different mesh size ranging from 80 mesh to fine mesh i.e upto 10 microns and supplied to paints, rubber, PVC Compounding, fertilizer, feed industries and Coffee and tea plantations and also sold to the nearby cement and lime based industries which are located within a radius of 35Km from the mine site.

The anticipated annual production of ROM (proved 111) would be about 13,277 tonnes/year (avg.) and for the end of the life of the mine is 74,277Ts of ROM (proved 111), when the Mine is fully developed.

2.0 Mining report /mining plan / working mines.

Proposals was given to work under "B Category" in the previous approved Scheme period, but this present Review of Mining plan period is prepared under "A" category method by deploying machineries for development of benches to meet the demand in the market.

The method of mining is by open cast "A" Category method; excavator will be deployed for the formation of benches and loading. Excavator attached with rock breaker will be deployed for breaking and fragmentation to avoid blasting as the strata is medium hard in nature. Jackhammers with compressors will be deployed for drilling. Manual labours will be engaged for jackhammer drilling, sorting of waste and for loading the limestone into trucks, occasionally excavator will also be used. Blasting will be carried out occasionally with controlled initiation system.

Drilling and Blasting:

Drilling Source:-

Jack hammer operated by the compressed air from tractor mounted compressor or Portable compressors.

Drilling parameters:-

Burden 0.9m spacing 1.0m depth 1.65m

Charge pattern:-

Charge 0.4 to 0.6kgs per hole. Stemming is 1/3 and explosives 2/3.The stemming material is moisture clay/pyroxenite mixed waste.

Initiation System:-

Bottom initiation system with safety fuses and ordinary or /plain electric detonators.

No of blast hole:

Number of the hole required per day is 13, based on the above said parameters.

Powder factor:

Powder factor is reported as 6 tonnes per kg of explosives.

Explosive required:

As stated above, the ROM requirements are 44 tons/day, based on the past experience the Powder factor is 6 tonnes/kg of explosive inclusive of blasting.

Hence the daily requirement of explosives is 44/6 = 7.5 kg/day.

Secondary Blasting:

Secondary Blasting is not needed, since the primary blasting itself will take care of the required fragmentation of Waste rock and mineral body.

Storage of explosives:

No Portable magazine is available for storing explosives. Agreement is made with explosive authorized dealer for supply of explosives under Form-22 at mine site and blasting will be done by the qualified blaster. Hence question for storage of Explosives does not arise.

Explosive Van:

The authorised explosive supplier will bring our requirements of explosive in his approved van and take away the balance explosive after blasting if any.

Mining:

There are two existing pits and their dimension is pit-1 [160m (max) x 50m (avg) x 14m (d) (max)] and pit-2 [48m (max) x 20m x 12m (d) (max)].

One bench is proposed on the topsoil with 2.0m height and 2.0m width with 45° slope.

In mineral, five benches are proposed with 4.0m height & 6.0m width slope maintained as 60° from horizontal.

Footpaths and roads are suitably formed for easy movement of men and materials for manual workings.

During the present plan period [2020-21 to 2024-25], the mine working is proposed to be carried out in the centre portion of the mining lease area, in West - East direction, to a depth of about 18m from RL 229.0m to RL 211.0m. Please refer plate nos.V-A to V-E.

The lessee assures to carry out the detailed Exploration as per the UNFC Norms in the year 2020-21 itself. If the Resource & Reserves are enhanced considerably, a modified Mining plan will be prepared and submitted to IBM for subsequent clearance & approval.

The proposed average annual production ROM will be about 13,277 tonnes with 300 working days in a year.

The mineral rejects that would be generated during the previous approved plan period was dumped on the Western side the lease area, the same will be removed and proposed to be backfill in the old pit situated in the southwestern side of the lease area, where the area is very narrow for recovering the deposit in systematic operation.

The generation of mineral rejects during the present plan period is proposed to be backfill in the old pit situated in the southwestern side of the lease area.

The generation of topsoil during the present plan period is proposed to be utilized for Afforestation purposes and also the formation of earthen bund along the north and western boundary barrier of the lease area.

Afforestation is proposed in the 7.5m boundary barrier. Nearly 200sq.m/year is proposed for afforestation on the Eastern boundary barrier of the lease area.

The waste will be loaded manually into tippers and occasionally loaded by excavators for transporting it to the backfill area. Labors will be provided with mine helmet, safety shoes and respirator. During rainy seasons mine workings will be restricted in the top benches, the seepage water and rain water will be drained by 5HP portable pumps.

The working is planned in such a way that after complete exploitation of limestone, the excavation will be partially filled and partially allowed to collect rain water which will act as a temporary aquifer.

Haul roads will be conformed to statuary standards for smooth transport of mineral and waste.

The sequence of working proposed for next five years is indicated in Plate Nos. V-A to V-E. If there is any change in the system of mining, the same will be intimated to Indian Bureau of Mines and the mining plan will be suitably modified for subsequent clearance and approval.

3.0 Specific end-use grades of reserves (above economic cut-off grade).

The mined out mineral is used for its own captive plant in the name of M/s. Air Mineral Enterprises which is located in Sirugudi, 3.0kms from mining lease area for grinding the mineral in different mesh size ranging from 80 mesh to fine mesh i.e upto 10 microns and supplied to paints, rubber, PVC Compounding, fertilizer, feed industries and Coffee and tea plantations and also sold to the nearby cement and lime based industries which are located within a radius of 35Km from the mine site.

Grade of Limestone

Composite samples were taken from the mining lease area and after coning and quartering one representative sample were analyzed in the NABL laboratory.

The grade of Limestone is found to be of cement and chemical industrial grade and the recovery percentage of limestone mineral is 80% (i.e. 60% High Grade Limestone + 20% Low grade Limestone) and the bulk density is 2.6. The average analysis of Limestone as analyzed in the NABL laboratory is tabulated below:

Table – 14

LIMESTONE		Low grade limestone
Parameter	Composition %	Composition %
Calcium Oxides (CaO)	46.72	31.27
Magnesium Oxides (MgO)	1.23	3.74
Iron (Fe_2O_3)	0.18	0.32
Alumina as (Al_2O_3)	0.36	0.41
Silica (SiO_2)	7.25	26.21
Loss of Ignition (LOI)	44.23	36.15
Sodium di-oxide (Na_2O)	-	0.43
Potassium di-oxide (K_2O)	-	0.61

The quality of Limestone ranges between 46.0 to 48 of CaO, 7.5 to 8.5 of SiO_2 and 0.5 to 1.0% of Fe_2O_3. As analyzed by NABL laboratory, Limestone which has more than 70-85% of $CaCO_3$ is best suited for cement industries, the grade below 40% of $CaCO_3$ are now considered as low-grade mineral, the grade below 20% of $CaCO_3$ and contaminations with calc gneiss waste are considered as Mineral rejects in these particular formations. Chemical analysis report of the limestone and low grade limestone are enclosed as Annexure – V & VA.

The reserve above cutoff grade is tabulated below:

MINERAL RESERVE & LIFE OF THE MINE:

Reserves estimation of mineral is done by cross sections method. For Reserve calculation, the length and width of the deposit is shown in the Geological plan & cross sections. (Please Refer Plate. IV). The recovery percentage of Limestone in this mine is 80% (i.e. 60% High Grade Limestone + 20% Low grade Limestone) which was well inferred by the experience gained by the lessee during the core drills made in the lease area and the bulk density has been reckoned as 2.6.

Table – 15

Depth of estimation of the reserves and resources during the present Mining plan period [2020-21 to 2024-25]

22m [2m topsoil + 20m limestone (proved 111)]	Centre & East
22m [2m topsoil + 15m limestone (proved 111)] + 5m limestone (probable 222)]	West
17m [2m topsoil + 15m limestone (proved 111)]	Southwest

Reassessed Mineral Reserves and Resources as per UNFC System as on 20.12.2019

Table-16

A. Mineral Reserves (111)

Section	Bench	Dimension				Bulk density	ROM (Ts)	Limestone @60% Recovery (Ts)	Low Grade Limestone @20% Recovery (Ts)	Mineral Rejects @20% (Ts)	Top Soil (Ts)
		L(m)	W(m)	D(m)	Volume (cum)						
X2Y2-CD	I	26	24	2	1248	2	-	-	-	-	2496
	II	23	19	2	874	2.6	2272	1363	454	454	-
	II	32	19	2	1216	2.6	3162	1897	632	632	-
	III	25	9	4	900	2.6	2340	1404	468	468	-
	Total						**7774**	**4664**	**1555**	**1555**	**2496**
X3Y3-CD	I	1	20	2	40	2	-	-	-	-	80
	II	49	22	2	2156	2.6	5606	3363	1121	1121	-
	II	49	45	2	4410	2.6	11466	6880	2293	2293	-
	III	29	46	4	5336	2.6	13874	8324	2775	2775	-
	IV	10	46	4	1840	2.6	4784	2870	957	957	-
	Total						**35729**	**21438**	**7146**	**7146**	**80**
X4Y4-CD	V	44	50	4	8800	2.6	22880	13728	4576	4576	-
	VI	23	33	4	3036	2.6	7894	4736	1579	1579	-
	Total						**30774**	**18464**	**6155**	**6155**	**-**
Grand Total							**74277**	**44566**	**14855**	**14855**	**2576**

Table-16A

B. Mineral Resources (222)

Section	Bench	Dimension			Volume (cum)	Bulk density	ROM (Ts)
		L (m)	W(m)	D(m)			
X2Y2-CD	V	59	25	1	1475	2.6	3835
	VI	59	25	4	5900	2.6	15340
	Total						**19175**

Table-17

C. Mineral Resources locked up in benches (221)

Section	Bench	Dimension			Volume (cum)	Bulk density	ROM (Ts)	Limestone @60% Recovery (Ts)	Low Grade Limestone @20% Recovery (Ts)	Mineral Rejects @20% (Ts)
		L (m)	W(m)	D(m)						
X1Y1-AB	II	6	9	4	216	2.6	562	337	112	112
	III	10	13	4	520	2.6	1352	811	270	270
	IV	12	17	2	408	2.6	1061	636	212	212
	IV	29	41	2	2378	2.6	6183	3710	1237	1237
	V	29	41	3	3567	2.6	9274	5565	1855	1855
	Total						**18431**	**11059**	**3686**	**3686**
X2Y2-CD	II	9	6	4	216	2.6	562	337	112	112
	III	21	16	4	1344	2.6	3494	2097	699	699
	IV	59	25	4	5900	2.6	15340	9204	3068	3068
	V	59	25	3	4425	2.6	11505	6903	2301	2301
	Total						**30901**	**18541**	**6180**	**6180**
X3Y3-CD	II	10	1	4	40	2.6	104	62	21	21
	III	36	1	4	144	2.6	374	225	75	75
	IV	55	1	4	220	2.6	572	343	114	114
	V	65	53	4	13780	2.6	35828	21497	7166	7166
	VI	65	53	4	13780	2.6	35828	21497	7166	7166
	Total						**72706**	**43624**	**14541**	**14541**
X4Y4-CD	II	15	4	4	240	2.6	624	374	125	125
	III	22	15	4	1320	2.6	3432	2059	686	686
	IV	26	17	4	1768	2.6	4597	2758	919	919
	V	40	26	4	4160	2.6	10816	6490	2163	2163
	VI	60	42	4	10080	2.6	26208	15725	5242	5242
	Total						**45677**	**27406**	**9135**	**9135**
Grand Total							**167716**	**100629**	**33543**	**33543**

Table-18

D. Mineral Resources locked in 7.5m safety barrier (221)

Area in S.qm	Depth in (m)	Volume (cum)	Bulk Density	ROM (Ts)	Limestone @ 60% recovery (Ts)	Low grade Limestone @20% (Ts)	Mineral Rejects @20% (Ts)	Top soil (Ts)
3845	2	7690	2	-	-	-	-	15380
3845	20	76900	2.6	199940	119964	39988	39988	-
1763	2	3526	2	-	-	-	-	7052
1763	15	26445	2.6	68757	41254	13751	13751	-
Total				**268697**	**161218**	**53739**	**53739**	**22432**

Table-19

Summary of Reserves & Resources

Description	Section	ROM (Ts)	Limestone @ 60% recovery (Ts)	Low grade Limestone @20% (Ts)	Mineral Rejects @20% (Ts)	Top Soil (Ts)
A. Mineral Reserves (111)	X2Y2-CD	7774	4664	1555	1555	2496
	X3Y3-CD	35729	21438	7146	7146	80
	X4Y4-CD	30774	18464	6155	6155	-
	Total	**74277**	**44566**	**14855**	**14855**	**2576**
B. Mineral Resources (222)	X2Y2-CD	19175	**-**	**-**	**-**	**-**
C. Mineral Resources locked up in benches (221)		167716	100629	33543	33543	**-**
D. Mineral Resources locked in 7.5m safety barrier (221)		268697	161218	53739	53739	22432

The Mineral reserves still available in this mine would be 74,277 tonnes from ROM, 44,566 tonnes of Limestone (60% from ROM) and 14,855 tonnes of Low grade Limestone (20% from ROM).

The actual Mineral reserves of ROM is estimated about 74,277 tonnes after giving due allowance for boundary barriers of the lease area. The recovery percentage of Limestone is calculated as 80% (i.e. 60% High Grade Limestone + 20% Low grade Limestone) with an annual production of ROM is estimated about 13,277 tonnes, the life of the mine is expected to be around 74,277 /13,277= 5.60 years.

After thorough exploration of the field and after re-estimating the reserve, the life of the mine may be extended or shortened.

After obtaining necessary permission under Regulation 111(3) of MMR, 1961, Limestone in the boundary barrier will be exploited up to the lease boundary line to extend the life of the mine.

4.0 Specific knowledge of forest/non-forest and other land use data

The lease area is a patta land and it does not fall under forest of any category. Therefore, the lessee has surface rights over the lease area.

The present and post mining land use pattern is given as under

Table -20

S.No	Description	Present Area (Ha)	Additional Area required during the present MP Period (Ha) [2020-21 to 2024-25]	Area at the end of life of Mine (Ha)
1.	Area under Mining	0.89.6	0.16.0	1.05.6
2.	Waste dump	0.12.1	Nil*	Nil*
3.	Earthen Bund	Nil	0.13.0	0.13.0
4.	Office & infrastructure	Nil	0.01.0	0.01.0
5.	Processing plant	-	-	-
6.	Mineral stack processing yard	-	-	-
7.	Sub grade mineral stacks	-	-	-
8.	Mine roads	0.02.0	Nil	0.02.0
9.	Areas under plantation	0.04.0	0.10.0	0.14.0
10.	Un utilized area	0.62.3	0.34.4	0.34.4
12.	Total	**1.70.0**		**1.70.0**

* Dump will be backfill

Based on the economical axis it is inferred that the mine is economically viable to exploit the limestone mineral at present market scenario.

Signature of the Qualified Person

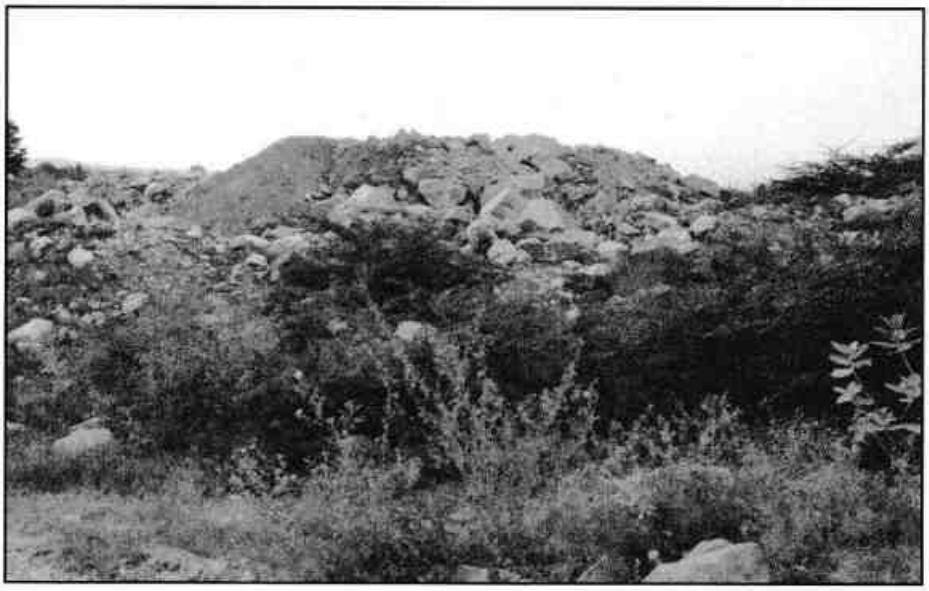
A.Jagannathan, B.E., F.C.C., M.M.E.A., M.I.E.,

Place: Salem
Date: 02.01.2020

Name of the lessee: M/s. Sivam Mines
Name of the Mine: Sirugudi Limestone Mine
Extent: 1.70.0 Ha
S.F.Nos: 693/1, 2, 3, 4 & 7
Village: Sirugudi
Taluk: Natham
District: Dindigul

Existing pit with Environmental status of the area

Existing Dump



ANNEXURE - II.

ABSTRACT

Industries – Mines and Minerals – Limestone – Dindigul District – Natham Taluk – Sirugudi Village – S.F. Nos. 693/1, 2, 3, 4 and 7 over an extent of 1.70.0 hectares of patta land – Transfer of mining lease granted to Thiru. S. Asai Alangaram to M/s. Sivam Mines – Orders - Issued.

INDUSTRIES (MMA.1) DEPARTMENT

G.O. (D) No. 173

Dated: 05.11.2014
திருவள்ளுவர் ஆண்டு 2045
ஜய வருடம், ஐப்பசி திங்கள் 19

Read:

1. G.O. (3D) No.83, Industries (MMA.2) Department, dated: 09.10.1996.
2. Representation of Thriu. S. Asai Alangaram, dated: 25.1.2010.
3. From the District Collector, Dindigul, Roc.No. 52/2010/Mines, dated: 3.3.2010.
4. From the Commissioner of Geology and Mining, Letter Rc. No. 3256/MM4/2010, dated: 9.4.2010 and 31.12.2013.

-0-

ORDER

In the Government Order first read above, orders have been issued granting second renewal of mining lease in favour of Thiru S. Asai Alangaram, Dindigul District for mining limestone over an extent of 1.70.0 hectares in S.F. Nos. 693/1, 2, 3, 4 and 7 of patta land of Sirugudi Village, Natham Taluk, Dindigul District for a period of 20 years. The lease period is from 28.02.1996 to 27.02.2016.

2. In his letter second read above Thiru. S. Asai Alangaram has stated that he is willing to develop the mines in a scientific manner using scientific methods and hence he and his brother Thiru. S. Ilangovan have agreed to transfer their leases to partnership concern under rule 37 of Mineral Concession Rules, 1960 in the name and style of "M/s. Sivam Mines" having its registered office at 6/209, Pudupatti, Sirugudi Village, Natham Taluk, Dindigul District and requested to transfer the lease granted in the name of Thiru. S. Asai Alangaram to the above said partnership firm M/s. Sivam Mines.

3. The District Collector, Dindigul in his letter third read above has stated that on perusing the records based on rule 37 of the Mineral Concession Rules, 1960, it was found that both the transferor and transferee have submitted the affidavit towards income-tax, mining dues, and also details about the mining lease in the State of Tamil Nadu. Further, the lessee has also produced no mining dues certificate in respect of Dindigul District and transferee firm have also produced the affidavit to bear the liabilities of the lessee and the partnership firm has been registered on 25.01.2010 by the Registrar of Firms, Dindigul. The District Collector, Dindigul has recommended the application for name transfer from Thiru. S. Asai Alangaram to the partnership concern that is in the name of "M/s. Sivam Mines".

4. Based on the recommendation of the District Collector, Dindigul, the Commissioner of Geology and Mining in his letter fourth read above has stated that Thiru. S. Asai Alangaram has furnished the mining due clearance certificate issued by the District Collector, Dindigul for the year 2012-2013 and recommended the application preferred by Thiru. S. Asai Alangaram for transfer of second renewal of mining lease granted to him for mining limestone over an extent of 1.70.0 hectares of patta lands in S.F. Nos. 693/1, 2, 3, 4 and 7 of Sirugudi Village, Natham Taluk, Dindigul District for a period of 20 years from 28.02.1996 to 27.02.2016. in the Government Order first read above in the name of M/s. Sivam Mines subject to the condition that the transferee should scrupulously follow the Mining Plan/Scheme of Mining approved by Indian Bureau of Mines in respect of the said lease hold area as provided under rule 37 of Mineral Concession Rules, 1960.

5. After careful examination, the Government have decided to accept the recommendation of the District Collector, Dindigul and the Commissioner of Geology and Mining. Accordingly, the second renewal of mining lease granted in the Government Order first read above for limestone over an extent of 1.70.0 hectares of patta lands in S.F. Nos. 693/1, 2, 3, 4 and 7 of Sirugudi Village, Natham Taluk, Dindigul District for a period of 20 years is transferred from Thiru S.Asai Alangaram to M/s. Sivam Mines upto the valid lease period (i.e. 28.02.1996 to 27.02.2016.) subject to the condition that the transferee should scrupulously follow the Mining Plan/Scheme of Mining approved by Indian Bureau of Mines in respect of the said lease hold area as provided under rule 37 of Mineral Concession Rules, 1960.

6. The District Collector, Dindigul is requested to take further action and collect the latest mining dues if any pending from the transferee. The original application of transfer of second renewal of mining lease is returned herewith for follow up action.

(BY ORDER OF THE GOVERNOR)

C.V. SANKAR
PRINCIPAL SECRETARY TO GOVERNMENT

To
The Commissioner of Geology and Mining,
Guindy, Chennai-600 032.
The District Collector, Dindigul. (w.e.)
The Controller General, Indian Bureau of Mines,
New Secretariat Buildings,Nagpur.
The Regional Controller of Mines,
Indian Bureau of Mines, 29,Vijayaragava Road,
T.Nagar, Chennai-600 017.
Thriu. S. Asai Alangaram, S/o. K.A. Semban Chettiar,
Sirugudi (PO), Natham Taluk, Dindigul District–624 404.
M/s. Sivam Mines, 6/209, Pudupatti,
Sirugudi Village, Natham Taluk, Dindigul District.
Copy to:
Office of the Hon'ble Minister (Industries), Chennai-600 009.
Industries (OP.II) Department, Chennai-600 009.,
SF/SCs.

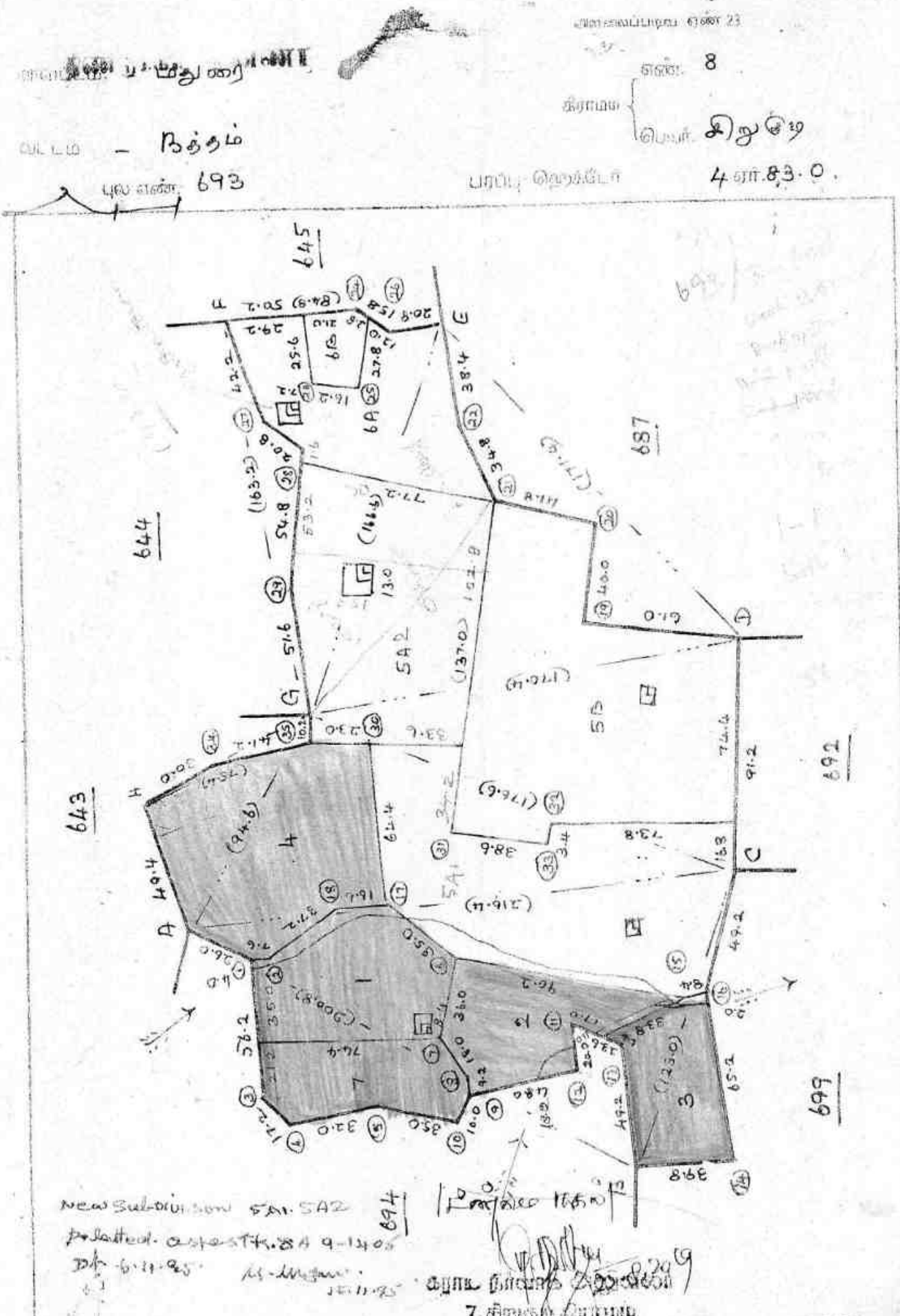
// Forwarded / By order //

Section Officer

2/11/2014

1188A

ANNEXURE - III



ANNEXURE - II A

தமிழக அரசு

வருவாய்த் துறை

நில உரிமை விபரங்கள் : இ. எண் 10(1) பிரிவு

மாவட்டம் : திண்டுக்கல்

வட்டம் : நத்தம்

வருவாய கிராமம் : சிறுகுடி

பட்டா எண் : 3100

உரிமையாளர்கள் பெயர்

1. செம்மன் செட்டியார் மகன் இளங்கோவன்

புல எண்	உட்பிரிவு	நன்செய் பரப்பு ஹெக் - ஏர்	நன்செய் தீர்வை ரூ - பை	புன்செய் பரப்பு ஹெக் - ஏர்	புன்செய் தீர்வை ரூ - பை	மற்றவை பரப்பு ஹெக் - ஏர்	மற்றவை தீர்வை ரூ - பை
698	4A	0 - 54.50	4.21	--	--	--	--
631	8	0 - 4.50	0.62	--	--	--	--
642	2C	--	--	0 - 5.00	0.19	--	--
642	2F	--	--	0 - 4.00	0.15	--	--
642	2J	--	--	0 - 3.00	0.11	--	--
642	3A	--	--	0 - 6.00	0.15	--	--
642	4D	--	--	0 - 7.00	0.19	--	--
642	5D	--	--	0 - 1.50	0.06	--	--
631	4	--	--	0 - 1.50	0.06	--	--
631	6	--	--	0 - 15.50	0.43	--	--
631	11	--	--	0 - 30.00	0.83	--	--
693	3	--	--	0 - 24.00	0.66	--	--
693	1	--	--	0 - 37.50	1.04	--	--
693	7	--	--	0 - 22.50	0.84	--	--
693	2	--	--	0 - 29.00	0.81	--	--
693	4	--	--	0 - 57.00	1.58	--	--
693	5A1	--	--	0 - 82.00	2.27	--	--
693	5A2B	--	--	0 - 11.00	0.30	--	--
		0 - 59.00	4.83	3 - 36.50	9.67		

குறிப்பு2 :

1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **http://eservices.tn.gov.in** என்ற இணைய தளத்தில் 13/13/007/03100/30734 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 28-08-2019 அன்று 09:27:33 AM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின்2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணைய தளத்தில் சரிபார்க்கவும்

1428-ஆம் பசலியில் திருச்சிராப்பள்ளி மாவட்டம் கிராமக் கணக்கு வட்டம் 7 - முசிறி

நில வரித் திட்டத்தின்படி புலன்களின் விபரம்.					கைப்பற்று தாருடைய பெயரும் எண்ணும் அல்லது அனுபோக தாருடைய பெயர்.	சாகுபடி மாளின் பெயர்.	முதல் போகம்.				
நில அளவை எண்.	உட்பிரிவு எண்.	மாப்பு.	தீர்வை.	ஒரு போகம் அல்லது இரு போகம்.		நிலத்தின் எந்த பருவி மாளது சாகுபடியாளரால் பயிரிடப்பட்டுள்ளதாக.	எந்த மாதத்தில் பயிர் செய்யப்பட்டது அல்லது அறுவடை செய்யப்பட்டது.	பயிரின் பெயர்.	பயிராள / அறுவடையாள மாப்பு.	உண்மையான பாய்ச்சல் ஆகாயம்.	விளைச்சல் அளவு விழுக்காடு.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
693	1	[illegible]			[illegible]						
693	2	[illegible]		3/00	—		—	—			
693	3	[illegible]		3/00	—		—	—			
693	4	[illegible]		3/00	—		—	—			
693	7	[illegible]		3/00	—						

[illegible]

[illegible]
உதவி நிலவரி உதவியாளர்
7. முசிறி தாலுகா
திருச்சி மாவட்டம்

இரண்டாம் போகம்.					கீழ்க்கண்டவகையில் பயிரிடப்படாத உள்ள நிலத்தின் தன்மை மற்றும் பயிரின் விவரங்கள் ஒவ்வொரு நில வுளவை எண் அல்லது அதன் பகுதியில்.	பயிர் பார்வையிடும் அலுவலர் குறிப்புரைகள்.
எந்த மாதத்தில் பயிர் செய்யப்பட்டது அல்லது அறுவடை செய்யப்பட்டது.	பயிரின் பெயர்.	பயிராள / அறுவடையாள மாப்பு.	உண்மையான பாய்ச்சல் ஆகாயம்.	விளைச்சல் அளவு விழுக்காடு.	(அ) வகை, (ஆ) பயனற்ற பயிர் செய்ய முடாத நிலம், (இ) விவசாயம் மற்றும் பிற காரியங்களுக்கு பயன் படுத்தப் படும் நிலம், (ஈ) பயிரிடத்தக்க தரிசு (உ) நிலையான புல் தரைகளும் மற்றும் இதர மேய்ச்சல் நிலங்களும், (ஊ) விதைக்கப்பட்ட நிகர பரப்பில் சேர்க்கப்படாத பலவகைப் பயிர்களும் தோப்புகளும், (எ) நடப்புத் தரிசுகள் (ஏ) இதர தரிசு நிலங்கள்.	
(13)	(14)	(15)	(16)	(17)	(18)	(18அ)	(19)
					[illegible]		

380/82-R.F. III-A-10-40,00,000 Cgs.-GBP.-Mou.-7.

12198

ANNEXURE - III-B

ANNEXURE - III - C

அ-பதிவேடு விவரங்கள்

மாவட்டம் : திண்டுக்கல்

வட்டம் : நத்தம்

கிராமம் : சிறுகுடி

1. புல எண்	**693**	9. மண் வயனமும் ரகமும்	**8 - 1**
2. உட்பிரிவு எண்	**1**	10. மண் தரம்	**4**
3. பழைய புல உட்பிரிவு எண்	**693-1**	11. தீர்வை (ரூ - பை)	**2.77**
4. பகுதி	**P**	12. பரப்பு (ஹெக்டேர் - ஏர்)	**0 - 37.50**
5. அரசு / ரயத்துவாரி	**ரயத்துவாரி**	13. மொத்த தீர்வை (ரூ - பை)	**1.04**
6. நிலத்தின் வகை	**புஞ்சை**	14. பட்டா எண்	**3100**
7. பாசன ஆதாரம்	**-**	15. குறிப்பு	**-**
8. இரு போகமா	**-**	16. பெயர்	**1.இளங்கோவன்**

குறிப்பு 1:

1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **http://eservices.tn.gov.in** என்ற இணைய தளத்தில் **60734** என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

அ-பதிவேடு விவரங்கள்

மாவட்டம் : திண்டுக்கல்

வட்டம் : நத்தம்

கிராமம் : சிறுகுடி

1. புல எண்	693	9. மண் வயனமும் ரகமும்	8 - 1
2. உட்பிரிவு எண்	2	10. மண் தரம்	4
3. பழைய புல உட்பிரிவு எண்	693-2	11. தீர்வை (ரூ - ஹெ)	2.77
4. பகுதி	P	12. பரப்பு (ஹெக்டேர் - ஏர்)	0 - 29.00
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	0.81
6. நிலத்தின் வகை	புஞ்சை	14. பட்டா எண்	3100
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	1.இளங்கோவன்

குறிப்பு 1:

1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **http://eservices.tn.gov.in** என்ற இணைய தளத்தில் **60734** என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

அ-பதிவேடு விவரங்கள்

மாவட்டம் : திண்டுக்கல்

வட்டம் : நத்தம்

கிராமம் : சிறுகுடி

1. புல எண்	**693**	9. மண் வயனமும் ரகமும்	**8 - 1**
2. உட்பிரிவு எண்	**3**	10. மண் தரம்	**4**
3. பழைய புல உட்பிரிவு எண்	**693-3**	11. தீர்வை (ரூ - ஹெ)	**2.77**
4. பகுதி	**P**	12. பரப்பு (ஹெக்டேர் - ஏர்)	**0 - 24.00**
5. அரசு / ரயத்துவாரி	**ரயத்துவாரி**	13. மொத்த தீர்வை (ரூ - பை)	**0.66**
6. நிலத்தின் வகை	**புஞ்சை**	14. பட்டா எண்	**3100**
7. பாசன ஆதாரம்	**-**	15. குறிப்பு	**-**
8. இரு போகமா	**-**	16. பெயர்	**1.இளங்கோவன்**

குறிப்பு 1:

1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **http://eservices.tn.gov.in** என்ற இணைய தளத்தில் **60734** என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

அ-பதிவேடு விவரங்கள்

மாவட்டம் : திண்டுக்கல்

வட்டம் : நத்தம்

கிராமம் : சிறுகுடி

1. புல எண்	**693**	9. மண் வயனமும் ரகமும்	**8 - 1**
2. உட்பிரிவு எண்	**4**	10. மண் தரம்	**4**
3. பழைய புல உட்பிரிவு எண்	**693-4**	11. தீர்வை (ரூ - ஹெ)	**2.77**
4. பகுதி	**-**	12. பரப்பு (ஹெக்டேர் - ஏர்)	**0 - 57.00**
5. அரசு / ரயத்துவாரி	**ரயத்துவாரி**	13. மொத்த தீர்வை (ரூ - பை)	**1.58**
6. நிலத்தின் வகை	**புஞ்சை**	14. பட்டா எண்	**3100**
7. பாசன ஆதாரம்	**-**	15. குறிப்பு	**-**
8. இரு போகமா	**0**	16. பெயர்	**1.இளங்கோவன்**

குறிப்பு 1:

1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **http://eservices.tn.gov.in** என்ற இணைய தளத்தில் **60734** என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

அ-பதிவேடு விவரங்கள்

மாவட்டம் : திண்டுக்கல்

வட்டம் : நத்தம்

கிராமம் : சிறுகுடி

1. புல எண்	**693**	9. மண் வயனமும் ரகமும்	**0 - -**
2. உட்பிரிவு எண்	**7**	10. மண் தரம்	**0**
3. பழைய புல உட்பிரிவு எண்	**693-7**	11. தீர்வை (ரூ - ஹெ)	**3.71**
4. பகுதி	**-**	12. பரப்பு (ஹெக்டேர் - ஏர்)	**0 - 22.50**
5. அரசு / ரயத்துவாரி	**ரயத்துவாரி**	13. மொத்த தீர்வை (ரூ - பை)	**0.84**
6. நிலத்தின் வகை	**புஞ்சை**	14. பட்டா எண்	**3100**
7. பாசன ஆதாரம்	**-**	15. குறிப்பு	**-**
8. இரு போகமா	**-**	16. பெயர்	**1.இளங்கோவன்**

குறிப்பு 1:

1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **http://eservices.tn.gov.in** என்ற இணைய தளத்தில் **60734** என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

ANNEXURE - IV

45

GLCS
Committed to Precision
LABORATORY | CONSULTANCY | SUSTAINABILITY

GLOBAL LAB AND CONSULTANCY SERVICES
(An ISO / IEC 17025:2017 / NABL accredited Laboratory)
S.F No.92/3A2, Geetha Nagar, Alagapuram Pudur,
Salem – 636 016. Tamil Nadu. India.
Phone Nos. : +91 427 2970 989 / 70944 53636
E-Mail: lab@glcs.in; Web: www.glcs.in

NABL
TC - 6060

TEST REPORT

Report Number: ULR – TC606019000000628F **Report Date:** 30.12.2019

Issued To :	**Sivam Mines,** 6/209, Main Road, Sirugudi Post, Natham (TK) **Dindigul District.**	**Sample Location**	S.F.No.: 693/1,2,3,4 & 7 Extent: 1.70.0 Ha Sirugudi Village, Natham Taluk, Dindigul District
Attention	-	**Sample Receipt Condition**	Ambient – Good
TRF. No.	749	**Sample Quantity**	2 Kg
Sample Name	Limestone	**Sampled by**	Client
Sample Description	Powder	**Sampling Method**	-
Sample Code	GLCS / 2050	**Date of Analysis**	23.12.2019
Sample Receipt Date	23.12.2019	**Date of Completion**	30.12.2019

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Calcium as CaO	IS 1760 (Part 3) :1992 (Reaffirmed - 2006)	%	46.72
2	Magnesium as MgO	IS 1760 (Part 3) :1992 (Reaffirmed - 2006)	%	1.23
3	Iron as Fe_2O_3	IS 1760 (Part 3) :1992 (Reaffirmed - 2006)	%	0.18
4	Alumina as Al_2O_3	IS 1760 (Part 3) :1992 (Reaffirmed - 2006)	%	0.36
5	Silica as SiO_2	IS 1760 (Part 2) :1991 (Reaffirmed - 2006)	%	7.25
6	Loss On Ignition	IS 1760 (Part 1) :1991 (Reaffirmed - 2006)	%	44.23

For Global Lab and Consultancy Services

Prepared

Verified

Global Lab and Consultancy Services Laboratory Salem-636005

Authorised Signatory
S. MURUGESAN
Quality Manager

*****End of Report*****
Page 1 of 1

Note: The test results are only to the sample submitted for test. Any Correction of the test report on full or part shall invalidate the report. Samples are not drawn by us unless otherwise stated. Sample will be retained for 14 days from the date of reporting except in case of regulatory samples or specifically instructed by client. Perishable samples will be discarded immediately after reporting. We do not accept only liability with regard to origin or source from which the samples are extracted. The Laboratory is not responsible for authenticity of photocopied test reports. Any holder of this report is advised that information contained here on reflects the laboratory's finding at the time of its intervention only and within the limits of client instructions. The authenticity of the test report's issued by us can be verified by submitting on E-mail request with report number and report date along with report copy.

GLCS
Committed to Precision
LABORATORY | CONSULTANCY | SUSTAINABILITY

GLOBAL LAB AND CONSULTANCY SERVICES
(An ISO / IEC 17025:2017 / NABL accredited Laboratory)
S.F No.92/3A2, Geetha Nagar, Alagapuram Pudur,
Salem – 636 016. Tamil Nadu. India.
Phone Nos. : +91 427 2970 989 / 70944 53636
E-Mail: lab@glcs.in; Web: www.glcs.in

NABL
TC - 6060

TEST REPORT

Report Number: ULR – TC606019000000629P **Report Date:** 30.12.2019

Issued To :	**Sivam Mines,** 6/209, Main Road, Sirugudi Post, Natham (TK) **Dindigul District.**	**Sample Location**	S.F.No.: 693/1,2,3,4 & 7 Extent: 1.70.0 Ha Sirugudi Village, Natham Taluk, Dindigul District
Attention	-	**Sample Receipt Condition**	Ambient – Good
TRF. No.	749	**Sample Quantity**	2 Kg
Sample Name	Low Grade Limestone	**Sampled by**	Client
Sample Description	Powder	**Sampling Method**	-
Sample Code	GLCS / 2051	**Date of Analysis**	23.12.2019
Sample Receipt Date	23.12.2019	**Date of Completion**	30.12.2019

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Calcium as CaO	IS 1760 (Part 3) :1992 (Reaffirmed - 2006)	%	31.27
2	Magnesium as MgO	IS 1760 (Part 3) :1992 (Reaffirmed - 2006)	%	3.74
3	Iron as Fe_2O_3	IS 1760 (Part 3) :1992 (Reaffirmed - 2006)	%	0.32
4	Alumina as Al_2O_3	IS 1760 (Part 3) :1992 (Reaffirmed - 2006)	%	0.41
5	Silica as SiO_2	IS 1760 (Part 2) :1991 (Reaffirmed - 2006)	%	26.21
6	Loss On Ignition	IS 1760 (Part 1) :1991 (Reaffirmed - 2006)	%	36.15
7	*Sodium as Na_2O	GLCS/SOP/M/007	%	0.43
8	*Potassium as K_2O	GLCS/SOP/M/008	%	0.61

Note: * Not covered under NABL scope

For Global Lab and Consultancy Services

Prepared

Verified

Global Lab and Consultancy Services Laboratory Salem-636005

Authorised Signatory
S. MURUGESAN
Quality Manager

*****End of Report*****

Note: The test results are only to the sample submitted for test. Any Correction of the test report on full or part shall invalidate the report. Samples are not drawn by us unless otherwise stated. Sample will be retained for 14 days from the date of reporting except in case of regulatory samples or specifically instructed by client. Perishable samples will be discarded immediately after reporting. We do not accept only liability with regard to origin or source from which the samples are extracted. The Laboratory is not responsible for authenticity of photocopied test reports. Any holder of this report is advised that information contained here on reflects the laboratory's finding at the time of its intervention only and within the limits of client instructions. The authenticity of the test report's issued by us can be verified by submitting on E-mail request with report number and report date along with report copy.

ANNEXURE - VI

भारतीय गैर न्यायिक

भारत INDIA

रु. 500 FIVE HUNDRED RUPEES

पाँच सौ रुपये Rs. 500

INDIA NON JUDICIAL

தமிழ்நாடு तमिलनाडु TAMILNADU 5591 Y 93292

13-12-2014

M/s SIVAM MINES
SIRUGUDI

P. Radhaselvi
ப. ராதாசெல்வி
முத்திரைத்தாள் விற்பனையாளர்,
134 பெரிய கடை வீதி,
திண்டுக்கல் - 1, தமிழ்நாடு
உரிமம் எண் 2453/ஆ/1/1997

FORM O
TRANSFER OF MINING LEASE
(See rule 37-A)

When the transferor is an individual, S.ASAI ALANGARAM This indenture made this day of DECEMBER 2014 between S.Asai alangaram., K.A.Semaban(Late),1/174,Main Road,Sirugudi(Po),Natham(Tk),Dindigul(Dt),Pin code:624404 and the Occupation as Agriculturist.

When the transferee is a registered partnership firm and the Partner's are as follows,

1.S.Asaialangaram, S/o.K.A.Semban Chettiar,1/174 Main Road, Sirugudi(Po), Natham(Tk),Dindigul(Dt),

DISTRICT COLLECTOR
DINDIGUL

13099

2.S.Ilangovan,S/o K.A.Semban Chettiar ,6/208, Main Road, Sirugudi(Po),Natham(Tk),Dindigul(Dt),

3.I.VijayAlangar,S/o.S.Ilangovan,6/208,MainRoad,Sirugudi(Po),Natham(Tk), Dindigul(Dt),

4.I.SemponManickam,D/o.S.Ilangovan,6/208,MainRoad,Sirugudi(Po),Natham (Tk),Dindigul(Dt).,

carrying on business in partnership under the firm name and style of M/s.SIVAM MINES registered under the Indian Partnership Act, 1932 (9of 1932) with Regn No:11/2010,dated 25.01.2010 and having registered office at 6/209,Main Road,Sirugudi(Po),Natham(Tk),Dindigul(Dt)-624404

And the Governor of TAMILNADU (hereinafter referred to as the "State Government" which expression shall where the context so admits be deemed to include the successors and assigns) of the third part.

Whereas by virtue of an indenture of lease dated the G.O.(3D) No. 83,Ind(MMA.2)dept/dt.09.10.96 and not registered in any Sub-Registrar office (hereinafter referred to as lease) the original whereof is attached hereto and marked "A" entered into between the State Government (therein called the lessor) and the transferor (therein called the lessee), the transferor is entitled to search for, win and work the mines and minerals in respect of Limestone in the land described in Schedule thereto and also in Schedule annexed hereto for the term and subject to the payment of the rents and royalties and observance and performance of the lessee's covenant and conditions in the said deed of lease reserved and contained including a covenant not to assign the lease or any interest there under without the previous sanction of the State Government.

And whereas the transferor is now desirous of transferring and assigning the lease to the transferee and the State Government has, at the request of the transferor, granted (with the prior approval of the Central Government) permission to the transferor vide order No G.O.(D) No.173/Industries/(MMA.1)Dept/dated 05.11.2014 to such a transfer and

assignment of the lease upon the conditions of the transferees entering into an agreement is and containing the terms and conditions hereinafter setforth.

Now this Deed Witnesseth as follows:

1. The transferee hereby covenants with the State Government that from and after the transfer and assignment of the lease the transferee shall be bound by, and be liable to perform, observe and conform and be subject to all the provisions of all the covenants stipulations and conditions contained in said hereinbefore recited lease in the same manner in all respects as if the lease had been granted to the transferee as the lessee thereunder and he had originally executed it such.

2. It is further hereby agreed and declared by the transferor of the one part and the transferee of the other part that –

(i) The transferor and the transferee declare that they have ensured that the mineral rights over the area for which the mining lease is being transferred vest in the State Government.

(ii) The transferor hereby declares that he has not assigned subject, mortgaged or in any other manner transferred the mining lease now being transferred and that no other person or persons has any right, title or interest whereunder in the present mining lease being transferred.

(iii) The transferor further declares that he has not entered into or made any agreements, contract or understanding whereby he has been or is being directly or indirectly financed to a substantial extent by or under which the transferor's operation or understandings ere or are being substantially controlled by any person or body of persons other than the transferor.

(iv) The transferee hereby declares that he/she has accepted all the conditions and liabilities which the transferor was having in respect of such mining lease.

(v) The transferee further declares that he is financially capable of and will directly undertake mining operations.

(vi) The transferee further declares that he has filed an affidavit stating that he has filed up-to-date income-tax returns, paid the income-tax assessed on him and paid the income-tax on the basis of self-assessment as provided in the Income-tax Act, 1961 (43 of 1961)

(vii) The transferor has supplied to the transferee the original or certified copies of all plans of abandoned workings in the area and in a belt 65 meters wide surrounding it.

(viii) The transferee hereby further declares that as a consequence of this transfer, the total area while held by him under mineral concessions are not in contravention of section 6 of the Mines and Minerals (Regulation and Development) Act, 1957 or rule 35 of the Mineral Concession Rules, 1960.

(ix) The transferor has paid all the rents, royalties, and other dues towards Government till the date, in respect of this lease.

In witness whereof the parties hereto have signed on the date and year first above written.

LESSEE

[Managing Partner
M/s. Sivam Mines,
Sirugudi Villae,
Natham Taluk, Dindigul]

LESSOR/
DISTRICT COLLECTOR

3/3

1. M. Pothi Raj (M. Pothuraj)
S/o Muthiah
Kodai Road
Nilakkottai TK
Dindigul DT

2. D. NAGARAJ
S/o Dhandiapan,
4th ward Ekkadi Street,
Nilakkottai.

1. ASSISTANT DIRECTOR
GEOLOGY AND MINING
DINDIGUL.

2. Assistant Geologist,
Geology and Mining,
Dindigul.

3. SPECIAL DEPUTY TAHSILDAR

भारतीय विशिष्ट पहचान प्राधिकरण
भारत सरकार
Unique Identification Authority of India
Government of India

आधार

பதிவேட்டு எண்/Enrolment No.: 2043/88136/07186

Ilangovan S (இளங்கோவன் செ)

S/O: Semban, 6/208, East street, Natham, Sirugudi,
Dindigul,
Tamil Nadu - 624402

Date: 28/04/2016

உங்கள் ஆதார் எண்/Your Aadhaar No.:

9633 9607 2481

எனது ஆதார், எனது அடையாளம்.

1947 | help@uidai.gov.in | www.uidai.gov.in

தகவல்

- ஆதார் அடையாளத்திற்கான சான்று, குடியுரிமைக்கு அல்ல.
- அடையாள சான்றை ஆன்லைன் அதன்படுத்தல் மூலமாகப் பெறவும்.
- இது எலக்ட்ரானிக் செயல்முறை மூலம் தயாரிக்கப்பட்ட கடிதமாகும்.

INFORMATION

- Aadhaar is a proof of identity, not of citizenship.
- To establish identity, authenticate online.
- This is electronically generated letter.

Validity unknown
Digitally signed by UNIQUE IDENTIFICATION AUTHORITY OF INDIA
Date: 2015.04.28 19:21:35 IST

- ஆதார் நாடு முழுவதிலும் செல்லுபடியாகும்.
- ஆதார் ஆதார் பெறுவதற்கு ஒரே ஒரு முறை மட்டுமே நீங்கள் விண்ணப்பத்தை பூர்த்தி செய்து பதிவு செய்ய வேண்டிய அவசியம் ஏற்படும்.
- தயவுசெய்து உங்களின் சமீபத்தைய புதிய மொபைல் நம்பர் மற்றும் இ-மெயில் முகவரியை பதிவு செய்யவும். இதனால் உங்களுக்கு பல்வேறு சேவைகளை பெற்றுக் கொள்ளும் சௌகரியம் கிடைக்கும்.

- Aadhaar is valid throughout the country.
- You need to enrol only once for Aadhaar.
- Please update your mobile number and e-mail address. This will help you to avail various services in future.

भारत सरकार
GOVERNMENT OF INDIA

இளங்கோவன் செ
Ilangovan S
பிறந்த நாள்/ DOB: 05/01/1955
ஆண் / MALE

9633 9607 2481

எனது ஆதார், எனது அடையாளம்.

भारतीय विशिष्ट पहचान प्राधिकरण
UNIQUE IDENTIFICATION AUTHORITY OF INDIA

முகவரி:
தந்தை / தாய் பெயர்:
செம்பன், 6/208, கிழக்கு தெரு, நத்தம், சிறுகுடி, திண்டுக்கல்,
தமிழ் நாடு - 624402

Address:
S/O: Semban, 6/208, East street, Natham, Sirugudi, Dindigul, Tamil Nadu - 624402

9633 9607 2481

MERA AADHAAR, MERI PEHACHAN

ANNEXURE- VIII

FORM - J

Received .....
at .....(Place)
on .....(Date)

Initial of
Receiving Officer

GOVERNMENT OF TAMIL NADU
APPLICATION FOR RENEWAL OF MINING LEASE
(SEE RULE 24A)
Dated day of

To
The Secretary,
Industries Department,
Secretariat,
Fort.St.George,
CHENNAI-600009.

The Commissioner,
Department of Geology & Mining,
Industrial Estate,
Guindy,
CHENNAI-600032.

Through : **The District Collector, DINDIGUL.**

Sir,

I request for renewal of my mining lease under the Mineral Concession Rules, 1960.

A sum of **Rs.2,500/-** being the application fee payable under sub-rule (3) (1) (a) of rule 22 of the said rules has been deposited.

2. The required particulars are given below :

(i)Name of the applicant with complete address	**M/s. SIVAM MINES,** 6/209 ,Main Road,Sirugudi(Po),Natham(Tk), Dindigul(Dt)-624404,Tamilnadu state.
ii) Is the applicant a Private individual/ Private Company/Public Company/Firm or Association ?	Partnership Firm.
iii) In case applicant is :	
a. an individual, his nationality	Not applicable
b. a company, an attested copy of the Certificate of Registration shall be enclosed.	Copy of certificate of registration in Form C is enclosed.
c. Omitted	----

d. a firm or association, the nationality of all the Partners of the firm or members of the association.	Partnership Firm. All the Partners are Indian Nationals.
iv) Profession or Nature of business of Applicant.	Mining and Mineral Trading.
v) (Omitted)	----
vi) (Omitted)	----
a. No. and date of the valid clearance certificate of payment of mining dues (Copy enclosed).	Affidavits enclosed.
vii) An affidavit, that upto date Income-Tax Returns, as prescribed under the Income Tax Act, 1961, have been filed and the tax due, including the tax on account of self assessment has been paid.	Affidavits enclosed.
viii) a. Particulars of the mining lease of which renewals is desired.	IIIrd Renewal of Mining Lease
b. Details of Previous Renewal granted, if any.	1) Mining Lease was granted for Three Years in G.O.No.Ms.No.1691, Industries. dt.4.12.82 (From 28.2.83 To 27.2.86) 2) Ist Renewal of Mining Lease granted for Ten Years in G.O.Ms.No.1439 Ind.13.12.1990 (From 28.02.86 to 27.02.96.) 3)II nd Renewal of Mining Lease Granted for Twenty years G.O.(3D)No.83 vide,Ind(MMA.2)Dept dt 9-10-96 (From 28.2.96 to 27.2.16)
ix) Period for which renewal of mining lease is required.	**Thirty Years.**
x) Whether renewal is applied for the whole or part of the lease hold ?	Renewal applied for whole of the area granted on mining lease.
XA) a. Does the applicant continue to have surface rights over the area of the land for which he requires renewal of the mining lease.	Consent obtained from pattadar. S.Asai alangaram who is one among the partner of M/s.Sivam mines.
b.If not, has been obtained the consent of the owners and occupier for undertaking mining operations. If so the consent of the owner and occupier of the land obtained in writing, be filled.	Not applicable
xB)Particulars of areas mineral-wise in each state duly supported by affidavit for which the applicant or any person joint in interest with him.	Affidavits enclosed

a. already holds under mining lease b.has already applied for but not granted or c. being applied for simultaneously	Affidavits enclosed.
xC) a Mining Plan which shall include a)the plan of the area showing the nature and extent of the mineral body, spot or spots where the excavation is to be done in the first year and its extent, a detailed cross section and detailed plan of spot(s) of excavation based on prospecting date gathered by the applicant, a tentative scheme of mining (for the first five years of the lease).	Details will be furnished in the Mining Plan.
b) the details of geology and lithology of the area, the extent of manual mining and through machines.	The limestone is medium to coarse grained,grey To green and at places bluish in colour,Diopside,Chondrodite,Silica,Mica and traces of ores like (Magnetite,Pyrite,Apatite,etc.,) are present as impurities.The limestone is generally either dolomitic or sillsious in composition and impure and intercalated. Small patches of good grade limestone occur interacted With the dolomitic and silicious limestone in this area may be due to tight folding.The chief rock types of ths area are calc-gneiss,quartzite,biotite-gneiss,pegmatite and charnockite.The rocks of the area is in disturbed condition and there is no uniform dip or strike.Generally the dip ranges from 80° to 85° and the strike direction is varying at different places from west to east NE to SW.This is a pocket deposit. The bands of limestone in this area striking in NE-SW direction.The bands have almost vertical dip.
c) annual programme and plan for excavation (for five years) and	2015-2016 - 3,000 MT 2016-2017 - 12,000 MT 2017-2018 - 12,000 MT 2018-2019 - 12,000 MT 2019-2020 - 12,000 MT
d)the plan of the area showing natural water courses : limit or reserved and	Details will be furnished in the Mining Plan

other Forest areas and density of trees, assessment of impact of mining activity of forest land surface and environment including air and water pollution and details of the scheme for afforestation land reclamation, use of pollution control devices.	
xD) Is the mineral going to be used in his own industry ? If so, give full details;(for "own industry"see Explanation under Rule 24B)	Yes,The Mineral Limestone is going to be utilized in our own industry in the name and style of M/s.AIR MINERAL ENTERPRISES" The partners are same as Follows, Managing Partner : S.Ilangovan : 60% Partner : I.Vijay alangar : 20% Parnter : I.Sempon Manickam : 20% In the mineral processing unit, we are grinding the mineral in different mesh size ranging from 80 mesh to fine mesh ie upto 10 microns and supplied to paints,rubber,PVC Compounding,fertilizer,feed industries and coffee and tea plantations to neutralize the soil acidity.
xi) In case the renewal applied for is only for part of the lease hold.	**Whole Area.**
a) the area applied for renewal	**: 1.70.0 Hect.**
b) description of the area applied for renewal (description should be adequate for purpose of demarcating the plot)	**S.F.No.** : **Extent** 693/1 : 0.37.50 Hect. 693/2 : 0.29.00 Hect. 693/3 : 0.24.00 Hect. 693/4 : 0.57.00 Hect. 693/7 : 0.22.50 Hect. **TOTAL** : **1.70.0 Hect.** Village : Sirugudi Taluk : Natham District : Dindigul
c) Particulars of map of the lease hold with area applied for renewal clearly marked on it (attached.)	FMB Sketch is enclosed.
d) Particulars of existing or created dumps of ore, if any.	Details will be furnished in the Mining Plan.
xii) Means by which the mineral is to be	Limestone – Manual mining.

raised, ie. by land labour or mechanical or electric power.	
xiii) Manner in which the mineral raised to be utilized.	
a) For manufacture in India	Yes.The Mineral Limestone excavated will be utilized exclusively in our industry and supplied to the enduser.
b) Exports to foreign countries	Not applicable.
c)In the former case the Industries in connection with which it is required, should be specified in the letter case, the countries to which the mineral will be exported and whether the mineral is to be, exported after processing or in new form should be stated.	Not applicable.
xiv) Details of output during the last three years and phased programme for production during, the next three years, alongwith a layout plan for development if any.	2012– 2013 - 1389.000 MT 2013 – 2014 - 1670.000 MT 2014 – 2015 - 2065.000 MT(upto December 2014) 2015 – 2016 - 3,000.000 MT 2016 – 2017 - 12,000.000 MT 2017– 2018 - 12,00.000 MT
Xv) In case of coal, details of existing Railway transport facility available and additional transport facility if any, required.	Not applicable.
Xvi) Any other particulars which the applicant wishes to furnished	If the Third renewal is granted by the govt is a great boom to our venture towards the semi-mechanisation and we hope that on future in the mining industry is lightened by all your goodselves,blessings and suggestions.

We do hereby declare that the particulars furnished above are correct and are ready to furnish and other details including accurate plans as required by you before the grant of renewal of the lease.

Yours faithfully,

For M/S SIVAM MINES

Managing Partner

(S.ILANGOVAN.B.E.,)

Encl:

1. Application in triplicate.
2. Challan for Rs.2,500/- paid at SBI,Dindigul on 12/2/2015 towards the application fee.
3. Challan for Rs.1,000/-paid at SBI,Dindigul on 12/2/2015 towards the fee for preliminary expenses.
4. FMB & Topo sketches.
5. Chitta, Adangal .
6. ID Proof for PAN Card&Voter ID for all partners.
7. Affidavits for Mining Dues, Income-Tax, copy of the ITR and Mining Leases for firm and all Partners.
8. Copy of the Partnership Deed.
9. Copy of the Company of Registration in Form-C.
10. Copy of the Partnership firm for captive industry.
11. Copy of Government Orders.
12. Consent from Pattadar.
13. Report from RQP.
14. Location Map, Key Plan, Mine Lease Plan, Geological plan and sections.
15. Mining scheme valid upto 27.02.2016.

GOVERNMENT OF TAMIL NADU
Department of Geology and Mining

FORM - D

(Receipt of Application for renewal of mining lease)
(See Rule 10(4) & 23(4) of M.C.Rules 1960)

ReNo. 210 /2015/Mines Date : 23.02.2015

Received the renewal application with the following enclosures for the renewal of mining lease for mining limestone from M/s. Sivam Mines on 20.02.2015 for 1.70.0 hects of patta land located in Sirugudi Village, Natham Taluk, Dindigul District with the following enclosures.

1. Mining lease renewal application in form J in Triplicate
2. Chalan for Rs. 2500/- SBI, Dindigul dt: 12-02-2015 (application fees)
3. Chalan for Rs 1000/- remitted in SBI, Dindigul dated 12-02-2015 (preliminary expenses)
4. FMB, A-Register, Adangal, and patta copy.
5. Permanent Identification Number copy of Thiru S. Ilangovan, Managing Partner of Tvl Sivam Mines, Thiru S. Asai Alangaram, Partner, Thiru I. Vijay Alankar, Partner, and Selvi Il Sempon Manickam, Partner
6. Copy of Firm Registration certificate.
7. Affidavit submitted by Thiru S. Ilangovan, Managing Partner of M/s. Sivam Mines for
   i. No mining dues clearance
   ii. Mining leases held details, mining applied for details.
   iii. Income tax returns details
8. Affidavit submitted by Thiru S. Ilangovan, Managing Partner of M/s. Sivam Mines, Thiru S. Asai Alangaram, Partner, Thiru I. Vijay Alankar, Partner, and Selvi Il Sempon Manickam, Partner for
   d. No mining dues clearance
   e. Mining leases held details, mining applied for details.
   f. Income tax returns details
9. Firm Registration copy (Xerox).
10. G.O. copies for the original leases. (Xerox)
11. Name transfer GO Copy (Xerox)

12. Deed of partnership dated 16-01-2010 executed between Thiru S. Asai Alangaram, Thiru S. Ilangovan, Thiru I. Vijay Alankar, and Selvi I. Sempon Manickam.
13. Consent received from Thiru S. Asai Alangaram to M/s. Sivam Mines for mining limestone
14. Copy of Geological and Geoscientific assessment report of limestone deposit prepared by Dr. P. Thangaraju,m RQP.
15. Scheme of Mining and progressive Mine Closure Plan (three copies)

23/3/15

Assistant Director,
Geology and Mining,
Dindigul.

23/3/2015

1421A

ANNEXURE - IX

भारतीय गैर न्यायिक

पचास रुपये

रु.50

FIFTY RUPEES

Rs.50

INDIA

INDIA NON JUDICIAL

தமிழ்நாடு तमिलनाडु TAMILNADU

K 74487

136
16.1.2010

M/s சிவம் மைன்ஸ்
சிறுகுடி

P. Radhaselvi
ப. ராதாசெல்வி,
முத்திரைத்தாள் விற்பனையாளர்,
134, பெரிய கடை வீதி,
திண்டுக்கல்-1, தமிழ்நாடு.
உரிமம் எண் : 2453/ ஆ1/ 97_79

DEED OF PARTNERSHIP

This deed of partnership executed on the Eighteenth day of January 2010 between

1. Thiru. S.Asaialangaram son of Thiru K.A. Semban chettiar aged about 56 years residing a Door No 1/174, Main Road, Sirugudi Post, Natham Taluk, Dindigul Distric 1

2. Thiru. S.Ilangovan son of Thiru K.A.Semban chettiar aged about 54 years residing a Door No.6 / 208, Main Road, Sirugudi Post, Natham Taluk, Dindigul Distric 2

3. Thiru. I.Vijay Alangar son of Thiru S. Ilangovan aged about 26 years residing at Doo No 6 / 208, Main Road, Sirugudi Post, Natham Taluk, Dindigul Distric 3

and

S. Asaialangaram

I. Vijay Alangar

14B1A

भारतीय गैर न्यायिक

पचास रुपये रु.50

FIFTY RUPEES Rs.50

INDIA

INDIA NON JUDICIAL

தமிழ்நாடு तमिलनाडु TAMILNADU

137
16-1-2010

K 744877

M/s சிவம்மைன்ஸ்
சிறு கடி

P. Radha Selvi
ப. ராதாசெல்வி,
முத்திரைத்தாள் விற்பனையாளர்,
134, பெரிய கடை வீதி,
திண்டுக்கல்-1, தமிழ்நாடு.
உரிமை எண் : 2453/ ஆ.1/ 97_39

1. Selvi. I.Sempon Manickam daughter of Thiru S.Ilangovan aged about 22 years residing at Door No.6 / 208, Main Road, Sirugudi Post, Natham Taluk, Dindigul District 4

WHEREAS the above said parties have entered into partnership and are carrying on the business of mining manufacturing and dealing in limestone and allied products under the name and style of SIVAM MINES at Door No. 6 / 209 Main Road, Sirugudi Post,Natham Taluk,Dindigul District, in partnership in accordance with the following TERMS AND CONDITIONS.

TERMS AND CONDITIONS

1. The partnership business shall be carried on under the name and style of "SIVAM MINES" and or under any other name or names at door No.6 / 209,Main Road, Sirugudi Post, Natham Taluk, Dindigul District and at any other place of places as the partners decided from time to time.

2. The partnership commences with effect from Eighteenth day of January 2010 and it shall be determinable at will. Any Partner desirous of leaving the firm shall give not less than three months notice in writing to the other partners.

I. Vijay Alagu

1441A

भारतीय गैर न्यायिक

पचास रुपये

रु.50

भारत

INDIA

FIFTY RUPEES

Rs.50

INDIA NON JUDICIAL

தமிழ்நாடு तमिलनाडु TAMILNADU

K 744878

138

16.1.2010

P. Radhaselvi

M/s சிவம் மைன்ஸ்

சீர்காழி

ப. ராதாசெல்வி,
முத்திரைத்தாள் விற்பனையாளர்,
134, பெரிய கடை வீதி,
திண்டுக்கல்-1, தமிழ்நாடு.
உரிமை எண் : 2453/ ஆ/ 97_TP

3. The firm shall carry on the business of mining, manufacturers, traders and dealers of Limestone,Dolomite, Calcite and its products of different mesh size, other chemicals based on limestone and any other business or businesses as may be determined by the partners from time to time.

4. Partner Thiru S.Asaialangaram who is holding the Mining lease for Limestone granted by the Govt. of Tamilnadu vide

i) G.O.3(D) No.83 / IND(MMA.2) Dept.dt.09.10.1996 for 1.70.5 Hectares (4.21acres) valid up to 27.02.2016.

ii) G.O.3(D) No.325 / IND MMA II Dept.dt.09.11.1995 for 0.24.0 Hectares (0.60 acres) valid up to 16.04.2016.

iii) G.O.3(D) No.91 / IND MMA 2 Dept.dt.13.06.1997 for 2.53.0 Hectares (6.25 acres) Valid up to 26.11.2017.

iv) Govt.Lr No.6754 / MMA2/1999 – 2000 dt. 21.02.2003 for 1.92.0 Hectares(4.75 acres) is pending with the Government for grant and

S. Asaialangaram

T. Vijayalakshmi

1451A

भारतीय गैर न्यायिक

पचास रुपये

रु.50

FIFTY RUPEES

Rs.50

INDIA

INDIA NON JUDICIAL

தமிழ்நாடு तमिलनाडु TAMILNADU

K 74487

139
16.1.2010

M/s சிவம் மைன்ஸ்
சிறுகுடி

P. Radhaselvi
ப. ராதாசெல்வி,
முத்திரைத்தாள் விற்பனையாளர்,
134, பெரிய கடை வீதி,
திண்டுக்கல்-1, தமிழ்நாடு.
உரிமை எண் : 2453/ ஆ1/ 97_39

Partner Thiru S.Ilangovan who is holding the Mining lease for Limestone granted by the Govt. o Tamilnadu vide

i) G.O.Ms No318 / IND (MMA2)Dept.dt 26.10.1995 for 0.94.5 Hectares (2.34 acres) Valid up to 16.04.2016.

ii) G.O.3(D) No.89 / IND (MMA2)Dept.dt.17.10.1996 for 0.94.0 Hectares (2.33 acres)Valid up to 03.03.2017.

Both of them do hereby agree to carry out the operations of mining in the name of the firm. Al the partners do hereby agree to do the Mining Operations in the name of the firm in the event o their getting Licenses in their individual names.

5. The capital of the firm shall be the total of the credit balance in the accounts of the partners an such credit balance in the accounts of the partners shall carry interest at the rate of 12% pe annum. This rate can be changed from time to time as decided by the partners at such other rate as may be prescribed by the Income Tax Act 1961 may be adopted.

S. Asuriakumar

Ivijan Alangy

146/5

भारतीय गैर न्यायिक

पचास रुपये

रु.50

FIFTY RUPEES

Rs.50

INDIA

INDIA NON JUDICIAL

தமிழ்நாடு तमिलनाडु TAMILNADU

K 744880

140
16.1.2010

M/s சிவம் மைன்ஸ்

சிறுகுடி

P. Radhaselvi
ப. ராதாசெல்வி,
முத்திரைத்தாள் விற்பனையாளர்,
134, பெரிய கடை வீதி,
திண்டுக்கல்-1, தமிழ்நாடு.
உரிமம் எண் : 2453/ ஆ1/ 97_39

6. Any further money that may be advanced by the partners other than capital shall be entitled interest at the rate of 12% annum.

7. Partner S. Ilangovan shall be the Managing Partner of the firm and discharge duties on general administration and shall also be responsible for carrying out the requisite obligations as is expected of the firm by the statutory authorities. He shall have power in general, to act on behalf of the firm in all matters, transactions and details relating to the firm and in particular, he shall individually have power;

a) to represent the firm before all Government, quassi – Government, Taxation, Licensing, Excise, Judicial, postal and other authorities,

b) to institute, defend, compromise, abandon or withdraw any suits and legal proceeding on behalf of the firm.

c) to receive all registered tapals, VPPs.,Money Orders insured post and other postal articles addressed to the firm.

d) to receive all money due to the firm and give valid acquittances therefor.

1 S. Asmi Ahmed 3 I. Vijay Alagu

14716

தமிழ்நாடு तमिलनाडु TAMILNADU

K 744881

141
16.1.2010

M/s சிவம் மைன்ஸ்

சிறுகிழ

P. Radhaselvi Rs

ப. ராதாசெல்வி,
முத்திரைத்தாள் விற்பனையாளர்,
134, பெரிய கடை வீதி,
திண்டுக்கல்-1, தமிழ்நாடு.
உரிமை எண் : 2453/ ஆ/ 97_39

e) to borrow any amount from Bank, Institutions, individuals etc.,on such terms and conditions as security, rate of interest and mode of repayment as he deems fit.

f) to open accounts with Banks and to operate such accounts and to draw,endorse or otherwise deal with negotiable instruments.

g) to appoint the necessary staff or agents on such terms and conditions and remuneration /commission deemed fit by him and also to terminate their services,if found necessary,and

h) to do all such other acts and things as may be necessary. Incidental and conducive to the proper, efficient and profitable conduct of the partnership business.

He shall be paid a monthly remuneration up to Rs.15,000/- (Rupees Fifteen thousand only) This remuneration may be increased or decreased with the consent of the partners from time to time.

8. Partner S. Asaialangaram shall be in charge of manufacturing activities and he shall be paid a monthly remuneration up to Rs.15,000/- (Rupees Fifteen Thousand only).This remuneration may be increased or decreased with the consent of the partners from time to time.

1 S. Asaialangaram

2 I. Vijaya Alagu

4

1481A

9. Proper books of accounts shall be maintained for the purpose of business of the firm and shall be closed of profit and Loss Account for the first time at the end of March 2010 and thereafter at the end of 31st March every Year, The Profit and Loss as ascertained after charging all expenditure of the firm including salary and interest if any paid to the partners shall be divided or borne by the partners in the following ratio.

S. ASAIALANGARAM	-	10%
S. ILANGOVAN	-	50%
I. VIJAYALANGAR	-	20%
I. SEMPON MANICKAM	-	20%

10. The partnership commences with effect from Eighteenth day of January 2010 and it shall be determinable at WILL. Any partner desirous of leaving the firm shall give not less than three months notice in writing to the other partners. Any dispute or difference arising among partners the decision of the Majority of the partners shall be the final and binding on all the partners as conclusive decision.

11. Death or retirement of any one of the partners shall not by itself dissolve the firm. In the event of death of my partner; the surviving partners shall continue the business with or without admitting the legal heirs of the deceased partner. In the event of retirement of any partner, the business of the firm shall be continued by the other partners with or without admitting any new partner of partners. In these circumstances the remaining partners may or may not admit minors to the benefits of partnership.

12. The Provisions of Indian Partnership act 1932 and its later amendments shall apply to this partnership to the extent to which they are not specifically modified or excluded by the special clauses.

In WITNESS WHERE OF THE partners have set their hands on the day and year first above mentioned.

1. S. Asaialangaram

2. [signature]

3. I. vijayalangar

4. [signature]

WITNESSES

1. N. Arburani w/o - Nallamuthan Sirugudi
2/45 West Street, Sirugudi Po., Natham Tk.
Dindigul-Dt., Pin-1

2. V.K. Vengataramana S/o V. Krishnamoorthy, Natham
V.K. VENGATARAMAN. 22/7, Bazar Street, Natham.
Dindigul-Dt. Pin-[illegible]

ANNEXURE - X

SPEED POST

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES
OFFICE OF THE REGIONAL CONTROLLER OF MINES

Telephone no.:24914461/1570
Telefax no. 044-24911295
Email ID: ro.chennai@ibm.gov.in/rcomchennai@yahoo.co.in

C-4-A Rajaji Bhavan
CGO complex, Besant Nagar
Chennai – 600 090.

No. TN/DGL/MP/LST-1969-MDS

Dated : 30 /03/2016

To :
M/s. Sivam Mines
6/209, Main Road, Sirugudi Post
Natham Taluk, Dindigul District.

Sub. : Approval of Modified Mining Plan (including Progressive Mine Closure Plan) for Sirugudi Limestone Mine over 1.70.0 Ha. In S.F.no.693/1,2,3,4 & 7 in Sirugudi Village, Natham Taluk, Dindigul District, Tamilnadu submitted under rule 17 of MCR, 2016.

Ref. : RQP letter No.Nil dated 17.03.2016.

Sir,

In exercise of the power conferred by the clause (b) of sub-section (2) of Section 5 of the Mines and Minerals (Development & Regulation) Act, 1957 read with Government of India Order No. S.O. 445 (E) dated 28.04.1987, I hereby **approve** the aforesaid Modified Mining Plan (including Progressive Mine Closure Plan). This approval is subject to the following conditions.

1) That the Mining Plan (including Progressive Mine Closure Plan) is approved without prejudice to any other law applicable to the mine/area from time to time whether made by the Central Government, State Government or any other authority.
2) That this approval of the Mining Plan (including Progressive Mine Closure Plan) does not in any way imply the approval of the Government in terms of any other provision of the Mines & Mineral (Development & Regulation) Act, 1957 or the Mineral Concession Rules, 1960 or any other law including Forest (Conservation) Act, 1960, Environment Protection Act, 1986 and *the rules made there under.*
3) That this Mining Plan (including Progressive Mine Closure Plan) is approved without prejudice to any other order or direction from any court of competent jurisdiction.
4) Provisions of the Mines Act, 1957 and Rules & Regulations made thereunder including submission of notice of opening, appointment of manager and other statutory officials as required by the Mines Act, 1952 shall be complied with.
5) The Provisions made under MM(R&D) Act, 2015 (Amended) and Rules made thereunder shall be complied with.
6) The contents of circular No. 2/2010 issued by the Chief Controller of Mines, IBM, Nagpur vide his letter No. 11013/3/MP/90-CCOM Vol. VII dated 06.04.2010 shall be complied with.
7) The execution of Mining Plan / Scheme of Mining shall be subjected to vacation of prohibitory orders / notices, if any.
8) This approval of mining operations and associated activities is restricted to the mining lease area only. The mining lease area is as shown on the statutory plans under rule 28 of Mineral Conservation and Development Rules, 1988, by the lessee/RQP/applicant and Indian Bureau of Mines does not take any responsibility regarding correctness of the boundaries of the lease shown on the ground with reference to the lease map and other plans furnished by the applicant/lessee.

9) The Environmental Monitoring Cell of the Company shall continue monitoring ambient air quality, dust fall rate, water quality, soil sample analysis and noise level measurements on various stations established for the purpose both in the core zone and buffer zone, as per Department of Environment guidelines and keeping in view IBM's Circular No.3/92, season-wise every year or by engaging preferably the services of an Environmental laboratory approved by MOEF/CPCB. The data so generated shall be maintained in a bound paged register kept for the purpose and the same shall be made available to the inspecting officer on demand.
10) If anything is found to be concealed as required by the Mines Act in the contents of Mining Plan and proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.
11) Yearly report as required under Rule 23E(2) of MCDR,1988 setting for the extent of protection and rehabilitation works carried out as envisaged in the approved progressive mine closure plan and if there is any deviations, reasons thereof shall be submitted before 1st July of every year to the regional office, IBM , Chennai.
12) The modified mining plan is approved for the proposals contained therein and as applicable from the date of approval of the document for the mining activities to be carried out within the mining leasehold.
13) The next Scheme of Mining will be due for submission on 01.12.2019.
14) The financial assurance submitted should be renewed before expiry of the same.
15) In case mining lease falls within a radius of 10 kms. of National Park/Sanctuary, recommendations of NBWL have to be obtained as per the orders of the Hon'ble Supreme Court in I.A. No. 460/2004.

Yours faithfully,

Encl. Copy of approved Mining Plan
(including Progressive Mine Closure Plan)

sd-
(T.K. Rath)
Regional Controller of Mines

Copy for information to :

1. Shri P. Thangaraju, RQP, Old No.260-B, New No.17, Advaitha Ashram Road, Alagapuram, Salem – 636 004.
2. The Commissioner of Geology & Mining, Government of Tamilnadu, Guindy, Chennai – 600 032 along with copy of the approved mining plan.

Encl : As above.

24.5.12
(T.K. Rath)
Regional Controller of Mines

SIVAM MINES

S. ILANGOVAN B.E.,
Managing Partner

6/209,Main Road,Sirugudi(PO),
Natham(TK), Dindugul(DT),
Pin code:-624402
Cell: 94430 – 67632,94867-32753

Mine Code : 38TMN06007
Registratio No.: IBM/5284/2011

To

1. **The Secretary to Government,**
   Industries Department,
   Fort St.George,
   Chennai– 600 009.
2. **The Director,**
   Department of Geology and Mining,
   Government of Tamilnadu,
   Guindy, Chennai– 600 032.
3. **The District Collector,**
   Collectorate,
   Dindigul District.

Respected Sir,

Sub: Requesting for extension of Mining lease for 50 years from the date of 1st grant in respect of Sirugudi Limestone Mine over an extent of 1.70.0Ha in S.F. Nos. 693/1, 2, 3, 4 & 7 of Sirugudi Village, Natham Taluk, Dindigul District, Tamilnadu State of M/s. Sivam Mines as per recent MMDR Ammendment Act, 2015 –Reg.

Ref: 1. G.O. Ms.No. 1691, dated: 04.12.1982,
2. Government of India, Gazette Notification for MMDR Ammendment Act, 2015, dated: 26.03.2015.

With reference to the subject cited, the fresh lease was granted for Limestone Mineral over an extent of 1.70.0 hectares in S.F. Nos. 693/1, 2, 3, 4 & 7 of Sirugudi Village, Natham Taluk, Dindigul District for a period of 3 years reference 1st cited above, the lease was executed on 28.02.1983. With reference to the 2nd cited above the Government of India, Gazette Notification for MMDR Ammendment Act, 2015, dated: 26.03.2015, Section 8A (2) and (3) represents all mining leases granted before the commencement of this Ammendment shall be deemed to have been granted for a period of fifty years. Hence, we request you to kindly arrange to extend the lease period upto 27.02.2033. This is for your kind information and necessary action please.

Thanking you,

Yours Faithfully,
For M/s. Sivam Mines

For M/S SIVAM MINES

S. Ilangovan, B.E.,
Managing Partner

Place: Dindigul
Date : 24 .12.2019

Encl:

1. Copy of G.O. Ms.No. 1691, dated: 04.12.1982.
2. Copy of Mining Lease Deed.
3. Copy of Government of India, Gazette Notification for MMDR Ammendment Act, 2015, dated: 26.03.2015.

SIVAM MINES

S. ILANGOVAN B.E.,
Managing Partner

6/209,Main Road,Sirugudi(PO),
Natham(TK), Dindugul(DT),
Pin code:-624402
Cell: 94430 – 67632,94867-32753

Mine code: 38TMN06007
IBM Reg. No. IBM/5284/2011

To

The Regional Controller of Mines,
Indian Bureau of Mines,
C-4-A, Rajaji Bhavan, C.G.O Complex,
Bezant Nagar, Chennai – 90.

Sub: Submission of Form I & Form J in respect of Sirugudi Limestone Mine, over an extent of 1.70.0 hectares in S.F. Nos: 693/1, 2, 3, 4 & 7 in Sirugudi Village, Natham Taluk, Dindigul District, Tamilnadu State of M/s. Sivam Mines - Reg.

Sir,

With reference to the subject cited, We herewith enclose Form I & Form J in respect of afore said mine for your kind perusal.

Thanking You,

Yours faithfully
For M/s. Sivam Mines
For M/S SIVAM MINES
Managing Partner
S.Ilangovan
(Managing Partner)

Place: Dindigul
Date:26.12.2019

Encl: Form I & Form J.

FORM –I

(See rule 47)

(Notice of sinking shafts and boreholes)

MINE CODE - 38TMN06007

To

1. The Controller General,
   Indian Bureau of Mines,
   Nagpur – 440 001.
2. The Controller of Mines,
   Indian Bureau of Mines, Bangalore,
   PIN: 560 022.
3. The Regional Controller of Mines,
   Indian Bureau of Mines, Chennai,
   PIN: 600 090.
4. The State Government concerned.

1.	Type of Mineral Concession Mining Lease Prospecting License Prospecting License-cum-Mining lease	Mining Lease
2.	IBM Registration Number	IBM /5284/2011
3.	Unique IBM Concession Number Prospecting License Prospecting License-cum-Mining Lease	-
4.	Mining Lease code	-
5.	Mine code	38TMN06007
6.	Name of the mineral or minerals for which prospecting license or prospecting license cum mining lease-mining lease has been granted:	Limestone
7.	Name and address of the mineral concession holder	**M/s. Sivam Mines,** 6/209, Main Road, Sirugudi Post, Natham (Tk), Dindigul District – 624 404.
8.	Particulars of mineral concession	The Mining lease was granted (Second Renewal) vide G.O.(3D).No.83 Inds (MMA2) Dept., dated: 09.10.1996 for a period of twenty years.
9.	Location of the mineral concession	Sirugudi Village

Toposheet Number	S.F. Nos & Village	Extent Ha	Taluk	District	State
58-J/08	693/1, 2, 3, 4 & 7– Sirugudi	1.70.0 Ha	Natham	Dindigul	Tamil Nadu

10.	Number of shafts-bore holes intended to be sunk or extended (Attach a plan on a scale not less than 1 centimeter = 40 metres indicating the precise location of the shaft borehole).	Core Drills-2 Nos, From R.L.225.0m (maximum)
11.	Purpose for which each of the shafts-boreholes is intended to be sunk or extended	To find the depth of mineralization and the ultimate pit limit.
12.	Type of shaft(s)-contemplated and its-their dimension(s)	Vertical Shaft Dia = 89 mm
13.	Type of drill used and size of core to be obtained	Core size : 49mm
14.	Intended depth upto which shaft-boreholes is to be extended	Of 18.0 metres depth. [2 Core Drills – of 18.0 metres (maximum)] from working pit level. DCD-1 – 18.0m DCD-2 – 8.0m **Total meterage – 26m**
15.	If the shaft-borehole commences from underground the depth of the level at which the shaft-borehole is sunk	Not applicable
16.	Name and qualification of the geologist or mining engineer in charge of the operation	By Contract R.Arul Prakash, M.Sc., (Geology), Geologist.
17.	Date of commencement of proposed shaft sinking-drilling operation.	18.12.2019

Yours faithfully
M/s. Sivam Mines

For M/S SIVAM MINES

Managing Partner

Signature :
Name in full: S. Ilangovan, B.E.
Designation: Managing Partner

Place: Dindigul
Date: 26.12.2019

FORM –J

[See rule 48 (1)]

(Particulars to be recorded in respect of each bore-hole-pit-shaft)

MINE CODE - 38TMN06007

1.	Type of Mineral Concession Mining Lease Prospecting License Prospecting License-cum-Mining lease	Mining Lease
2.	IBM Registration Number	IBM /5284/2011
3.	Unique IBM Concession Number Prospecting License Prospecting License-cum-Mining Lease	-
4.	Mining Lease code	-
5.	Mine code	38TMN06007
6.	Name of the mineral or minerals for which prospecting license or prospecting license cum mining lease-mining lease has been granted:	Limestone
7.	Name and address of the mineral concession holder	**M/s. Sivam Mines,** 6/209, Main Road, Sirugudi Post, Natham (Tk), Dindigul District – 624 404.
8.	Particulars of mineral concession	The Mining lease was granted (Second Renewal) vide G.O.(3D).No.83 Inds (MMA2) Dept., dated: 09.10.1996 for a period of twenty years.
9.	Location of the mineral concession	Sirugudi Village

Toposheet Number	S.F. Nos & Village	Extent Ha	Taluk	District	State
58-J/08	693/1, 2, 3, 4 & 7– Sirugudi	1.70.0 Ha	Natham	Dindigul	Tamil Nadu

10.	Type and make of the drill and size of core.	Vertical Shaft Dia = 89 mm Core size : 49mm
11.	Bore hole-pit number and its location (a) Reduced levels at the collar of the borehole-pit (b) Inclination and bearing of the hole (c) Altitude of the formation	 R.L.225.0m (maximum) Vertical Banded Formation
12.	Duration of drilling-pitting (a) Date of commencement (b) Date of completion	 18.12.2019 19.12.2019

13.	Total length of the bore hole-pit-shaft	Of 18.0 metres depth. [2 Core Drills – of 18.0 metres (maximum)] from working pit level. DCD-1 – 18.0m DCD-2 – 8.0m **Total meterage – 26m**
14.	Purpose of drilling-pitting-shaft	To find the depth of mineralization and ultimate pit limit, the estimation of resource and reserve as per UNFC norms.
15.	Total operating expenditure incurred (in Rs.)	Core Drills – Rs. 1200/m. (26m x Rs.1200) = Rs. 31,200/-
16.	Details of intersection (as given below)	

Sl. No.	RUN DETAILS				Size of core/ pit/shaft	Percentage recovery of core	Lithology	Analysis Details (Major radicals a b c d)	Remarks
	From (in metres)	To (in metres)	Width (in metres)	True Width (in metres)					
1	2	3	4	5	6	7	8	9	10
1.	225.0m	207.0m	-	-	49mm	100%	Please Refer Table No.1 for details	$CaCo_3$	-
2.	215.0m	207.0m	-	-					-

Details of Exploration:

Locations of Core drills are marked in the geological plan and sections. (Refer the Geological Plan & Sections).

LITHOLOG OF THE CORE DRILL

No. of core drills	Latitude	Longitude	Depth of core drills (m)	Depth of deposition of Limestone in (RL)	Strata
DCD 1	10^0 14' 33.86"N	78^0 17' 45.72"E	18.0	225.0m – 207.0m	Limestone
DCD 2	10^0 14' 34.34"N	78^0 17' 47.26"E	8.0	215.0m – 207.0m	Limestone

Yours faithfully
M/s. Sivam Mines

For M/S SIVAM MINES

Signature : Managing Partner
Name in full: S. Ilangovan, B.E.,
Designation: Managing Partner

Place: Dindigul
Date: 26.12.2019

1. Change of District Code & S.No.approved in File No.4429/80, dated 24.11.87.

ANNEXURE-XII-A

2. Change of constitution approved Vide file No. D.DIS.PMT. 323/D2/88 Dated 15.3.89.

NIC. Code

Additional manufacturing activities included.

Vol.3/101

DEPARTMENT OF INDUSTRIES AND COMMERCE

GOVERNMENT OF TAMILNADU

REGISTRATION AS A SMALL SCALE INDUSTRIAL UNIT

PERMANENT CERTIFICATE

This is to certify that Thiruvalargal AIR MINERAL ENTERPRISES, Partner S.Asai Alangaram

a ~~Proprietary~~/Partnership/~~Pvt.Ltd/Pub.Ltd~~ concern (Office Address) 8, Veerakoil Street, Natham 624 401.

is a Small Scale Industrial Unit, registered with this Department and is allotted below mentioned Registration Number:

Number					Date		
18	19	00360	PMT	SSI	4	12	1987

Old Regn No.18/08/07146/PMT/SSI. Dated 28.6.85

for the factory location at S.No.686/2-A, Sirugudi Village, Pudupatti Natham Taluk

for the following manufacturing/~~processing~~ activity LIME STONE POWRR HYDRATED LIME, QUICK LIME, SLACKED LIME AND CEM ONLY

PLACE: 21 MAR 1989

Office Seal

mr 20/3.

20.3.89

For *Industries Commissioner and Director of Industries and Commerce, Madras.*

N.B.—1. This Registration is valid for the factory location, products and the constitution of the Unit at the time of allotment of this Certificate.

2. This Registration is liable to revocation or cancellation in the event of any misuse or unauthorised diversion as determined by the Industries Commissioner and Director of Industries and Commerce, Madras.

3. This Registration Certificate should be prominently exhibited at the factory premises of the Industrial Unit.

4. Date of commencement of production (wherever applicable).....

5. The Industrial production return should be furnished at the end of every accounting year.

15827

-49-

भारतीय गैर न्यायिक

एक सौ रुपये

रु. 100

Rs. 100

ONE HUNDRED RUPEES

भारत INDIA

INDIA NON JUDICIAL

तमिलनाडु TAMILNADU ஏர் மினரல் எண்டர்பிரைசஸ் சிறுகுடி. C 432630

Rs 100/-
7923
2.4.2007

DEED OF PARTNERSHIP

This deed of partnership entered into on this First day of April 2014 between,

1. Thiru. S. Ilangovan B.E., son of Sri K.A. Semban Chettiar, aged about 60 years , residing at 6/208, Main Road, Sirugudi Post Natham Taluk Dindigul District PIN 624 404.

2. Thiru. I. Vijay Alangar son of Thiru. S. Ilangovan aged about 31 years residing at 6/208, Main Road, Sirugudi Post Natham Taluk Dindigul District PIN 624 404.

I. Vijay Alangar

15928

भारतीय गैर न्यायिक

एक सौ रुपये

Rs. 100

रु. 100

ONE HUNDRED RUPEES

भारत INDIA

INDIA NON JUDICIAL

तमिलनाडु TAMILNADU

C 432631

and

3. Selvi. I Sempon Manickam daughter of Thiru. S. Ilangovan aged about 27 years residing at 6/208, Main Road, Sirugudi Post Natham Taluk Dindigul District PIN 624 404.

WHEREAS the above said Thiru. S. Ilangovan and Thiru. I. Vijay Alangar and Selvi. I. Sempon Manickam were carrying on the business of mining, manufacturing and dealing in limestone and allied products under the name and style of "AIR MINERAL ENTERPRISES" at Survey No. 686/2A, Sirugudi Village, Natham Taluk, Dindigul District duly evidenced by latest deed of partnership dated 09.11.2005.

I.

16029

भारतीय गैर न्यायिक

एक सौ रुपये

रु. 100

Rs. 100

ONE HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

तमिलनाडु TAMILNADU ஒர்மிலைல் ஒண்டர்பாலைசல் சிசகுடி

C 432632

Rs 100/-
7925
2.4.2007

S. தங்கமீனாள்
முத்திரைகளின் விற்பனை
சென்னை நிர்: 3

And WHEREAS with a view to modify certain terms and conditions as now prevalent between the parties, the parties considered it expedient and necessary to execute a fresh deed of partnership incorporating the changes in the terms and conditions as mentioned below:

TERMS AND CONDITIONS

1) The Partnership business shall continue to be carried on under the name and style of "AIR MINERAL ENTERPRISES" and or under any other name or names.

(1) [signature]

(2) T. Vijayarangam

(3) [signature]

2) The business of the partnership firm shall continue to be carried on at Survey No. 686/2A, Sirugudi Village, Natham Taluk, Dindigul District and / or at any other place or places as the partners decide from time to time.

3) The partnership commences with effect from First Day of April 2014 and it shall be determinable at will. Any partner desirous of leaving the firm shall give not less than three months notice in writing in advance to the other partners.

4) The firm shall continue to carry on the business of mining, manufacturing, traders and dealers of Dolomite, calcite, limestone products of different mesh size, other chemicals based on limestone and other minerals and chemicals, and / or any other business or businesses as may be determined by the partners from time to time.

5) The Capital of the firm shall be the total of the credit balance in the accounts of the partners and such capital balance of the partners shall carry interest up to 12 per annum. This rate can be changed from time to time as decided by the partners or such other rates as may be prescribed by the Income Tax Act 1961 may be adopted.

6) The accounts of the firm shall continue to be closed as on 31st March of every year. The net Profit / Loss shall be divided or shared by the partners in the following ratio:

1. S. Ilangovan	60%
2. I. Vijay Alangar	20%
3. I. Sempon Manickam	20%

7) Partner S. Ilangovan shall be in charge of general administration and shall also be responsible for carrying out the requisite obligations as is expected of the firm by statutory authorities.

1623A

He shall have power in general, to act on behalf of the firm in all matters, transactions and details relating to the firm and in particular, he shall individually have power;

a. to represent the firm before all Government, quasi-Government, Taxation, Licensing, Excise, Judicial, Postal and other authorities;

b. to institute, defend, compromise, abandon or withdraw any suits and legal proceedings on behalf of the firm;

c. to receive all registered tapals, V.P.Ps., Money Orders, insured post and other postal articles, addressed to the firm;

d. to receive all monies due to the firm and give valid acquittances therefore;

e. to borrow any amount from Bank, Institutions, Individuals, etc., on such terms and conditions as to security, rate of interest and mode of repayment as he deems fit;

f. to open accounts with Banks and to operate such accounts and to draw, endorse or otherwise deal with negotiable instrument;

g. to appoint the necessary staff or agents on such terms and conditions and remuneration / commission deemed fit by him and also to terminate their services, if found necessary ; and

h. to do all such other acts and things as may be necessary; incidental and conductive to the proper, efficient and profitable conduct of the partnership business.

He shall be paid a monthly remuneration up to Rs10,000/- (Rupees Ten Thousand Only) from 01-04-2014.This remuneration may be increased or decreased with the consent of the partners from time to time.

1. 2.

8) Bank account or accounts opened in the name of the firm shall be operated by the Managing partner Thiru. S. Ilangovan individually.

9) Death or retirement of any one of the partners shall not by itself dissolve the firm. In the event of death of any partner, the surviving partner shall continue the business with admitting the legal heirs of the deceased partner. In the event of retirement of any partner, the business of the firm shall be continued by the other partners with or without admitting any new partner or partners.

10) The provisions of the Indian Partnership Act, 1932 shall apply to this partnership to the extent to which they are not specifically modified or excluded by the special clauses.

IN WITNESS WHEREOF THE parties hereto have set their hands on the day and year first above mentioned.

1. [signature]

(S. ILANGOVAN)

2. I. Vijayalangar

(I. VIJAY ALANGAR)

3. [signature]

(I. SEMPON MANICKAM)

WITNESSES:

SA 1. [signature] S/o K.A. Semban chettiar, Sirugudi

2. [signature] S/o M. Nagapan Chettiar 12, Ashok Nagar, Nathan

தமிழ்நாடு

எண்: 6669

நாள்: 26.11.2004

கி. இளவரசன்
முத்திரைத்தாள் விற்பனையாளர்
லைசன்ஸ் எண் 3949 / B 1 / 2000
நத்தம்

DEED OF RETIREMENT

This deed of Retirement of partnership made on this first day of December 2004 between,

1. Mr.S. Ilangovan B.E.,. son of Sri K.A. Semban Chettiar, aged about 49years , residing at 4/121, White House, Main Road, Sirugudi Post (PIN 624 404)Natham Taluk Dindigul District.

and

2. Mrs. I. Madhavi, wife of Mr. S. Ilangovan aged about 39 years residing at 4/121, White House, Main Road, Sirugudi Post (PIN 624 404)Natham Taluk Dindigul District.

.....2

S. Ilangovan

I. Madhavi

50 Rs.

पचास रुपये

भारत

INDIA

FIFTY RUPEES

५०रु.

50Rs

ஆர். மீனாவ் அண்பர் பிரைசன்
திருகுடி

தமிழ்நாடு [illegible]
எண்: 6670
நாள்: 26.11.2004

K. [illegible]
கி. இளவரசன்
முத்திரைத்தாள் விற்பனையாளர்
லைசென்ஸ் நிர் 3949 / B 1 / 2000
நத்தம்

DEPARTMENT
1 JAN 2003

Herein after referred to as the "continuing Partners" (or) party of the first part.

and

1. Mr. S. Asai Alangaram, B. Sc., son of Sri K.A. Semban Chettiar, aged about 51 years , residing at 4/122, White House, Main Road, Sirugudi Post (PIN 624 404)Natham Taluk Dindigul District.

Herein after referred to as the "Retiring Partner" (or) party of the second part.

WHEREAS the above said Mr. S. Asai Alangaram, Mr. S Ilangovan and I. Madhavi have entered into partnership and are carrying on the business of mining, manufacturing and dealing in limestone and allied products under the name and

.....3

1 [illegible]

SA 1 S. Asai [illegible]

2 I. Madhavi

style of "AIR MINERAL ENTERPRISES" at Survey No.686/2A, Sirugudi Village, Natham Taluk, Dindigul District duly evidenced by deed of partnership dated 1st day of April 2004 till 30.11.2004 and

Whereas the party of the second part has, after negotiations amongst themselves have decided to retire from the said firm as from 1st December, 2004 and have settled the accounts amongst themselves, and the party of the first part has continued and taken over the running business of the firm along with all movable and immovable properties and assets and liabilities, past, present, future contingent (or) otherwise in connection with and relating to the said business along with the trade name of the firm and its products and rights, titles and interest in quota, permits, licences, concessions, allotments and other assets and both the parties have agreed to such arrangement on retirement of the party of the second part and have settled the accounts accordingly and are desirous of reducing the terms and conditions of retirement in writing, this indenture witnesseth as follows:

1. The party of second part has retired from the firm of "M/s. AIR MINERAL ENTERPRISES" and the party of first part has taken over the business of the firm as running concern on and from 01.12.2004

2. The party of the first part have taken over and continued the running business of the said firm along with all the movable and immovable properties and all the Assets and Liabilities, past, present, future accrued or accruing contingent or otherwise along with the trade name of the firm and its products, and rights titles and interests in quotas, permits, licences and concessions along with the rights in telephones. The party of the second part shall not carry on the business in the name of "M/s. AIR MINERAL ENTERORISES" or hold out themselves to be partners in said firm after 30th November 2004.

.....4

1

2 G. Madhavi

3. The partners have settled the accounts after closing the accounts up to 30th November 2004.
4. That apart from the matters specified in this deed, all the assets and liabilities of the partnership business, movable and immovable properties including the Goodwill, if any, licence quota rights, loan or any other benefits shall rest with and become the properties of the continuing partners with effect from 01.12.2004 and the retiring partners has no right, title or interest in the assets whatsoever of partnership, including movable or immovable, or its business or its future profits or loss and shall likewise be not responsible or liable for any liability of the partnership business.
5. The parties to this Indenture have agreed that all books of accounts, documents and papers of the firm shall henceforth remain in the custody and possession of the party of the first part and the party of the second part shall be entitled to take copies of any entry in the account books etc. at their cost at reasonable times.
6. The retiring partner agree to be present and sign all the documents, forms, or papers for transferring the properties movable or immovable or assets of the firm in the name of the continuing partners or their nominees or other person or persons as directed by them.

In WITNESS WHERE OF THE Parties hereto have set their hands on the day and year first above mentioned.

1) [signature] }
} Continuing partners
2) G. Madhavi }

SA 1) [signature] } Retiring partner

WITNESSES:

1) M. [signature] M. DEEPA ALANGAR S/o V. Manickam, Sirugudi

2) Vh. Venkataratna S/o Vhi Muzaneertey. Nathan.

604

University of Madras

FACULTY OF ENGINEERING.

The Senate of the University of Madras hereby makes known that A. Jaganathan has been admitted to the Degree of Bachelor of Engineering Mining Branch, he having been certified by duly appointed Examiners to be qualified to receive the same, at the Examination held in the month of January in the year 1965. He was placed in the Second Class.

Given under the seal of the University.

Senate House,
October 14, 1965.

Registrar, University of Madras.

A. L. Mudaliar
Vice-Chancellor.

ATTESTED XEROX COPY

V.S. Saravanan 5/10/2005

V.S.SARAVANAN, M.Com., B.L.
Advocate & Notary Public
(Salem & Namakkal District.)
Tallapur, A.M.P.H., Namakkal Dt. TN.

A. JAGANNATHAN, B.E., F.C.C., M.M.E.A.,
Qualified Person

बर्न स्टैण्डर्ड कम्पनी लिमिटेड
(भारत सरकार का एक उपक्रम)
पोस्ट बैग No: 565
सेलम 636 005

TNGST. No. 2800006
CST. No. 408514/Slm/13-8-58
IAC. No. 147
AN ISO 9001-2000 COMPANY

Telephone : General 2341403/4/5/6
Sales : 2341406, Purchase : 2341402
Fax : 91-427-2341407
Telegram : BURN Salem
E-mail : slm_burnstd@sancharnet.in

BURN STANDARD CO. LTD.,
(A Subsidiary of BBUNL) (A Govt. of India U/T)
Post Bag. No. 565, SALEM - 636 005.

S/LB/cert/ 01.10.2005

SERVICE CERTIFICATE

This is to certify that Shri A.Jaganathan, B.E., (Mining Engineer), was employed with us from from 01.08.1967. He has worked in different capacities and has resigned from the services of the company on 10.04.1984. At the time resignation he was working as Manager (Mines).

For Burn Standard Co. Ltd.,

S.Jason Soundararajan
DGM (Prsl & Admn)

A.JAGANNATHAN, B.E.,F.C.C.M.M.E.A.,
Qualified Person

नए नवीकृत
Renewed up to 18 NOV 1991

P Swaminathan 14/9/89
Regional Controller of Mines
INDIAN BUREAU OF MINES
(Ministry of Steel, Mines & Co...
MADRAS

CERTIFICATE OF RECOGNITION AS QUALIFIED PERSON TO PREPARE MINING PLANS

(Under Rule 22 (c) of Mineral Concession Rules 1960)

Shri A. JAGANATHAN *resident of* 5/247, JUNCTION MAIN ROAD, FIVE ROADS, SALEM - 4, *son of* SHRI P. ATHIAPPA GOUNDER, *having given satisfactory evidence of his qualifications and experience is hereby granted recognition under Rule 22 (c) of the Mineral Concession Rules, 1960 as a Qualified Person to prepare Mining Plans.*

His registration number is RQP / MAS / 019 / 87 /A

This recognition is valid for a period of two years ending 19.11.1989

P Swaminathan
Regional Controller of Mines
Indian Bureau of Mines
MADRAS

Place : MADRAS
Date : 20.11.1987

A.JAGANNATHAN, B.E.,F.C.C.M.M.E.A.
Qualified Person

17140

तक नवीकृत
Renewed up to 17 NOV 1993

Regional Controller of Mines
INDIAN BUREAU OF MINES

तक नवीकृत
Renewed up to 17-11-2011

Regional Controller of Mines,
INDIAN BUREAU OF MINES

तक नवीकृत
Renewed up to 17-11-2021

REGIONAL CONTROLLER OF MINES
INDIAN BUREAU OF MINES
CHENNAI REGION

तक नवीकृत
Renewed up to 17 NOV 1995

क्षेत्रीय खान नियंत्रक
Regional Controller of Mines
भारतीय खान ब्यूरो
INDIAN BUREAU OF MINES

तक नवीकृत
Renewed up to 17 NOV 1997

क्षेत्रीय खान नियंत्रक
Regional Controller of Mines
भारतीय खान ब्यूरो
INDIAN BUREAU OF MINES

तक नवीकृत
Renewed up to 17.11.99

M. K. A.
Regional Controller of Mines,
INDIAN BUREAU OF MINES
Ministry of Steel, Mines &
MADRAS

तक नवीकृत
Renewed up to 17.11.2001

Regional Controller of Mines,
INDIAN BUREAU OF MINES

A. JAGANNATHAN, B.E.,F.C.C.,M.M.E.A.,
Qualified Person

ANNEXURE-XIV

भारतीय गैर न्यायिक

एक सौ रुपये Rs. 100

रु. 100 ONE HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

தமிழ்நாடு तमिलनाडु TAMILNADU 23.12-2019

கனரா பேங்க் / சிறுகுடி

BY 118163

ஆ.ரா.தாகிருஷ்ணன்
பதிவாளர் விற்பனையாளர்
நீதி மன்ற வளாகம்
உ.எண்:363/ஆ.1/2004
மு/1.வாழ்க வளமுடன் தொ.
L.G.B.காம்பவுண்டு
M.R.பட்டி. திண்டுக்கல்

Bank Guarantee

Form No. _____

The Regional Controller of Mines,
Indian Bureau of Mines,
CHENNAI

Dear Sirs,

Guarantee No. C22GPGE193570002
Amount of Guarantee **Rs.10,00,000/-**
Guarantee Period from **23.12.2019 TO 31.03.2025**
Last date for lodgment of claim **31.03.2025**

This Bank guarantee executed on 23 **Day of December, 2019** by Canara Bank,Sirugudi Constituted under the Banking Regulations Act, having its central office at Bangalore and amongst other places, a branch at Sirugudi in favour of the Regional Controller of Mines, Indian Bureau of Mines, Chennai for an amount not exceeding **Rs.10,00,000/-** (Rs. **Ten Lakhs** only) at the request of **M/s. Sivam Mines, (Thiru.S.Ilangovan, B.E., Managing Partner),**

This guarantee is issued subject to the condition that the liability of the bank under this guarantee is limited to maximum of **Rs.10,00,000/-** (Rs. **Ten Lakhs** only) and the guarantee shall remain in full force up to **31.03.2025** (date of expiry) and cannot be revoked on or before **31.03.2025** (last date of claim) by the **Bank/applicant.**

For CANARA BANK

Manager,
SIRUGUDI (Dindigul Dt)

गोकुल राज Gokul Raj
अधिकारी Officer
ह.अ.सं. S.P No: 65379

For Canara Bank
Sirugudi
11775
Officer

17342

SUBJECT TO AS AFORESAID

BANK GUARANTEE AND CO-ACCEPTANCE BOND

1. Agreement on production of a Bank guarantee for **Rs.10,00,000/-** (Rs. **Ten Lakhs** only) under rule 27(1) of MCDR, 2017.

2. We Canara Bank,Sirugudi at the request of **M/s. Sivam Mines, (Thiru.S.Ilangovan, B.E., Managing Partner),** do hereby undertake to pay to the Regional Controller of Mines, Indian Bureau of Mines, Chennai or any other officer authority nominated by the Controller General, Indian Bureau of Mines an amount not exceeding **Rs.10,00,000/- (Rs. Ten Lakhs** only) against any loss or damage caused to or suffered or would be caused to or suffered by the Government or towards non compliance of provisions of Rule 22, 23 & 26 of MCDR, 2017 i.e. Mine closure plan/progressive mine closure plan approved in respect of the mining lease **Sirugudi Limestone Mine** for Limestone (ore /ores) over an area of **1.70.0Ha.** Granted by State Government to **M/s. Sivam Mines,** situated in S.F. Nos: **693/1, 2, 3, 4 & 7** in **Sirugudi** Village, **Natham** Taluk, **Dindigul** District, Tamilnadu State **(G.O. Ms.No. 1691, dated: 04.12.1982)** by reason of any breach of the said lessee of any of the terms or conditions contained in the Mine closure Plan/ Progressive mine closure plan.

3. We, **Canara Bank,Sirugudi** do hereby undertake to pay the amount due and payable under this guarantee without any demure, to the authority merely on receipt of a written demand on or before from the Regional Controller of Mines, Indian Bureau of Mines **Chennai** or any other authorized by the Controller General, Indian Bureau of Mines stating that the amount claimed is due by way of loss or loss of damage caused to or would be caused to or suffered by the government by reason of breach by the said lessee or any of the terms or conditions contained in the Mining plan / Mining scheme or by reason of lessee's failure to perform the said mine closure plan/progressive mine closure plan. However our liability under this guarantee shall be restricted to an amount not exceeding **Rs.10,00,000/- (Rs. Ten Lakhs** only).

4. We Canara Bank,Sirugudi undertake to pay to the authority upon receiving a written demand from the Regional Controller of Mines, Indian Bureau of Mines, **Chennai** or any other officer authorized by the Controller General, Indian Bureau of Mines or Govt. of India any money so demanded notwithstanding any dispute or disputes raised by the lessee in any suit or proceedings pending before any court or tribunal relating there to our liability under this present being absolute and unequivocal.

The payment so made by is under this bond shall be valid discharge of our liability for payment there under and lessee shall have no claim against us for making such payment.

5. We, **Canara Bank,Sirugudi** further agree that the guarantee herein contained shall remain in full force and effect during the period up to the end of the Mining plan/Review of Mining plan/Scheme of Mining of five years that would be taken for performance of the said Agreement and that shall continue to be enforceable till all the dues of the Govt. under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged till Regional Controller of Mines, Indian Bureau of Mines, **Chennai** or any other officer authorized by the Controller General, Indian Bureau of Mines certifies that the terms and conditions of the said progressive mine closure plan/final mine closure plan have been fully and properly carried out by the said lessee or till the validity period, which ever is earlier and accordingly discharge this guarantee. Unless a demand or claim under this guarantee is made on us in writing and received by us on or before **31.03.2025** we shall be discharged from all liability under this guarantee thereafter.

For CANARA BANK

Manager.
SIRUGUDI Dindigul Dt

गोकुल राज Gokul Raj
सहायक अधिकारी Officer
S.P. No. 65375

For Canara Bank
Sirugudi
117757
Officer

6. We Canara Bank,Sirugudi further agree that Regional Controller of Mines, Indian Bureau of Mines, **Chennai** or any other officer authorized by the Controller General, Indian Bureau of Mines shall have fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said lessee from time to time or to postpone for any time or from time to time any powers exercisable by Regional Controller of Mines, **Chennai** against the said lessee and to forbear or enforce any of the terms and conditions relating to the said agreement, we, (bank) shall not be relieved from our liability by reason of any such variation or extension being granted to the said lessee or for any forbearance, act or omission on the part of Regional Controller of Mines, Indian Bureau of Mines, **Chennai** or any indulgence by Regional Controller of Mines, Indian Bureau of Mines, **Chennai** to the said lessee or any manner or thing whatsoever which under the law relating to sureties, would but this provision have effect of so relieving us.

7. This guarantee will not be discharged due to change in constitution of the bank or lessee.

8. We, **Canara Bank,Sirugudi** lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Regional Controller of Mines, Indian Bureau of Mines, Chennai in writing.

9. Notwithstanding anything contained herein :

a) Our liability under this Bank guarantee shall not exceed **Rs.10,00,000/- (Rs. Ten Lakhs** only).
b) The bank guarantee shall be valid up to **31.03.2025**
c) The period of bank guarantee submitted is valid for the period of the proposals given in the Mining plan/Review of mining plan/Scheme of mining/PMCP etc. We are liable to pay the guarantee amount or any part thereof under this Bank guarantee only if served upon us a written claim or demand and we have received it on or before **31.03.2025**

10. If the bank guarantee is to be en-cashed through the court, in that case the (city where Regional office, IBM is located) court will have jurisdiction.

11. In witness whereof, the bank through its authorized officer has set its hand and stamp on this 23rd Day of **December, 2019** at Sirugudi.

This Bank Guarantee issued in paper from shall become operative only when the BG advice transmitted through SFMS is advised to the beneficiary by the advising bank.

For CANARA BANK

Manager,
SIRUGUDI (Dindigul Dt)

For CANARA BANK

Manager,
SIRUGUDI (Dindigul Dt)

गोकुल राज Gokul Raj
अधिकारी Officer
ह. क्र. S.P No: 65379

For Canara Bank
Sirugudi
Officer

SIRUGUDI LIMESTONE MINE
Lessee: M/s. Sivam Mines.

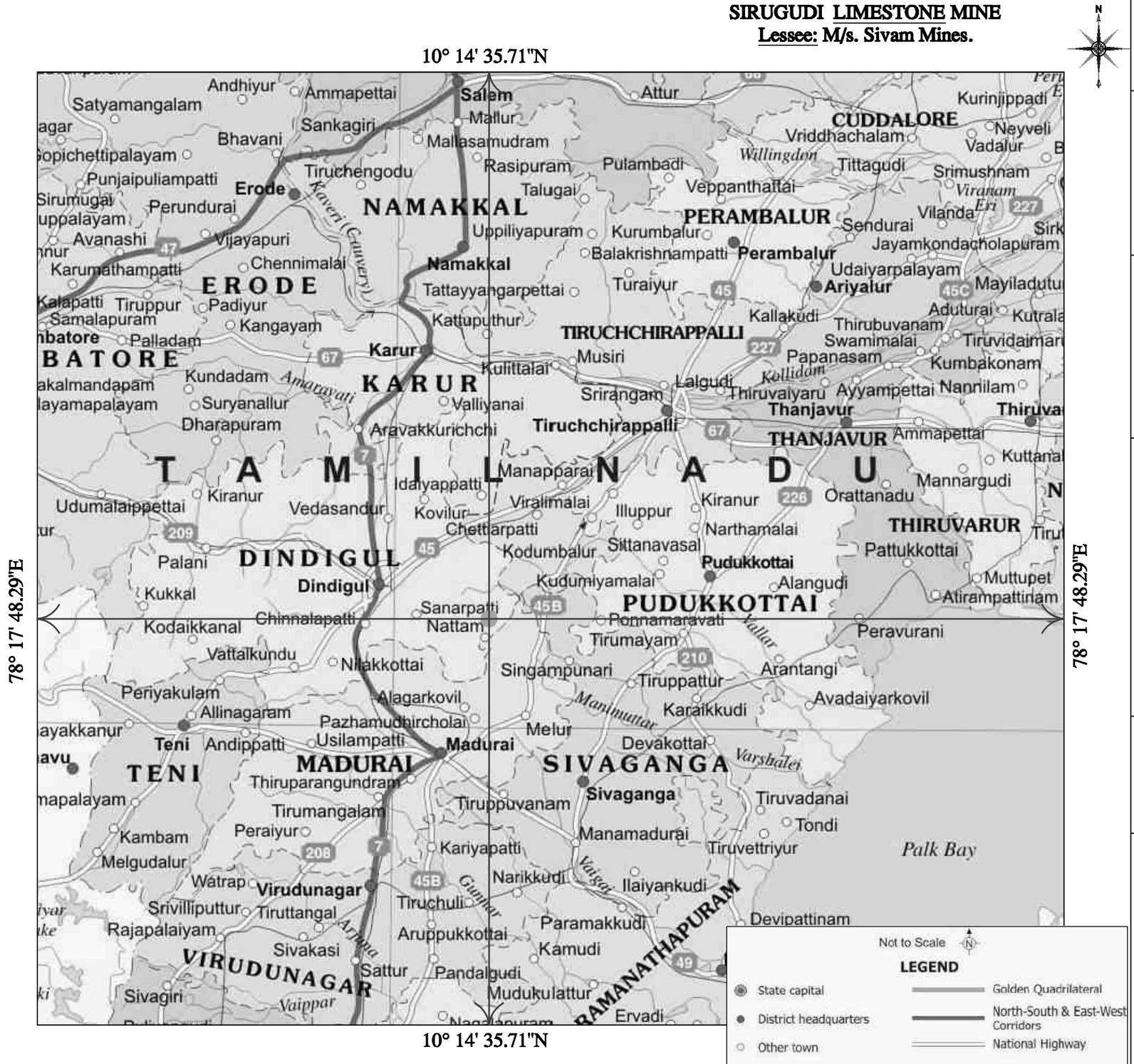


PLATE NO - I

DATE OF SURVEY : 20.12.2019

LESSEE:

M/s. SIVAM MINES,
No. 6/ 209, MAIN ROAD,
SIRUGUDI POST,
NATHAM TALUK,
DINDIGUL DISTRICT.

LOCATION OF MINE:

S.F.Nos	: 639/ 1, 2, 3, 4 & 7
EXTENT	: 1.70.0 Ha
VILLAGE	: SIRUGUDI
TALUK	: NATHAM
DISTRICT	: DINDIGUL
STATE	: TAMILNADU.

INDEX

M.L. AREA :

TOPO SHEET No : 58 , J-08

LATITUDE : 10° 14' 35.71"N

LONGITUDE : 78° 17' 48.29"E

LOCATION PLAN

NOT TO SCALE

PREPARED BY:

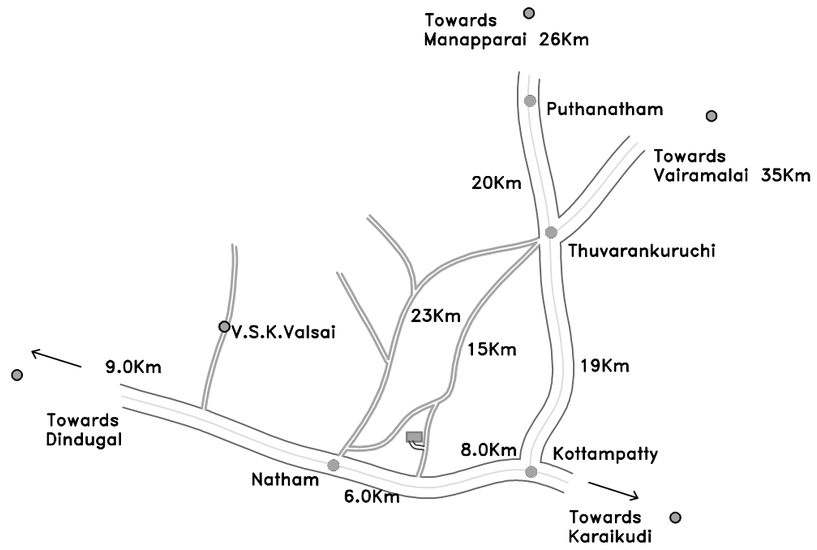
THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

A.JAGANNATHAN,BE.,F.C.C.,M.M.E.A.,M.I.E.,
QUALIFIED PERSON

PLATE NO : I-A

ROUTE MAP

SIRUGUDI LIMESTONE MINE
Lessee: M/s. Sivam Mines.



INDEX

- MINE LEASE AREA
- NH ROAD
- SH ROAD
- PANCHAYAT ROAD
- APPROACH ROAD

LESSEE:

M/s. SIVAM MINES,
No. 6/209, MAIN ROAD,
SIRUGUDI POST, NATHAM TALUK,
DINDIGUL DISTRICT.

LOCATION OF MINE:

S.F.Nos	: 639/1, 2, 3, 4 & 7
EXTENT	: 1.70.0 Ha
VILLAGE	: SIRUGUDI
TALUK	: NATHAM
DISTRICT	: DINDIGUL
STATE	: TAMILNADU.

SCALE
NOT TO SCALE

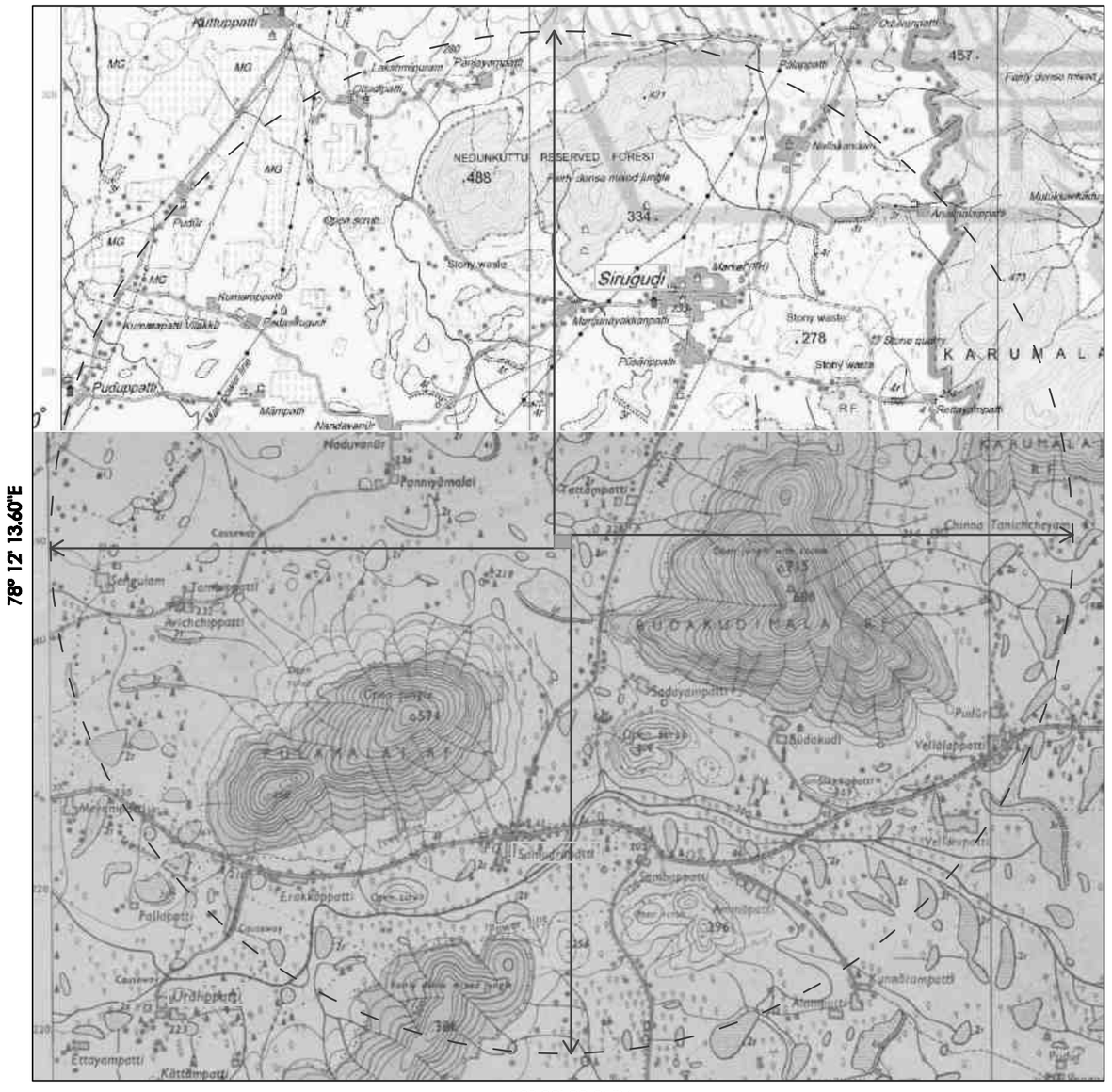
PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

A.JAGANNATHAN,BE.,F.C.C.,M.M.E.A.,M.I.E.,
QUALIFIED PERSON

SIRUGUDI LIMESTONE MINE
Lessee: M/s. Sivam Mines.

10° 20' 00.94"N



10° 09' 03.91"N

***The marks indicate the population is more than 500 peoples**

LESSEE:

M/s. SIVAM MINES,
No. 6/ 209, MAIN ROAD,
SIRUGUDI POST,
NATHAM TALUK,
DINDIGUL DISTRICT.

LOCATION OF MINE:

S.F.Nos	: 639/ 1, 2, 3, 4 & 7
EXTENT	: 1.70.0 Ha
VILLAGE	: SIRUGUDI
TALUK	: NATHAM
DISTRICT	: DINDIGUL
STATE	: TAMILNADU.

PLATE NO: I-B

KEY PLAN

TOPOSHEET NO: 58, J / 08

SCALE- 1:50,000

INDEX

MINE LEASE AREA

5KM RADIUS

INDEX

Express highway: with toll; with bridge; with distar
Roads metalled: according to importance.....
Roads, double carriageway; according to importan
Unmetalled road. Cart-track. Pack-track with pass.
Streams: with track in bed; undefined. Canal.....
Dams: masonry or rock-filled; earthwork. Weir.....
River; dry with water channel; with island & rocks.
Submerged rocks. Shoal. Swamp. Reeds.....
Wells: lined; unlined. Tubewell. Spring. Tanks:per
Embankments: road or rail; tank. Broken ground...
Railways, broad gauge: double: single with station
Railways, other gauges: double; single with distanc
Mineral line or tramway. Kiln. Cutting with tunnel
Contours with sub-features. Rocky slopes. Cliffs...
Sand features: (1)flat. (2)sand-hills(permanent).....
Towns or Villages: inhabited; deserted. Fort.....
Huts: permanent; temporary. Tower. Antiquities....
Temple. Chhatri. Church. Mosque. Idgah. Tomb. G
Lighthouse. Lightship. Buoys: lighted; unlighted. A
Mine. Vine on trellis. Grass. Scrub.....
Palms: palmyra; other. Plantain. Conifer. Bamboo.
Areas: cultivated; Wooded. Surveyed trees.....
Boundary, international.....
Boundary, state: demarcated; undemarcated.....
Boundary, district; subdivision; tahsil or taluk; fore
Boundary pillers: surveyed; unlocated.....
Heights. triangulated: station: point; approximate...
Bench-mark: geodetic; tertiary; canal.....
Post office. Telegraph office. Overhead tank.....
Rest house or inspection bungalow. Circuit house.
Camping Ground. Forest: reserved; protected.....
Spaces names: administrative; locality or tribal.....
Hospital. Dispensary. Veterinary: Hospital/Dispens
Aerodrome. Helipad. Tourist site.....
Powerline: with pylons surveyed; with poles unsur

PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

A.JAGANNATHAN,BE.,F.C.C.,M.M.E.A.,M.I.E.,
QUALIFIED PERSON

SIRUGUDI LIMESTONE MINE

Lessee: M/s. Sivam Mines.

GCP-1
Open Well
10°14'39.44"N
78°17'50.16"E

Towards Avichchippatti

Towards Thethampatti

N

BOUNDARY CO-ORDINATES

S.N.	LATITUDE	LONGITUDE
1	10° 14' 29.27"N	78° 17' 41.99"E
2	10° 14' 30.55"N	78° 17' 42.20"E
3	10° 14' 30.40"N	78° 17' 43.81"E
4	10° 14' 31.02"N	78° 17' 44.25"E
5	10° 14' 31.09"N	78° 17' 43.60"E
6	10° 14' 32.65"N	78° 17' 43.58"E
7	10° 14' 32.85"N	78° 17' 43.32"E
8	10° 14' 33.89"N	78° 17' 43.79"E
9	10° 14' 34.93"N	78° 17' 43.80"E
10	10° 14' 35.25"N	78° 17' 44.27"E
11	10° 14' 35.01"N	78° 17' 46.10"E
12	10° 14' 35.63"N	78° 17' 46.67"E
13	10° 14' 35.71"N	78° 17' 48.29"E
14	10° 14' 34.76"N	78° 17' 48.54"E
15	10° 14' 33.43"N	78° 17' 48.48"E
16	10° 14' 32.70"N	78° 17' 48.28"E
17	10° 14' 32.83"N	78° 17' 46.17"E
18	10° 14' 32.12"N	78° 17' 45.27"E
19	10° 14' 29.42"N	78° 17' 44.12"E
20	10° 14' 29.14"N	78° 17' 44.13"E

DATUM WGS-84

643 RL229m

693/7 693/4 693/1 693/2 693/5A1 693/3 694 699

TBM

10°14'29.88"N
78°17'55.27"E
GCP-2
Mushroom form

10°14'29.20"N
78°17'37.05"E
GCP-3
Open Well

INDEX

- MINE LEASE BOUNDARY
- 7.5m SAFETY BARRIER
- TEMPORARY BENCH MARK
- APPROACH ROAD
- PANCHAYAT ROAD
- GROUND CONTROL POINT

LESSEE:

M/s. SIVAM MINES,
No. 6/ 209, MAIN ROAD,
SIRUGUDI POST,
NATHAM TALUK,
DINDIGUL DISTRICT.

LOCATION OF MINE:

S.F.Nos. : 639/ 1, 2, 3, 4 & 7
EXTENT : 1.70.0 Ha
VILLAGE : SIRUGUDI
TALUK : NATHAM
DISTRICT : DINDIGUL
STATE : TAMILNADU.

PLATE NO - II

DATE OF SURVEY : 20.12.2019

MINE LEASE PLAN

SCALE :- 1:1000

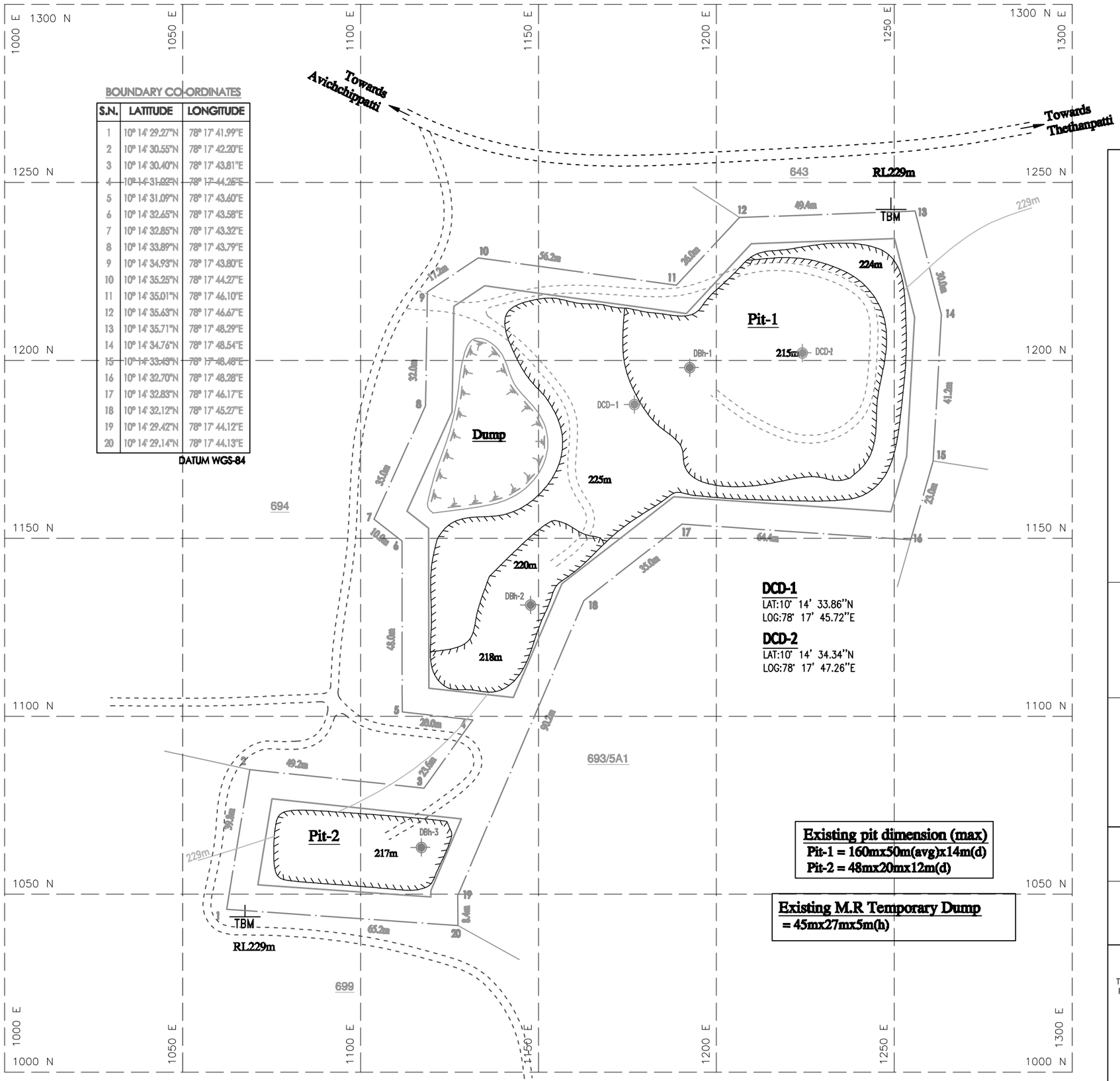
PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

A.JAGANNATHAN,BE.,F.C.C.,M.M.E.A.,M.I.E.,
QUALIFIED PERSON

SIRUGUDI LIMESTONE MINE

Lessee: M/s. Sivam Mines.



BOUNDARY CO-ORDINATES

S.N.	LATITUDE	LONGITUDE
1	10° 14' 29.27"N	78° 17' 41.99"E
2	10° 14' 30.55"N	78° 17' 42.20"E
3	10° 14' 30.40"N	78° 17' 43.81"E
4	10° 14' 31.92"N	78° 17' 44.25"E
5	10° 14' 31.09"N	78° 17' 43.60"E
6	10° 14' 32.65"N	78° 17' 43.58"E
7	10° 14' 32.85"N	78° 17' 43.32"E
8	10° 14' 33.89"N	78° 17' 43.79"E
9	10° 14' 34.93"N	78° 17' 43.80"E
10	10° 14' 35.25"N	78° 17' 44.27"E
11	10° 14' 35.01"N	78° 17' 46.10"E
12	10° 14' 35.63"N	78° 17' 46.67"E
13	10° 14' 35.71"N	78° 17' 48.29"E
14	10° 14' 34.76"N	78° 17' 48.54"E
15	10° 14' 33.63"N	78° 17' 48.48"E
16	10° 14' 32.70"N	78° 17' 48.28"E
17	10° 14' 32.83"N	78° 17' 46.17"E
18	10° 14' 32.12"N	78° 17' 45.27"E
19	10° 14' 29.42"N	78° 17' 44.12"E
20	10° 14' 29.14"N	78° 17' 44.13"E

DATUM WGS-84

DCD-1
LAT:10° 14' 33.86"N
LOG:78° 17' 45.72"E

DCD-2
LAT:10° 14' 34.34"N
LOG:78° 17' 47.26"E

Existing pit dimension (max)
Pit-1 = 160mx50m(avg)x14m(d)
Pit-2 = 48mx20mx12m(d)

Existing M.R Temporary Dump
= 45mx27mx5m(h)

INDEX

- MINE LEASE BOUNDARY
- 7.5m SAFETY BARRIER
- TEMPORARY BENCH MARK
- TOP SOIL
- EXISTING PIT
- DUMP
- CONTOUR LINE
- SHRUBS
- MINE ROAD
- APPROACH ROAD
- VILLAGE ROAD
- DRILLED BOREHOLE
- DRILLED COREHOLE

LESSEE:

M/s. SIVAM MINES,
No. 6/ 209, MAIN ROAD,
SIRUGUDI POST,
NATHAM TALUK,
DINDIGUL DISTRICT.

LOCATION OF MINE:

S.F.Nos : 639/ 1, 2, 3, 4 & 7
EXTENT : 1.70.0 Ha
VILLAGE : SIRUGUDI
TALUK : NATHAM
DISTRICT : DINDIGUL
STATE : TAMILNADU.

PLATE NO - III

DATE OF SURVEY : 20.12.2019

SURFACE PLAN

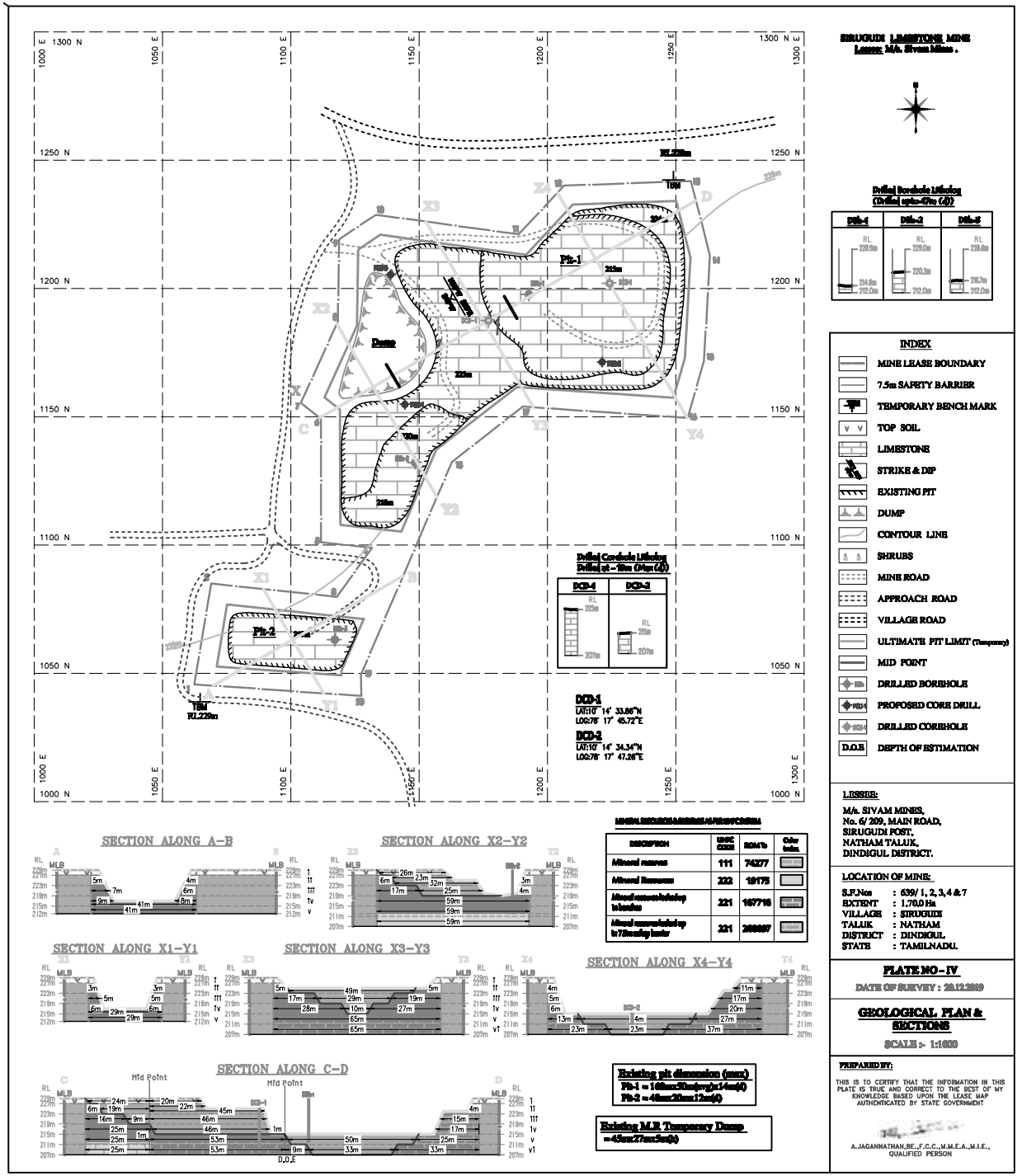
SCALE :- 1:1000

PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

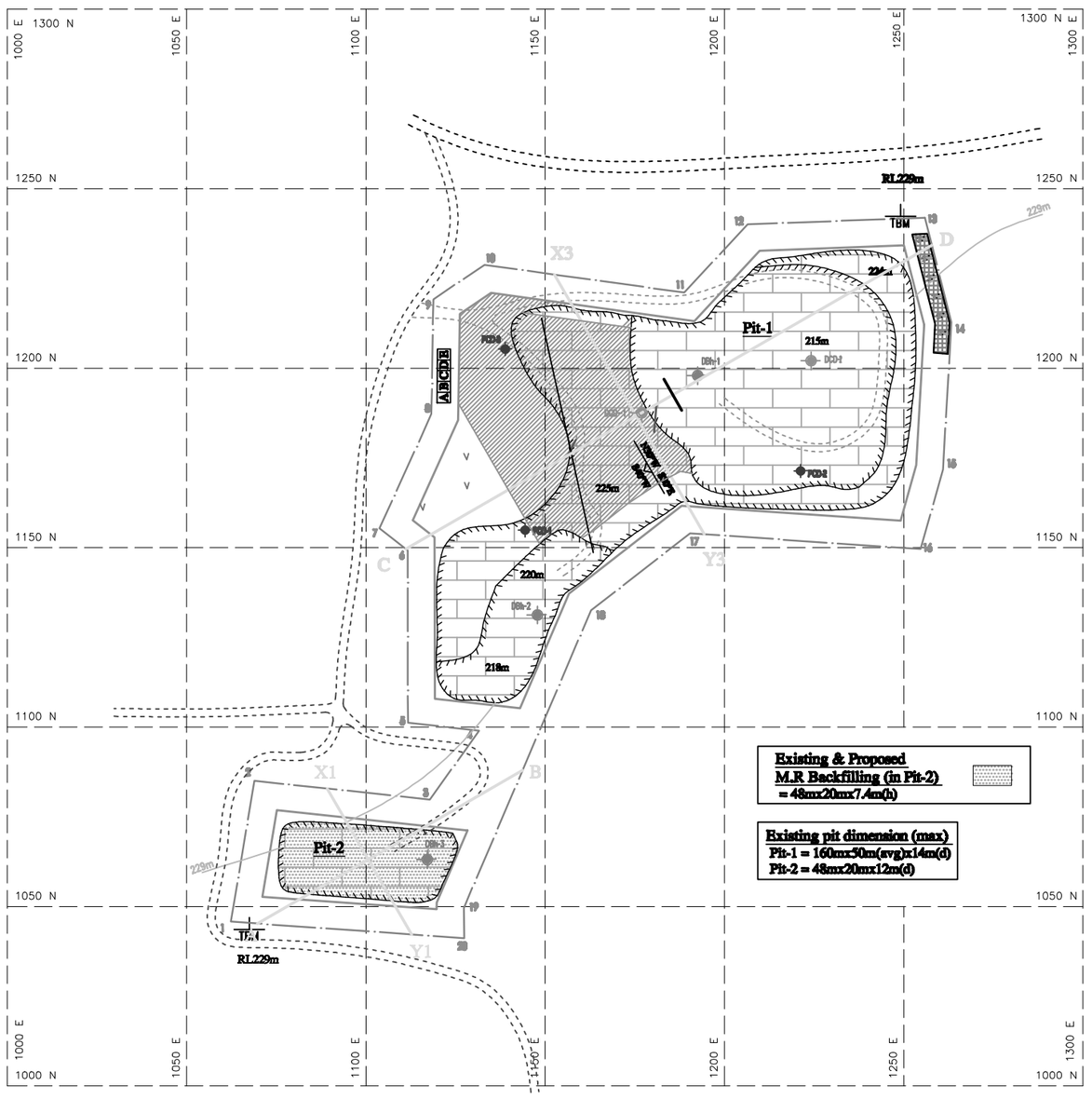
A.JAGANNATHAN,BE.,F.C.C.,M.M.E.A.,M.I.E.,
QUALIFIED PERSON

180 A


SIRUGUDI LIMESTONE MINE
Lessee: M/s. Sivam Mines.
Drilled Borehole Litholog
(Drilled upto-47m (d))
Dump
Pit-1
Pit-2
TBM
RL229m
DCD-1
LAT:10° 14' 33.66"N
LOG:78° 17' 45.72"E
DCD-2
LAT:10° 14' 34.34"N
LOG:78° 17' 47.26"E
INDEX
MINE LEASE BOUNDARY
7.5m SAFETY BARRIER
TEMPORARY BENCH MARK
TOP SOIL
LIMESTONE
STRIKE & DIP
EXISTING PIT
DUMP
CONTOUR LINE
SHRUBS
MINE ROAD
APPROACH ROAD
VILLAGE ROAD
ULTIMATE PIT LIMIT (Temporary)
MID POINT
DRILLED BOREHOLE
PROPOSED CORE DRILL
DRILLED COREHOLE
D.O.E DEPTH OF ESTIMATION
LESSEE:
M/s. SIVAM MINES,
No. 6/209, MAIN ROAD,
SIRUGUDI POST,
NATHAM TALUK,
DINDIGUL DISTRICT.
LOCATION OF MINE:
S.F.Nos : 639/ 1, 2, 3, 4 & 7
EXTENT : 1.70.0 Ha
VILLAGE : SIRUGUDI
TALUK : NATHAM
DISTRICT : DINDIGUL
STATE : TAMILNADU
PLATE NO - IV
DATE OF SURVEY : 28.12.2019
GEOLOGICAL PLAN & SECTIONS
SCALE :- 1:1000
PREPARED BY:
THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT
A.JAGANNATHAN,BE.,F.C.C.,M.M.E.A.,M.I.E.,
QUALIFIED PERSON
SECTION ALONG A–B
SECTION ALONG X2–Y2
SECTION ALONG X1–Y1
SECTION ALONG X3–Y3
SECTION ALONG X4–Y4
SECTION ALONG C–D
Mid Point
D.O.E
Existing pit dimension (max)
Pit-1 = 160m×50m×typ.14m(d)
Pit-2 = 40m×20m×12m(d)
Existing M.R Temporary Dump
=45m×27m×5m(h)
DESCRIPTION
UNFC CODE
RSMTs
Color Index
Mineral reserve
111
74377
Mineral Resource
222
19175
Mineral resource beloning to inferred
221
167716
Mineral resource beloning to Probable
221
269697

SIRUGUDI LIMESTONE MINE

Lessee: M/s. Sivam Mines.



SITE SERVICES
A - OFFICE
B - STORE ROOM
C - FIRST AID ROOM
D - REST SHELTER
E - TOILET

INDEX

- MINE LEASE BOUNDARY
- 7.5m SAFETY BARRIER
- TEMPORARY BENCH MARK
- TOP SOIL
- LIMESTONE
- STRIKE & DIP
- EXISTING PIT
- DUMP
- CONTOUR LINE
- SHRUBS
- MINE ROAD
- APPROACH ROAD
- VILLAGE ROAD
- MID POINT
- DRILLED BOREHOLE
- PROPOSED CORE DRILL
- DRILLED COREHOLE

LESSEE:

M/s. SIVAM MINES,
No. 6/ 209, MAIN ROAD,
SIRUGUDI POST,
NATHAM TALUK,
DINDIGUL DISTRICT.

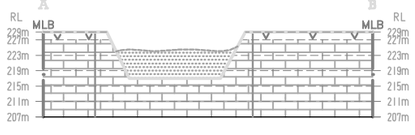
LOCATION OF MINE:

S.F.Nos : 639/ 1, 2, 3, 4 & 7
EXTENT : 1.70.0 Ha
VILLAGE : SIRUGUDI
TALUK : NATHAM
DISTRICT : DINDIGUL
STATE : TAMILNADU.

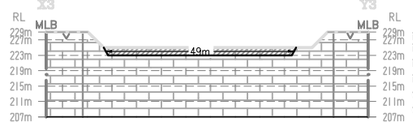
PLATE NO : V-A

DATE OF SURVEY : 20.12.2019

SECTION ALONG A–B



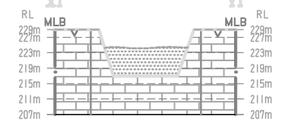
SECTION ALONG X3–Y3



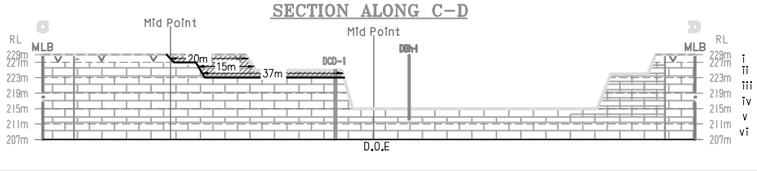
2020-21 Year Proposed to be Excavated

2020-21 Year Proposed to be Planted

SECTION ALONG X1–Y1



SECTION ALONG C–D



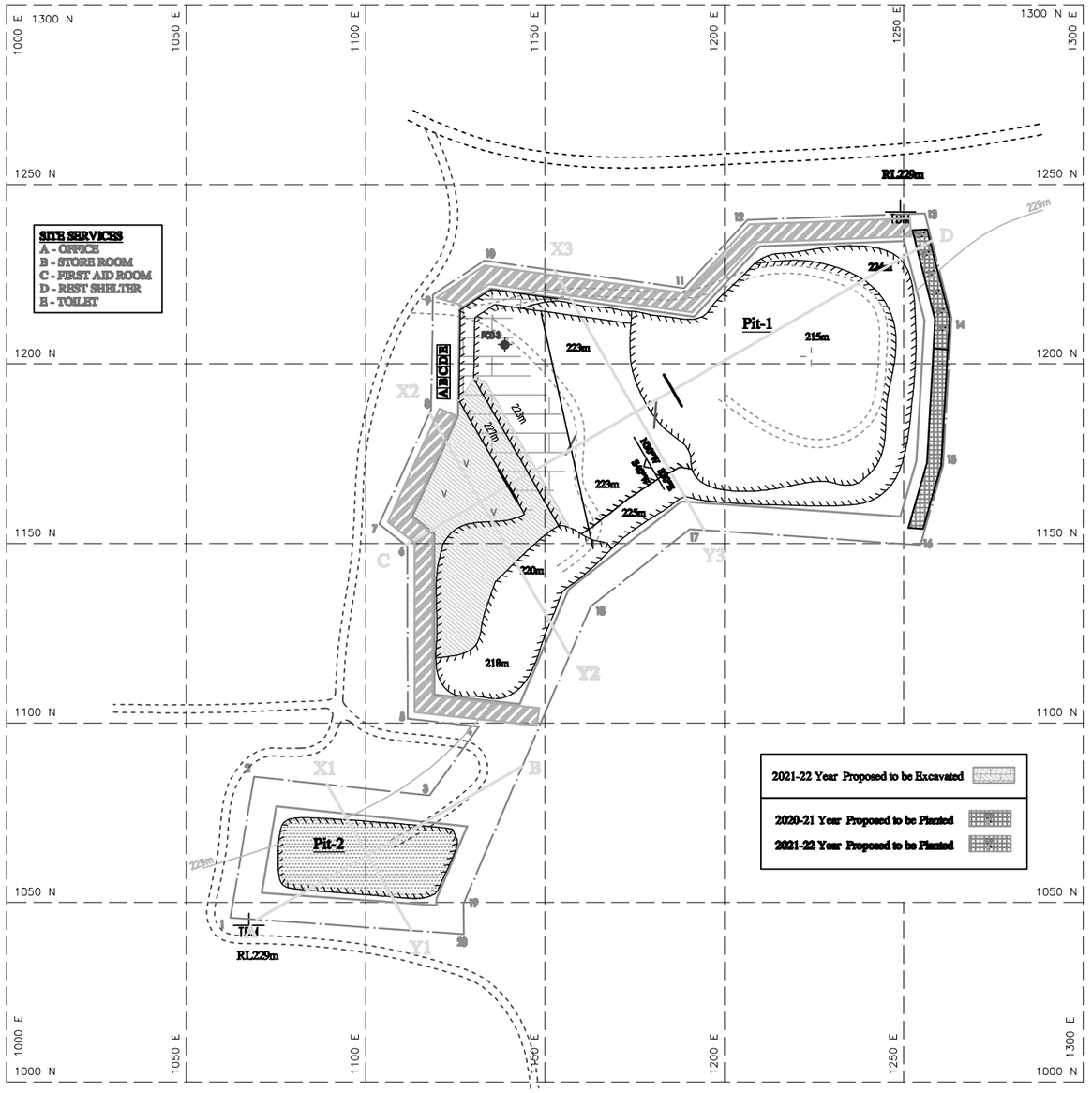
2020-21 YEARWISE DEVELOPMENT- PRODUCTION PLAN & SECTIONS

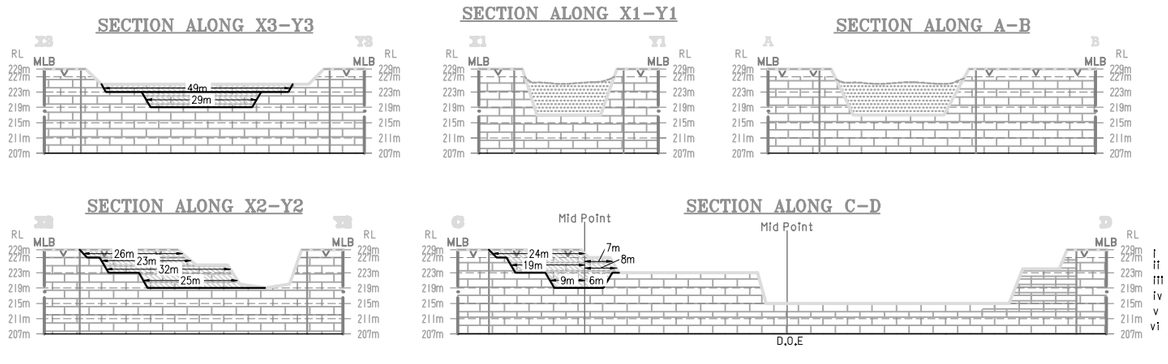
SCALE :- 1 : 1000

PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

A.JAGANNATHAN,BE.,F.C.C.,M.M.E.A.,M.I.E.,
QUALIFIED PERSON





SIRUGUDI LIMESTONE MINE
Lessee: M/s. Sivam Mines.

Earthen Bund
= 260m x 5m(w) x 2m(h)

Existing & Proposed M.R Backfilling (in Pit-2)
= 48mx20mx8.5m(h)

Existing pit dimension (max)
Pit-1 = 160mx50m(avg)x14m(d)
Pit-2 = 48mx20mx12m(d)

INDEX

- MINE LEASE BOUNDARY
- 7.5m SAFETY BARRIER
- TEMPORARY BENCH MARK
- TOP SOIL
- LIMESTONE
- STRIKE & DIP
- EXISTING PIT
- BACK FILLING
- CONTOUR LINE
- SHRUBS
- MINE ROAD
- APPROACH ROAD
- VILLAGE ROAD
- MID POINT
- EARTHEN BUND

LESSEE:

M/s. SIVAM MINES,
No. 6/ 209, MAIN ROAD,
SIRUGUDI POST,
NATHAM TALUK,
DINDIGUL DISTRICT.

LOCATION OF MINE:

S.F.Nos : 639/ 1, 2, 3, 4 & 7
EXTENT : 1.70.0 Ha
VILLAGE : SIRUGUDI
TALUK : NATHAM
DISTRICT : DINDIGUL
STATE : TAMILNADU.

PLATE NO : V-B

DATE OF SURVEY : 20.12.2019

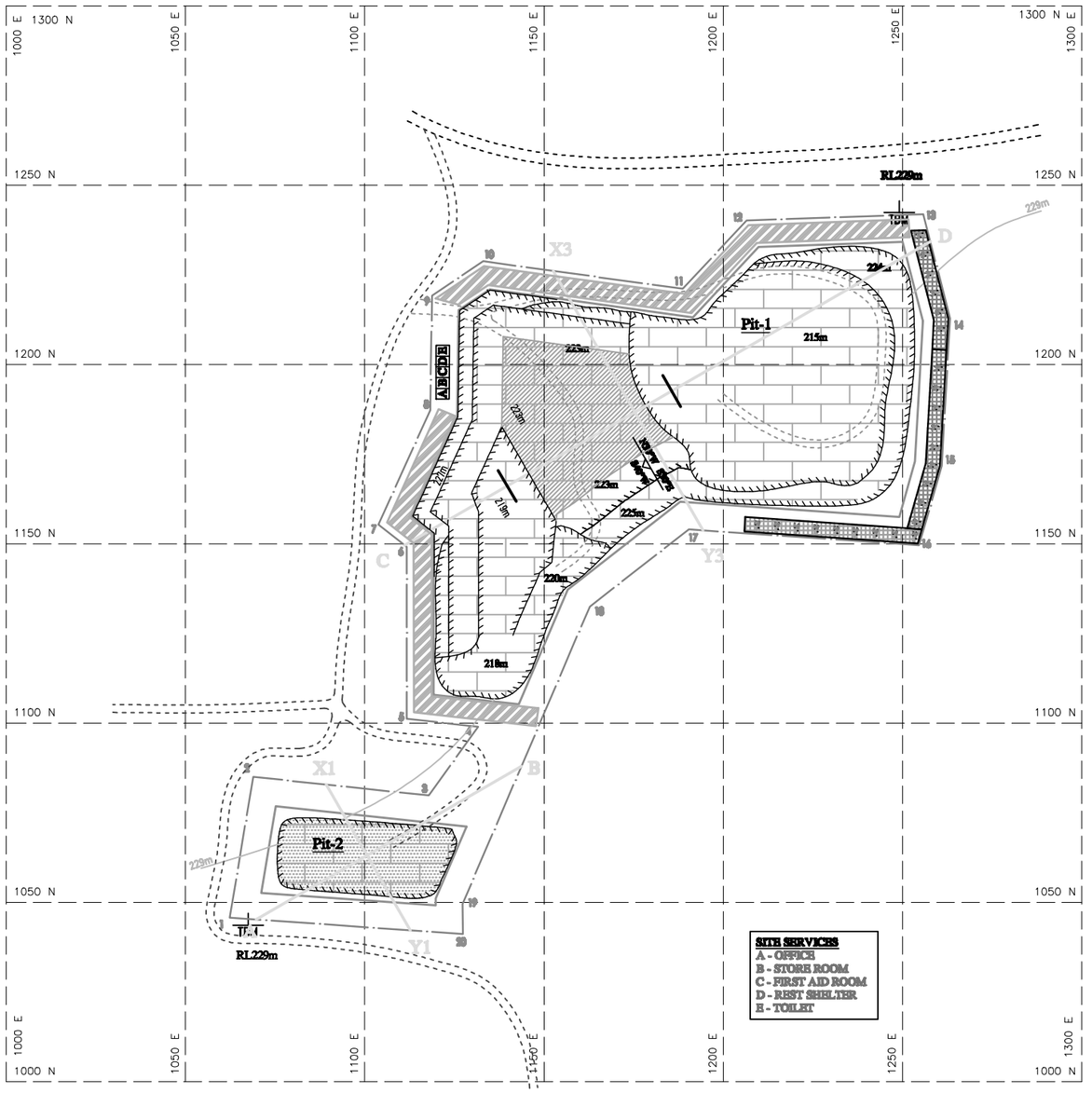
2021-22 YEARWISE DEVELOPMENT-PRODUCTION PLAN & SECTIONS

SCALE :- 1 : 1000

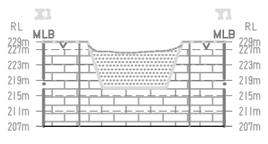
PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

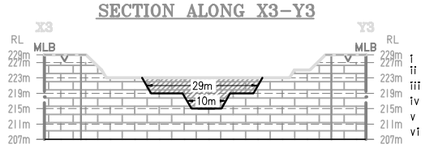
A.JAGANNATHAN,BE.,F.C.C.,M.M.E.A.,M.I.E.,
QUALIFIED PERSON



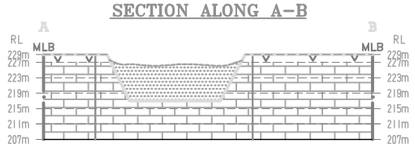
SECTION ALONG X1–Y1



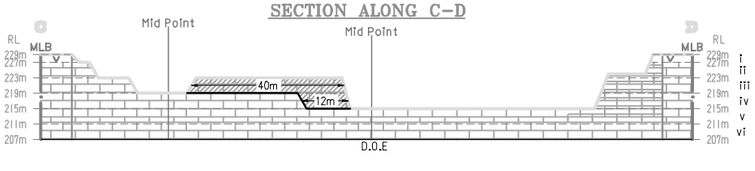
SECTION ALONG X3–Y3



SECTION ALONG A–B



SECTION ALONG C–D



2022-23 Year Proposed to be Excavated

2020-21 Year Proposed to be Planted

2021-22 Year Proposed to be Planted

2022-23 Year Proposed to be Planted

SIRUGUDI LIMESTONE MINE
Lessee: M/s. Sivam Mines.

Earthen Bund
= 260m x 5m(w) x 2m(h)

Existing & Proposed M.R Backfilling (in Pit-2)
= 48mx20mx9.5m(h)

Existing pit dimension (max)
Pit-1 = 160mx50m(avg)x14m(d)
Pit-2 = 48mx20mx12m(d)

INDEX

- MINE LEASE BOUNDARY
- 7.5m SAFETY BARRIER
- TEMPORARY BENCH MARK
- TOP SOIL
- LIMESTONE
- STRIKE & DIP
- EXISTING PIT
- BACK FILLING
- CONTOUR LINE
- SHRUBS
- MINE ROAD
- APPROACH ROAD
- VILLAGE ROAD
- MID POINT
- EARTHEN BUND

LESSEE:

M/s. SIVAM MINES,
No. 6/ 209, MAIN ROAD,
SIRUGUDI POST,
NATHAM TALUK,
DINDIGUL DISTRICT.

LOCATION OF MINE:

S.F.Nos : 639/ 1, 2, 3, 4 & 7
EXTENT : 1.70.0 Ha
VILLAGE : SIRUGUDI
TALUK : NATHAM
DISTRICT : DINDIGUL
STATE : TAMILNADU.

PLATE NO : V-C

DATE OF SURVEY : 20.12.2019

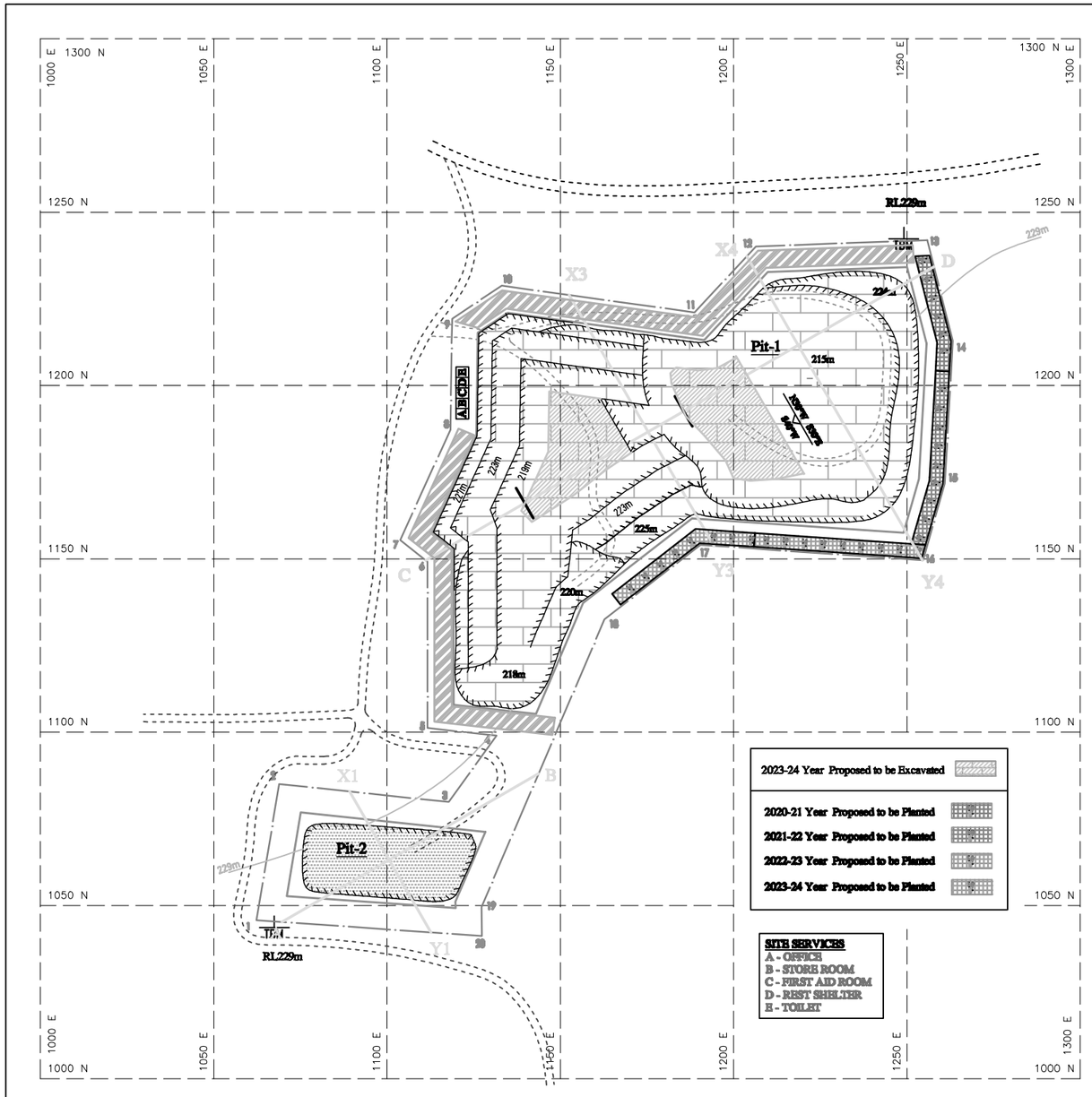
2022-25 YEARWISE DEVELOPMENT-PRODUCTION PLAN & SECTIONS

SCALE :- 1 : 1000

PREPARRD BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

A.JAGANNATHAN,BE.,F.C.C.,M.M.E.A.,M.I.E.,
QUALIFIED PERSON



2023-24 Year Proposed to be Excavated

2020-21 Year Proposed to be Planted

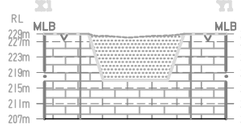
2021-22 Year Proposed to be Planted

2022-23 Year Proposed to be Planted

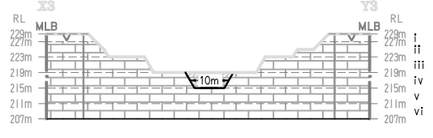
2023-24 Year Proposed to be Planted

SITE SERVICES
A - OFFICE
B - STORE ROOM
C - FIRST AID ROOM
D - REST SHELTER
E - TOILET

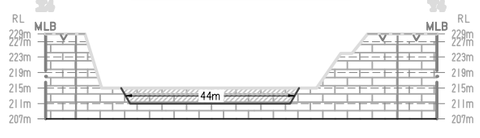
SECTION ALONG X1–Y1



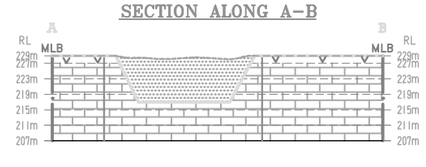
SECTION ALONG X3–Y3



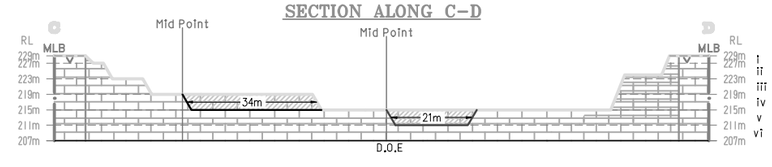
SECTION ALONG X4–Y4



SECTION ALONG A–B



SECTION ALONG C–D



SIRUGUDI LIMESTONE MINE
Lessee: M/s. Sivam Mines.

Earthen Bund
= 260m x 5m(w) x 2m(h)

Existing & Proposed M.R Backfilling (in Pit-2)
= 48mx20mx10.5m(h)

Existing pit dimension (max)
Pit-1 = 160mx50m(avg)x14m(d)
Pit-2 = 48mx20mx12m(d)

INDEX

- MINE LEASE BOUNDARY
- 7.5m SAFETY BARRIER
- TEMPORARY BENCH MARK
- TOP SOIL
- LIMESTONE
- STRIKE & DIP
- EXISTING PIT
- BACK FILLING
- CONTOUR LINE
- SHRUBS
- MINE ROAD
- APPROACH ROAD
- VILLAGE ROAD
- MID POINT
- EARTHEN BUND

LESSEE:

M/s. SIVAM MINES,
No. 6/ 209, MAIN ROAD,
SIRUGUDI POST,
NATHAM TALUK,
DINDIGUL DISTRICT.

LOCATION OF MINE:

S.F.Nos : 639/ 1, 2, 3, 4 & 7
EXTENT : 1.70.0 Ha
VILLAGE : SIRUGUDI
TALUK : NATHAM
DISTRICT : DINDIGUL
STATE : TAMILNADU.

PLATE NO : V-D

DATE OF SURVEY : 20.12.2019

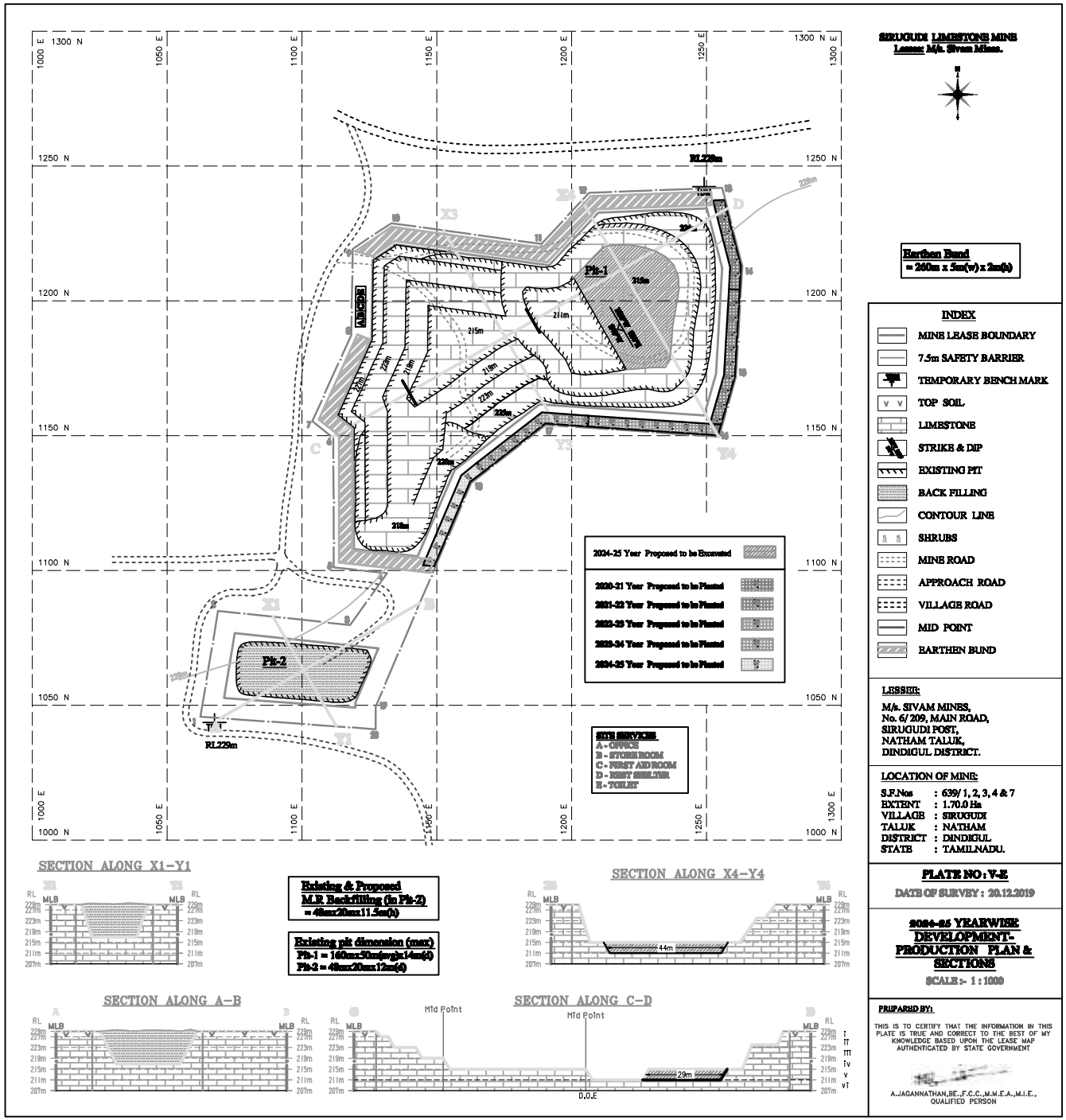
~~2023-24~~ YEARWISE DEVELOPMENT-PRODUCTION PLAN & SECTIONS

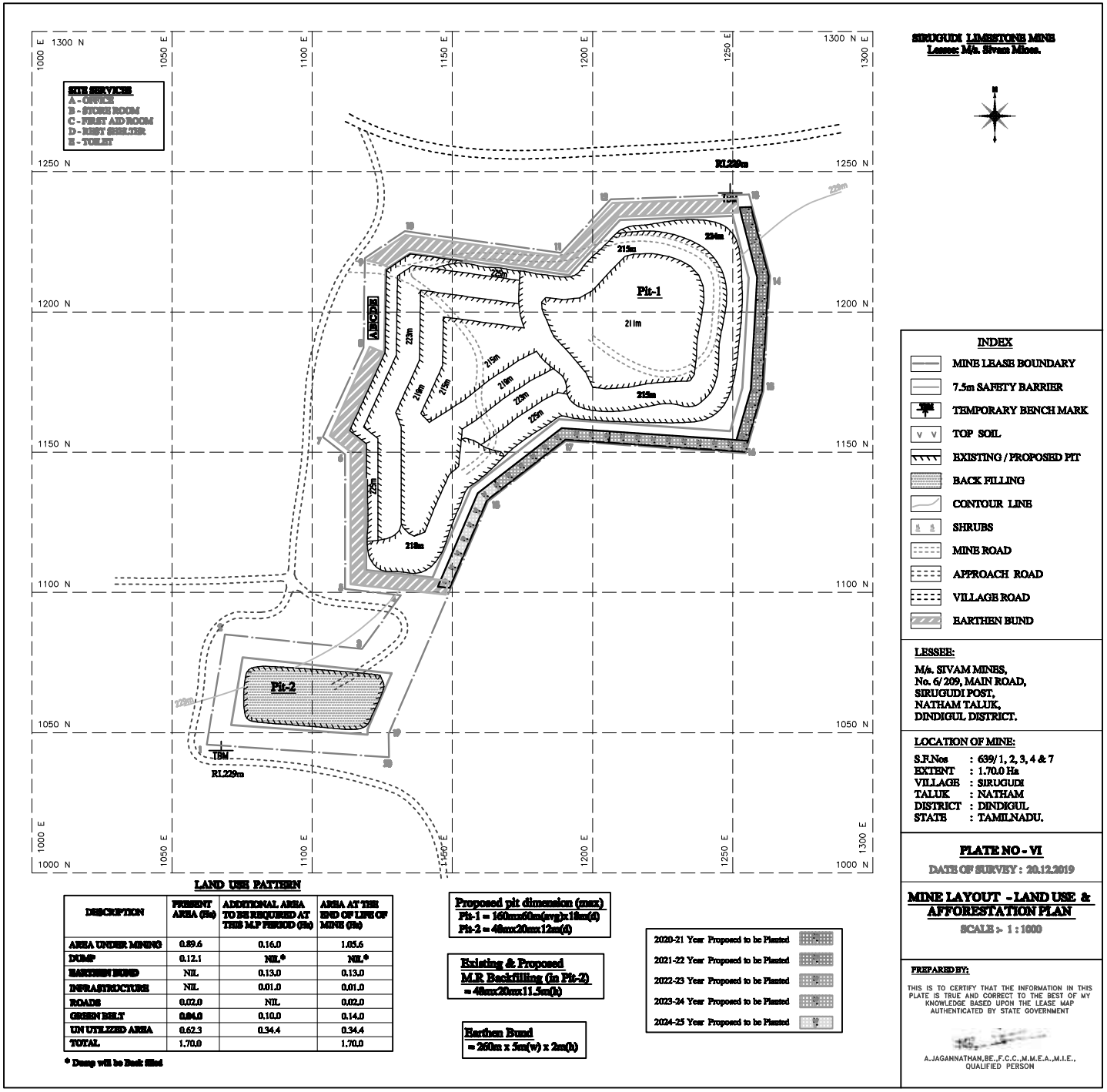
SCALE :- 1 : 1000

PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

A.JAGANNATHAN,BE.,F.C.C.,M.M.E.A.,M.I.E.,
QUALIFIED PERSON


SIRUGUDI LIMESTONE MINE
Lessee: M/s. Sivam Mines.
Earthen Bund
= 260m x 5m(w) x 2m(h)
INDEX
MINE LEASE BOUNDARY
7.5m SAFETY BARRIER
TEMPORARY BENCH MARK
TOP SOIL
LIMESTONE
STRIKE & DIP
EXISTING PIT
BACK FILLING
CONTOUR LINE
SHRUBS
MINE ROAD
APPROACH ROAD
VILLAGE ROAD
MID POINT
EARTHEN BUND
Pit-1
Pit-2
RL229m
2024-25 Year Proposed to be Excavated
2020-21 Year Proposed to be Planted
2021-22 Year Proposed to be Planted
2022-23 Year Proposed to be Planted
2023-24 Year Proposed to be Planted
2024-25 Year Proposed to be Planted
SITE SERVICES
A - OFFICE
B - STORE ROOM
C - FIRST AID ROOM
D - REST SHELTER
E - TOILET
LESSEE:
M/s. SIVAM MINES,
No. 6/ 209, MAIN ROAD,
SIRUGUDI POST,
NATHAM TALUK,
DINDIGUL DISTRICT.
LOCATION OF MINE:
S.F.Nos : 639/ 1, 2, 3, 4 & 7
EXTENT : 1.70.0 Ha
VILLAGE : SIRUGUDI
TALUK : NATHAM
DISTRICT : DINDIGUL
STATE : TAMILNADU.
PLATE NO : V-E
DATE OF SURVEY : 20.12.2019
2024-25 YEARWISE DEVELOPMENT-PRODUCTION PLAN & SECTIONS
SCALE :- 1 : 1000
PREPARED BY:
THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT
A.JAGANNATHAN,BE.,F.C.C.,M.M.E.A.,M.I.E.,
QUALIFIED PERSON
Existing & Proposed M.R Backfilling (in Pit-2)
= 40mx20mx11.5m(h)
Existing pit dimension (max)
Pit-1 = 160mx50m(avg)x14m(d)
Pit-2 = 40mx20mx12m(d)
SECTION ALONG X1-Y1
SECTION ALONG X4-Y4
SECTION ALONG A-B
SECTION ALONG C-D
Mid Point
D.O.E



LAND USE PATTERN

DESCRIPTION	PRESENT AREA (Ha)	ADDITIONAL AREA TO BE REQUIRED AT THIS M.P PERIOD (Ha)	AREA AT THE END OF LIFE OF MINE (Ha)
AREA UNDER MINING	0.89.6	0.16.0	1.05.6
DUMP	0.12.1	NIL*	NIL*
EARTHEN BUND	NIL	0.13.0	0.13.0
INFRASTRUCTURE	NIL	0.01.0	0.01.0
ROADS	0.02.0	NIL	0.02.0
GREEN BELT	0.04.0	0.10.0	0.14.0
UN UTILIZED AREA	0.62.3	0.34.4	0.34.4
TOTAL	1.70.0		1.70.0

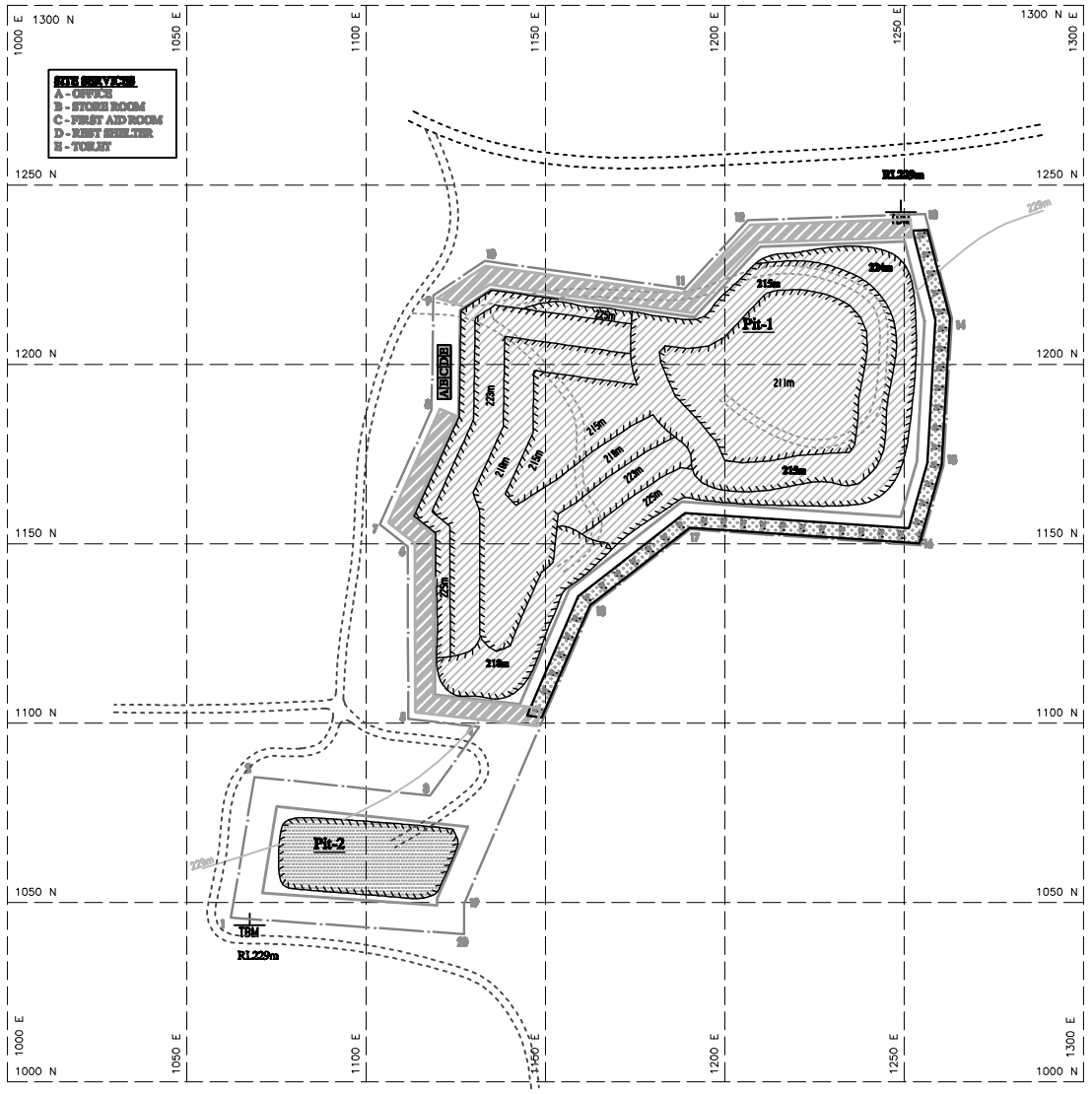
* Dump will be Back filled

Proposed pit dimension (max)
Pit-1 = 160mx60m(avg)x18m(d)
Pit-2 = 40mx20mx12m(d)

Existing & Proposed M.R Backfilling (in Pit-2)
= 40mx20mx11.5m(h)

Earthen Bund
= 260m x 5m(w) x 2m(h)

2020-21 Year Proposed to be Planted
2021-22 Year Proposed to be Planted
2022-23 Year Proposed to be Planted
2023-24 Year Proposed to be Planted
2024-25 Year Proposed to be Planted



SIRUGUDI LIMESTONE MINE
Lessee: M/s. Sivam Mines.

INDEX

- MINE LEASE BOUNDARY
- 7.5m SAFETY BARRIER
- TEMPORARY BENCH MARK
- TOP SOIL
- EXISTING / PROPOSED PIT
- BACK FILLING
- CONTOUR LINE
- SHRUBS
- MINE ROAD
- APPROACH ROAD
- VILLAGE ROAD
- EARTHEN BUND

LESSEE:

M/s. SIVAM MINES,
No. 6/ 209, MAIN ROAD,
SIRUGUDI POST,
NATHAM TALUK,
DINDIGUL DISTRICT.

LOCATION OF MINE:

S.F.Nos : 639/ 1, 2, 3, 4 & 7
EXTENT : 1.70.0 Ha
VILLAGE : SIRUGUDI
TALUK : NATHAM
DISTRICT : DINDIGUL
STATE : TAMILNADU.

PLATE NO - VII

DATE OF SURVEY : 20.12.2019

FINANCIAL AREA ASSURANCE PLAN

SCALE :- 1 : 1000

PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

A.JAGANNATHAN,BE.,F.C.C.,M.M.E.A.,M.I.E.,
QUALIFIED PERSON

AREA CONSIDERED FOR FINANCIAL ASSURANCE

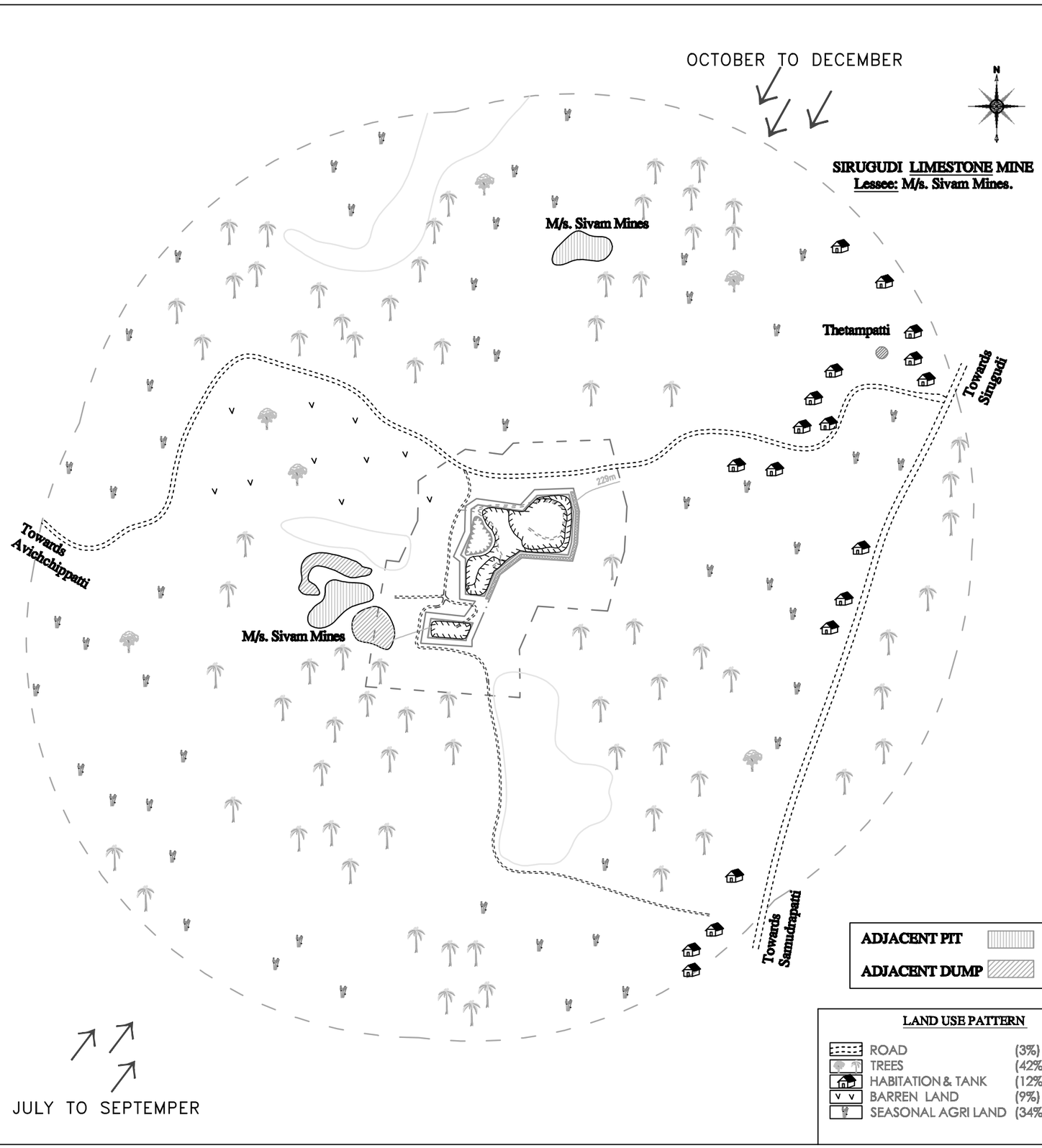
DESCRIPTION	Area Put on use at Start of Plan (Ha)	Additional Area Required at this M.P period (Ha)	Net Area Considered for Calculation (Ha)	Color code
AREA UNDER MINING	0.89.6	0.14.0	1.03.6	
DUMP	0.12.1	NIL*	NIL*	
EARTHEN BUND	NIL	0.13.0	0.13.0	
INFRASTRUCTURE	NIL	0.01.9	0.01.9	
ROADS	0.02.0	NIL	0.02.0	
GREEN BELT	0.04.0	0.10.0	0.14.0	
TOTAL	1.07.7	0.40.0	1.35.6	

* Dump will be Back filled

Proposed pit dimension (max)
Pit-1 = 160mx60m(avg)x18m(d)
Pit-2 = 40mx20mx12m(d)

Existing & Proposed M.R Backfilling (in Pit-2)
= 40mx20mx11.5m(h)

Earthen Bund
= 260m x 5m(w) x 2m(h)



ADJACENT PIT

ADJACENT DUMP

LAND USE PATTERN

ROAD	(3%)
TREES	(42%)
HABITATION & TANK	(12%)
BARREN LAND	(9%)
SEASONAL AGRI LAND	(34%)

INDEX

- (i) LEASE BOUNDARY
- (ii) CONTOUR 1m INTERVAL
- NIL (iii) DRAINAGE PATTERN
- (iv) ROADS & RAILWAYS
  (v) TOURIST HISTORICAL PLACES & PLACE OF WORSHIP
- NIL (vi) FOREST, SANCTUARIES, WASTE LAND AGRICULTURAL LAND
- (vii) VILLAGE BOUNDARY & POPULATION
- (viii) WIND DIRECTION
- (ix) MINE WORKING, WASTE DUMP, AFFORESTATION, PROSES PLANT, SURFACE BUILDING, WORKSHOP & TOWNSHIP
- (x) RECLAIMED AREA, CHECK DAM, BENEFICIATION OPERATION, PUMPING STATION & DISCHARGE WATER
- 60m RADIUS
- 500m RADIUS
- TREES & SEASONAL AGRICULTURE LAND
- MINE ROAD
- VILLAGE ROAD
- SAFETY DISTANCE
- APPROACH ROAD

LESSEE:

M/s. SIVAM MINES,
No. 6/ 209, MAIN ROAD,
SIRUGUDI POST, NATHAM TALUK,
DINDIGUL DISTRICT.

LOCATION OF MINE:

S.F.Nos : 639/ 1, 2, 3, 4 & 7
EXTENT : 1.70.0 Ha
VILLAGE : SIRUGUDI
TALUK : NATHAM
DISTRICT : DINDIGUL
STATE : TAMILNADU.

PLATE NO - VIII

DATE OF SURVEY : 20.12.2019

ENVIRONMENTAL PLAN

Scale:- 1: 5000

PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

A.JAGANNATHAN,BE.,F.C.C.,M.M.E.A.,M.I.E.,
QUALIFIED PERSON

SIRUGUDI LIMESTONE MINE
Lessee: M/s. Sivam Mines.

SITE SERVICES
A - OFFICE
B - STORE ROOM
C - FIRST AID ROOM
D - REST SHELTER
E - TOILET

INDEX

- MINE LEASE BOUNDARY
- 7.5m SAFETY BARRIER
- TEMPORARY BENCH MARK
- TOP SOIL
- LIMESTONE
- STRIKE & DIP
- EXISTING PIT
- BACK FILLING
- CONTOUR LINE
- SHRUBS
- MINE ROAD
- APPROACH ROAD
- VILLAGE ROAD
- MID POINT
- 2020-25 Yr PLANTATION
- EARTHEN BUND

LESSEE:

M/s. SIVAM MINES,
No. 6/ 209, MAIN ROAD,
SIRUGUDI POST,
NATHAM TALUK,
DINDIGUL DISTRICT.

LOCATION OF MINE:

S.F.Nos	: 639/ 1, 2, 3, 4 & 7
EXTENT	: 1.70.0 Ha
VILLAGE	: SIRUGUDI
TALUK	: NATHAM
DISTRICT	: DINDIGUL
STATE	: TAMILNADU.

PLATE NO - IX

DATE OF SURVEY : 20.12.2019

CONCEPTUAL PLAN & SECTIONS

SCALE :- 1 : 1000

PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

A.JAGANNATHAN,BE.,F.C.C.,M.M.E.A.,M.I.E.,
QUALIFIED PERSON

புவியியல் மற்றும் சுரங்கத்துறை

ந.க.எண்.618/2019(கனிமம்)

மாவட்ட ஆட்சியர் அலுவலகம்,
திண்டுக்கல்

நாள். .07.2019

குறிப்பாணை

பொருள் : கனிமங்களும், சுரங்கங்களும் - திண்டுக்கல் மாவட்டம் - நத்தம் வட்டம், சிறுகுடி கிராமம், புல எண்கள். 693/1 முதல் 693/7 மற்றும் சிலவற்றில் 1.70.0 ஹெக்டேர் பரப்பு - சுண்ணாம்புக்கல் குவாரி உரிமம் வழங்கப்பட்டது - சுற்றுச்சூழல் இசைவு சமர்பிக்காமல் குவாரிப்பணி மேற்கொண்டது - கனிமத் தொகை செலுத்தக் கோருவது - தொடர்பாக.

பார்வை :

1. அரசாணை 3(டி) எண்.83, தொழில்(எம்.எம்.ஏ2) துறை நாள்: 09.11.1996
2. அரசாணை 3(டி) எண்.173, தொழில்(எம்.எம்.ஏ2) துறை நாள்: 05.11.2014
3. அரசணை எண். (MS) எண் 79 தொழில் (MMC.I) துறை நாள் 06.04.2015.
4. மாண்பமை உச்சநீதிமன்ற தீர்ப்புரை நாள். 02.08.2017 வழக்கு எண். W.P.(Civil) No.114 of 2014.
5. சுற்றுச்சூழல் அமைச்சகம், இந்திய அரசின் வனம் மற்றும் பருவ நிலைமாற்றம், அறிவிக்கை S.O.141(E) நாள்.15.01.2016.
6. இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை, சென்னை அவர்களின் கடித ந.க.எண்.1375/LC/2016, நாள்.20.08.2018.

*****

திண்டுக்கல் மாவட்டம், நத்தம் வட்டம், சிறுகுடி கிராமம், புல எண்கள். 693/1 முதல் 693/7 மற்றும் சிலவற்றில் 1.70.0 ஹெக்டேர் பரப்பில் பார்வை 1-ல் கண்டுள்ள அரசாணையின்படி 28.02.1996 முதல் 27.02.2016 வரை 20 வருடங்களுக்கு குத்தகை உரிமம் வழங்கப்பட்டு Deemed Extention முறையில் குத்தகை காலம் நடைமுறையில் உள்ளது.

இந்நிலையில் உச்சநீதிமன்ற வழிகாட்டுதலின் படி குத்தகை உரிமம் பெற்ற குவாரிதாரர்கள் மத்திய/மாநில சுற்றுச்சூழல் பாதுகாப்பு குழுமத்தின் இசைவினைப் பெறவும் பார்வை 2ல் கண்ட அரசாணை அமலுக்கு வந்த நாளிலிருந்து 90 தினங்களுக்குள் (அதாவது 04.07.2015 க்குள்) வரைவு சுரங்கத்திட்டத்தினை, உதவி இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை அவர்களிடம் சமர்ப்பிக்குமாறு ஆணை பிறப்பிக்கப்பட்டுள்ளது.

எனவே, 1959ம் வருட தமிழ்நாடு சிறுகனிம விதி 42 ன்படி மத்திய/மாநில சுற்றுச்சூழல் பாதுகாப்பு குழுமத்தின் இசைவினைப் பெற்று சமர்ப்பிக்குமாறு பார்வை 3ல் காணும் குறிப்பாணையில் கேட்டுக்கொள்ளப்பட்டது.

பார்வை 4ல் காணும் உச்சநீதிமன்ற தீர்ப்பில் சுற்றுச்சூழல் இசைவு பெறாமல் குவாரிப்பணி மேற்கொண்ட குத்தகைதாரர்களிடமிருந்து 100% கனிமத் தொகையினை வசூல் செய்ய உத்தரவிடப்பட்டுள்ளது. மேலும் பார்வை 5ல் காணும் 15.01.2016 நாளிட்ட அறிவிக்கையில் அனைத்து வகை கனிமக் குவாரிகள் / சுரங்கங்கள் சுற்றுச்சூழல் இசைவினை பெற்று குவாரிப்பணி மேற்கொள்ளப்பட வேண்டும் என தெரிவிக்கப்பட்டுள்ளது.

அதன்படி தாங்கள் 15.01.2016 முதல் 10.01.2017 முடிய சுற்றுச்சூழல் இசைவு இன்றி குவாரிப்பணி மேற்கொண்டு குவாரியிலிருந்து எடுத்துச் சென்ற கனிமத்திற்கு உண்டான கனிமத்தொகை பின்வருமாறு கணக்கிடப்பட்டுள்ளது.

வ. எண்	கால வரையறை	எடுத்துச் செல்லப்பட்ட கனிமத்தின் அளவு	செலுத்த வேண்டிய கனிமத் தொகை
1.	15.01.2016 முதல் 10.01.2017	3000	1387500
மொத்தம்		3000	1387500

எனவே மேற்படி கனிமத் தொகையான ரூ.13,87,500/- (ரூபாய் பதிமூன்று லட்சத்தி எண்பத்து ஏழாயிரத்து ஐநூறு மட்டும்) இக்குறிப்பாணை கிடைக்கப்பெற்ற 15 தினங்களுக்குள் கீழ்க்கண்ட தலைப்பில் செலுத்தி அசல் சலாணை இவ்வலுவகத்தில் சமர்பிக்குமாறு கேட்டுக்கொள்ளப்படுகிறது.

மாவட்ட ஆட்சியருக்காக,
உதவி இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை,
திண்டுக்கல்

பெறுநர்:
தி/ள்.சிவம் மைன்ஸ்,
சிறுகுடி கிராமம்,
நத்தம் வட்டம்,
திண்டுக்கல் மாவட்டம்.

06/8/19

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2024-25/001	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/001
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 1 – Near Lease 2, 10°14'31.42"N 78°17'43.09"E**		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
06-07.10.2023	7:00-7:00	35.3	17.5	4.1	12.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07-08.10.2023	7:15-7:15	35.9	18.1	4.4	12.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13-14.10.2023	7:00-7:00	35.1	17.1	4.2	42.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14-15.10.2023	7:15-7:15	35.4	17.9	4.3	42.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20-21.10.2023	7:00-7:00	35.6	18.1	4.1	13.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21-22.10.2023	7:15-7:15	36.1	18.5	4.4	13.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27-28.10.2023	7:00-7:00	36.2	17.6	4.2	13.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28-29.10.2023	7:15-7:15	36.8	18.2	4.5	13.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03-04.11.2023	7:00-7:00	36.2	17.2	4.0	12.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04-05.11.2023	7:15-7:15	36.9	17.8	4.2	12.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10-11.11.2023	7:00-7:00	36.8	17.3	4.3	12.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11-12.11.2023	7:15-7:15	37.2	17.9	4.5	13.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17-18.11.2023	7:00-7:00	37.3	18.3	4.2	13.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18-19.11.2023	7:15-7:15	37.4	19.1	4.5	13.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24-25.11.2023	7:00-7:00	37.4	18.6	4.3	13.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25-26.11.2023	7:15-7:15	37.9	19.2	4.4	13.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
01-02.12.2023	7:00-7:00	35.3	18.4	4.1	13.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02-03.12.2023	7:15-7:15	36.1	18.9	4.2	13.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
08-09.12.2023	7:00-7:00	35.4	19.1	4.3	14.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09-10.12.2023	7:15-7:15	36.2	19.7	4.4	14.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
15-16.12.2023	7:00-7:00	35.3	19.3	4.2	14.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16-17.12.2023	7:15-7:15	36.9	19.8	4.5	14.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
22-23.12.2023	7:00-7:00	36.1	19.2	4.3	12.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23-24.12.2023	7:15-7:15	36.8	19.9	4.4	12.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<100	<80	<80	<100	<400	<4

Note: BDL: Below Detection Limit ;**DL**: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2024-25/001	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/001
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 1 – Near Lease 2, 10°14'31.42"N 78°17'43.09"E**		

Date	Period. hrs	As (ng/m^3)	C6H6 (µg/m^3)	BaP (ng/m^3)	Pb (µg/m^3)	Ni (ng/m^3)
06-07.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07-08.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13-14.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14-15.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20-21.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21-22.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27-28.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28-29.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03-04.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04-05.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10-11.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11-12.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17-18.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18-19.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24-25.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25-26.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
01-02.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02-03.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
08-09.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09-10.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
15-16.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16-17.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
22-23.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23-24.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	<100	<60	<80	<80

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2024-25/002	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/002
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 2 – Near Lease 1, 10°14'32.59"N 78°17'46.66"E**		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
06-07.10.2023	7:00-7:00	35.3	17.5	4.1	12.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07-08.10.2023	7:15-7:15	35.9	18.1	4.4	12.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13-14.10.2023	7:00-7:00	35.1	17.1	4.2	42.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14-15.10.2023	7:15-7:15	35.4	17.9	4.3	42.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20-21.10.2023	7:00-7:00	35.6	18.1	4.1	13.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21-22.10.2023	7:15-7:15	36.1	18.5	4.4	13.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27-28.10.2023	7:00-7:00	36.2	17.6	4.2	13.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28-29.10.2023	7:15-7:15	36.8	18.2	4.5	13.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03-04.11.2023	7:00-7:00	36.2	17.2	4.0	12.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04-05.11.2023	7:15-7:15	36.9	17.8	4.2	12.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10-11.11.2023	7:00-7:00	36.8	17.3	4.3	12.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11-12.11.2023	7:15-7:15	37.2	17.9	4.5	13.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17-18.11.2023	7:00-7:00	37.3	18.3	4.2	13.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18-19.11.2023	7:15-7:15	37.4	19.1	4.5	13.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24-25.11.2023	7:00-7:00	37.4	18.6	4.3	13.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25-26.11.2023	7:15-7:15	37.9	19.2	4.4	13.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
01-02.12.2023	7:00-7:00	35.3	18.4	4.1	13.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02-03.12.2023	7:15-7:15	36.1	18.9	4.2	13.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
08-09.12.2023	7:00-7:00	35.4	19.1	4.3	14.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09-10.12.2023	7:15-7:15	36.2	19.7	4.4	14.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
15-16.12.2023	7:00-7:00	35.3	19.3	4.2	14.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16-17.12.2023	7:15-7:15	36.9	19.8	4.5	14.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
22-23.12.2023	7:00-7:00	36.1	19.2	4.3	12.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23-24.12.2023	7:15-7:15	36.8	19.9	4.4	12.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<100	<80	<80	<100	<400	<4

Note: BDL: Below Detection Limit ;**DL**: Detection Limit
Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory
Name : Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2024-25/002	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/002
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 2 – Near Lease 1, 10°14'32.59"N 78°17'46.66"E**		

Date	Period. hrs	As (ng/m³)	C6H6 (µg/m³)	BaP (ng/m³)	Pb (µg/m³)	Ni (ng/m³)
06-07.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07-08.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13-14.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14-15.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20-21.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21-22.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27-28.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28-29.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03-04.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04-05.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10-11.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11-12.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17-18.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18-19.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24-25.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25-26.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
01-02.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02-03.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
08-09.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09-10.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
15-16.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16-17.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
22-23.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23-24.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	<100	<60	<80	<80

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2024-25/003	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/003
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 3 – Near Lease 2, 10°14'29.65"N 78°17'43.25"E**		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
06-07.10.2023	7:00-7:00	35.9	17.1	4.3	12.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07-08.10.2023	7:15-7:15	36.4	17.6	4.5	12.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13-14.10.2023	7:00-7:00	36.3	17.4	4.4	12.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14-15.10.2023	7:15-7:15	36.9	17.9	4.5	13.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20-21.10.2023	7:00-7:00	36.4	18.4	4.3	13.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21-22.10.2023	7:15-7:15	36.7	18.9	4.4	13.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27-28.10.2023	7:00-7:00	37.3	18.1	4.2	12.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28-29.10.2023	7:15-7:15	37.9	18.6	4.3	12.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03-04.11.2023	7:00-7:00	37.2	18.3	4.1	13.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04-05.11.2023	7:15-7:15	37.8	18.9	4.2	13.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10-11.11.2023	7:00-7:00	37.4	19.1	4.2	13.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11-12.11.2023	7:15-7:15	38.0	19.5	4.4	13.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17-18.11.2023	7:00-7:00	35.3	19.3	4.3	14.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18-19.11.2023	7:15-7:15	35.9	19.9	4.5	14.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24-25.11.2023	7:00-7:00	35.4	19.4	4.4	14.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25-26.11.2023	7:15-7:15	36.1	19.8	4.5	14.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
01-02.12.2023	7:00-7:00	36.3	17.3	4.2	14.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02-03.12.2023	7:15-7:15	36.9	17.9	4.5	13.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
08-09.12.2023	7:00-7:00	36.7	17.4	4.3	13.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09-10.12.2023	7:15-7:15	37.1	17.8	4.4	12.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
15-16.12.2023	7:00-7:00	37.3	17.6	4.2	12.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16-17.12.2023	7:15-7:15	37.9	18.2	4.4	12.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
22-23.12.2023	7:00-7:00	37.4	18.3	4.2	12.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23-24.12.2023	7:15-7:15	37.8	18.4	4.3	13.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<100	<80	<80	<100	<400	<4

Note: BDL: Below Detection Limit ;**DL**: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2024-25/003	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/003
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 3 – Near Lease 2, 10°14'29.65"N 78°17'43.25"E**		

Date	Period. hrs	As (ng/m³)	C6H6 (µg/m³)	BaP (ng/m³)	Pb (µg/m³)	Ni (ng/m³)
06-07.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07-08.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13-14.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14-15.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20-21.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21-22.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27-28.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28-29.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03-04.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04-05.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10-11.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11-12.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17-18.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18-19.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24-25.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25-26.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
01-02.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02-03.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
08-09.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09-10.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
15-16.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16-17.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
22-23.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23-24.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	<100	<60	<80	<80

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2024-25/004	**Report Date**	0
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/004
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 4 – Near Lease 4, 10°14'48.60"N 78°17'48.60"E**		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
06-07.10.2023	7:00-7:00	36.1	18.1	4.1	12.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07-08.10.2023	7:15-7:15	37.3	18.5	4.4	12.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13-14.10.2023	7:00-7:00	36.4	18.4	4.2	42.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14-15.10.2023	7:15-7:15	36.9	18.9	4.3	42.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20-21.10.2023	7:00-7:00	37.1	19.1	4.1	13.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21-22.10.2023	7:15-7:15	37.8	19.4	4.4	13.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27-28.10.2023	7:00-7:00	35.2	19.3	4.2	13.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28-29.10.2023	7:15-7:15	35.9	19.9	4.5	13.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03-04.11.2023	7:00-7:00	35.3	18.4	4.0	12.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04-05.11.2023	7:15-7:15	35.8	18.7	4.2	12.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10-11.11.2023	7:00-7:00	36.2	19.1	4.3	12.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11-12.11.2023	7:15-7:15	36.7	19.2	4.5	13.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17-18.11.2023	7:00-7:00	36.4	19.7	4.2	13.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18-19.11.2023	7:15-7:15	37.3	19.5	4.5	13.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24-25.11.2023	7:00-7:00	37.1	20.0	4.3	13.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25-26.11.2023	7:15-7:15	37.9	18.3	4.4	13.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
01-02.12.2023	7:00-7:00	36.1	18.7	4.1	13.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02-03.12.2023	7:15-7:15	36.4	17.4	4.2	13.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
08-09.12.2023	7:00-7:00	36.7	17.9	4.3	14.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09-10.12.2023	7:15-7:15	37.3	17.3	4.4	14.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
15-16.12.2023	7:00-7:00	35.3	18.1	4.2	14.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16-17.12.2023	7:15-7:15	35.8	18.4	4.5	14.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
22-23.12.2023	7:00-7:00	35.3	18.9	4.3	12.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23-24.12.2023	7:15-7:15	35.6	19.7	4.4	12.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<100	<80	<80	<100	<400	<4

Note: BDL: Below Detection Limit ;**DL**: Detection Limit
Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2024-25/004	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/004
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 4 – Near Lease 4, 10°14'48.60"N 78°17'48.60"E**		

Date	Period. hrs	As (ng/m³)	C6H6 (µg/m³)	BaP (ng/m³)	Pb (µg/m³)	Ni (ng/m³)
06-07.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07-08.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13-14.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14-15.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20-21.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21-22.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27-28.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28-29.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03-04.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04-05.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10-11.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11-12.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17-18.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18-19.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24-25.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25-26.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
01-02.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02-03.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
08-09.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09-10.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
15-16.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16-17.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
22-23.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23-24.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	<100	<60	<80	<80

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2024-25/005	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/005
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 5 – Near Lease 4, 10°14'46.32"N 78°17'49.98"E**		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
06-07.10.2023	7:00-7:00	35.4	18.4	4.4	14.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07-08.10.2023	7:15-7:15	36.3	18.7	4.5	14.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13-14.10.2023	7:00-7:00	36.1	19.3	4.2	13.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14-15.10.2023	7:15-7:15	36.4	19.7	4.3	13.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20-21.10.2023	7:00-7:00	35.7	19.6	4.4	13.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21-22.10.2023	7:15-7:15	36.3	20.0	4.5	13.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27-28.10.2023	7:00-7:00	35.4	18.4	4.3	14.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28-29.10.2023	7:15-7:15	35.9	18.7	4.5	14.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03-04.11.2023	7:00-7:00	35.3	17.4	4.4	14.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04-05.11.2023	7:15-7:15	35.8	17.9	4.5	14.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10-11.11.2023	7:00-7:00	36.4	17.5	4.3	13.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11-12.11.2023	7:15-7:15	36.9	18.1	4.4	13.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17-18.11.2023	7:00-7:00	37.1	18.3	4.0	12.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18-19.11.2023	7:15-7:15	37.4	18.7	4.1	12.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24-25.11.2023	7:00-7:00	36.1	17.7	4.2	12.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25-26.11.2023	7:15-7:15	36.7	17.9	4.5	12.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
01-02.12.2023	7:00-7:00	35.3	17.3	4.1	13.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02-03.12.2023	7:15-7:15	35.9	17.6	4.4	13.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
08-09.12.2023	7:00-7:00	36.1	17.7	4.3	12.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09-10.12.2023	7:15-7:15	36.4	18.4	4.5	12.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
15-16.12.2023	7:00-7:00	.35.3	18.3	4.2	14.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16-17.12.2023	7:15-7:15	36.7	18.9	4.3	14.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
22-23.12.2023	7:00-7:00	36.6	19.1	4..4	13.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23-24.12.2023	7:15-7:15	36.9	19.4	4.5	13.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<100	<80	<80	<100	<400	<4

Note: BDL: Below Detection Limit ;**DL**: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2024-25/005	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/005
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 5 – Near Lease 4, 10°14'46.32"N 78°17'49.98"E**		

Date	Period. hrs	As (ng/m³)	C6H6 (µg/m³)	BaP (ng/m³)	Pb (µg/m³)	Ni (ng/m³)
06-07.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07-08.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13-14.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14-15.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20-21.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21-22.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27-28.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28-29.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03-04.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04-05.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10-11.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11-12.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17-18.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18-19.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24-25.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25-26.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
01-02.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02-03.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
08-09.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09-10.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
15-16.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16-17.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
22-23.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23-24.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	<100	<60	<80	<80

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2024-25/006	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/006
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 6 – Near Lease 5, 10°14'57.78"N 78°17'34.06"E**		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
06-07.10.2023	7:00-7:00	39.4	20.1	5.1	16.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07-08.10.2023	7:15-7:15	40.7	21.3	5.4	17.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13-14.10.2023	7:00-7:00	41.7	20.4	5.2	16.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14-15.10.2023	7:15-7:15	42.4	21.7	5.5	18.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20-21.10.2023	7:00-7:00	42.7	21.3	5.4	18.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21-22.10.2023	7:15-7:15	43.0	22.4	5.6	19.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27-28.10.2023	7:00-7:00	41.7	21.4	5.5	19.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28-29.10.2023	7:15-7:15	42.3	22.	5.9	19.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03-04.11.2023	7:00-7:00	39.1	22.1	5.4	16.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04-05.11.2023	7:15-7:15	39.9	23.7	5.6	17.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10-11.11.2023	7:00-7:00	39.2	20.4	5.3	16.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11-12.11.2023	7:15-7:15	40.2	22.3	5.8	17.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17-18.11.2023	7:00-7:00	41.3	21.7	5.7	17.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18-19.11.2023	7:15-7:15	41.8	22.4	6.0	18.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24-25.11.2023	7:00-7:00	40.4	22.3	5.4	18.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25-26.11.2023	7:15-7:15	42.9	23.7	5.9	19.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
01-02.12.2023	7:00-7:00	41.3	21.4	5.2	16.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02-03.12.2023	7:15-7:15	42.3	22.7	5.3	17.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
08-09.12.2023	7:00-7:00	42.1	22.1	5.4	17.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09-10.12.2023	7:15-7:15	42.9	23.9	5.6	18.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
15-16.12.2023	7:00-7:00	39.4	21.4	5.7	17.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16-17.12.2023	7:15-7:15	40.3	22.3	5.9	19.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
22-23.12.2023	7:00-7:00	39.7	20.4	5.1	17.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23-24.12.2023	7:15-7:15	40.9	22.7	5.9	19.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<100	<80	<80	<100	<400	<4

Note: BDL: Below Detection Limit ;**DL**: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2024-25/006	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/006
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 6 – Near Lease 5, 10°14'57.78"N 78°17'34.06"E**		

Date	Period. hrs	As (ng/m³)	C6H6 (µg/m³)	BaP (ng/m³)	Pb (µg/m³)	Ni (ng/m³)
06-07.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07-08.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13-14.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14-15.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20-21.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21-22.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27-28.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28-29.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03-04.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04-05.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10-11.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11-12.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17-18.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18-19.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24-25.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25-26.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
01-02.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02-03.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
08-09.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09-10.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
15-16.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16-17.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
22-23.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23-24.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	<100	<60	<80	<80

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2024-25/007	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/007
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 7 – Sirugudi, 10°15'46.94"N 78°18'29.24"E**		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
06-07.10.2023	7:00-7:00	39.3	21.2	5.3	16.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07-08.10.2023	7:15-7:15	40.2	22.7	5.7	17.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13-14.10.2023	7:00-7:00	39.7	21.4	5.2	16.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14-15.10.2023	7:15-7:15	40.9	22.8	5.6	18.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20-21.10.2023	7:00-7:00	41.2	20.3	5.4	17.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21-22.10.2023	7:15-7:15	42.7	21.7	5.7	19.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27-28.10.2023	7:00-7:00	41.3	20.4	5.4	17.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28-29.10.2023	7:15-7:15	42.9	22.8	5.9	19.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03-04.11.2023	7:00-7:00	39.1	21.7	5.2	17.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04-05.11.2023	7:15-7:15	40.4	23.2	5.4	18.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10-11.11.2023	7:00-7:00	40.1	21.4	5.3	17.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11-12.11.2023	7:15-7:15	41.7	23.8	5.7	18.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17-18.11.2023	7:00-7:00	41.2	20.4	5.4	17.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18-19.11.2023	7:15-7:15	42.9	22.6	5.6	18.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24-25.11.2023	7:00-7:00	40.1	21.7	5.5	17.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25-26.11.2023	7:15-7:15	42.7	23.7	5.7	18.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
01-02.12.2023	7:00-7:00	39.3	20.8	5.3	19.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02-03.12.2023	7:15-7:15	40.4	21.7	5.7	19.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
08-09.12.2023	7:00-7:00	39.2	21.4	5.4	18.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09-10.12.2023	7:15-7:15	41.7	22.7	5.7	19.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
15-16.12.2023	7:00-7:00	40.1	21.4	5.3	17.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16-17.12.2023	7:15-7:15	42.3	22.3	5.8	18.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
22-23.12.2023	7:00-7:00	42.1	21.4	5.2	18.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23-24.12.2023	7:15-7:15	40.9	22.9	5.9	19.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<100	<80	<80	<100	<400	<4

Note: BDL: Below Detection Limit ;**DL**: Detection Limit
Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2024-25/007	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/007
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 7 – Sirugudi, 10°15'46.94"N 78°18'29.24"E**		

Date	Period. hrs	As (ng/m³)	C6H6 (µg/m³)	BaP (ng/m³)	Pb (µg/m³)	Ni (ng/m³)
06-07.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07-08.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13-14.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14-15.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20-21.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21-22.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27-28.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28-29.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03-04.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04-05.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10-11.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11-12.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17-18.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18-19.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24-25.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25-26.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
01-02.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02-03.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
08-09.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09-10.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
15-16.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16-17.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
22-23.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23-24.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	<100	<60	<80	<80

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2024-25/008	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/008
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 8 – Samudrapatti, 10°13'19.98"N 78°18'34.47"E**		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
06-07.10.2023	7:00-7:00	39.7	22.3	5.1	16.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07-08.10.2023	7:15-7:15	40.9	23.4	5.4	17.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13-14.10.2023	7:00-7:00	41.3	20.9	5.2	16.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14-15.10.2023	7:15-7:15	42.7	22.3	5.7	17.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20-21.10.2023	7:00-7:00	40.1	21.4	5.3	17.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21-22.10.2023	7:15-7:15	42.7	23.7	5.7	18.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27-28.10.2023	7:00-7:00	40.1	20.7	5.5	18.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28-29.10.2023	7:15-7:15	42.1	21.9	5.9	19.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03-04.11.2023	7:00-7:00	40.1	22.4	5.2	18.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04-05.11.2023	7:15-7:15	42.1	23.7	5.6	19.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10-11.11.2023	7:00-7:00	41.3	21.4	5.4	16.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11-12.11.2023	7:15-7:15	42.4	22.9	5.9	17.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17-18.11.2023	7:00-7:00	41.3	20.9	5.3	19.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18-19.11.2023	7:15-7:15	42.4	21.4	5.7	19.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24-25.11.2023	7:00-7:00	40.4	21.7	5.1	17.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25-26.11.2023	7:15-7:15	41.3	22.4	5.5	18.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
01-02.12.2023	7:00-7:00	40.3	20.7	5.2	16.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02-03.12.2023	7:15-7:15	41.4	21.7	5.6	17.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
08-09.12.2023	7:00-7:00	39.7	20.8	5.1	17.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09-10.12.2023	7:15-7:15	40.5	21.8	5.4	18.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
15-16.12.2023	7:00-7:00	41.3	22.7	5.2	17.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16-17.12.2023	7:15-7:15	42.7	24.0	5.6	18.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
22-23.12.2023	7:00-7:00	41.7	22.3	5.3	17.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23-24.12.2023	7:15-7:15	42.9	23.8	5.9	18.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<100	<80	<80	<100	<400	<4

Note: BDL: Below Detection Limit ;**DL**: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2024-25/009	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/009
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 9 – V.Pudur, 10°13'30.08"N 78°19'59.39"E**		

Date	Period. hrs	As (ng/m³)	C6H6 (µg/m³)	BaP (ng/m³)	Pb (µg/m³)	Ni (ng/m³)
06-07.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07-08.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13-14.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14-15.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20-21.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21-22.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27-28.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28-29.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03-04.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04-05.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10-11.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11-12.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17-18.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18-19.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24-25.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25-26.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
01-02.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02-03.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
08-09.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09-10.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
15-16.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16-17.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
22-23.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23-24.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	<100	<60	<80	<80

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2024-25/010	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/010
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 10 – Uralipatti, 10°13'2.82"N 78°15'1.28"E**		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
06-07.10.2023	7:00-7:00	40.7	22.8	5.3	16.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07-08.10.2023	7:15-7:15	41.7	24.0	5.4	17.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13-14.10.2023	7:00-7:00	39.3	23.2	5.5	16.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14-15.10.2023	7:15-7:15	40.4	23.9	5.7	17.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20-21.10.2023	7:00-7:00	39.1	20.4	5.6	17.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21-22.10.2023	7:15-7:15	41.7	22.7	5.8	18.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27-28.10.2023	7:00-7:00	40.2	21.3	.5.4	17.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28-29.10.2023	7:15-7:15	41.3	22.4	5.6	18.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03-04.11.2023	7:00-7:00	39.3	21.3	5.3	18.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04-05.11.2023	7:15-7:15	40.4	22.9	5.7	19.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10-11.11.2023	7:00-7:00	39.7	21.9	5.4	18.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11-12.11.2023	7:15-7:15	41.3	23.4	5.8	19.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17-18.11.2023	7:00-7:00	40.4	22.1	5.2	17.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18-19.11.2023	7:15-7:15	42.3	23.9	5.9	18.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24-25.11.2023	7:00-7:00	41.3	22.4	5.1	16.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25-26.11.2023	7:15-7:15	42.7	23.4	5.5	19.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
01-02.12.2023	7:00-7:00	40.3	20.4	5.1	17.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02-03.12.2023	7:15-7:15	42.7	21.8	5.5	18.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
08-09.12.2023	7:00-7:00	41.3	21.3	5.2	17.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09-10.12.2023	7:15-7:15	42.9	22.4	5.6	18.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
15-16.12.2023	7:00-7:00	42.3	21.9	5.4	18.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16-17.12.2023	7:15-7:15	42.9	22.4	5.8	19.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
22-23.12.2023	7:00-7:00	40.7	21.3	5.2	18.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23-24.12.2023	7:15-7:15	42.3	22.3	5.6	19.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<100	<80	<80	<100	<400	<4

Note: BDL: Below Detection Limit ;**DL**: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2024-25/010	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/010
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 10 – Uralipatti, 10°13'2.82"N 78°15'1.28"E**		

Date	Period. hrs	As (ng/m³)	C6H6 (µg/m³)	BaP (ng/m³)	Pb (µg/m³)	Ni (ng/m³)
06-07.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07-08.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13-14.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14-15.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20-21.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21-22.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27-28.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28-29.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03-04.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04-05.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10-11.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11-12.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17-18.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18-19.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24-25.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25-26.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
01-02.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02-03.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
08-09.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09-10.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
15-16.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16-17.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
22-23.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23-24.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	<100	<60	<80	<80

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2024-25/011	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/11
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 11– Panniamalai, 10°16'45.84"N 78°16'36.52"E**		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
06-07.10.2023	7:00-7:00	40.1	22.4	5.4	16.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07-08.10.2023	7:15-7:15	42.1	23.7	5.7	17.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13-14.10.2023	7:00-7:00	41.0	21.4	5.5	17.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14-15.10.2023	7:15-7:15	42.3	22.7	5.8	18.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20-21.10.2023	7:00-7:00	42.3	22.4	5.7	18.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21-22.10.2023	7:15-7:15	42.9	23.7	5.9	19.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27-28.10.2023	7:00-7:00	40.3	20.4	5.3	16.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28-29.10.2023	7:15-7:15	42.3	21.7	5.6	17.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03-04.11.2023	7:00-7:00	39.7	21.4	5.2	16.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04-05.11.2023	7:15-7:15	40.5	22.7	5.4	17.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10-11.11.2023	7:00-7:00	41.5	22.1	5.3	17.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11-12.11.2023	7:15-7:15	42.7	23.4	5.6	17.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17-18.11.2023	7:00-7:00	41.7	22.4	5.4	16.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18-19.11.2023	7:15-7:15	42.9	23.9	5.8	19.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24-25.11.2023	7:00-7:00	41.4	22.4	5.5	16.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25-26.11.2023	7:15-7:15	42.1	23.9	5.9	17.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
01-02.12.2023	7:00-7:00	40.1	20.9	5.2	16.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02-03.12.2023	7:15-7:15	42.3	22.4	5.6	17.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
08-09.12.2023	7:00-7:00	40.4	21.7	5.3	16.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09-10.12.2023	7:15-7:15	42.3	23.4	5.7	17.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
15-16.12.2023	7:00-7:00	40.3	22.4	5.4	18.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16-17.12.2023	7:15-7:15	41.3	23.7	5.8	19.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
22-23.12.2023	7:00-7:00	41.2	21.4	5.3	17.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23-24.12.2023	7:15-7:15	43.0	28.4	5.9	19.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<100	<80	<80	<100	<400	<4

Note: BDL: Below Detection Limit ;**DL**: Detection Limit
Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2024-25/011	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/011
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 11– Panniamalai, 10°16'45.84"N 78°16'36.52"E**		

Date	Period. hrs	As (ng/m³)	C6H6 (µg/m³)	BaP (ng/m³)	Pb (µg/m³)	Ni (ng/m³)
06-07.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07-08.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13-14.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14-15.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20-21.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21-22.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27-28.10.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28-29.10.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03-04.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04-05.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10-11.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11-12.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17-18.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18-19.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24-25.11.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25-26.11.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
01-02.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02-03.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
08-09.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09-10.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
15-16.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16-17.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
22-23.12.2023	7:00-7:00	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23-24.12.2023	7:15-7:15	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	<100	<60	<80	<80

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2024-25/012	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District Extent: 0.24.29 ha,0.94.0 ha ,0.94.5 ha,1.70.0 ha,2.53.0 ha		
Sampling Method	SOP	**Sample Drawn by**	Laboratory
Sample Name	Water	**Sample Code**	EHS360/012
Sample	Water	**Sample Condition**	Good
Sampling Location	**W1 - Project Site Lease 1 - Mine pit water - 10°14'27.98"N 78°17'42.80"E** **W2 - Project Site Lease 3 - Bore water - 10°14'35.66"N 78°17'55.58"E** **W3 - Project site Lease 4 - Pit water - 10°14'43.75"N 78°17'49.77"E** **W4 - Project site Lease 5 - Pit water - 10°14'57.33"N 78°17'34.83"E** **W5 – Sirugudi – Ground Water - 10°15'47.45"N 78°18'26.16"E**		

S.NO	Test Parameters	Unit	BW1	BW2	BW3	BW4	BW5	IS:10500 Norms*
1	pH @ 25°C	-	7.72	7.73	7.83	7.63	7.01	-
2	Conductivity@ 25°C	µs/cm	2140	1810	990	1740	1470	**1 / 5**
3	Turbidity	NTU	<1	<1	<1	<1	<1	**6.5 – 8.5**
4	Total Dissolved Solids	mg/l	1391	1177	643	1131	956	**500 / 2000**
5	Total Alkalinity	mg/l	430	280	310	235	310	
6	Total Hardness as $CaCO_3$	mg/l	563	561	288	581	590	**200 / 600**
7	Calcium as Ca	mg/l	108	99	56	104	104	**200 / 600**
8	Magnesium as Mg	mg/l	71	76	36	68	80	**75 / 200**
9	Chloride as Cl^-	mg/l	260	265	95	192	200	**250 / 1000**
10	Sulphate as SO_4^-	mg/l	120	104	72	110	95	**200 / 400**
11	Sodium as Na	mg/l	164	108	106	136	128	**0.3**
12	Iron as Fe	mg/l	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	-
13	Phosphate as PO_4	mg/l	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	-
14	Silica as SiO_2	mg/l	28.0	26.0	28.0	32.0	31.0	-
15	Total Coliform	mgl	Absent	Absent	Absent	Absent	Absent	Absent
16	E.Coli	mgl	Absent	Absent	Absent	Absent	Absent	Absent

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2024-25/013	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District		
Sampling Method	SOP	**Sample Drawn by**	Laboratory
Sample Name	Water	**Sample Code**	EHS360/013
Sample	Water	**Sample Condition**	Good
Sampling Location	**W1 - Samudrapatti - Ground Water - 10°13'20.25"N 78°18'35.50"E** **W2 - V.Pudur - Ground Water - 10°13'31.90"N 78°19'59.29"E** **W3 - Uralipatti - Ground Water - 10°13'2.66"N 78°15'1.61"E** **W4 - Panniamalai - Ground Water - 10°16'46.65"N 78°16'36.79"E** **W5 – Odugampatti – Ground Water - 10°17'12.01" N 78°19'18.76"E** **W6 – Avichipatti - Ground Water - 10°14'47.39"N 78°16'46.65"E**		

S.NO	Test Parameters	Unit	BW6	BW7	BW8	BW9	BW10	BW10	IS:10500 Norms*
1	pH @ 25°C	-	7.59	7.4	7.82	7.67	8.23	7.49	-
2	Conductivity@ 25°C	µs/cm	1440	2880	1070	1150	1340	610	1 / 5
3	Turbidity	NTU	<1	<1	<1	<1	<1	<1	6.5 – 8.5
4	Total Dissolved Solids	mg/l	936	1872	696	748	871	397	500 / 2000
5	Total Alkalinity	mg/l	288	292	150	154	156	200	
6	Total Hardness as $CaCO_3$	mg/l	570	501	260	285	292	270	200 / 600
7	Calcium as Ca	mg/l	106	103	56	58	54	72	200 / 600
8	Magnesium as Mg	mg/l	74	59	29	34	38	22	75 / 200
9	Chloride as Cl^-	mg/l	178	125	155	146	155	50	250 / 1000
10	Sulphate as SO_4^-	mg/l	92	94	119	122	138	26	200 / 400
11	Sodium as Na	mg/l	116	209	178	184	205	42	0.3
12	Iron as Fe	mg/l	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	-
13	Phosphate as PO_4	mg/l	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	BDL (DL:0.1)	-
14	Silica as SiO_2	mg/l	26.0	26.0	22.0	28.0	24.0	14.0	-
15	Total Coliform	mgl	Absent	Absent	Absent	Absent	Absent	Absent	Absent
16	E.Coli	mgl	Absent	Absent	Absent	Absent	Absent	Absent	Absent

************End of Report************

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2024-25/014	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District		
Sampling Method	SOP	**Sample Drawn by**	Laboratory
Sample Name	Soil	**Sample Code**	EHS360/014
Sample	Soil	**Sample Condition**	Good
Sampling Location	**S1 – Mine Lease 1 - 10°14'31.47"N 78°17'40.46"E** **S2 - Mine Lease 2 - 10°14'30.55"N 78°17'45.27"E** **S3 - Mine Lease 3 - 10°14'46.59"N 78°17'49.17"E** **S4 - Mine Lease 4 - 10°14'57.22"N 78°17'33.27"E** **S5 – Mine Lease 5 - 10°14'34.56"N 78°17'53.85"E**		

Sl. No.	Parameter		S1	S2	S3-	S4	S 5	Desirable Range	Interpretation
1	pH @ 25ºC		8.31	8.09	7.98	8.16	8.04	5.5-9.0	Strongly alkaline
2	Electrical Conductivity @ 25ºC, µS/cm		590	624	609	614	628	1000 - 2000	Low conductivity
3	Water Content, %		0.89	0.68	0.73	0.64	0.59	-	--
4	Available Phosphorous, µg/g		55.6	51.4	58.2	50.6	50.1	15 - 840	Very Low
5	Organic Matter,%		0.7	0.9	1.1	1.8	2.0	-	--
6	Soluble Calcium as Ca, meq/l		14.0	12.4	10.8	8.8	6.4	50 - 100	Low
7	Soluble Calcium & Magnesium , meq/l		20.6	20.6	19.5	12.8	10.3	-	--
8	Chloride as Cl^-, meq/l		12.8	11.7	12.4	11.8	10.1	0.1 – 0.2	High
9	Soluble Potassium as K, mg/100g		0.8	0.6	0.8	0.9	1.1	15 - 25	Low
10	Soluble Sodium as Na, mg/100g		4.7	3.6	3.1	3.3	2.9	-	-
11	Sulphate as SO_4^-,mg/100g		18.6	20.4	18.6	16.4	14.6	0.2 - 1	Low
12	Calcium Carbonate as $CaCO_3$, %		32	34	32	20	28	-	--
13	Carbonate and Bicarbonate, meq/l		1.6	1.4	1.8	2.2	1.2	-	--
14	Total Kjheldal Nitrogen, %		14	14	28	14	14	0.15 – 0.25	Very Low
15	Bulk density gm/cc		1.28	1.22	1.26	1.28	1.25	-	-
16	Water holding capacity %		42	42	48	44	44	-	-
17	Porosity %		56	54	60	52	50	-	-
18	Texture %	Sand	92	93	90	93	-	-	
		Silt	4	3	4	2	-	-	
		Clay	4	4	6	5	-	-	
19	Soil class		Sand	Sand	Sand	Sand	Sand	-	-

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2024-25/015	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District		
Sampling Method	SOP	**Sample Drawn by**	Laboratory
Sample Name	Soil	**Sample Code**	EHS360/015
Sample	Soil	**Sample Condition**	Good
Sampling Location	**S6 – Sirugudi - 10°15'43.05"N 78°18'27.50"E** **S7 - Samudrapatti - 10°13'22.42"N 78°18'34.95"E** **S8 - Uralipatti - 10°13'09.47"N 78°15'07.61"E** **S9 - Panniamalai - 10°16'46.65"N 78°16'33.58"E**		

Sl. No.	Parameter		S1	S2	S3-	S4	Desirable Range	Interpretation
1	pH @ 25ºC		7.85	7.47	8.02	7.68	5.5-9.0	Strongly alkaline
2	Electrical Conductivity @ 25ºC, µS/cm		484	516	534	546	1000 - 2000	Low conductivity
3	Water Content, %		1.34	1.25	1.16	1.09	-	--
4	Available Phosphorous, µg/g		48.4	51.2	50.8	49.6	15 - 840	Very Low
5	Organic Matter,%		1.5	1.2	1.8	1.3	-	--
6	Soluble Calcium as Ca, meq/l		3.8	4.4	2.6	1.9	50 - 100	Low
7	Soluble Calcium & Magnesium , meq/l		5.4	5.8	3.4	3.2	-	--
8	Chloride as Cl^-, meq/l		4.2	3.6	2.8	3.4	0.1 – 0.2	High
9	Soluble Potassium as K, mg/100g		1.1	0.9	1.4	0.2	15 - 25	Low
10	Soluble Sodium as Na, mg/100g		5.4	3.9	5.8	4.3	-	-
11	Sulphate as SO_4^-,mg/100g		14.8	12.6	13.4	15.8	0.2 - 1	Low
12	Calcium Carbonate as $CaCO_3$, %		28	36	34	28	-	--
13	Carbonate and Bicarbonate, meq/l		2.2	2.0	1.8	2.0	-	--
14	Total Kjheldal Nitrogen, %		56	48	14	28	0.15 – 0.25	Very Low
15	Bulk density gm/cc		1.52	1.44	1.38	1.30	-	-
16	Water holding capacity %		44	46	48	44	-	-
17	Porosity %		60	62	64	66	-	-
18	Texture %	40	35	35	40	-	-	
		25	30	35	30	-	-	
		35	35	30	30	-	-	
19	Soil class		Clay Loam	Clay	Clay loam	Clay	-	-

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2024-25/016	**Report Date**	04.01.2024
Site Location	**M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES** Sirugudi Village, Natham Taluk, Dindigul District		
Sampling Method	IS 9989	**Sample Drawn by**	Laboratory
Sample Name	Noise Level Monitoring	**Sample Code**	EHS360/016
Sample	Noise Level Monitoring	**Sample Condition**	Good
Sampling Location	-		

Sl. No.	Location	Noise Levels, dB(A)					
		Day Time (06:00-22:00 hrs.)			Night Time (22:00-06:00 hrs.)		
		Lmin.	Lmax.	Leq	Lmin.	Lmax.	Leq
1	N1-Project site	40.3	55	**50**	35	44.3	**41.8**
2	N2-Project site	40.3	55	**49.1**	35.1	44.7	**41.5**
3	N3-Project site	40.1	59.3	**49.8**	35.1	44.3	**41.7**
4	N4-Project site	40.3	55	**49.1**	35.3	45.3	**41.6**
5	N5-Project site	37.4	58.9	**49.4**	32.6	48.7	**41.2**
6	N6-Project site	38.7	55	**49.1**	36.1	40.5	**39.9**
7	N7-Project site	41.6	58.1	**48.5**	36.5	41.5	**40.6**
8	N8-Project site	42.7	55.7	**50**	30.2	40.5	**36.3**
9	N9-Project site	38.8	55.1	**48.7**	32.8	38.5	**36**
10	N10-Project site	39.5	59.5	**50.1**	32.9	44.1	**36.9**
11	N11-Project site	18.2	55.3	**49.1**	30.5	41.2	**38.5**
12	N12-Project site	38.3	55.1	**48.3**	31.1	38.6	**38.5**
13	N13–Project site	39.4	58.6	**47.8**	33.7	41.9	**38.8**
14	N14-Project site	39.1	55.3	**47.4**	33.2	39.5	**37.4**
15	N 15-Project site	44	55.8	**50.5**	33.1	44.3	**39.9**
16	N16-Project site	38.5	45.9	**45.1**	32.7	40.5	**38.3**
17	N17–Project site	40.5	59.3	**52.0**	31.8	46.1	**39.3**
18	N18–Project site	37.4	56.2	**48.7**	31.1	39.7	**36.9**
Buffer Zone :							
19	N19- Sirugudi	42.1	58.7	**51.3**	36.4	48.7	**41.5**
20	N20- V.Pudhur	42.5	59.4	**50.8**	35.1	48.9	**43.2**
21	N21- Pannianmalai	43.1	59.8	**51.2**	36.2	48.7	**39.8**

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
10/2, Ground Floor, 50th Street 7th Avenue
Ashok Nagar, Chennai - 600083.

QUALITY COUNCIL® OF INDIA
Creating an Ecosystem for Quality

National Accreditation Board for Education and Training

Certificate of Accreditation

Geo Exploration & Mining Solutions, Salem

No. 17, Advaitha Ashram Road, Fairlands, Salem – 636 004, Tamilnadu, India.

*The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –*

S.No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals opencast only	1	1 (a) (i)	A
2	Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes	31	7 (c)	B
3	Building and construction projects	38	8(a)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated Jan 06, 2023 and posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/23/2684 dated Feb 20, 2023. The accreditation needs to be renewed before the expiry date by Geo Exploration & Mining Solutions, Salem following due process of assessment.

Sr. Director, NABET
Dated: Feb 20, 2023

Certificate No.
NABET/EIA/2225/RA 0276

Valid up to
August 06, 2025

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to the QCI-NABET website.