

**DRAFT ENVIRONMENTAL IMPACT ASSESSMENT  
&  
ENVIRONMENT MANAGEMENT PLAN**

**“VIOLATION” CATEGORY – MAJOR MINERAL – NON-FOREST LAND –NON-CAPTIVE**

**SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES**

**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**

PROJECT LOCATION	PROPOSED PRODUCTION
S.F. No 616/1B (P), 1C,618/1 (P) & 619 <b>Extent: 0.94.0 Ha (Patta Land)</b> Sirugudi Village, Natham Taluk, Dindigul District.	Available Mineable Reserves = 37,838 tonnes (ROM) Review of Mining Plan Period =37,838 tonnes (ROM) Depth = 25m Bgl <b>Lease valid upto = 31.03.2047</b> (As per MMDR Amendment Act 2015) Review of Mining Plan Period = 2022-23 to 2026-27
<b>Complied as per TOR vide</b> <b>Lr No.SEIAA-TN/F.No.6254/TOR-335/2018 Dated 11.05.2018</b> <b>Extension of ToR obtained vide</b> <b>Letter No. SEIAA-TN/F.No.6254/TOR-335/2018/ Dated: 28.10.2022</b> <b>As per 422<sup>nd</sup> SEAC &amp; 657<sup>th</sup> SEIAA (Minutes of Meeting)</b> <b>(ToR Valid upto 27.10.2024)</b>	
<b>Environmental Consultant</b> <b>GEO EXPLORATION AND MINING SOLUTIONS</b>  Old No. 260-B, New No. 17, Advaitha Ashram Road, Alagapuram, Salem – 636 004, Tamil Nadu, India <b>Accredited for sector 1 Cat ‘A’, sector 31 &amp; 38 Cat ‘B’</b> Certificate No : NABET/EIA/2225/RA 0276 Phone: 0427-2431989, Email: infogeoexploration@gmail.com Web: www.gemssalem.com 	<b>Laboratory</b> <b>EHS 360 LABS PRIVATE LIMITED,</b> 10/2 Ground floor, 50 <sup>th</sup> street, 7 <sup>th</sup> Avenue, Ashok Nagar, Chennai – 600 083.
<b><u>Baseline Monitoring Period</u></b> <b>October 2023 – December 2023</b>	
<b>JUNE 2024</b>	

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## **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 27<sup>th</sup> 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: 14<sup>th</sup> 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 was granted to Thiru. S. Ilangovan, Dindigul District vide G.O. 3(D).No. 89, Dated 17.10.1996 for a period of 20 years from 04.03.1997 to 03.03.2017 and the lease deed was executed on 04.03.1997.

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.170Industries (MMA1) Department, Dated: 03.11.2014.

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/64252/2017 Dated: 29.04.2017.

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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 vide online proposal number SIA/TN/MIN/223069/2018 Dated 03.04.2018.

ToR was issued vide Lr.No.SEIAA-TN/F.No.6254/TOR-335/2018 Dated: 11.05.2018.

Proponent applied for the extension for the existing ToR vide online proposal No SIA/TN/MIN/268110/2022 Dated 15.04.2022. The proposals were considered in 319<sup>th</sup> SEAC – TN Meeting held on 12.10.2022 and issued Terms of Reference (ToR) vide Lr.No.SEIAA-TN/F.No.6254/TOR-335/Ext/2018 Dated: 28.10.2022,

Again, the proposal was placed in 369<sup>th</sup> SEAC meeting held on 24.04.2023 and SEAC decided to constitute a subcommittee to make an on-site inspection to assess the present Status of the project site and Environmental settings as the proposal falls under violation category and submit the report along with the recommendations to the committee.

Further the committee called for the following additional details:

- A letter from the PP justify that the project activity is covered under category B2 of Item 1(a) “Mining of Minerals Project” of the schedule to the EIA notification 2006 as amended
- Valid Mine plan approved by the competent authority for the proposed period of quarrying.
- The PP shall furnish the copy of receipt of the penalty levied by Department of Geology and Mining for the exploitation of mineral without Prior EC

After the receipt of Additional details from the PP and the evaluation report by the subcommittee, SEAC will deliberate on the issue of environmental clearance under violation category. SEAC also decided to request SEIAA-TN to initiate action under sec-19 of the Environment (Protection) act, to be taken for violation cases, in accordance with law and the proposal was placed in 616<sup>th</sup> SEIAA meeting held on 10.05.2023.

The view of the above, the authority accepts the decision of SEAC and decided to request the member secretary SEIAA to communicate the SEAC minutes to the PP and to write to the state govt\TNPCB to take credible action under the provision of Sec – 19 of the

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Environment(Protection) act, 1986 against the Project Proponent as per the EIA notification dated 14.03.2017 and 08.03.2018

The Proposal was placed in 422<sup>nd</sup> SEAC meeting held on 09.11.2023 and as per the 422<sup>nd</sup> SEAC & 657<sup>th</sup> SEIAA Minutes of Meeting During the meeting, SEAC noted that the PP had not carried out the Public hearing for the above proposal.

Therefore after the long deliberation and discussions in the 422<sup>nd</sup> SEAC meeting, The SEAC has observed that the Public hearing is mandatory for all mining projects of Major Minerals category irrespective of the area for ensuring the scientific and systematic mining and the conservation minerals. The SEAC decided to direct the PP to conduct the Public hearing as per the procedure described in EIA notification 2006 and submit the minutes of the public hearing with action plan for considering the application\proposal towards the grant of EC.

Subsequently. the proponent requested to extend the validity of ToR to conduct Public Hearing and to update the EIA Report accordingly. since the validity of ToR issued is about to expire on 27.10.2023. The Committee after detailed discussion. accepted the request of the PP and extended the validity of ToR further for a Period of I year, i.e., up to 27.10.2024. After the receipt of the minutes of the Public Hearing along with updated Final EIA Report submitted by the PP along with a valid Mining Lease. and approved Mining Plan/Scheme of Mining including the PMCP/FMCP for the proposed mining operations, the SEAC may deliberate the future course of action.

This proposal was placed in 677<sup>th</sup> SEIAA meeting and after detailed discussions, the Authority decided to grant extension of ToR for further period of 1 year i.e. up to 27.10.2024 .as recommended by SEAC. All the other conditions stipulated in the ToR Letter No. SEIAA-TN/F.No.6254/ToR-335/2018/ dated 28.10.2022 issued under violation category

Now, as per MMDR Amendment Act 2015, the validity of lease period is extended upto 03.03.2047 and Review of Mining Plan & Progressive Mine Closure Plan was prepared by RQP and approved by Regional Controller of Mines, Indian Bureau of Mines, Chennai vide Lr.No TN/DGL/RST/ROMP-1714.MDS dated 13.10.2023

As per Gazette Notification S.O. 3977 (E) of 14<sup>th</sup> 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

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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.

This EIA report is prepared for Sirugudi Limestone Mine of M/s. Sivam Mines – Extent 0.94.0 ha with proposed capacity of 37,838 tonnes (ROM) at S.F. No. 616/1B (P), 1C,618/1 (P) & 619 in 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 was granted to Thiru. S. Ilangovan, Dindigul District vide G.O. 3(D).No.89, Dated 17.10.1996 for a period of 20 years from 04.03.1997 to 03.03.2017 and the lease deed was executed on 04.03.1997.

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.170 Industries (MMA1) Department, Dated: 03.11.2014.

**TABLE 1.1: IDENTIFICATION OF THE PROJECT**

Description	Details
S.F.No's	616/1B (P), 1C, 618/1 (P) & 619
Extent & Classification	0.94.0 ha Patta
Village, Taluk, District	Sirugudi Village, Natham Taluk, Dindigul District
Latitude Between	10°14'54.81" N to 10°14'58.85" N
Longitude Between	78°17'30.48" E to 78°17'35.19" E
MSL	225
Average Proposed Production	6054 tonnes per annum of Limestone @ 80% Recovery
Proposed Depth of Mining	25 m bgl (1 m Topsoil + 24 m Limestone)
Dip	85° SE
Strike	N 60° E – S 60° W
Existing Pit Dimension	120 m (L) * 47 m (W) * 25 m (D)

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.	:	<a href="mailto:ilangovanmadhavi4.9@gmail.com">ilangovanmadhavi4.9@gmail.com</a>

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, Advaita Ashram Road,

Alagapuram, Salem – 636 004

Tamil Nadu, India

Email: [infogeoexploration@gmail.com](mailto:infogeoexploration@gmail.com)

Website: [www.gemssalem.com](http://www.gemssalem.com)

Phone: 0427 – 2431989

**NABET Certificate No: NABET/EIA/2225/RA 0276**

### 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: 14<sup>th</sup> 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



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**Screening –**

As per Gazette Notification S.O. 3977 (E) Dated: 14<sup>th</sup> August 2018, the project is classified as Category “B”, The extent of mining area is 0.94.0 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.6254/TOR-335/Ext/2018/ Dated: 28.10.2022, The validity of the Terms of Reference is upto 27.10.2024.

**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.

**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, 14<sup>th</sup> September, 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 non-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	616/1B (P), 1C,618/1 (P) & 619
Extent& Classification	0.94.0 ha Patta
Village, Taluk, District	Sirugudi village, Natham Taluk, Dindigul District
IBM Registration No	IBM /5276/2011, Dated: 25.11.2011
Mine code	38TMN06010
Latitude Between	10°14'54.81" N to 10°14'58.85" N
Longitude Between	78°17'30.48" E to 78°17'35.19" E
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, Sivaganga. 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 <a href="https://moes.gov.in/writereaddata/files/LS_EN_20032020_385.pdf">https://moes.gov.in/writereaddata/files/LS_EN_20032020_385.pdf</a>

Source: Approved Mining Plan

**1.5.2 SIZE OF THE PROJECT****TABLE 1.3: RESOURCES AND RESERVES**

Description	Quantity in tonnes		
Geological Resources Reassessed and Approved by IBM	3,31,781		
Mineral reserves (111) ROM Reassessed and Approved	37,838		
Limestone @ 80% Reassessed and Approved by IBM	30,270		
Total Waste (Mineral rejects)	7,567		
Topsoil	00		
Proposed Production for 5 Year Mining Plan Period	ROM	Side Burden	Topsoil
	37,838	00	00
Average Production of Limestone per annum	6,054		
Limestone Production per day	20		

Source: Approved Mining Plan

**1.5.3 PAST PRODUCTION DETAILS TABLE**

The mining operation was commenced in the year of 1997 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*	1600 tonnes	Rs 20, 43,000/-

\* 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, 56<sup>th</sup> 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 supplyfeed 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 15 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**

<b>STATUTORY APPROVALS</b>	
Lease granted	G.O. 3(D).No. 89, Dated:17.10.1996 (Twenty Years) 04.03.1997 to 03.03.2017 [Transfer of Lease vide G.O.(D) No.170 Inds (MMA.1) dept., Dated:03.11.2014]
Deemed Extension	As per MMDR Amendment Act 2015, the validity of the lease period shall be deemed to have been extended upto 03.03.2047.
Mining plan period	Approved by IBM letter No TN/DAnna/MP/LST-873-MDS, Dated:12.12.1995.
1 <sup>st</sup> Scheme of mining	Approved by IBM vide Letter No TN/DGL/LST/MS-128-MDS, Dated:02.07.2002
2 <sup>nd</sup> Scheme of mining	Approved by IBM vide letter No TN/DGL/LST/MS-450-MDS, Dated:10.09.2007
3 <sup>rd</sup> Scheme of Mining	2012-13 to 2016-17 TN/DGL/LST/MS-765.MDS, Dated: 27.03.2013.
Review of Mining Plan	Review of Mining plan 2017-18 to 2021-22 TN/DGL/LST/ROMP/ 1407.MDS, Dated:17.03.2017.

## 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 2023 – 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 has 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	11 Locations	11 Samples

	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.		
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 $L_{eq}$ , $L_{day}$ and $L_{night}$ values.	21 Locations	

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 proponent shall furnish the DFO letter stating the proximity distance of nearest RF, WLS & Tiger reserve etc.,	The proponent ensure will be obtained letter from DFO and will be submitted to SEIAA.
2	The project proponent shall submit valid mining lease and scheme of mining plan obtained from the competent authority.	<b>Noted.</b> Review of Mining Plan & Progressive Mine Closure Plan was prepared by RQP and submitted to Regional Controller of Mines, Indian Bureau of Mines, Chennai for approval
3	The project proponent shall submit excess mined out quantity during the violation period after 15.01.2016 along with details of existing pit within the proposed mining area and the copy of remittance of fine levied for the same from the concerned AD, DD, Geology & Mining Dept.	Proponent obtained last permit on 10.01.2017.
4	The project proponent shall submit details of case filed against the project proponent under Section 19 of the Environment (Protection) Act 1986.	No such type of cases filed against this project.
5	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 Electricity will be used for the mining operation. Diesel consumption for this project would be around 230 – 250 Ltrs per day.
6	What are the green mining technologies to be adopted for reducing GHG/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.
7	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. 40
8	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.
9	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.
10	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.
11	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.
12	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 124.



13	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.
14	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.
15	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 45% and MgO is 2 to 4%. No toxic chemicals in the Limestone hence the risk to the human health is not arise.

<b>I. Standard Terms of Reference</b>		
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 post operational phases and submitted. Impact, if any, of change of land use should be given.	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. Land use plan of the mine lease in operation & post operation phase has been discuss in Chapter 2. Pg. No. 42.
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	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.

	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.	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.
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-	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 compiled data wise in the EIA report.

	dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.	
23.	Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	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
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 44
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 25m 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 225m AMSL. Ultimate depth of the mine is 25 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	Greenbelt development Plan & Recommended Species proposed for greenbelt development are given in the Chapter 10, Pg. No. 138.

	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.	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  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 - 144
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.	As per the Office Memorandum of MoEF & CC – F.No.22-28/2020.IA.III Dated: 12.11.2020, the requirement of Public Hearing for Violation cases was clarified and this proposal doesn't attract Public Hearing Process.
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.87.63 Lakhs EMP Capital Cost = Rs 21.80 Lakh EMP Recurring Cost = Rs 11.54 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.	<b>Besides the above, the below mentioned general points are also to be followed:-</b>	
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 4 <sup>th</sup> 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.

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**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 1<sup>st</sup>June and 1<sup>st</sup>December 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 transfer 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,



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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.

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**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.

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## **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 0.94.0 ha) falling under Category ‘B’

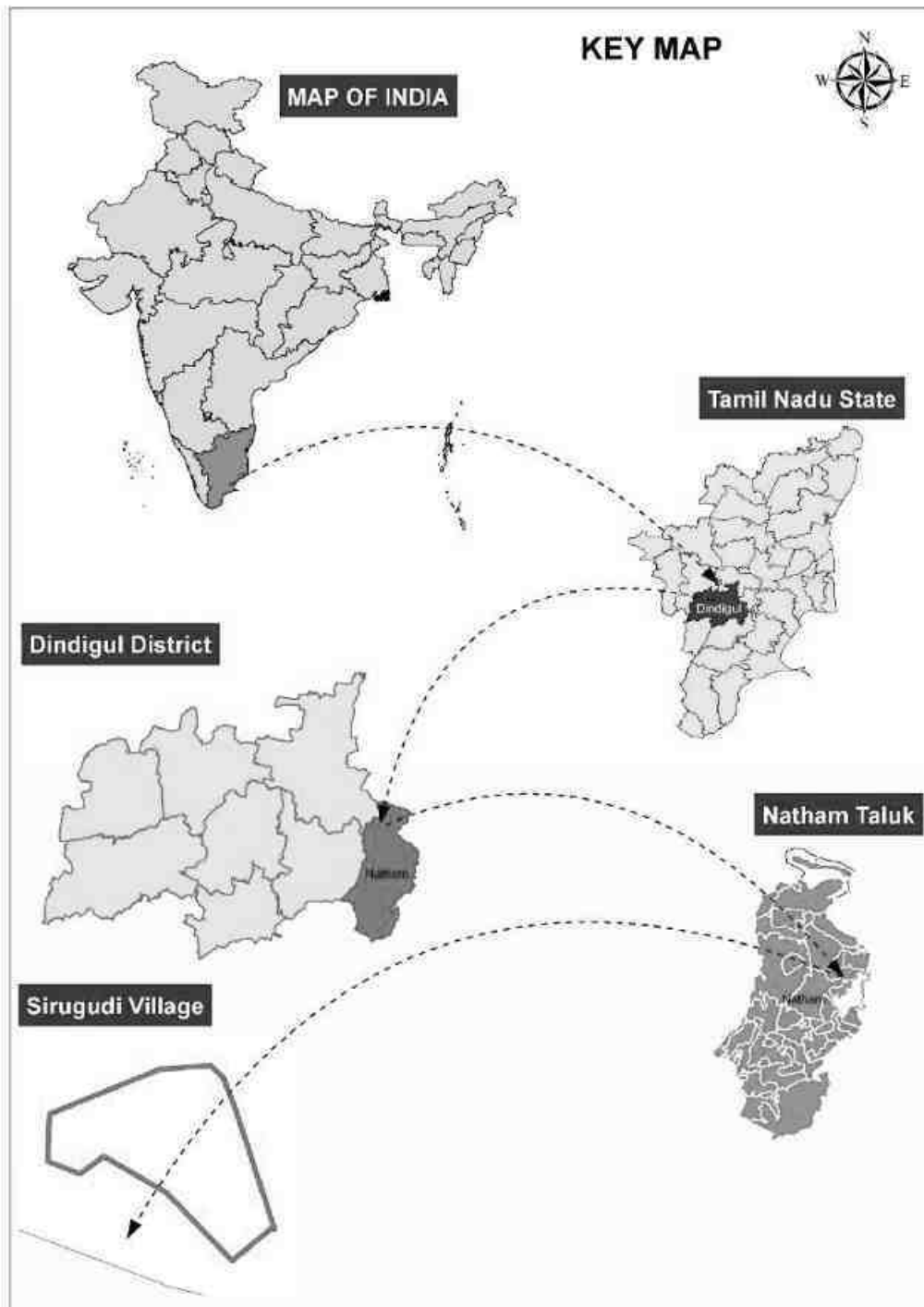
#### **TYPE OF THE PROJECT:**

- Existing limestone mines < 5ha, non-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**

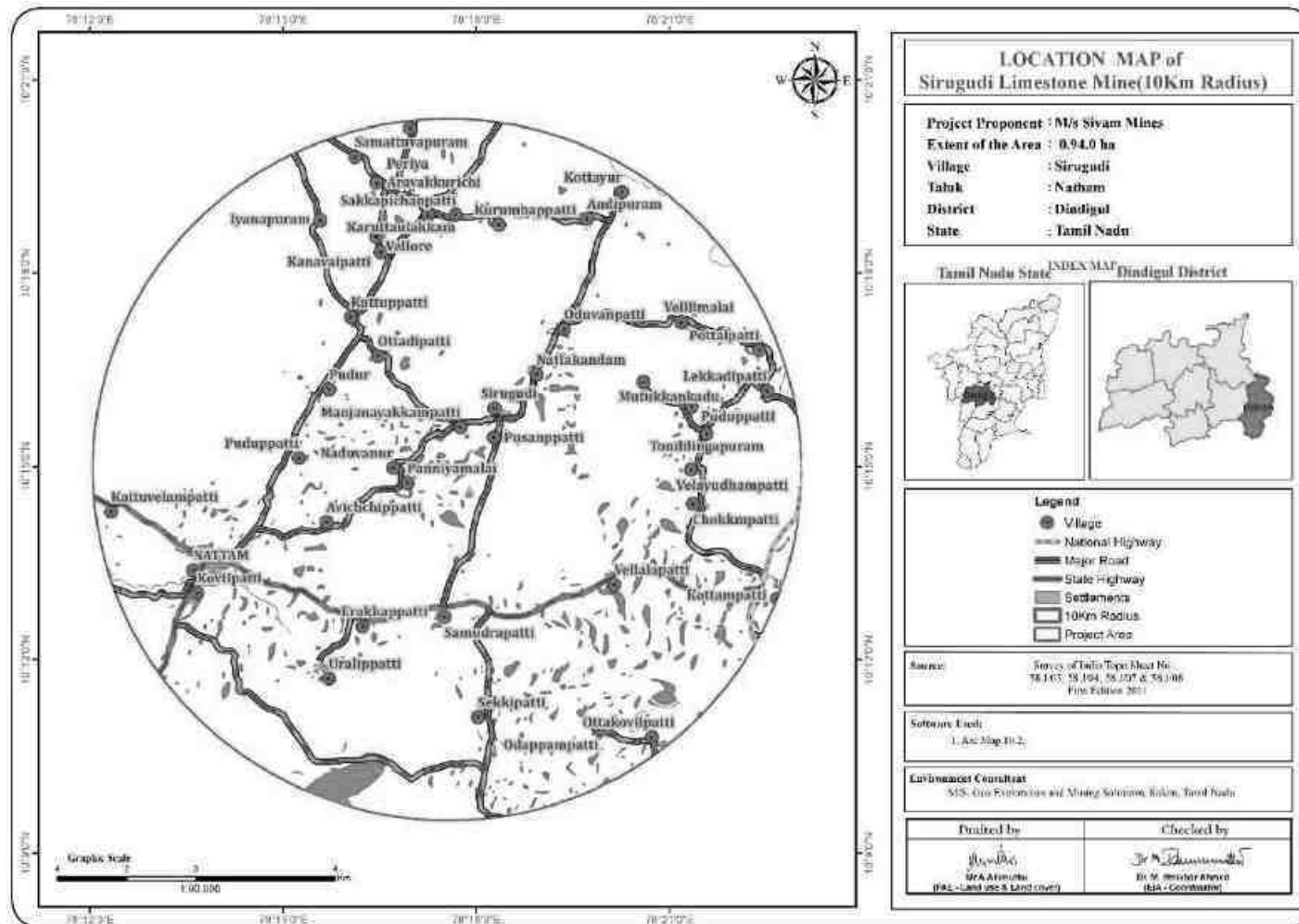
- The mining lease is located in Sirugudi Village, Natham Taluk, Dindigul District and Tamil Nadu (Extent: 0.94.0ha).
- The project falls in Toposheet No: 58 J/08.
- Latitude between N10°14'54.81" to N10°14'58.85"
- Longitude between 78°17'30.48" E to 78°17'35.19" E
- The project site is about 37 KM 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: KEY MAP**



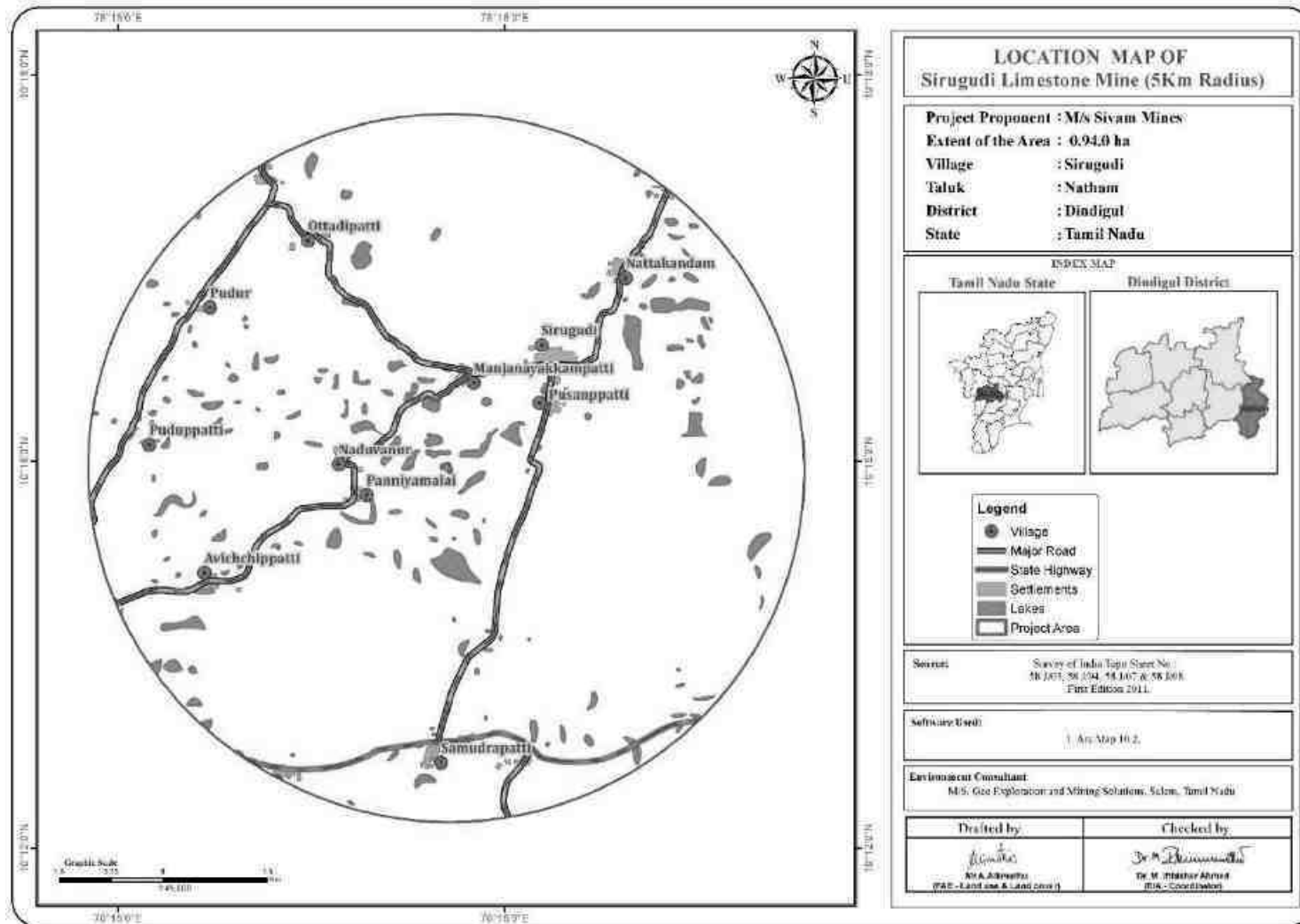
Source: Google maps

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



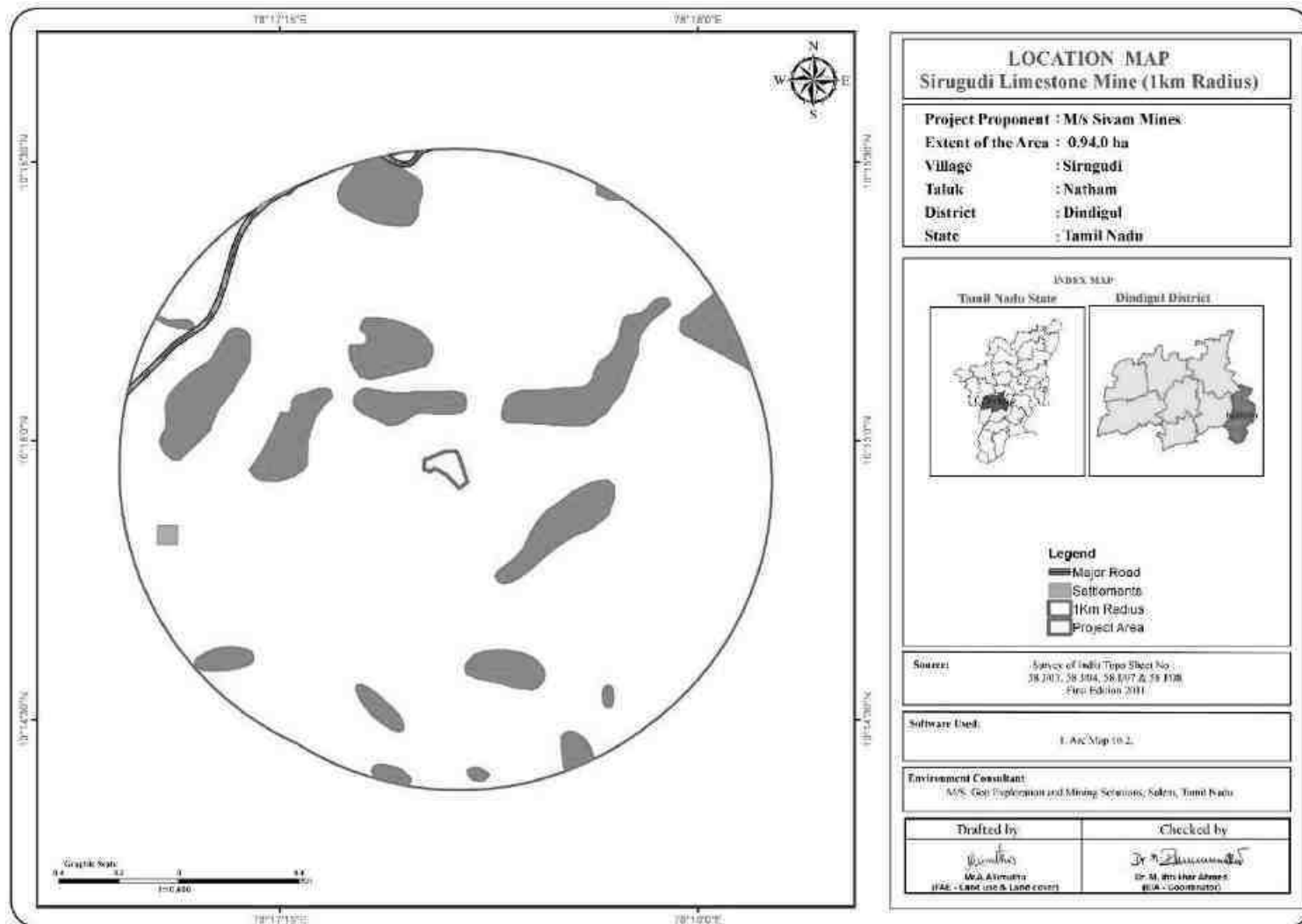
Source: Digitized in Geographical information System (ARC GIS), Survey of India Toposheet, 11<sup>th</sup> Edition 2011

**FIGURE 2.3: DIGITIZED LOCATION MAP ON THE GEO REFERENCED TOPOSHEET (5KMRADIUS)**



Source: Survey of India Toposheet, 11<sup>th</sup> Edition 2011

**FIGURE 2.4: LOCATION MAP COVERING 1KM RADIUS**



Source: Survey of India 11<sup>th</sup> Edition, 2011.

## 2.2 LEASE HOLD AREA

- The lease area is an existing limestone mines which is site specific, non-captive use, opencast category “A” other than fully mechanized.
- No beneficiation or mineral processing is proposed.
- Mine Lease Area = 0.94.0ha
- General gradient of the area is towards south.

**TABLE 2.1: LOCATION DETAILS**

Description	Details
Latitude between	10°14'54.81" N to 10°14'58.85" N
Longitude between	78°17'30.48" E to 78°17'35.19" E
MSL	225
Extent	0.94.0 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	693/1, 2, 3, 4 & 7	1.70.0

Source: Approved Mining Plan

**TABLE 2.4: NEAREST WATER BODIES WITHIN 10KM RADIUS**

Sl.No.	Water Bodies	Distance and Direction
1	Sirugudi Village Tank	900m South West
2	Sirugudi Village Tank	750 m North

Source: Approved Mining Plan

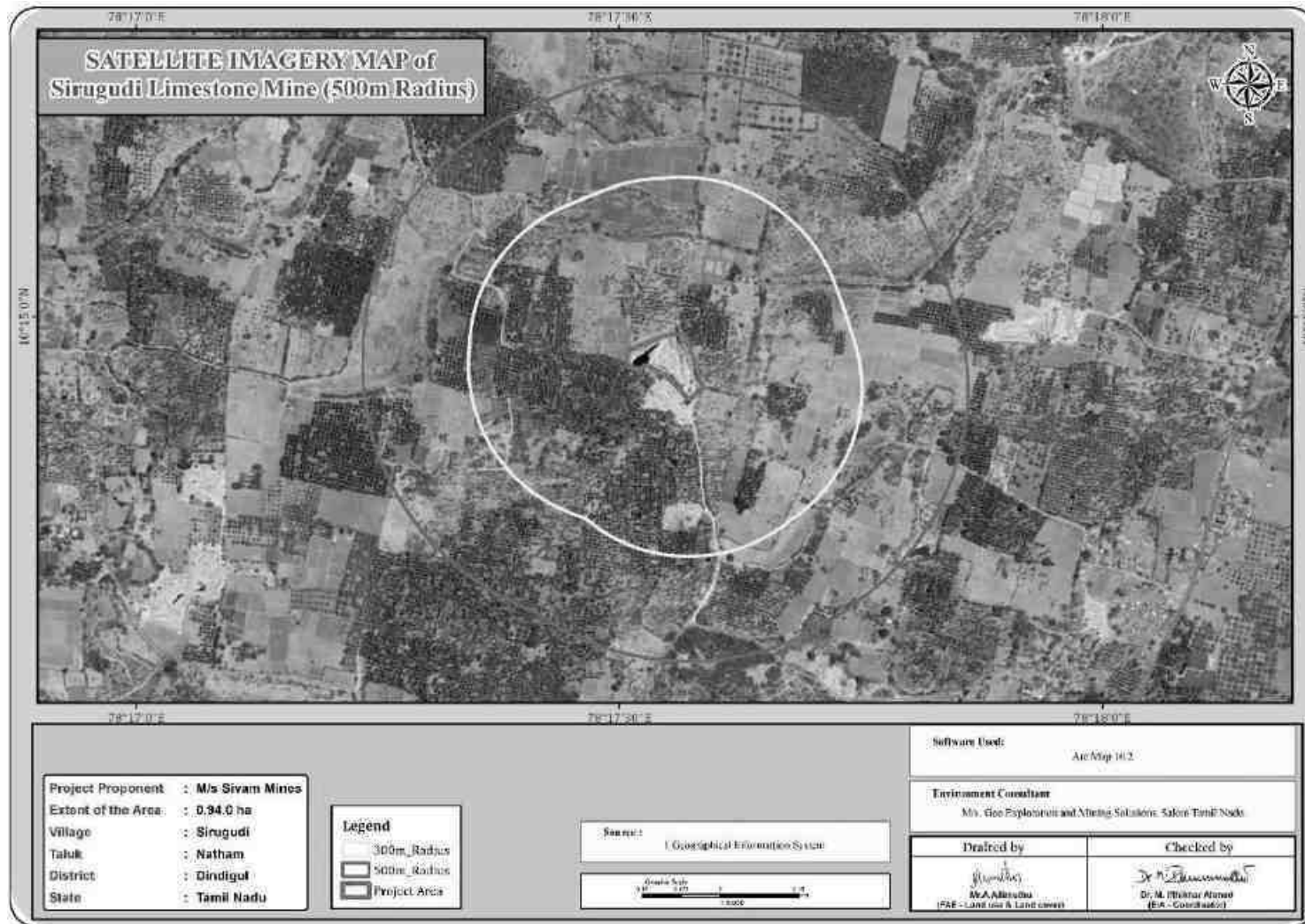


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**FIGURE 2.5: TOPOGRAPHICAL VIEW OF LEASE AREA**

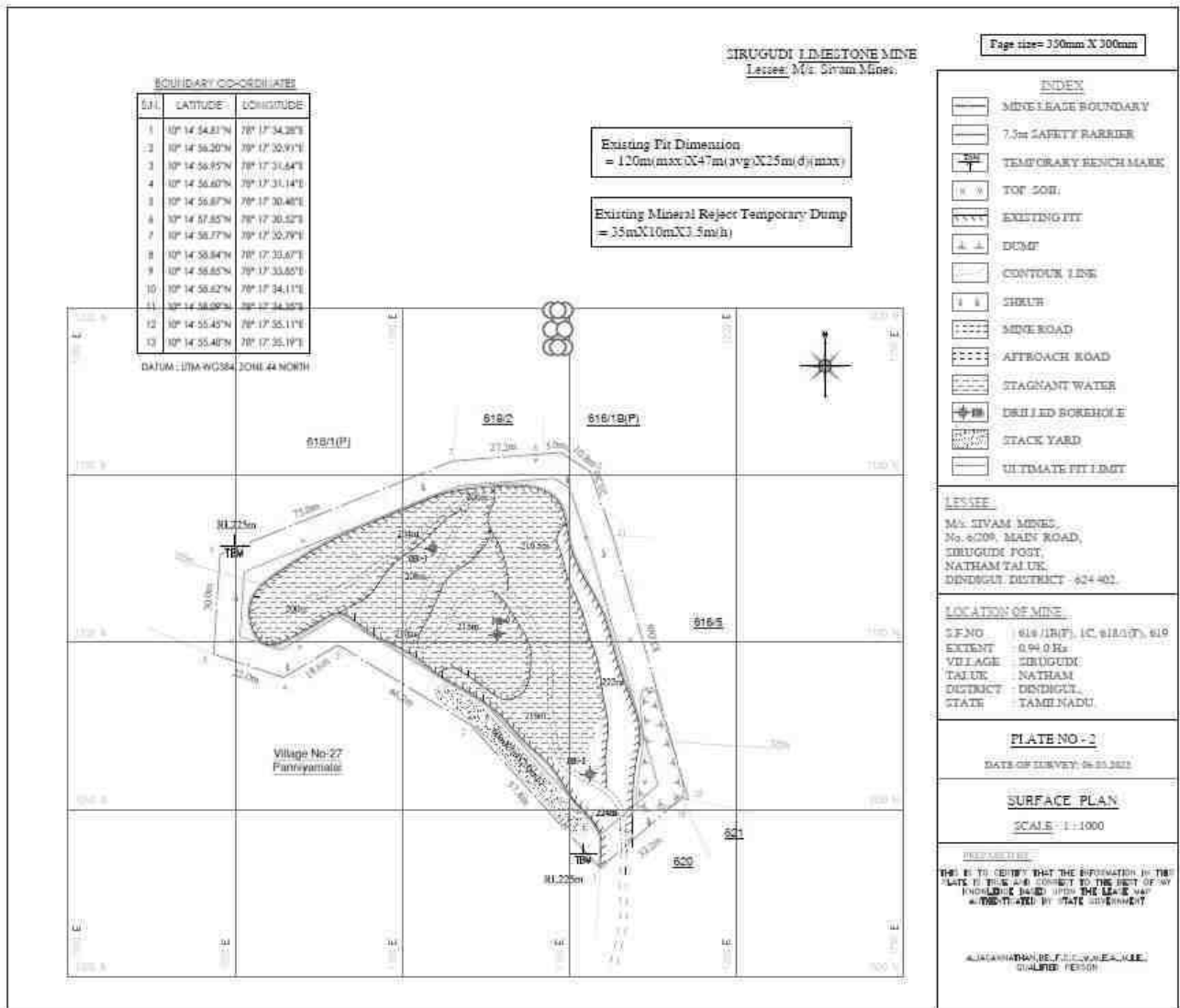


**FIGURE 2.6: MINE LEASE AREA COVERING WITH 300M AND 500M RADIUS**



Source: Google earth imagery

**FIGURE 2.7: 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 N60° E – S60° W with Dip SE80°.

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

Order of Super position:	
<u>AGE</u>	<u>ROCKFORMATION</u>
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 N60° E – S60° W with Dip SE80°. 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.

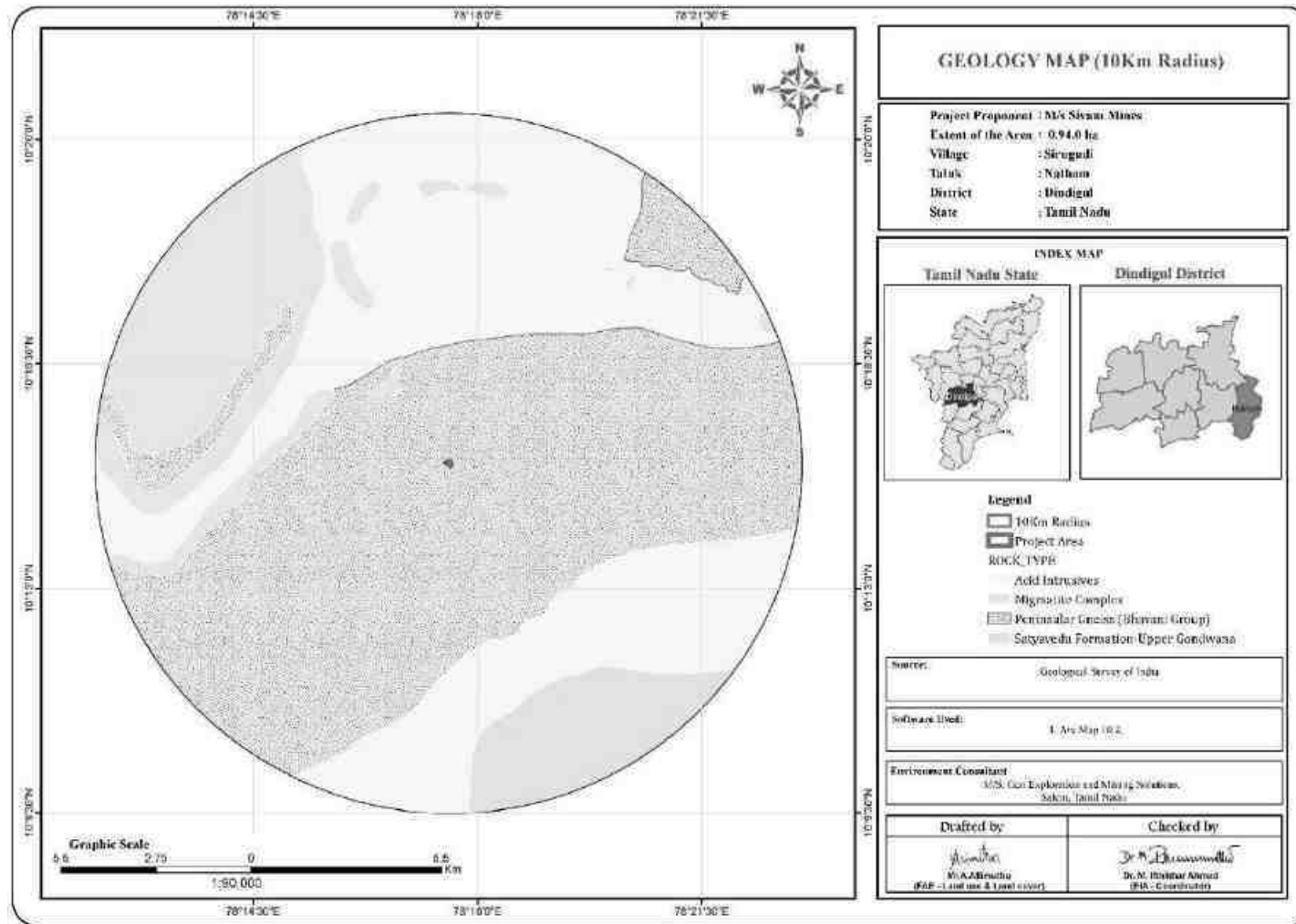
The physical attitudes of the limestone bands are as follows:

Strike direction : N60° E – S60° W

Dip amount and direction : NW 84°

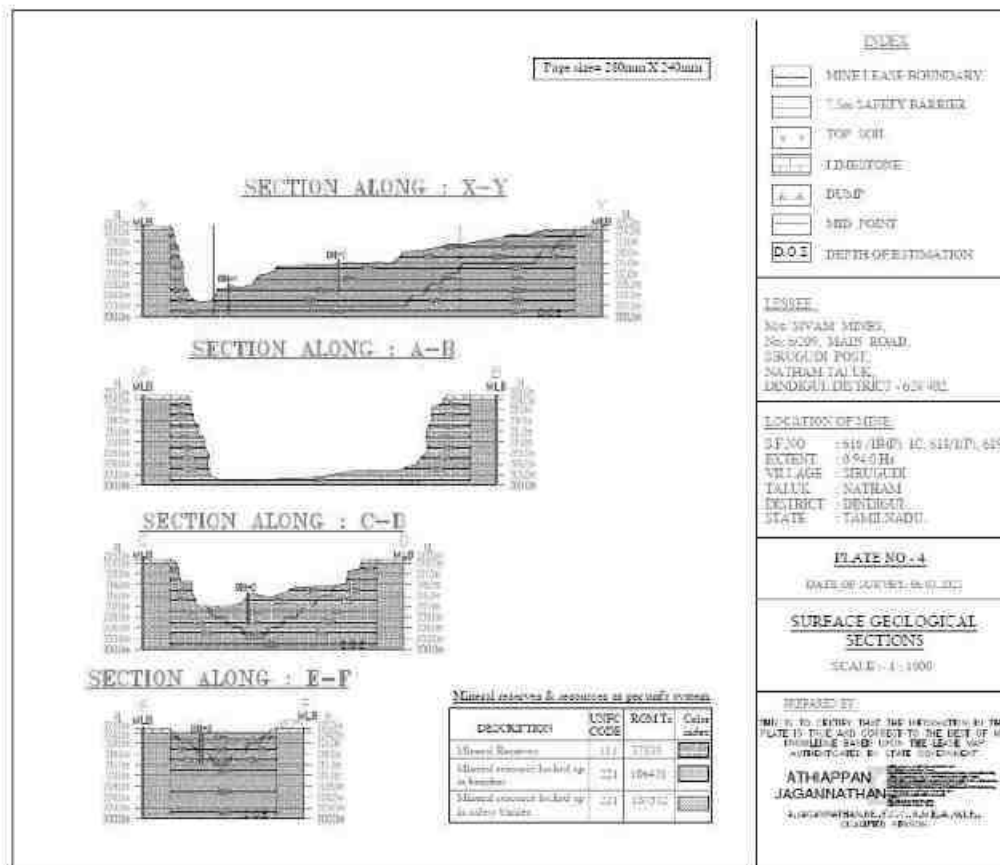
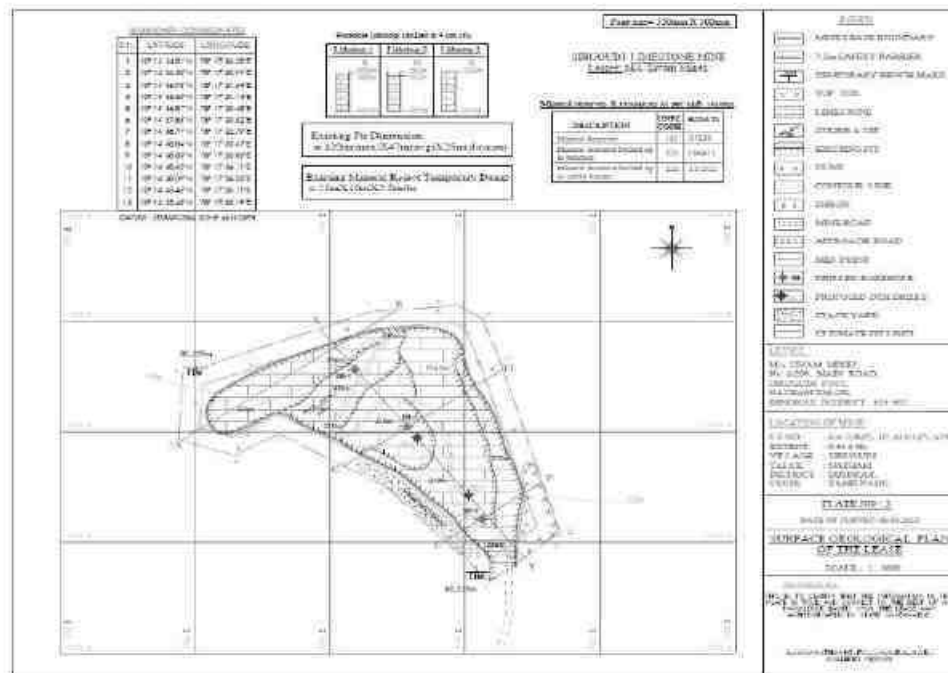
The depth of the mineralization has been proved maximum upto 25m depth with an average of 1.0m topsoil, based on the core drill investigation as per the UNFC classification.

**FIGURE 2.8: GEOLOGY MAP OF THE AREA COVERING 10 km RADIUS**



Source : Geographical information system ( ARC GIS MAP)

**FIGURE 2.9: 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	9	209.0m-208.2m	Mined out
		208.2m-200.0m	Limestone
DBH2	9	216.0m-215.1m	Mined out
		215.1m-207.0m	Limestone
DBH 3	8.8	223.8m-215.0m	Limestone

Source: Approved Review of mining plan and progressive mine closure plan (2017-18 to 2021-22)

LIMESTONE	
Parameter	Composition %
CaO	41.85
MgO	4.15
Fe <sub>2</sub> O <sub>3</sub>	0.36
Al <sub>2</sub> O <sub>3</sub>	0.85
SiO <sub>2</sub>	8.95
LOI	43.83

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	0.045	Cement Grade
Probable Mineral Reserves	121 & 122	-	
Total Remaining Resources			
Feasibility Mineral resources	211	-	
Pre-feasibility Mineral resources	221 & 222	0.270	
Measured Mineral resource	331	-	
Indicated Mineral resources	332	-	
Inferred Mineral resource	333	-	
Reconnaissance Mineral Resource	334	-	
Total Reserves + Resources		0.315	

Source: Approved Mining Plan

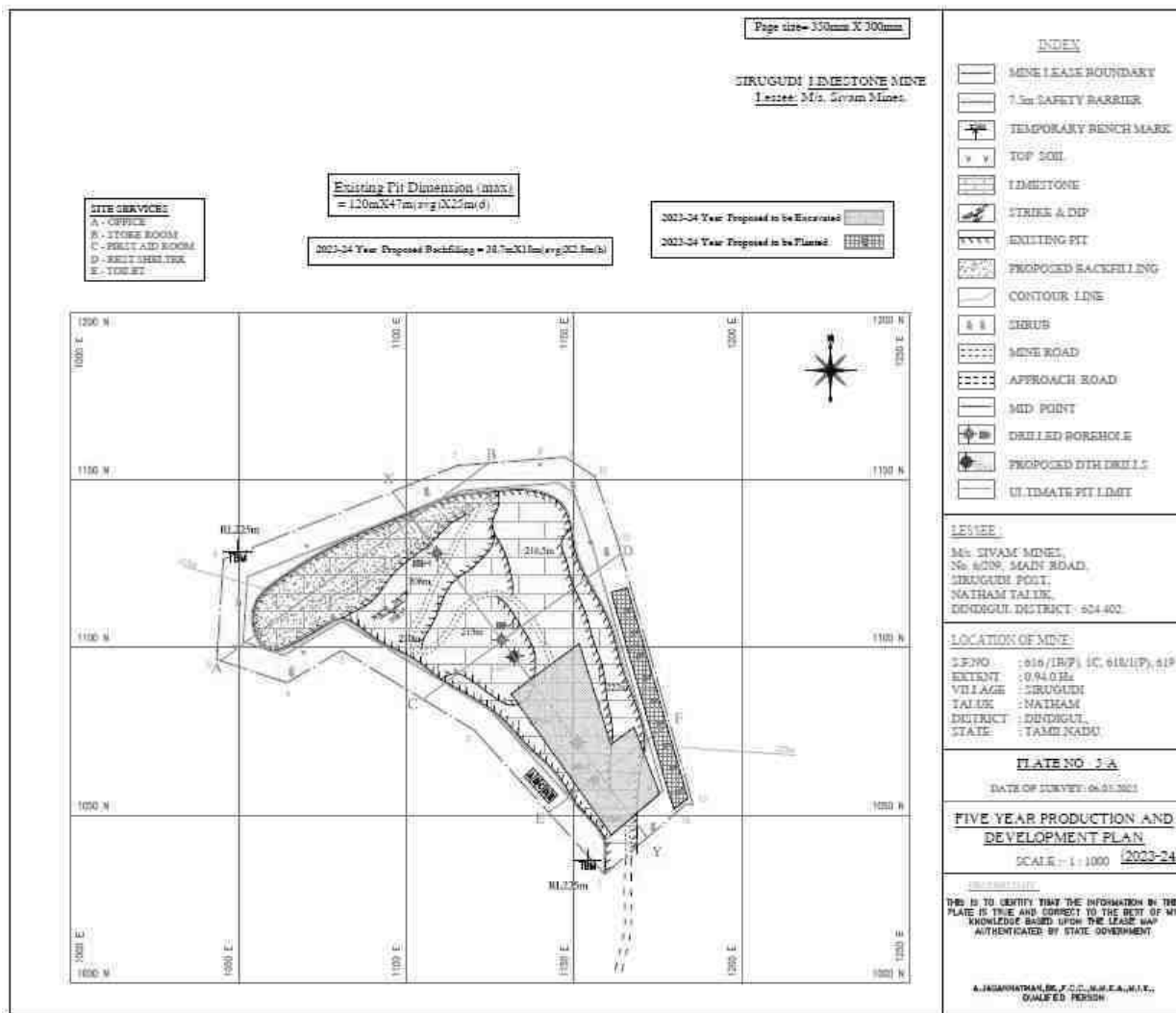
**2.4.1 CALENDAR PROGRAM FOR ORE AND WASTE RATIO**

**TABLE 2.7: SUMMARY OF YEAR WISE**

Year	ROM(Ts)	Limestone @ 80% (Ts)	Mineral Rejects @ 20% (Ts)	Ore waste ratio
2022-23	-	-	-	-
2023-24	9,454	7,563.20	1,890.80	1:0.25
2024-25	9,672	7,737.60	1,934.40	1:0.25
2025-26	9,898	7,918.40	1,979.60	1:0.25
2026-27	8,814	7,051.20	1,762.80	1:0.25
<b>Total</b>	<b>37,838</b>	<b>30,270.40</b>	<b>7,567.60</b>	<b>1:0.25</b>

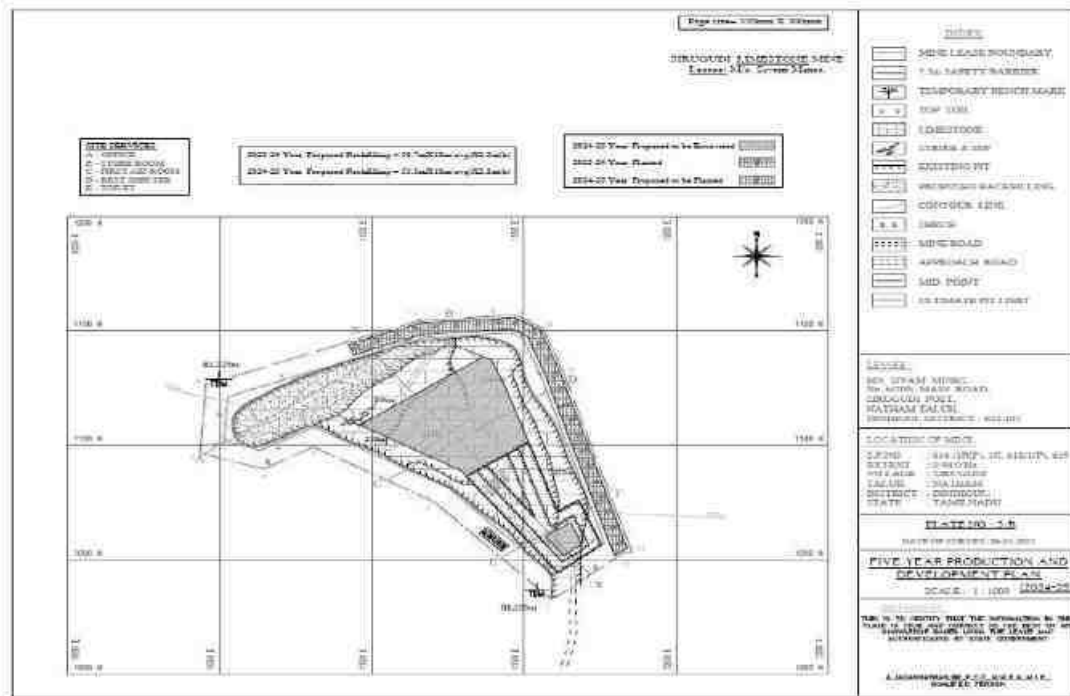
Source: Approved Mining Plan

**FIGURE 2.10: YEAR WISE PLAN AND SECTIONS 2023-2024**

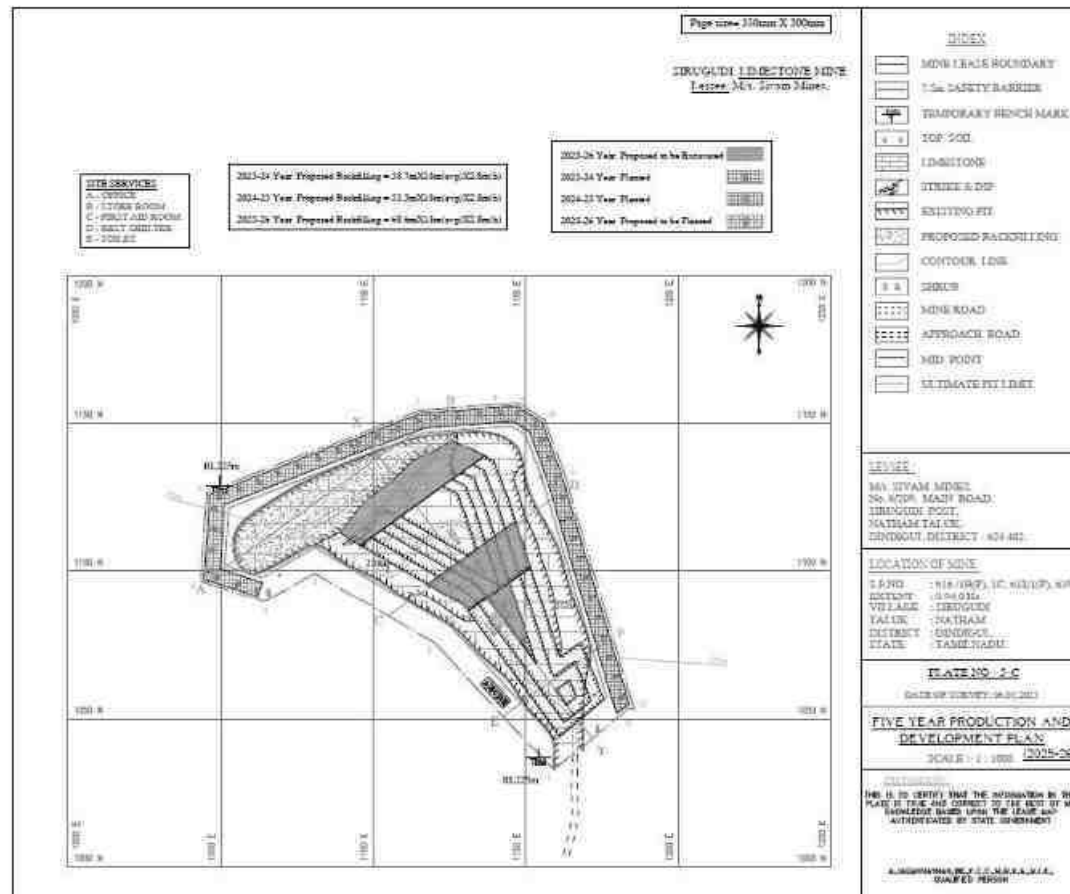




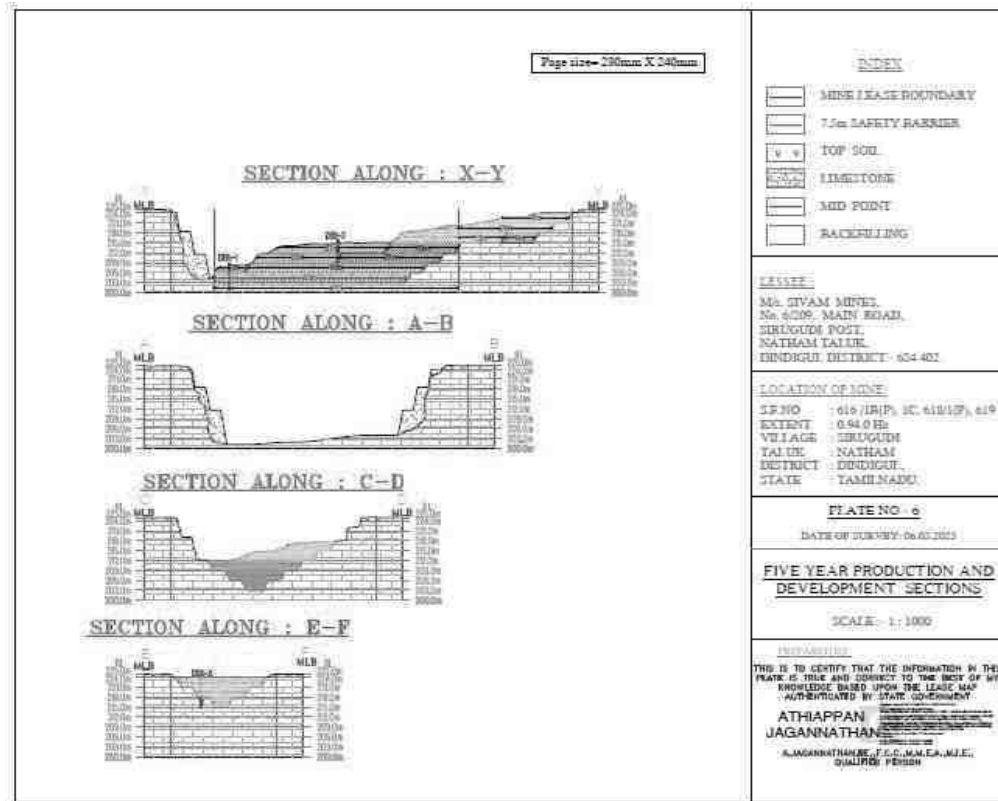
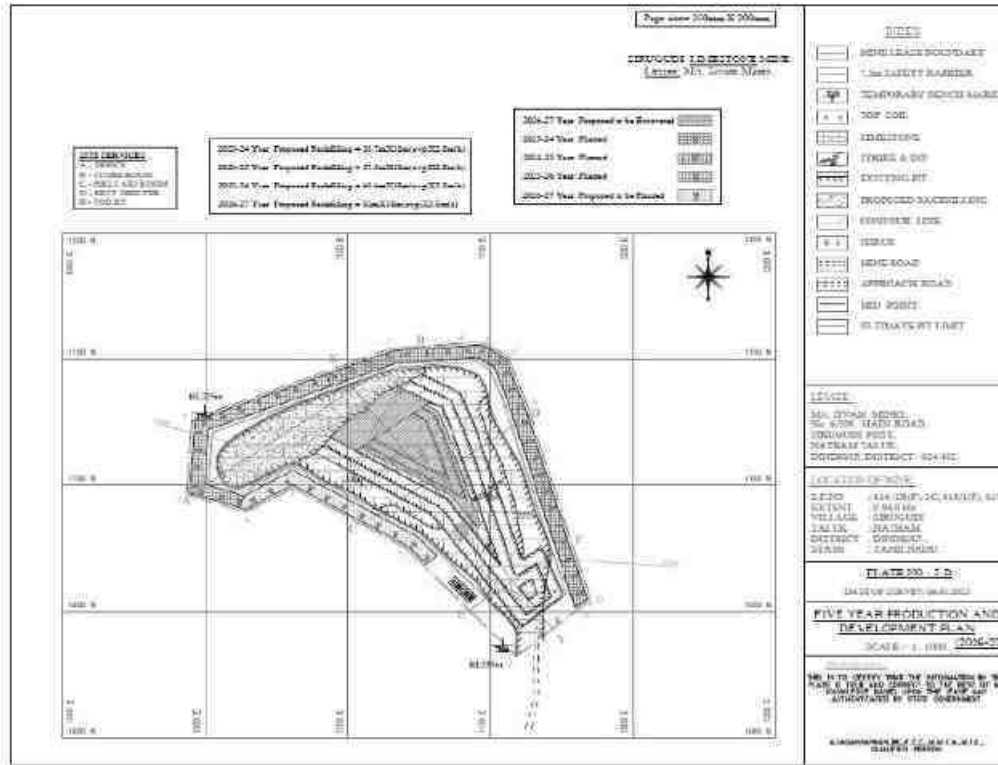
**YEAR WISE PLAN AND SECTIONS 2024-2025**



**YEAR WISE PLAN AND SECTIONS 2025-2026**



**YEAR WISE PLAN AND SECTIONS 2026-2027**



## 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 1.0m height and 1.5width with 45°slope.
- In mineral, seven benches are proposed with 3m height & 3m 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 3 – 4, 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 1 m; Top soil previously removed is preserved all along the boundary barrier to facilitate the greenbelt. There is no topsoil proposed for this Review of Mining plan period.

### 2.5.5 WASTE MANAGEMENT

**TABLE 2.10: DISPOSAL OF WASTE**

Description	Details
Existing waste	35m X 10m X 3.5m (h) & South East
Proposed waste (Mineral reject)	Existing and Proposed Mineral reject temporary dump 82m X 18m (avg) X 2.8m(h) (max)& Northwest
Top soil dump	There is no proposal for removal of topsoil during the Review of Mining plan period

Source: Approved Mining Plan

The grade below 40% of CaCO<sub>3</sub> 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 500 Numbers of saplings are proposed to be planted in the in the boundary barrier and village roads as indicated in the afforestation plan with 3m X 3m spacing 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) [2022-23 to 2026-27]	Area at the end of life of Mine (Ha)
1	Mining (Quarry )	0.56.4	Nil	0.56.4
2.	Waste dump	0.03.5	Nil*	Nil*
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	0.28.1	0.20.6	0.20.6
10.	Total	<b>0.94.0</b>		<b>0.94.0</b>

\* includes area under mining

### 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 road
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 needy cement industries for the peak production capacity.

Average Proposed production of Limestone per annum	=	6054 tonnes
Average Proposed production of Limestone per day	=	6054/300 = 20 tonnes
Capacity of tipper	=	12 tonnes
No of vehicles for the transportation	=	20 tonnes / 12 tonnes
	=	2 Trips 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.

### **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	0.4KLD	Approved Water Vendors
<b>Total</b>		<b>2 KLD</b>

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<sup>3</sup> 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 has 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	Details
Mining engineer	1
Geologist	1
Foreman	1
Mine-Mate	1
Drill Operator	4
Others	3
Semi-Skilled Workers	1
Un skilled Labour	3
<b>Total</b>	<b>15</b>

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
		1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	
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 3, 63,000/-
Operational Cost	Rs 84, 00,000/-
<b>Total</b>	<b>Rs 87, 63,000/-</b>



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### 3.DESCRPTION 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 Pre 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 <sub>10</sub> PM <sub>2.5</sub> SO <sub>2</sub> NO <sub>x</sub> 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 Quadrat & 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 &amp; CC.



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### **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 °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 2023 – 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.

### 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.

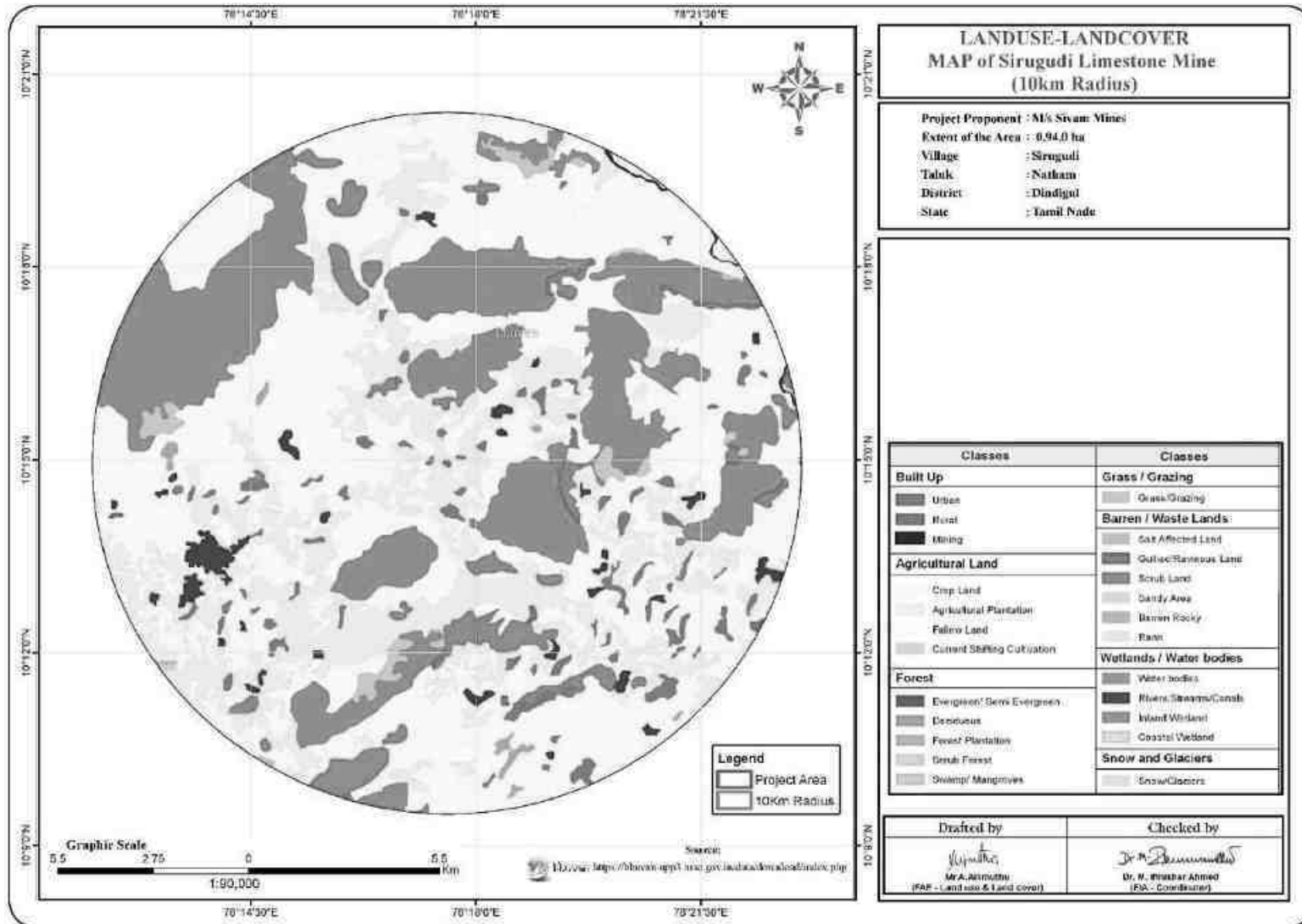
### 3.1.4 DESCRIPTION OF LAND USE

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

**TABLE 3.2: LAND USELAND COVER TABLE 10KM RADIUS**

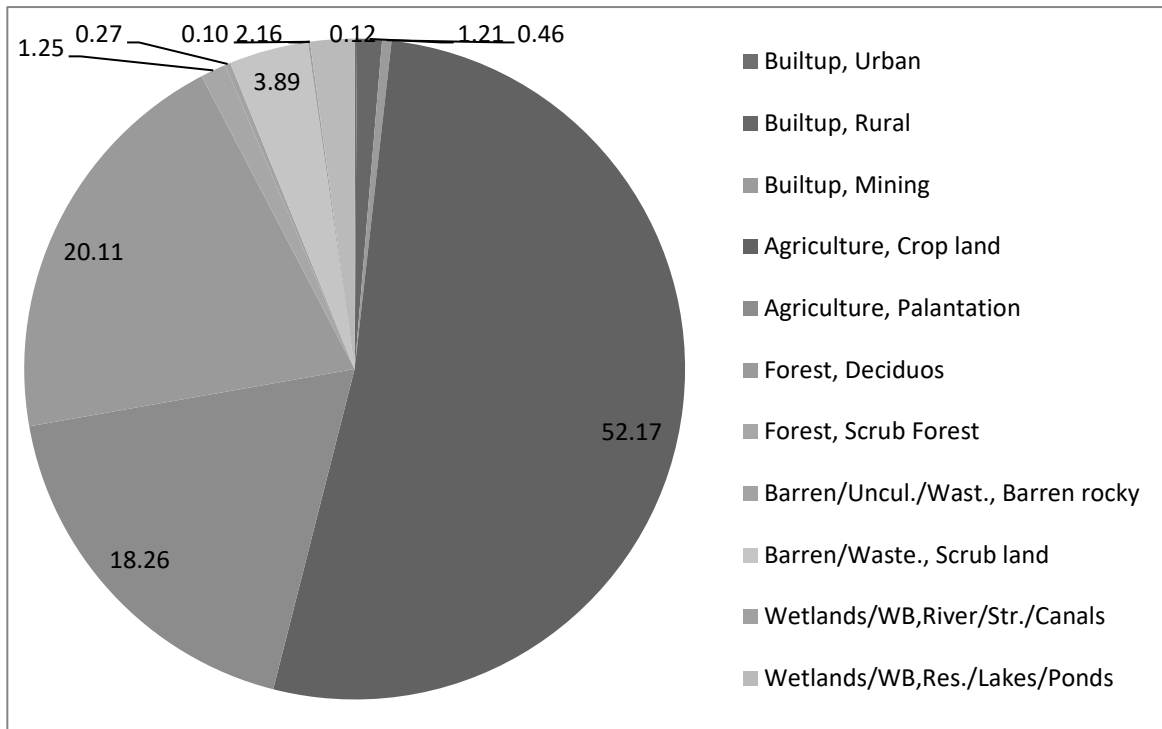
Sl.No.	Classification	Area in Ha.	Area in %
1	Builtup, Urban	36.99	0.12
2	Builtup, Rural	384.83	1.21
3	Builtup, Mining	146.85	0.46
4	Agriculture, Crop land	16592.75	52.17
5	Agriculture, Plantation	5808.03	18.26
7	Forest, Deciduos	6396.36	20.11
9	Forest, Scrub Forest	396.87	1.25
12	Barren/Uncul./Wast., 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
<b>Total</b>		<b>31802.33</b>	<b>100.00</b>

**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 0.94.0 ha which covers about 0.64% 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	Budagudimalai RF	1.5Km East
		Nedunkuttu RF	1.50Km North
		Poolamalai RF	2.3Km South East
		Karumalai RF	3.9km Northeast
		Karandamalai RF	6.2 Km North West
		Methugumalai RF	3.9 Km North West
3	Lakes/Reservoir/Dams	Sirugudi Village Tank	900m South West
		Sirugudi Village Tank	750 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 225 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.

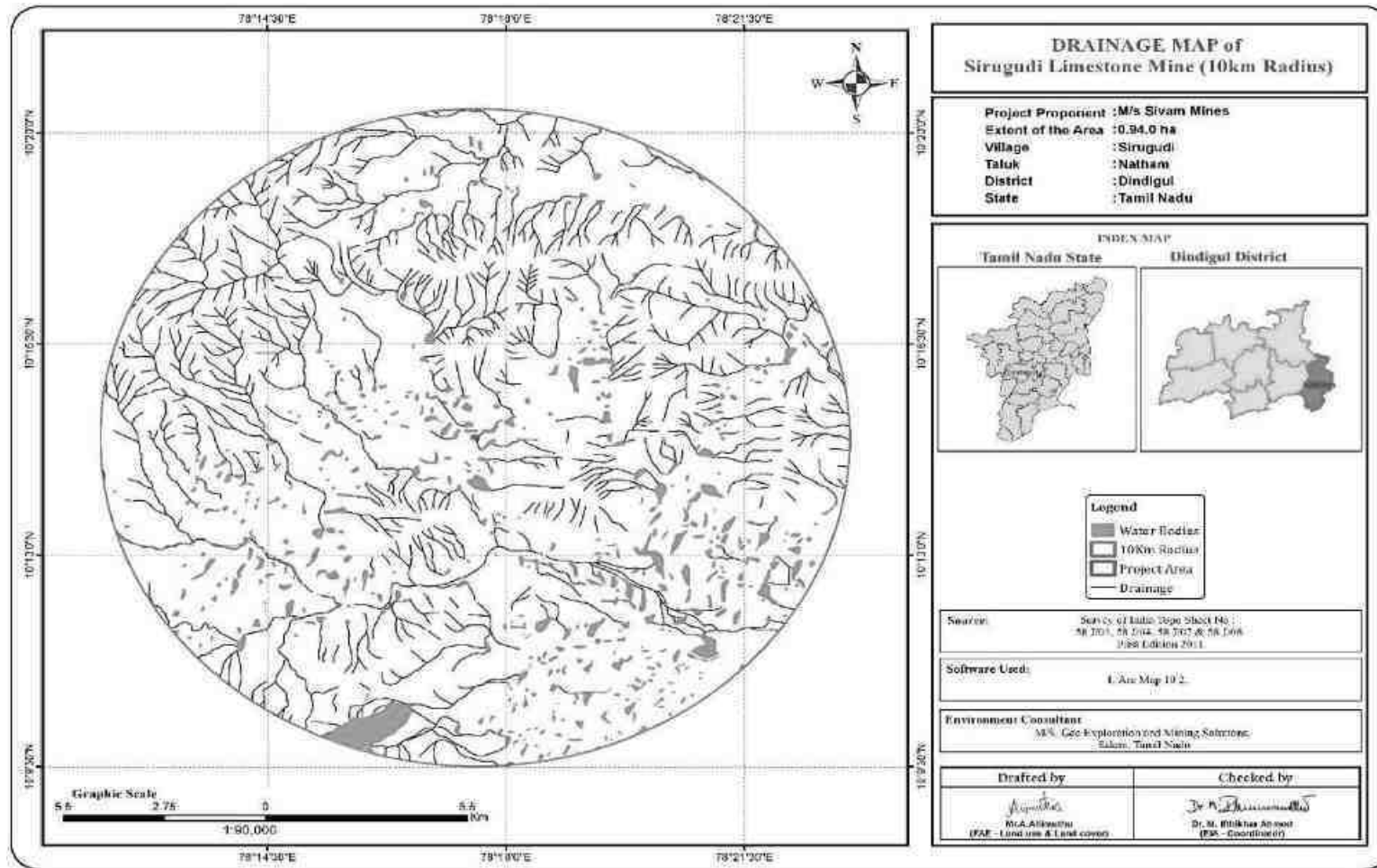
### 3.1.8 SEISMIC SENSITIVITY

Zone II, Low Risk Zone ([https://moes.gov.in/writereaddata/files/LS\\_EN\\_20032020\\_385.pdf](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 –

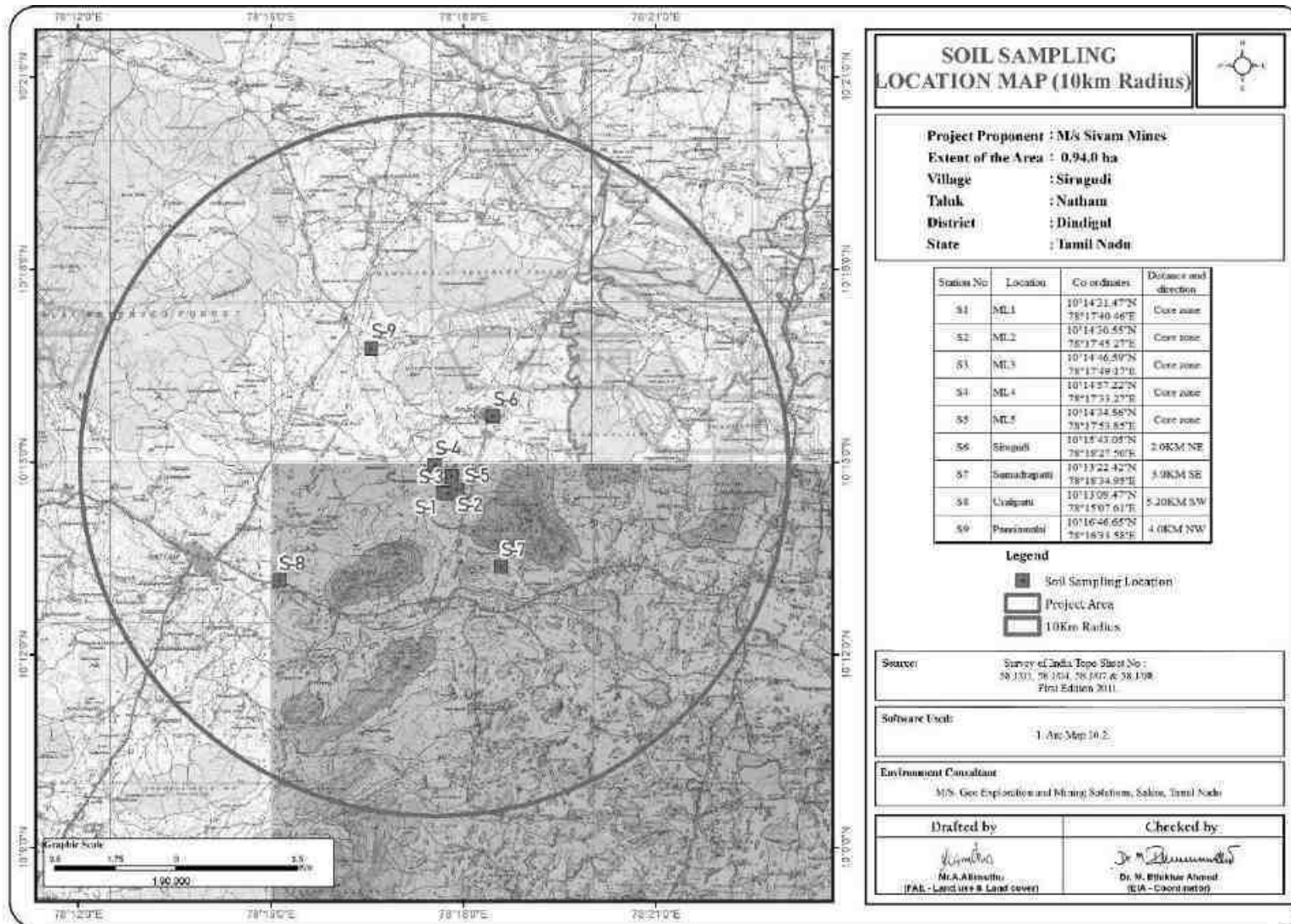
It is most essential to obtain a representative sample of soil from an area in any study. A composite sample of an area is normally preferred. The soil sample was collected from different locations in the month of October 2023 by hand auger boring and from trial pit method up to the depth of 90 cm and 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

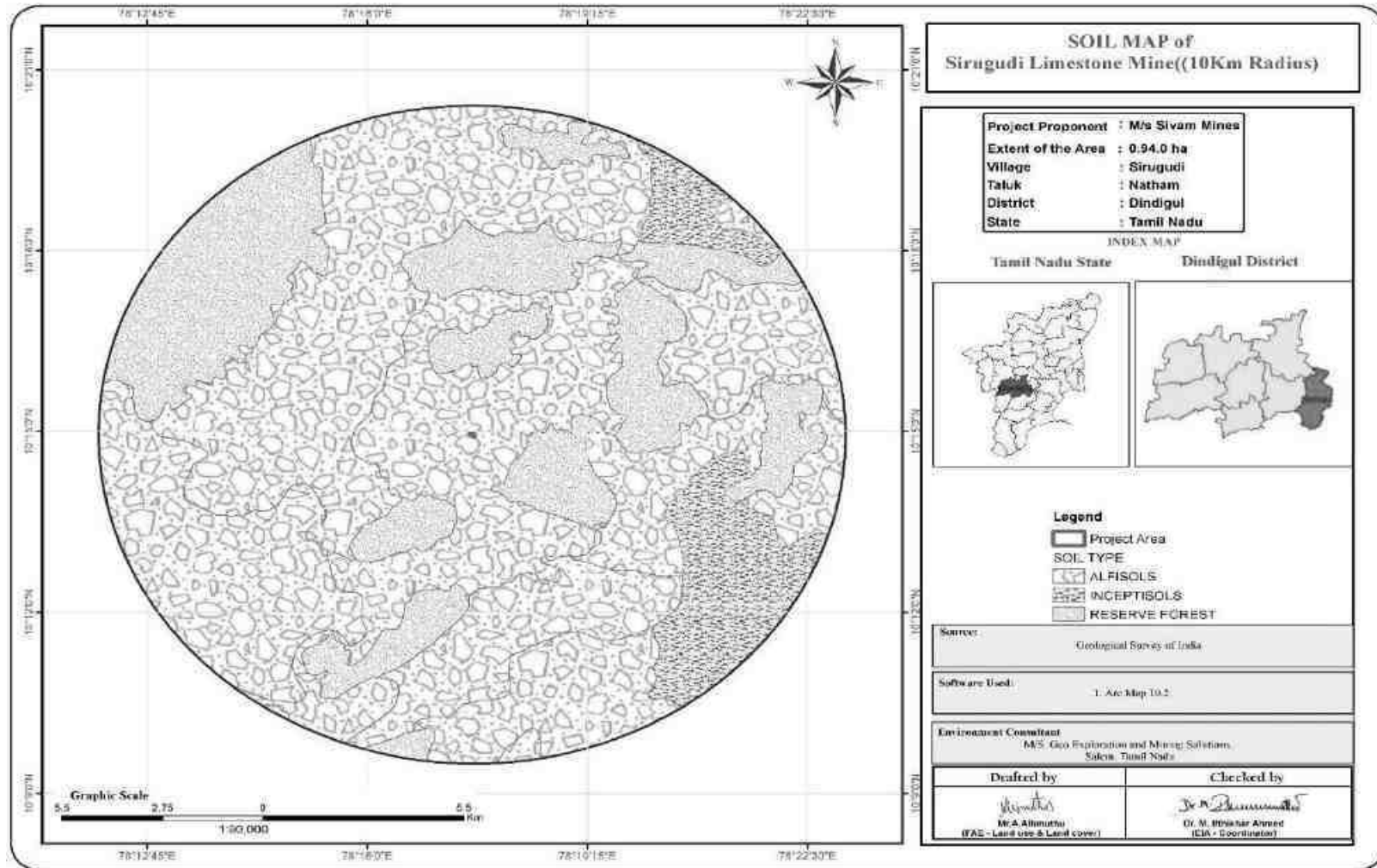
Source: Baseline Monitoring Data at Project Site

**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, $\mu$ S/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, $\mu$ g/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 <sup>-</sup> , 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 <sub>4</sub> ,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 <sub>3</sub> , %	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

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### 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.

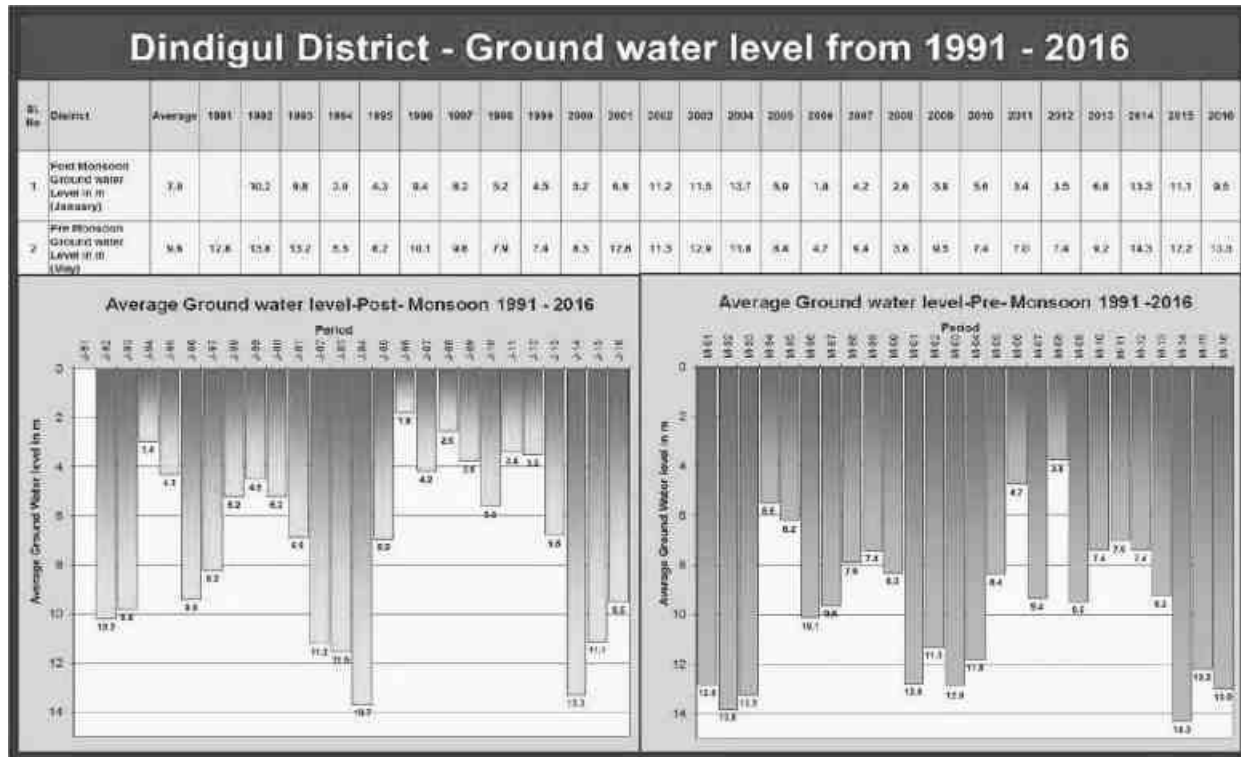
General water level of the area falls between 35m to 30m (35m in summer and 30m in rainy season).

#### 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.

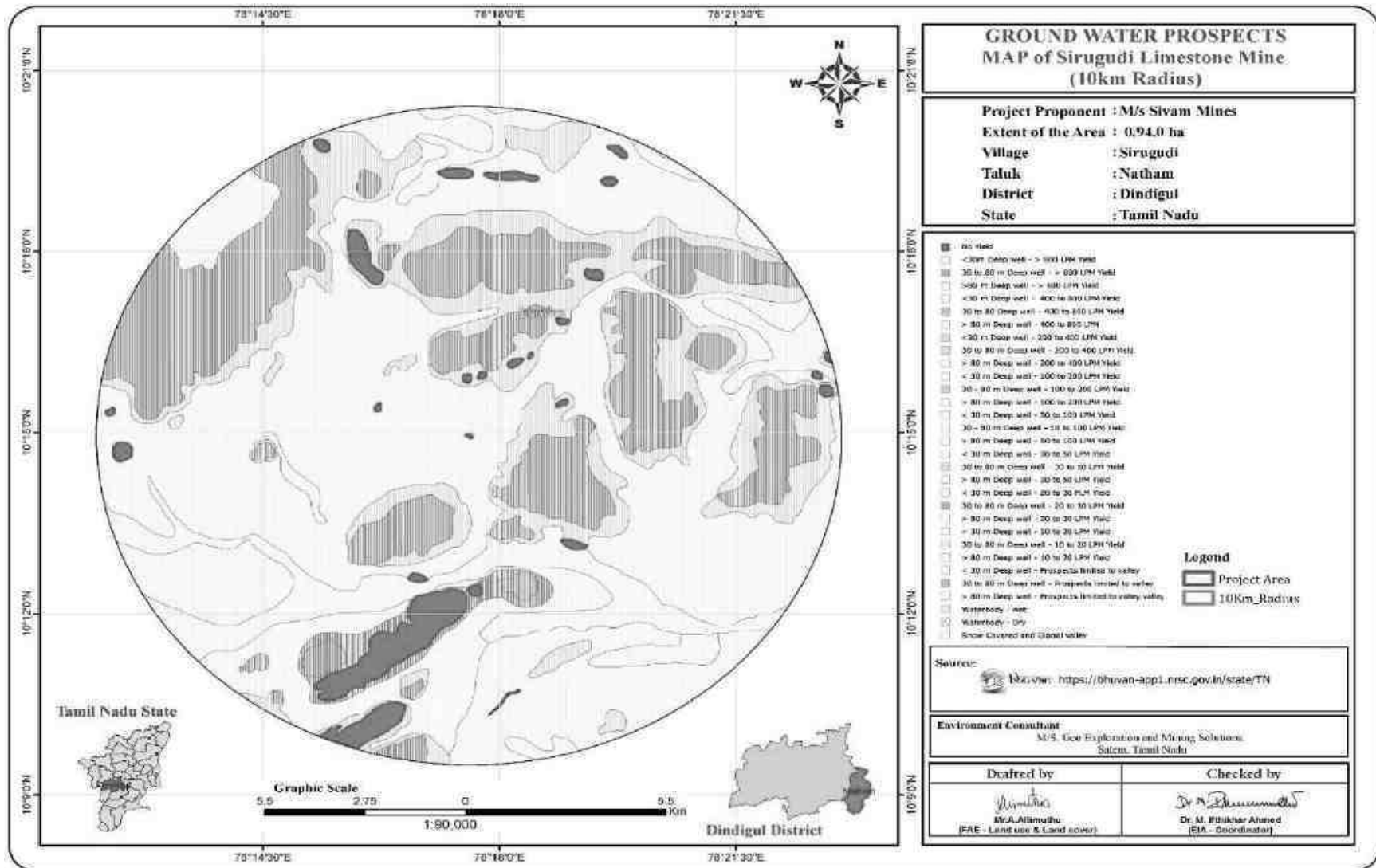
The study area falls in the Natham block which is categorized as Semi Critical (70%-90%) as per G.O. (MS) No 113 dated 09.06.2016.

**FIGURE 3.7: DISTRICT GROUND WATER LEVEL CHART**



Source: [http://www.twadboard.gov.in/twad/dgl\\_dist.aspx](http://www.twadboard.gov.in/twad/dgl_dist.aspx)  
 TWAD BOARD Tamil Nadu Water Supply and Drainage Board

**FIGURE 3.8: GROUND WATER LEVEL MAP 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: LabMonitoring Data

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**Methodology for sample collection –**

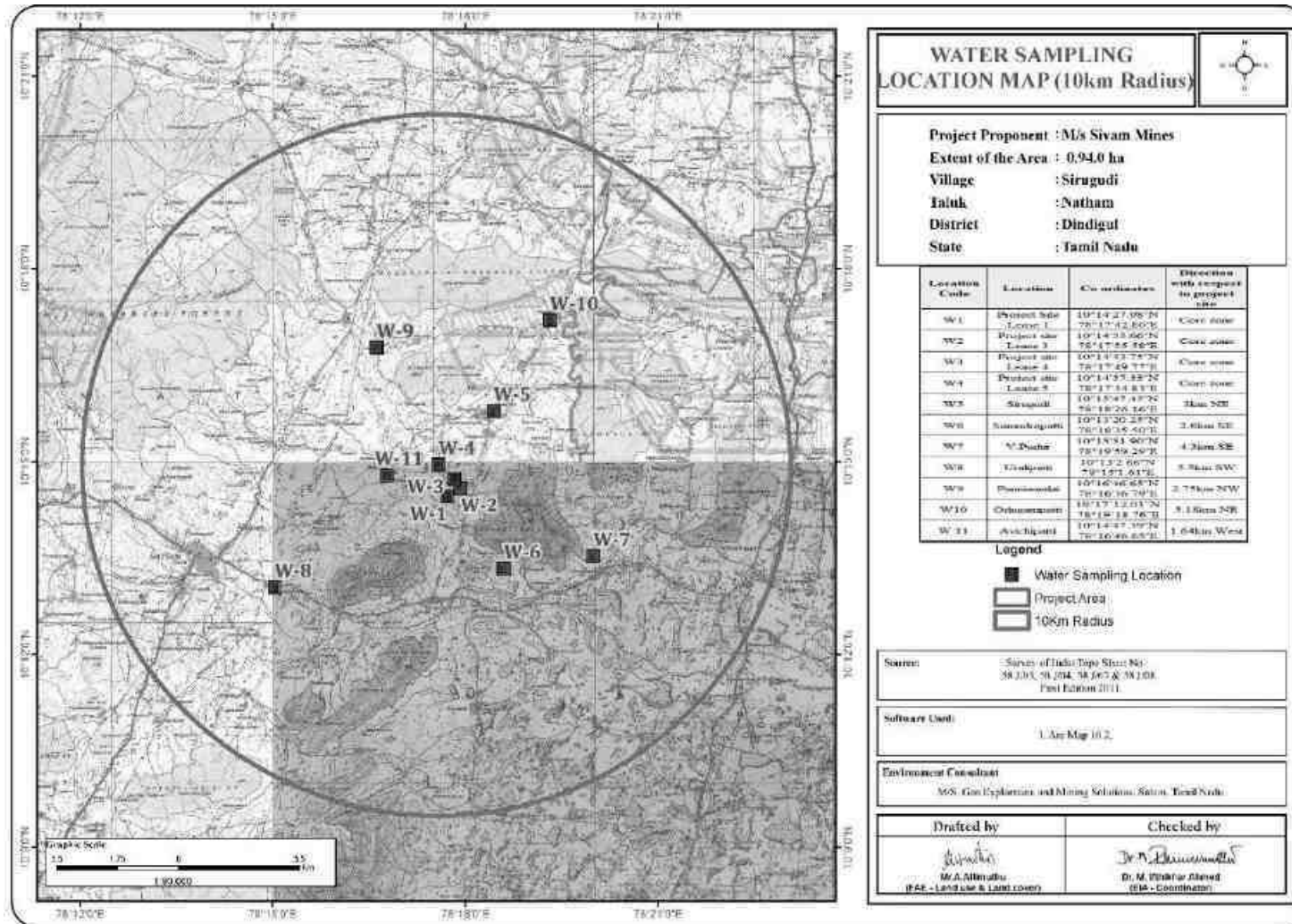
Water sample was collected in the month of November - 2023.

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 MONITORING LOCATIONS**



Source: Survey of India Toposheet, 11<sup>th</sup> Edition, 2011

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**FIGURE 3.10: WATER SAMPLE COLLECTION IN MINE PIT AND 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 <sub>3</sub>	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 <sup>-</sup>	mg/l	260	265	95	192	200	178	125	155	146	155	50	250 / 1000	
10	Sulphate as SO <sub>4</sub> <sup>-</sup>	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)	BDL (DL:0.1)	-
13	Phosphate as PO <sub>4</sub>	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)	BDL (DL:0.1)	-
14	Silica as SiO <sub>2</sub>	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	mg/l	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	
16	E.Coli	mg/l	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	

Source: LabAnalysisResults

**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: LabMonitoring 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

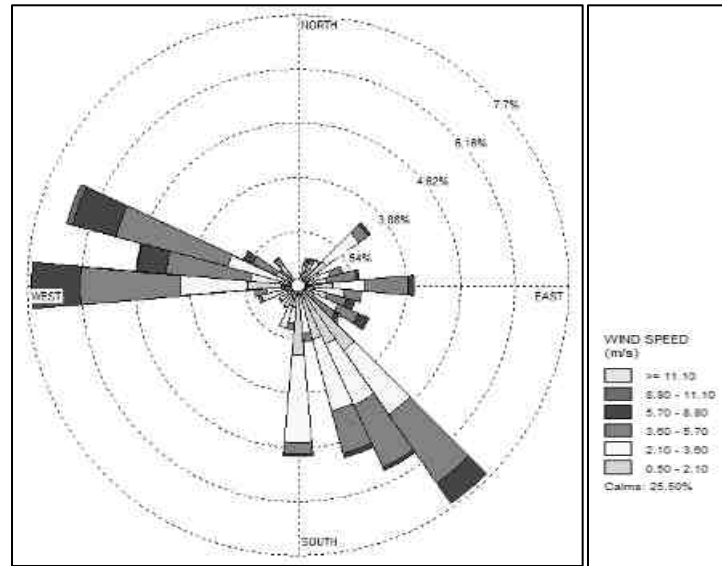
#### Rainfall

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

**TABLE 3.9: LAST FIVE YEARS RAINFALL DATA**

Actual rainfall in mm					Normal rainfall in mm
2017	2018	2019	2020	2021	
925.5	799.9	712.8	959.4	1238.5	985

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

**FIGURE 3.11: WIND ROSE DIAGRAM**

### 3.3.4 AMBIENT AIR QUALITY

Objectives:–

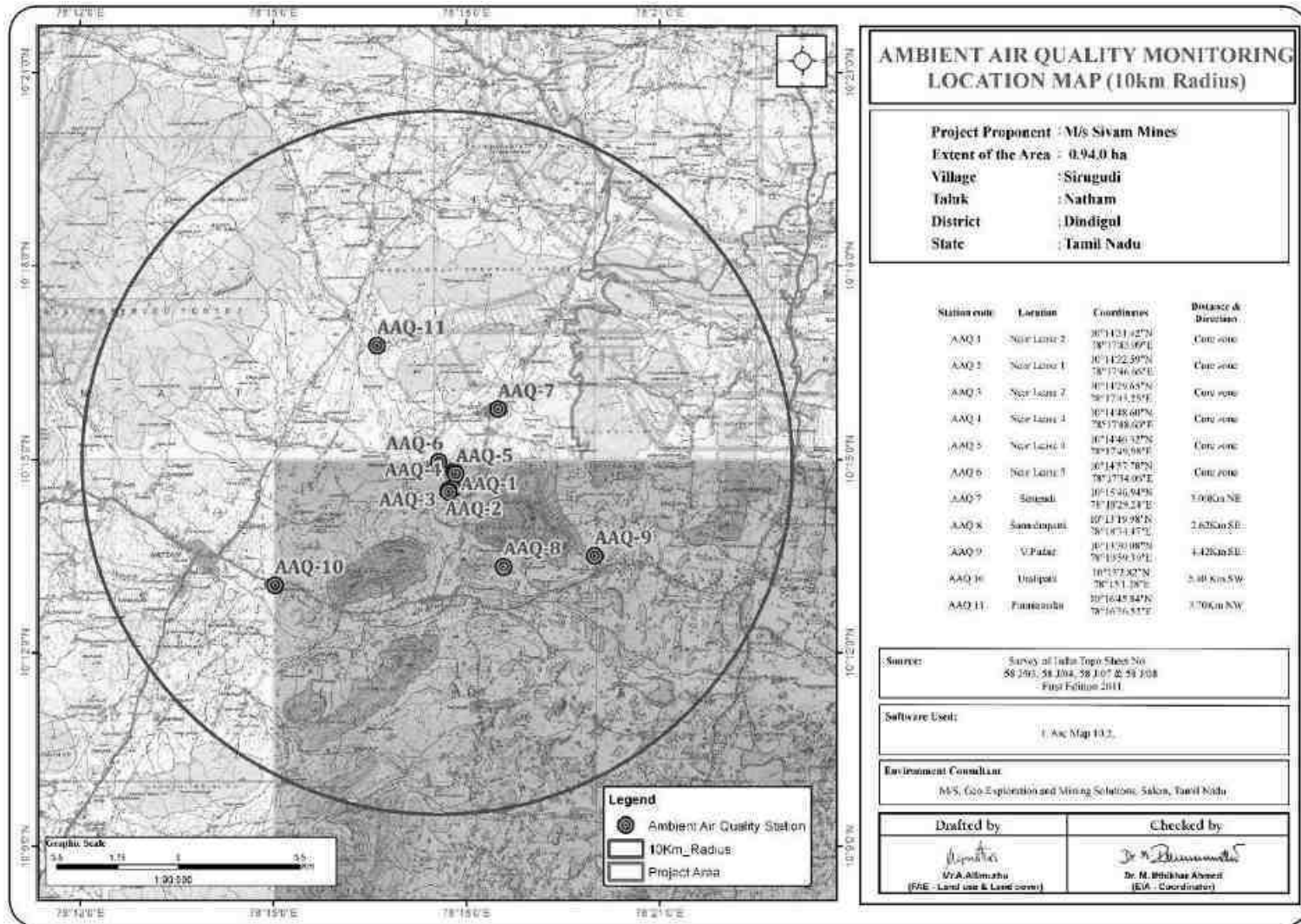
- The prime objective of the baseline air quality monitoring is to evaluate the existing air quality of the area in conformity to NAAQS (National Ambient Air Quality Standards) 2009.
- To identify specific industrial and other sources of pollution.
- To assess health hazards and potential damage to property.
- 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 2023 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, 11<sup>th</sup> 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<sub>2</sub>
- Nitrogen dioxide as NO<sub>2</sub>
- Particulate Matter (Size Less than 10 µm) as PM<sub>10</sub>
- Particulate Matter (Size Less than 2.5 µm) as PM<sub>2.5</sub>
- Ozone as O<sub>3</sub>
- Lead as Pb,
- Carbon Monoxide as CO
- Ammonia as NH<sub>3</sub>
- Benzene as C<sub>6</sub> H<sub>6</sub>
- 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 <sup>3</sup> /min ±0.02 m <sup>3</sup> /min (PM <sub>10</sub> )	0 – 3 LPM ± 0.2 LPM (gases)
Fine Particulate Sampler	APM 550	±0.03 DGM m <sup>3</sup> (PM <sub>2.5</sub> )	

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 <sub>10</sub>	IS 5182 (Part–23) 2006
B   PM <sub>2.5</sub>	IS 5182 (Part–23) 2006
C   SO <sub>2</sub> (Sulfur Dioxide)	IS 5182 (Part–2) 2001, with Improved West & Gaeke Method
D   NO <sub>x</sub> (Oxides of Nitrogen)	Modified Jacobs – Hochheiser Method / Arsenite Method (IS 5182 Part 6) 2011

Source: Lab Monitoring Data

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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<sub>2</sub> and Arsenite Modified Jacob & Hochheiser has been adopted for estimation of NO<sub>x</sub>.NH<sub>3</sub> by Indophenols blue Method, O<sub>3</sub> 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 2023 – December 2023

Location: AAQ1- Near lease area 2

Sampling Time: 24-hourly

Monitoring		Particulates, $\mu\text{g}/\text{m}^3$		Gaseous Pollutants, $\mu\text{g}/\text{m}^3$					Other Pollutants (Particulate Phase), $\mu\text{g}/\text{m}^3$				
Date	Period, hrs.	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	NH <sub>3</sub>	O <sub>3</sub> (8-hly Avg.)	CO (8-hly Avg.)	Pb, $\mu\text{g}/\text{m}^3$	As, $\text{ng}/\text{m}^3$	Ni, $\text{ng}/\text{m}^3$	C <sub>6</sub> H <sub>6</sub> , $\text{ng}/\text{m}^3$	BaP, $\text{ng}/\text{m}^3$
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: LabAnalysis Results

Legend: **PM<sub>2.5</sub>**-Particulate Matter size less than 2.5  $\mu\text{m}$ ; **PM<sub>10</sub>**-Respirable Particulate Matter size less than 10  $\mu\text{m}$ ; **SO<sub>2</sub>**-Sulphur dioxide; **NO<sub>x</sub>**-Oxides of Nitrogen; **NH<sub>3</sub>**-Ammonia; **O<sub>3</sub>**-Ozone; **CO**-Carbon monoxide;**Pb**-Particulate Lead; **As**-Particulate Arsenic; **Ni**-Particulate Nickel; **C<sub>6</sub>H<sub>6</sub>**-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 2023– December 2023

Location: AAQ2-Lease 1

Sampling Time: 24-hourly

Monitoring		Particulates, $\mu\text{g}/\text{m}^3$		Gaseous Pollutants, $\mu\text{g}/\text{m}^3$					Other Pollutants (Particulate Phase), $\mu\text{g}/\text{m}^3$				
Date	Period, hrs.	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	NH <sub>3</sub>	O <sub>3</sub> (8-hly Avg.)	CO (8-hly Avg.)	Pb, $\mu\text{g}/\text{m}^3$	As, $\text{ng}/\text{m}^3$	Ni, $\text{ng}/\text{m}^3$	C <sub>6</sub> H <sub>6</sub> , $\text{ng}/\text{m}^3$	BaP, $\text{ng}/\text{m}^3$
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	12.5	<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	12.9	<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 – A3**

Period: October 2023– December 2023

Location: AAQ3- Lease 2

Sampling Time: 24-hourly

Monitoring		Particulates, $\mu\text{g}/\text{m}^3$		Gaseous Pollutants, $\mu\text{g}/\text{m}^3$					Other Pollutants (Particulate Phase), $\mu\text{g}/\text{m}^3$				
Date	Period, hrs.	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	NH <sub>3</sub>	O <sub>3</sub> (8-hly Avg.)	CO (8-hly Avg.)	Pb, $\mu\text{g}/\text{m}^3$	As, $\text{ng}/\text{m}^3$	Ni, $\text{ng}/\text{m}^3$	C <sub>6</sub> H <sub>6</sub> , $\text{ng}/\text{m}^3$	BaP, $\text{ng}/\text{m}^3$
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: LabAnalysis Results

**TABLE 3.15: AMBIENT AIR QUALITY – AAQ4**

Period: October 2023– December 2023

Location: AAQ4-Lease - 4

Sampling Time: 24-hourly

Monitoring		Particulates, µg/m <sup>3</sup>		Gaseous Pollutants, µg/m <sup>3</sup>					Other Pollutants (Particulate Phase) , µg/m <sup>3</sup>				
Date	Period, hrs.	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	NH <sub>3</sub>	O <sub>3</sub> (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m <sup>3</sup>	As, ng/m <sup>3</sup>	Ni, ng/m <sup>3</sup>	C <sub>6</sub> H <sub>6</sub> , ng/m <sup>3</sup>	BaP, ng/m <sup>3</sup>
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 2023 – December 2023

Location: AAQ5-P. Lease 4

Sampling Time: 24-hourly

Monitoring		Particulates, µg/m <sup>3</sup>		Gaseous Pollutants, µg/m <sup>3</sup>					Other Pollutants (Particulate Phase) , µg/m <sup>3</sup>				
Date	Period, hrs.	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	NH <sub>3</sub>	O <sub>3</sub> (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m <sup>3</sup>	As, ng/m <sup>3</sup>	Ni, ng/m <sup>3</sup>	C <sub>6</sub> H <sub>6</sub> , ng/m <sup>3</sup>	BaP, ng/m <sup>3</sup>
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: LabAnalysis Results



**TABLE 3.17: AMBIENT AIR QUALITY – AAQ6**

Period: October 2023– December 2023

Location: AAQ6- Lease 5

Sampling Time: 24-hourly

Monitoring		Particulates, µg/m <sup>3</sup>		Gaseous Pollutants, µg/m <sup>3</sup>					Other Pollutants (Particulate Phase), µg/m <sup>3</sup>				
Date	Period, hrs.	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	NH <sub>3</sub>	O <sub>3</sub> (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m <sup>3</sup>	As, ng/m <sup>3</sup>	Ni, ng/m <sup>3</sup>	C <sub>6</sub> H <sub>6</sub> , ng/m <sup>3</sup>	BaP, ng/m <sup>3</sup>
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 2023– December 2023

Location: AAQ7- Sirugudi

Sampling Time: 24-hourly

Monitoring		Particulates, $\mu\text{g}/\text{m}^3$		Gaseous Pollutants, $\mu\text{g}/\text{m}^3$					Other Pollutants (Particulate Phase), $\mu\text{g}/\text{m}^3$				
Date	Period, hrs.	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	NH <sub>3</sub>	O <sub>3</sub> (8-hly Avg.)	CO (8-hly Avg.)	Pb, $\mu\text{g}/\text{m}^3$	As, $\text{ng}/\text{m}^3$	Ni, $\text{ng}/\text{m}^3$	C <sub>6</sub> H <sub>6</sub> , $\text{ng}/\text{m}^3$	BaP, $\text{ng}/\text{m}^3$
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 2023 – December 2023

Location: AAQ8- Samudrapatti

Sampling Time: 24-hourly

Monitoring		Particulates, µg/m <sup>3</sup>		Gaseous Pollutants, µg/m <sup>3</sup>					Other Pollutants (Particulate Phase) , µg/m <sup>3</sup>				
Date	Period, hrs.	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	NH <sub>3</sub>	O <sub>3</sub> (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m <sup>3</sup>	As, ng/m <sup>3</sup>	Ni, ng/m <sup>3</sup>	C <sub>6</sub> H <sub>6</sub> , ng/m <sup>3</sup>	BaP, ng/m <sup>3</sup>
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 2023 – December 2023

Location: AAQ9- V.Pudur

Sampling Time: 24-hourly

Monitoring		Particulates, µg/m <sup>3</sup>		Gaseous Pollutants, µg/m <sup>3</sup>					Other Pollutants (Particulate Phase), µg/m <sup>3</sup>				
Date	Period, hrs.	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	NH <sub>3</sub>	O <sub>3</sub> (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m <sup>3</sup>	As, ng/m <sup>3</sup>	Ni, ng/m <sup>3</sup>	C <sub>6</sub> H <sub>6</sub> , ng/m <sup>3</sup>	BaP, ng/m <sup>3</sup>
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 2023– December 2023

Location: AAQ10 - Uralipatti

Sampling Time: 24-hourly

Monitoring		Particulates, µg/m <sup>3</sup>		Gaseous Pollutants, µg/m <sup>3</sup>					Other Pollutants (Particulate Phase), µg/m <sup>3</sup>				
Date	Period, hrs.	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	NH <sub>3</sub>	O <sub>3</sub> (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m <sup>3</sup>	As, ng/m <sup>3</sup>	Ni, ng/m <sup>3</sup>	C <sub>6</sub> H <sub>6</sub> , ng/m <sup>3</sup>	BaP, ng/m <sup>3</sup>
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: LabAnalysis Results

**TABLE 3.22: AMBIENT AIR QUALITY – AAQ11**

Period: October 2023 – December 2023

Location: AAQ11 - Panniamalai

Sampling Time: 24-hourly

Monitoring		Particulates, µg/m <sup>3</sup>		Gaseous Pollutants, µg/m <sup>3</sup>					Other Pollutants (Particulate Phase), µg/m <sup>3</sup>				
Date	Period, hrs.	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	NH <sub>3</sub>	O <sub>3</sub> (8-hly Avg.)	CO (8-hly Avg.)	Pb, µg/m <sup>3</sup>	As, ng/m <sup>3</sup>	Ni, ng/m <sup>3</sup>	C <sub>6</sub> H <sub>6</sub> , ng/m <sup>3</sup>	BaP, ng/m <sup>3</sup>
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: LabAnalysis Results

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

Sl. No.	Parameter	Pollutant Concentration, $\mu\text{g}/\text{m}^3$							
		PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>
		AAQ1- Northeast corner of quarry				AAQ2-Northeast corner of quarry			
1	No. of Observations	24	24	24	24	24	24	24	24
2	10 <sup>th</sup> Percentile Value	17.3	35.3	4.1	17.36	17.36	35.40	4.10	12.33
3	20 <sup>th</sup> Percentile Value	17.3	35.4	4.16	17.72	17.72	35.70	4.20	12.60
4	30 <sup>th</sup> Percentile Value	17.76	35.4	4.2	17.90	17.90	35.80	4.20	12.97
5	40 <sup>th</sup> Percentile Value	18.12	36.16	4.3	18.12	18.12	36.14	4.22	13.20
6	50 <sup>th</sup> Percentile Value	18.35	36.55	4.35	18.35	18.35	36.35	4.30	13.45
7	60 <sup>th</sup> Percentile Value	18.4	36.7	4.4	18.58	18.58	36.64	4.30	13.68
8	70 <sup>th</sup> Percentile Value	18.4	36.71	4.41	19.10	19.10	36.81	4.40	13.81
9	80 <sup>th</sup> Percentile Value	18.86	37.1	4.5	19.20	19.20	36.98	4.40	14.18
10	90 <sup>th</sup> Percentile Value	19.34	37.17	4.5	19.58	19.58	37.75	4.50	14.84
11	95 <sup>th</sup> Percentile Value	19.4	37.285	4.5	19.79	19.79	37.90	4.50	38.36
12	98 <sup>th</sup> Percentile Value	19.67	37.624	4.5	19.85	19.85	37.90	4.50	42.72
13	Arithmetic Mean	<b>18.45</b>	<b>36.49</b>	<b>4.36</b>	<b>18.69</b>	<b>18.69</b>	36.67	<b>43.3</b>	<b>18.38</b>
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*	<b>60</b>	<b>100</b>	<b>80</b>	<b>60</b>	<b>100</b>	<b>100</b>	<b>80</b>	<b>60</b>
17	% Values exceeding Norms*	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	35.40	<b>0</b>	<b>0</b>

Source: LabAnalysis Results

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

Sl. No.	Parameter	Pollutant Concentration, $\mu\text{g}/\text{m}^3$							
		PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>
		AAQ3 - Southeast corner of quarry				AAQ4 - Northeast corner of quarry			
1	No. of Observations	24	24	24	24	24	24	24	24
2	10 <sup>th</sup> Percentile Value	17.46	35.40	4.10	12.46	17.40	35.90	4.20	12.40
3	20 <sup>th</sup> Percentile Value	17.78	35.70	4.20	12.66	17.60	36.22	4.20	12.64
4	30 <sup>th</sup> Percentile Value	18.17	35.80	4.20	12.88	17.89	36.39	4.29	12.90
5	40 <sup>th</sup> Percentile Value	18.32	36.14	4.30	13.12	18.12	36.70	4.30	13.12
6	50 <sup>th</sup> Percentile Value	18.45	36.35	4.30	13.25	18.30	36.90	4.30	13.25
7	60 <sup>th</sup> Percentile Value	18.68	36.64	4.30	13.68	18.40	37.18	4.40	13.70
8	70 <sup>th</sup> Percentile Value	18.71	36.81	4.40	13.81	18.90	37.31	4.40	13.81
9	80 <sup>th</sup> Percentile Value	19.20	36.98	4.50	14.24	19.18	37.56	4.44	13.98
10	90 <sup>th</sup> Percentile Value	19.37	37.75	4.50	14.58	19.47	37.87	4.50	14.27
11	95 <sup>th</sup> Percentile Value	19.57	37.90	4.50	14.87	19.76	37.90	4.50	14.64
12	98 <sup>th</sup> 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: LabAnalysis Results

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

Sl. No.	Parameter	Pollutant Concentration, $\mu\text{g}/\text{m}^3$							
		PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>
		AAQ5 – Northeast corner of quarry				AAQ6 - Northeast corner of quarry			
1	No. of Observations	24	24	24	24	24	24	24	24
2	10 <sup>th</sup> Percentile Value	17.96	35.30	4.10	12.49	17.53	35.40	4.12	12.70
3	20 <sup>th</sup> Percentile Value	18.22	35.72	4.10	12.76	17.70	35.74	4.20	12.90
4	30 <sup>th</sup> Percentile Value	18.40	35.89	4.19	13.19	17.90	35.90	4.30	13.19
5	40 <sup>th</sup> Percentile Value	18.54	36.12	4.20	13.30	18.30	36.10	4.30	13.30
6	50 <sup>th</sup> Percentile Value	18.80	36.40	4.30	13.35	18.40	36.30	4.40	13.70
7	60 <sup>th</sup> Percentile Value	19.06	36.64	4.30	13.68	18.64	36.40	4.40	13.86
8	70 <sup>th</sup> Percentile Value	19.21	36.92	4.30	13.72	18.72	36.48	4.44	14.12
9	80 <sup>th</sup> Percentile Value	19.44	37.18	4.40	13.98	19.18	36.70	4.50	14.30
10	90 <sup>th</sup> Percentile Value	19.70	37.30	4.47	14.27	19.54	36.90	4.50	14.61
11	95 <sup>th</sup> Percentile Value	19.87	37.73	4.50	14.39	19.69	37.08	4.50	14.87
12	98 <sup>th</sup> Percentile Value	19.95	37.85	4.66	14.67	19.86	37.27	4.50	14.90
13	Arithmetic Mean	<b>19.01</b>	<b>36.64</b>	<b>4.32</b>	<b>13.62</b>	<b>18.68</b>	<b>36.39</b>	<b>4.38</b>	<b>13.86</b>
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*	<b>60</b>	<b>100</b>	<b>80</b>	<b>80</b>	<b>60</b>	<b>100</b>	<b>80</b>	<b>80</b>
17	% Values exceeding Norms*	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Source: LabAnalysis Results

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

Sl. No.	Parameter	Pollutant Concentration, $\mu\text{g}/\text{m}^3$							
		PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>
		AAQ7 - Sirugudi				AAQ8 - Samudrapatti			
1	No. of Observations	24	24	24	24	24	24	24	24
2	10 <sup>th</sup> Percentile Value	20.4	39.4	5.2	16.52	20.52	39.30	5.23	17.10
3	20 <sup>th</sup> Percentile Value	21.3	39.82	5.3	17.02	21.32	39.94	5.30	17.22
4	30 <sup>th</sup> Percentile Value	21.4	40.29	5.4	17.19	21.40	40.10	5.39	17.40
5	40 <sup>th</sup> Percentile Value	21.7	40.74	5.4	17.42	21.46	40.40	5.40	17.98
6	50 <sup>th</sup> Percentile Value	22.05	41.3	5.5	17.9	21.70	40.90	5.45	18.40
7	60 <sup>th</sup> Percentile Value	22.26	41.7	5.6	18.18	22.18	41.20	5.60	18.40
8	70 <sup>th</sup> Percentile Value	22.31	42.12	5.7	18.4	22.70	41.70	5.70	18.70
9	80 <sup>th</sup> Percentile Value	22.52	42.34	5.84	19.4	22.80	42.18	5.70	19.14
10	90 <sup>th</sup> Percentile Value	23.4	42.84	5.9	19.7	23.11	42.70	5.77	19.58
11	95 <sup>th</sup> Percentile Value	23.7	42.9	5.9	19.7	23.63	42.87	5.89	19.70
12	98 <sup>th</sup> Percentile Value	23.808	42.954	5.954	19.808	23.75	42.90	5.90	19.81
13	Arithmetic Mean	<b>22.26</b>	<b>41.49</b>	<b>5.61</b>	<b>18.29</b>	<b>22.23</b>	<b>41.29</b>	<b>5.58</b>	<b>18.49</b>
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*	<b>60</b>	<b>100</b>	<b>80</b>	<b>80</b>	<b>60</b>	<b>100</b>	<b>80</b>	<b>80</b>
17	% Values exceeding Norms*	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Source: LabAnalysis Results



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

Sl. No.	Parameter	Pollutant Concentration, $\mu\text{g}/\text{m}^3$							
		PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>
		AAQ9 - V.Pudur				AAQ10 - Uralipatti			
1	No. of Observations	24	24	24	24	24	24	24	24
2	10 <sup>th</sup> Percentile Value	20.83	40.10	5.13	16.55	21.30	39.42	5.20	16.61
3	20 <sup>th</sup> Percentile Value	21.20	40.22	5.20	17.10	21.30	40.26	5.24	17.10
4	30 <sup>th</sup> Percentile Value	21.40	40.49	5.29	17.30	21.89	40.40	5.36	17.30
5	40 <sup>th</sup> Percentile Value	21.72	41.30	5.32	17.82	22.14	40.70	5.40	17.94
6	50 <sup>th</sup> Percentile Value	22.10	41.30	5.40	17.90	22.40	41.30	5.50	18.20
7	60 <sup>th</sup> Percentile Value	22.30	41.38	5.50	18.34	22.40	41.30	5.60	18.40
8	70 <sup>th</sup> Percentile Value	22.43	42.10	5.60	18.40	22.81	41.76	5.60	18.70
9	80 <sup>th</sup> Percentile Value	23.10	42.40	5.70	18.70	23.28	42.30	5.70	18.98
10	90 <sup>th</sup> Percentile Value	23.70	42.70	5.84	19.31	23.75	42.70	5.80	19.70
11	95 <sup>th</sup> Percentile Value	23.79	42.70	5.90	19.83	23.90	42.87	5.80	19.87
12	98 <sup>th</sup> Percentile Value	23.91	42.81	5.90	19.90	23.95	42.90	5.86	19.90
13	Arithmetic Mean	<b>22.41</b>	<b>41.59</b>	<b>5.53</b>	<b>18.29</b>	<b>22.65</b>	<b>41.45</b>	<b>5.55</b>	<b>18.43</b>
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*	<b>60</b>	<b>100</b>	<b>80</b>	<b>80</b>	<b>60</b>	<b>100</b>	<b>80</b>	<b>80</b>
17	% Values exceeding Norms*	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Source: LabAnalysis Results

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

Sl. No.	Parameter	Pollutant Concentration, $\mu\text{g}/\text{m}^3$			
		PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>
		AAQ11 - Panniamalai			
1	No. of Observations	24	24	24	24
2	10 <sup>th</sup> Percentile Value	21.40	40.16	5.30	16.40
3	20 <sup>th</sup> Percentile Value	21.58	40.36	5.30	16.40
4	30 <sup>th</sup> Percentile Value	22.06	40.95	5.40	17.07
5	40 <sup>th</sup> Percentile Value	22.40	41.32	5.42	17.30
6	50 <sup>th</sup> Percentile Value	22.40	41.60	5.55	17.40
7	60 <sup>th</sup> Percentile Value	22.64	42.10	5.60	17.90
8	70 <sup>th</sup> Percentile Value	23.40	42.30	5.70	17.92
9	80 <sup>th</sup> Percentile Value	23.70	42.30	5.80	18.64
10	90 <sup>th</sup> Percentile Value	23.84	42.84	5.87	19.55
11	95 <sup>th</sup> Percentile Value	23.90	42.90	5.90	19.70
12	98 <sup>th</sup> Percentile Value	26.33	42.95	5.90	19.70
13	Arithmetic Mean	<b>23.06</b>	<b>41.80</b>	<b>5.61</b>	<b>18.00</b>
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*	<b>60</b>	<b>100</b>	<b>80</b>	<b>80</b>
17	% Values exceeding Norms*	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Source: LabAnalysis Results

**Legend:** PM<sub>2.5</sub>-Particulate Matter size less than 2.5  $\mu\text{m}$ ; PM<sub>10</sub>-Respirable Particulate Matter size less than 10  $\mu\text{m}$ ; SO<sub>2</sub>-Sulphur dioxide; NO<sub>x</sub>-Oxides of Nitrogen; CO-Carbon monoxide; O<sub>3</sub>-Ozone; NH<sub>3</sub>-Ammonia; Pb-Particulate Lead; As-Particulate Arsenic; Ni-Particulate Nickel; C<sub>6</sub>H<sub>6</sub>-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<sub>10</sub> and PM<sub>2.5</sub> 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.

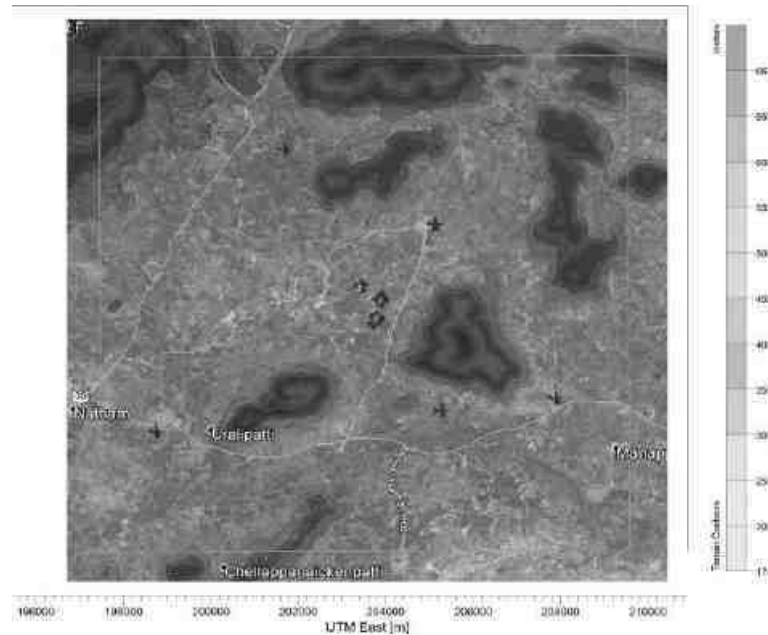
The AERMOD is actually a modeling system with three separate components:

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

Special features of AERMOD include its ability to treat the vertical inhomogeneity 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.

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**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 2023 – 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**

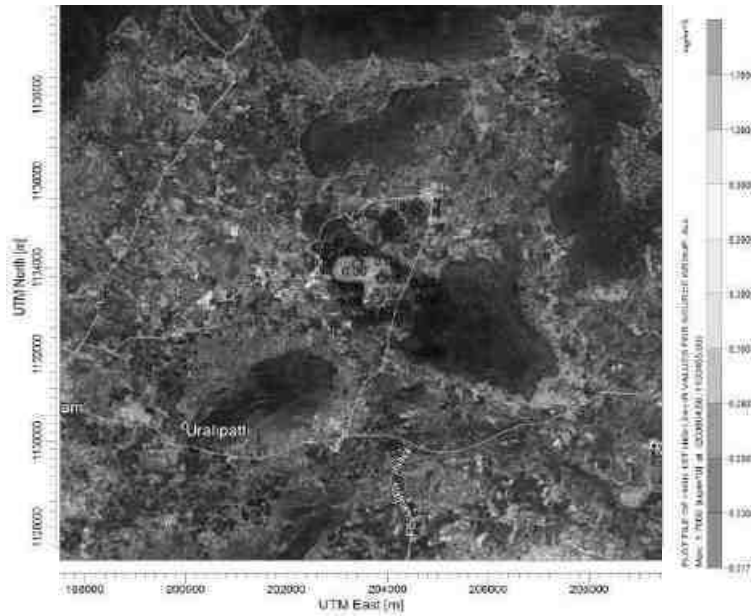
The emissions due to blasting in considered being minimal impact. Since the limestone is sold to needy industries in the raw form boulders ranging from 10cm to 30cm. no grinding is proposed hence the dust due to blasting is minimal.

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.

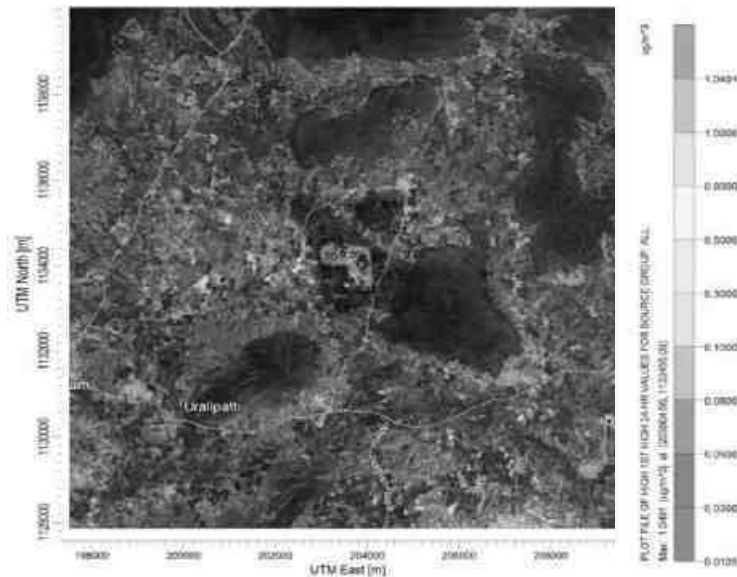
**TABLE 3.30: EMISSION RATES FOR HEAVY DUTY VEHICLES (AVERAGE)**

Pollutant	HDDV (diesel) (grams/mile)	Emission rate assuming Vehicle Travel within the project at 40 km/h(g/s)
NO <sub>x</sub>	8.613	0.029906
Pm <sub>2.5</sub>	0.202	0.001403
PM <sub>10</sub>	0.219	0.002281

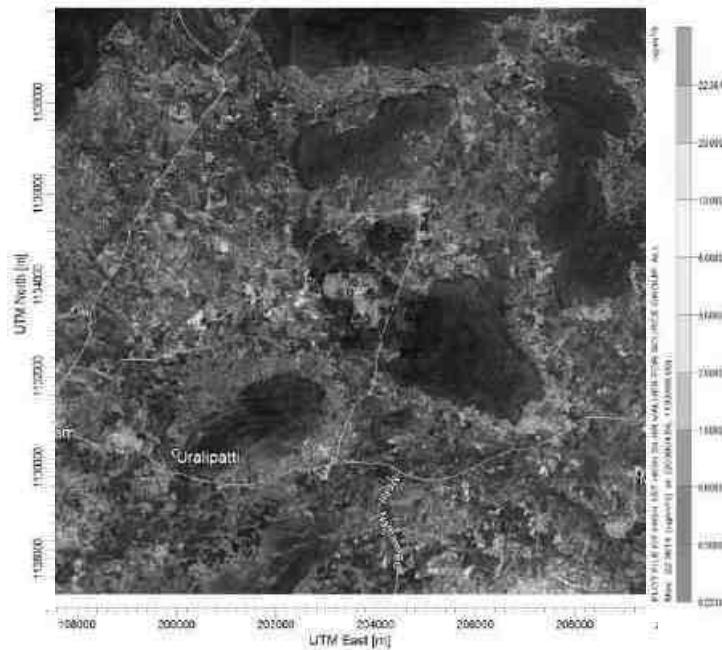
**FIGURE 3.15: PM<sub>10</sub> -24 HOUR AVERAGE**



**FIGURE 3.16: PM<sub>2.5</sub> -24 HOUR AVERAGE**



**FIGURE 3.17: NO<sub>x</sub> – 24 HOUR AVERAGE**



**RESULTS AND CONCLUSIONS**

The ground level concentrations are computed for 24-hr average. The combined ground level concentrations of PM<sub>10</sub> and NO<sub>x</sub> 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 <sub>10</sub> IN µg/m <sup>3</sup>			
	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 PM <sub>2.5</sub> IN µg/m <sup>3</sup>			
	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 <sub>x</sub> IN µg/m <sup>3</sup>			
	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 of PM<sub>10</sub>, PM<sub>2.5</sub> & NO<sub>x</sub> values are well below the standards prescribed by CPCB for ambient air quality.

### Controlling NO<sub>x</sub> Levels

NO<sub>x</sub> emissions in the mine mainly occur during blasting operations. The main reasons for NO<sub>x</sub> 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<sub>10</sub>:** The maximum and minimum concentrations for PM<sub>10</sub> were recorded as 43.00 µg/m<sup>3</sup> and 35.1 µg/m<sup>3</sup> respectively. 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<sup>3</sup>. Consent the CPCB standard of 100 µg/m<sup>3</sup>. The maximum PM<sub>10</sub> values are well within the prescribed limits.

**PM<sub>2.5</sub>:** The maximum and minimum concentrations for PM<sub>2.5</sub> were recorded as 28.4 µg/m<sup>3</sup> and 17.1 µg/m<sup>3</sup> 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<sup>3</sup>. Consent the CPCB standard of 60 µg/m<sup>3</sup>. The maximum PM<sub>2.5</sub> values are well within the prescribed limits.

**SO<sub>2</sub>:** The maximum and minimum SO<sub>2</sub> concentrations were recorded as 6.0 µg/m<sup>3</sup> and 4.0 µg/m<sup>3</sup>. 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<sup>3</sup>. Consent the CPCB standard of 80 µg/m<sup>3</sup>. The maximum SO<sub>2</sub> values are well within the prescribed limits.

**NO<sub>x</sub>:** The maximum and minimum NO<sub>x</sub> concentrations were recorded as 19.9 µg/m<sup>3</sup> and 11.2 µg/m<sup>3</sup>. 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<sup>3</sup>. Consent the CPCB standard of 80 µg/m<sup>3</sup>. The maximum NO<sub>2</sub> values are well within the prescribed limits.

The concentrations of PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, 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  $<1.0 \text{ mg/m}^3$  at all the monitoring locations against the NAAQ limit value of  $4\text{mg/m}^3$ (annual mean).

**Ozone (O<sub>3</sub>)** concentrations were monitored  $<5\mu\text{g/m}^3$  at all the monitoring locations against the NAAQ limit value of  $180\mu\text{g/m}^3$  (annual mean).

**Ammonia (NH<sub>3</sub>)** concentrations were monitored  $<5\mu\text{g/m}^3$  at all the monitoring locations against the NAAQ limit value of  $400 \mu\text{g/m}^3$  (annual mean).

**Lead (Pb)** concentrations were monitored  $<0.01 \mu\text{g/m}^3$  at all the monitoring locations against the NAAQ limit value of  $1\mu\text{g/m}^3$  (annual mean).

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

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

**Benzene (C<sub>6</sub>H<sub>6</sub>)** concentrations were monitored  $<1.0 \text{ ng/m}^3$  at all the monitoring locations against the NAAQ limit value of  $5.0 \text{ ng/m}^3$  (annual mean).

**Benzo(a) Pyrene (BaP)** concentrations were monitored  $<1.0 \text{ ng/m}^3$  at all the monitoring locations against the NAAQ limit value of  $1.0 \text{ ng/m}^3$  (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: LabMonitoring 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.

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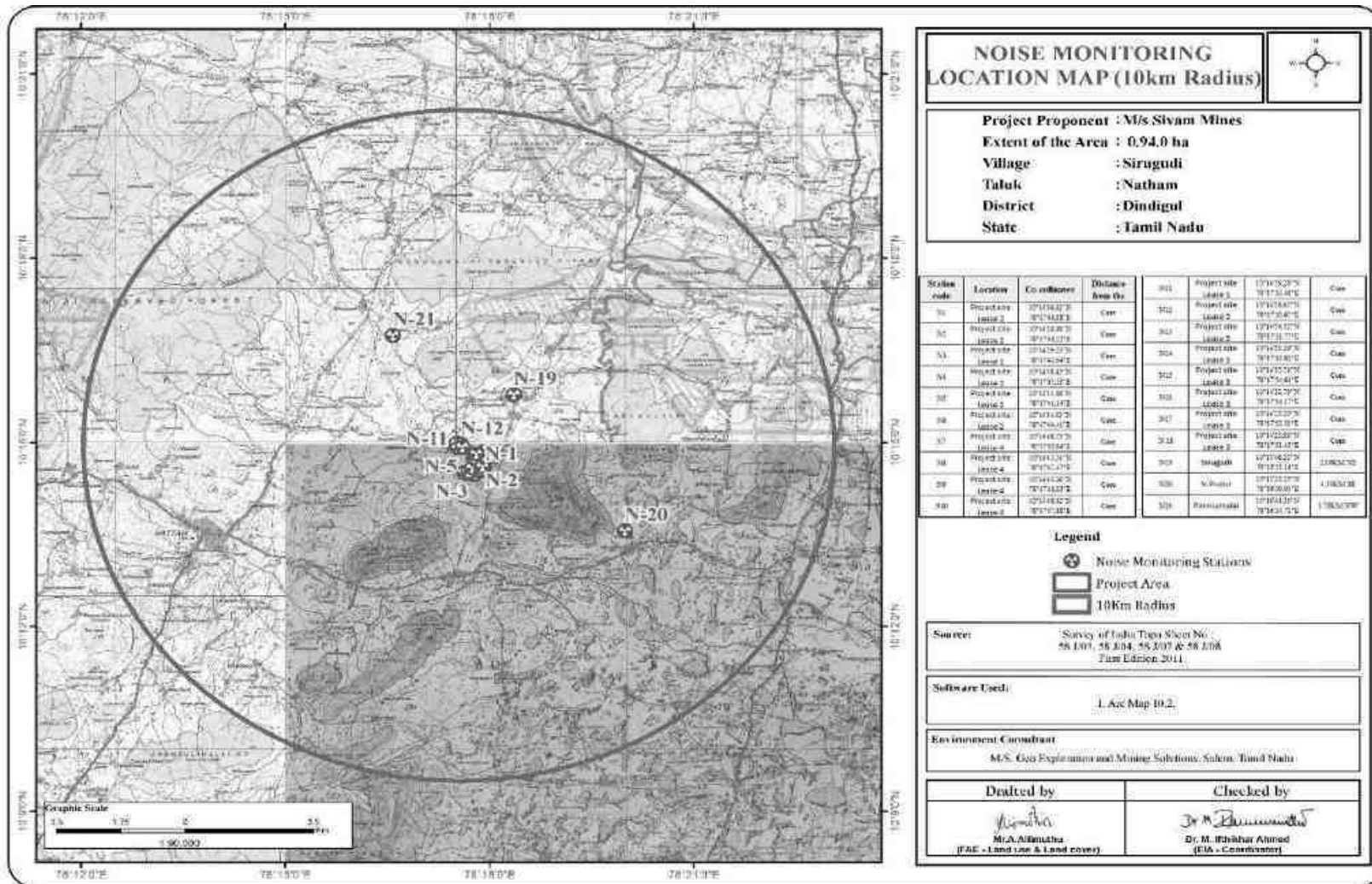
**FIGURE 3.18: NOISE LEVEL MONITORING PHOTOS*****Parameters Measured During Monitoring***

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

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

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

**FIGURE 3.19: NOISE MONITORING LOCATION MAP**



Source: Survey of India Toposheet, 11<sup>th</sup> 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	<b>50</b>	35	44.3	<b>41.8</b>
2	N2-Project site	40.3	55	<b>49.1</b>	35.1	44.7	<b>41.5</b>
3	N3-Project site	40.1	59.3	<b>49.8</b>	35.1	44.3	<b>41.7</b>
4	N4-Project site	40.3	55	<b>49.1</b>	35.3	45.3	<b>41.6</b>
5	N5-Project site	37.4	58.9	<b>49.4</b>	32.6	48.7	<b>41.2</b>
6	N6-Project site	38.7	55	<b>49.1</b>	36.1	40.5	<b>39.9</b>
7	N7-Project site	41.6	58.1	<b>48.5</b>	36.5	41.5	<b>40.6</b>
8	N8-Project site	42.7	55.7	<b>50</b>	30.2	40.5	<b>36.3</b>
9	N9-Project site	38.8	55.1	<b>48.7</b>	32.8	38.5	<b>36</b>
10	N10-Project site	39.5	59.5	<b>50.1</b>	32.9	44.1	<b>36.9</b>
11	N11-Project site	18.2	55.3	<b>49.1</b>	30.5	41.2	<b>38.5</b>
12	N12-Project site	38.3	55.1	<b>48.3</b>	31.1	38.6	<b>38.5</b>
13	N13-Project site	39.4	58.6	<b>47.8</b>	33.7	41.9	<b>38.8</b>
14	N14-Project site	39.1	55.3	<b>47.4</b>	33.2	39.5	<b>37.4</b>
15	N 15-Project site	44	55.8	<b>50.5</b>	33.1	44.3	<b>39.9</b>
16	N16-Project site	38.5	45.9	<b>45.1</b>	32.7	40.5	<b>38.3</b>
17	N17-Project site	40.5	59.3	<b>52.0</b>	31.8	46.1	<b>39.3</b>
18	N18-Project site	37.4	56.2	<b>48.7</b>	31.1	39.7	<b>36.9</b>
<b>Buffer Zone :</b>							
19	N19-Sirugudi	42.1	58.7	<b>51.3</b>	36.4	48.7	<b>41.5</b>
20	N20-V.Pudhur	42.5	59.4	<b>50.8</b>	35.1	48.9	<b>43.2</b>
21	N21-Pannianmalai	43.1	59.8	<b>51.2</b>	36.2	48.7	<b>39.8</b>
<b>MoEF&amp;CC Norms*</b>		-		<b>55</b>	-		<b>45</b>

Source: LabAnalysis 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 2023 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 status was assessed in different habitat types and project site of the study area. Quantitative data was collected using standard methods of quadrat method. Flora enumeration was done following standard sampling techniques. Random quadrates were laid in order to quantify the vegetation of the study area. Quadrat 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 quadrat 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.	<i>Azadirachta indica</i>	Meliaceae	Neem (Vembu)
2.	<i>Borassus flabellifer</i>	Arecaceae	Palmyra Palm
3	<i>Abutilon indicum</i>	Malvaceae	Indian mallow , Thuthi
4	<i>Solanum torvum</i>	Solanaceae	Turkey berry, Sundaikkai
5	<i>Euphorbia hirta</i>	Euphorbiaceae	Asthma Plant, Ammaan Pachcharisi
6	<i>Argemone Mexicana</i>	Papaveraceae	Prickly Poppy, Kudiyotti
7	<i>Solanum trilobatum</i>	Solanaceae	Thoothuvalai

**TABLE 3.35: FLORA IN THE BUFFER ZONE**

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



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

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

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

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.

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### 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 0.94.5 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 <sup>2</sup>	=	186person/ Km <sup>2</sup>
Sex ratio	=	1001
District headquarters	=	Dindigul

#### 3.6.3.2 DEMOGRAPHY OF SIRUGUDI VILLAGE: (SOURCE: DISTRICT SENSEX HANDBOOK 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 <sup>2</sup>
Literacy rate	=	63 %

**TABLE 3.38: DEMOGRAPHY PROFILE OF THE STUDY AREA**

Sl.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	Valaicherippatti	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<sup>2</sup> area gives a population density of about 500 persons / km<sup>2</sup>.

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 rely 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.

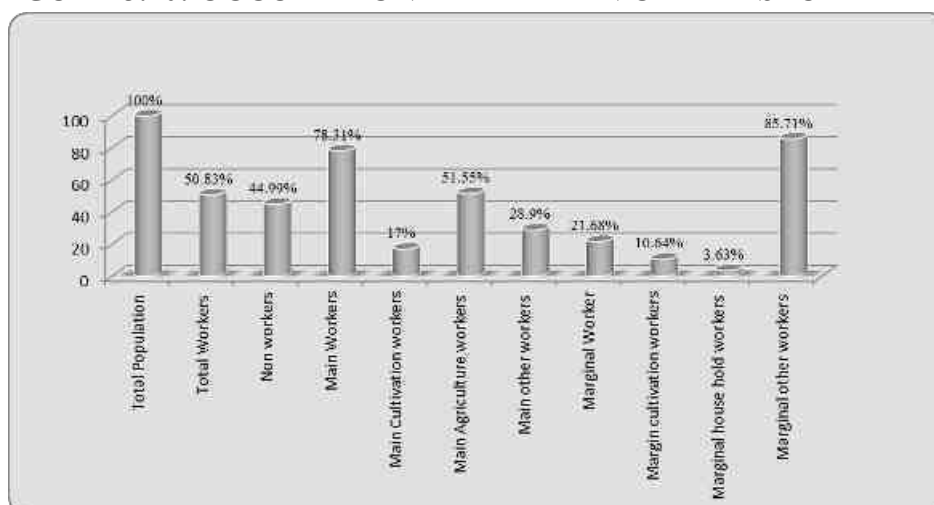
### 3.6.6 WORKERS OCCUPATIONAL PATTERN IN THE STUDY AREA:

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 in trade, 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.No	Description	No of peoples	Proportion %
1	<b>Total Population</b>	<b>1,59,060</b>	<b>100</b>
2	Total Workers	80,858	50.83
3	Non workers	71,573	44.99
4	<b>Main Workers</b>	<b>63,323</b>	<b>78.31</b>
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	<b>Marginal Worker</b>	<b>17,535</b>	<b>21.68</b>
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.

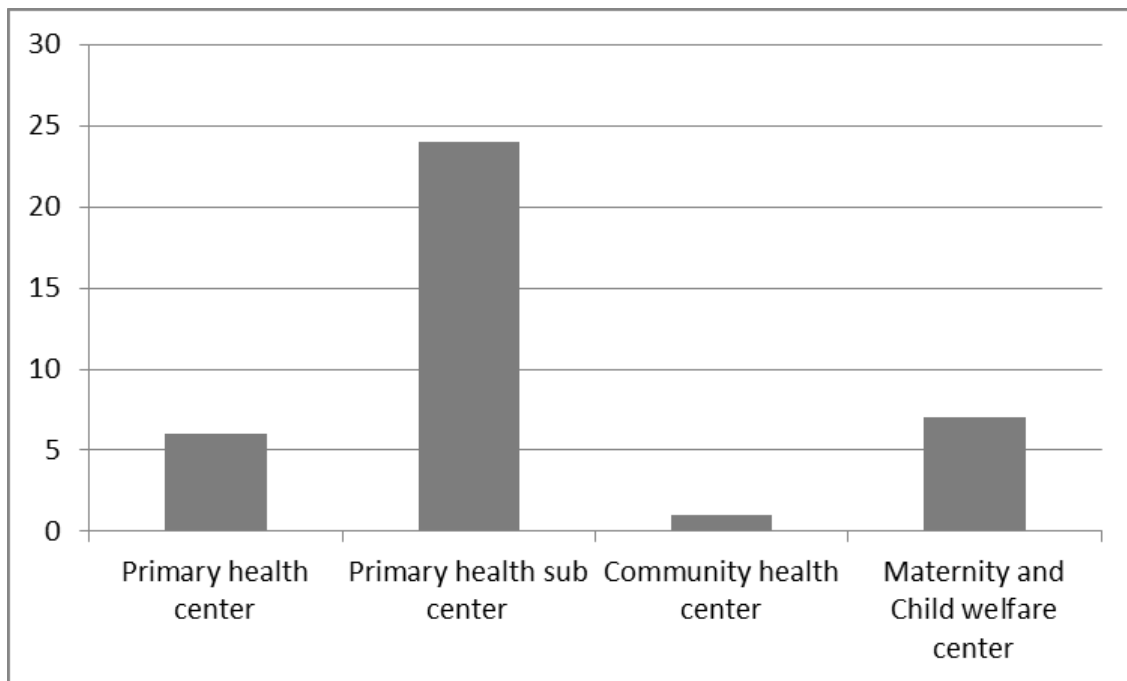
**TABLE 3.41: MEDICAL FACILITIES IN THE STUDY AREA**

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



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**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.

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## **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

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**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**

<b>Purpose</b>	<b>Quantity</b>	<b>Source</b>
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
<b>Total</b>	<b>2 KLD</b>	

### 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 go 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.

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### 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<sub>x</sub>, SO<sub>2</sub> 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.

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#### **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.

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#### **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.

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**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 CSR CER 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**

<b>S.No</b>	<b>Description</b>	<b>Amount in Rs/ year</b>
1	Construction of New toilets	<b>Rs 5,00,000/-</b>
2	Smart Class Facility	
3	Providing Environmental related books to school library	
4	Carrying out plantation in the school ground and village roads 300 Nos	
	<b>Total</b>	

#### **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  $37^{\circ}$  -  $28^{\circ}$  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.



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**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 be 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.

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## **5. ANALYSIS OF ALTERNATIVE (TECHNOLOGY & SITE)**

### **5.0 INTRODUCTION:**

The mining project is site specific and no alternate sites are proposed. There are no alternate sites are interlinked projects. There is no ore beneficiation, mineral processing proposed in the project. This is a site-specific project 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**

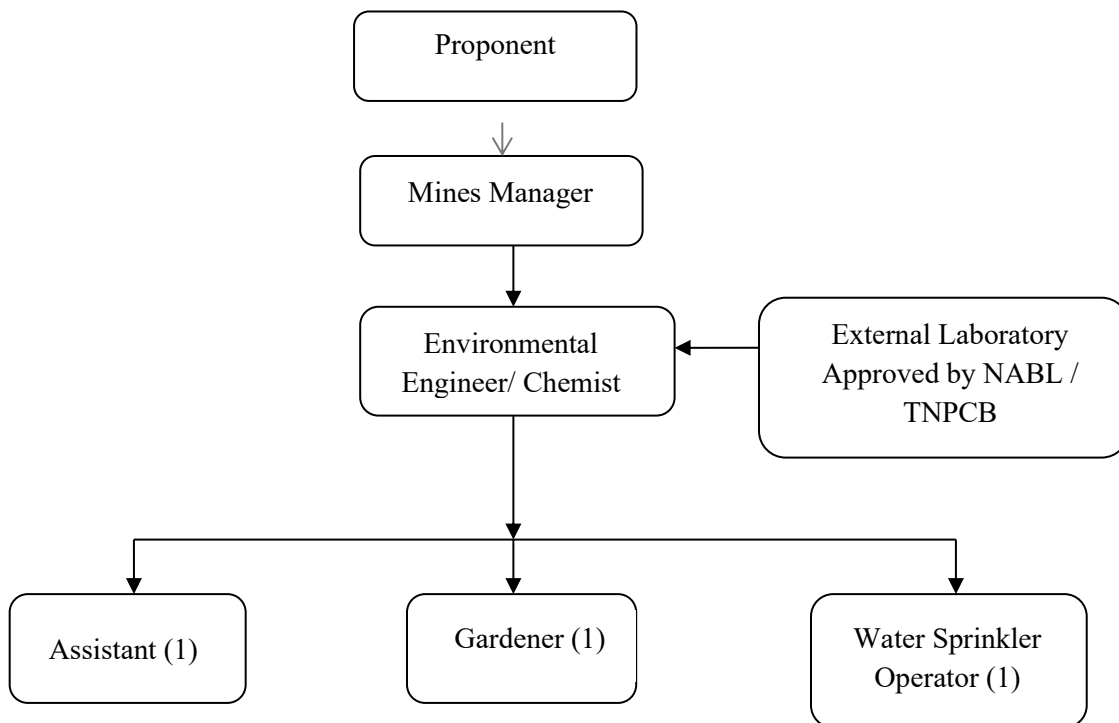
S.No	Activity	Schedule
<b>Air pollution monitoring</b>		
1	Ambient air monitoring of parameters specified by CPCB in their air consents from time to time within the core zone.	Half yearly once
2	Ambient air monitoring of parameters specified by CPCB in their air consents from time to time at stations outside ie., buffer zone	Half yearly once
<b>Water quality monitoring</b>		
3	Monitoring water quality from rain water collected in mine pit area. Rain water will be used 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
<b>Noise quality monitoring</b>		
6	Noise in the ambient atmosphere in mining lease & outside	Half yearly once
<b>Green belt maintenance</b>		
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 <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>x</sub> .	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 <sub>eq</sub> (day), L <sub>eq</sub> (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

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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**

<b>Sl.No.</b>	<b>Parameter</b>	<b>Capital Cost</b>	<b>Recurring Cost per annum</b>
1	Air Quality	Rs 76,000	Rs 76,000/-
2	Meteorology		
3	Water Quality		
4	Hydrology		
5	Soil Quality		
6	Noise Quality		
<b>Total</b>		<b>Rs 76,000/-</b>	<b>Rs 76,000/-</b>

Source: Approved Mining Plan



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## **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	<ul style="list-style-type: none"> <li>• Top soil bench may slide due to its unconsolidated nature.</li> <li>• Vibration due to movement of vehicles in the benches</li> </ul>	The top soil bench is about 1m which will not have any impact.
2.	Drilling	<p>A) due to high air pressure air hoses may burst.</p> <p>b) wear and tear of drill rods.</p>	Periodic Maintenance of worn out accessories of the compressor and drill equipment's will be replaced.
3.	Blasting.	<p>a Fly rock, ground vibration and noise etc.,</p> <p>b Improper charging of explosives.</p>	Controlled blasting technique will be implemented.
4.	Excavation of Ore	<p>a Hauling and loading equipment are in such proximity while excavation.</p> <p>b Swinging of bucket over the body of tipper.</p> <p>C Driving of un authorized person.</p>	<p>Operator shall not operate the machine when person &amp; vehicles are in such proximity.</p> <p>Shall not swing the bucket over the cab and operator leaves the machine after ensuring the bucket is on ground.</p> <p>Shall not allow any unauthorized person to operate and maintain the excavator.</p> <p>Induction training specified by the excavators manufacturers will be provided.</p>
5.	Transportation of Ore	<p>aoperating the vehicle nose to all</p> <p>b. Overloading of material</p> <p>c While reversal &amp; overtaking of vehicle</p>	<p>It will be ensured that all these causes will be minimized by giving training to the persons</p> <p>No over loading</p> <p>Audio visual reserve horn will be provided</p>
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	<p>a Inrush of storm water due to heavy rain.</p> <p>b Unusual seepage of water from river side</p> <p>d Sudden collapse of peripheral bund due to torrential pour</p>	<p>Guard will keep a continuous watch on water level and shall immediately inform to the mine officials when it approaches the danger mark.</p> <p>Withdraw all the persons from the mine via shortest route in an orderly manner</p> <p>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.</p>
8.	Natural calamities	Unexpected happenings like earth quakes/ land slides	There is no record in the past history of any natural calamities.

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### **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.

### **7.1.4 GENERAL 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, taxi stands, medical shop, district revenue authorities etc., and use them efficiently during the case of emergency.

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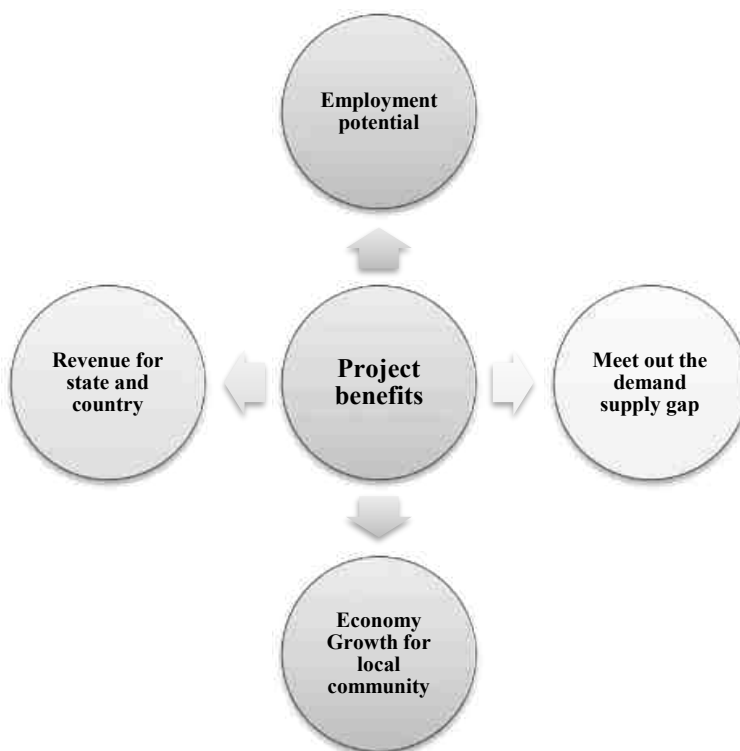
## **7.2 RECLAMATION AND REHABILITATION**

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 15; 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.

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## **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.

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**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 <sub>2</sub> and NO <sub>x</sub>	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<sup>0</sup>- 28<sup>0</sup> 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**



### 10.2 NOISE 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.

## 10.3 WATER 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.

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## GROUND WATER MANAGEMENT

The general ground level in the area is 225m RL. The water table in the area is 30 m BGL (Below ground level) during pre-monsoon and 35m BGL (Below ground level) during post monsoon season. The maximum depth is about 25m 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.

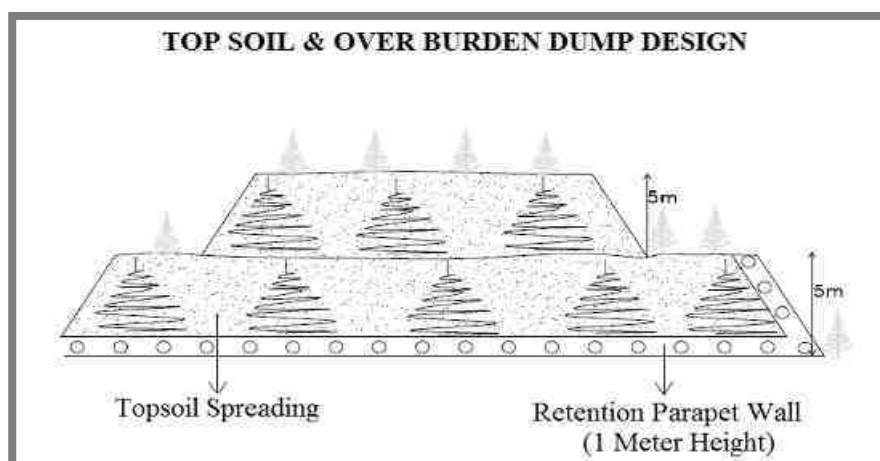
The main aim of greenbelt of mined out areas is to stabilize the land, to protect it from erosion and provide an aesthetic landscape. It is proposed to carry out greenbelt program as per mining plan approved by the Indian Bureau of Mines.

## 10.4 LAND RECLAMATION AND WASTE MANAGEMENT

### Details of overburden (OB) removal and stacking –

The top soil thickness is about 1m; The preserved top soil during earlier period 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.

## 10.5 BIOLOGICAL 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 roads 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.	<i>Azadirachta indica</i>	<i>Meliaceae</i>	Neem, Vembu
2.	<i>Tamarindus indica</i>	<i>Fabaceae</i>	Tamarind, Puliyamaram
3.	<i>Polyalthia longifolia</i>	<i>Annonaceae</i>	Indian mast tree, Vansulam (Asoka tree)
4.	<i>Borassus flabellifer</i>	<i>Areaceae</i>	Palmyra Palm

**TABLE 10.4: GREENBELT DEVELOPMENT PLAN**

Year	Area	No. of Saplings	Specie	Spacing	Survival Rate
2022-23	Safety zone and village roads	500	Neem	3 m * 3 m	80%

## 10.6 OCCUPATIONAL 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.

**FIGURE 10.3: 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**

Activities	Mitigation Measure	Provision for Implementation	Capital	Recurring
<b>Air Environment</b>	Compaction, gradation and drainage on both sides for Haulage Road	Rental Dozer & drainage construction on haul road @ Rs. 10,000/- per hectare; and yearly maintenance @ Rs. 10,000/- per hectare	9400	9400
	Fixed Water Sprinkling Arrangements + Water sprinkling by own water tankers	Fixed Sprinkler Installation and New Water Tanker Cost for Capital; and Water Sprinkling (thrice a day) Cost for recurring	800000	50000
	Muffle blasting – To control fly rocks during blasting	Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts	0	5000
	Wet drilling procedure / latest eco-friendly drill machine with separate dust extractor unit	Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500 per unit recurring cost for maintenance - <b>2 Units</b>	50000	5000
	No overloading of trucks/tippers/tractors	Manual Monitoring through Security guard	0	5000
	Stone carrying trucks will be covered by tarpaulin	Monitoring if trucks will be covered by tarpaulin	0	10000
	Enforcing speed limits of 20 km/hr within ML area	Installation of Speed Governors @ Rs. 5000/- per Tipper/Dumper deployed - <b>2 Units</b>	10000	500
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes by Manual Labour	0	5000
	Regular sweeping and maintenance of approach roads for at least about 200 m from ML Area	Provision for 2 labours @ Rs.10,000/labour (Contractual) per Hectare	0	18800
	Installing wheel wash system near gate of quarry	Installation + Maintenance + Supervision	50000	20000
<b>Noise Environment</b>	Source of noise will be during operation of transportation vehicles, HEMM for this proper maintenance will be done at regular intervals.	Provision made in Operating Cost	0	0
	Oiling & greasing of Transport vehicles and HEMM at regular interval will be done	Provision made in Operating Cost	0	0
	Adequate silencers will be provided in all the diesel engines of vehicles.	Provision made in Operating Cost	0	0
	It will be ensured that all transportation vehicles carry a fitness certificate.	Provision made in Operating Cost	0	0
	Safety tools and implements that are required will be kept adequately near blasting site at the time of charging.	Provision made in OHS part	0	0
	Line Drilling all along the boundary to reduce the PPV from blasting activity and implementing controlled blasting.	Provision made in Operating Cost	0	0



	Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured.	Blowing Whistle by Mining Mate / Blaster / Competent Person	0	0
	Provision for Portable blaster shed	Installation of Portable blasting shelter	50000	2000
	NONEL Blasting will be practiced to control Ground vibration and fly rocks	Rs. 30/- per 6 Tonnes of Blasted Material	0	98368
<b>Waste Management</b>	Waste management (Spent Oil, Grease etc.)	Provision for domestic waste collection and disposal through authorized agency	5000	20000
		Installation of dust bins	5000	2000
	Bio toilets will be made available outside mine lease on the land of owner itself	Provision made in Operating Cost	0	0
<b>Mine Closure</b>	1. Progressive Closure Activity - Surface Runoff managment	Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance of Rs. 5,000/- per annum	9400	5000
	2. Progressive Closure Activity Barbed Wire Fencing to quarry area will be provisioned.	Per Hectare fencing Cost @ Rs. 2,00,000/- with Maintenance of Rs 10,000/- per annum	188000	10000
	3. Progressive Closure Activity Green belt development - 500 trees per one hectare - Proposal for 500 Trees - (150 Inside Lease Area & 350 Outside Lease Area)	Site clearance, preparation of land, digging of pits / trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring)	30000	4500
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	105000	10500
	4. Implementation of Final Mine Closure Activity as per Approved Mining Plan on Last Year	Few activities already covered as progressive closure activities as greenbelt development, wire fencing, garland drain. *For Final Closure Activities 15% of the proposed closure cost will be spent during the final mine closure stage - Last Year	56700	0
	5. Contribution towards Green Fund. As per TNMMCR 1959, Rule 35 A	The Contribution towards Green Funds @ 10% of Seigniorage fee are indicated as part of EMP Budge and not necessarily implemented in the Project Site	223221	
<b>Implementation of EC, Mining Plan &amp; DGMS Condition</b>	Size 6' X 5' with blue background and white letters as mentioned in MoM Appendix II by the SEAC TN	Fixed Display Board at the Quarry Entrance as permanent structure mentioning Environmental Conditions	10000	1000
	Air, Water, Noise and Soil Quality Sampling every 6 Months for Compliance Report of EC Conditions	Submission of 2 Half Yearly Compliance - Lab Monitoring Report as per CPCB norms	0	50000

	Workers will be provided with Personal Protective Equipment's	Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee) - 12 <b>Employees</b>	48000	12000
	Health check up for workers will be provisioned	IME & PME Health check up @ Rs. 1000/- per employee	0	12000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	1880
	Mine will have safety precaution signages, boards.	Provision for signages and boards made	10000	2000
	No parking will be provided on the transport routes. Separate provision on the south side of the hill will be made for vehicles /HEMMs. Flaggers will be deployed for traffic management	Parking area with shelter and flags @ Rs. 50,000/- per hectare project and Rs. 10,000/- as maintenance cost	47000	10000
	Installation of CCTV cameras in the mines and mine entrance	Camera 4 Nos, DVR, Monitor with internet facility	30000	5000
	Implementation as per Mining Plan and ensure safe quarry working	Mines Manager (1 <sup>st</sup> Class / 2 <sup>nd</sup> Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116 of MMR,1961 @ 40,000/- for Manager & @ 25,000/- for Foreman / Mate	0	780000
<b>CER</b>	As per MoEF &CC OM 22-65/2017-IA.III Dated 25.02.2021	Detailed Description in following slides and Budget allocation is included as per MoeEF & CC OM	500000	
<b>TOTAL</b>			<b>2180021</b>	<b>1154948</b>

<b>Year Wise Break Up</b>	
<b>Year</b>	<b>Cost</b>
<b>2022 - 23</b>	<b>Rs.33,34,969/-</b>
2023 - 24	Rs.12,12,696/-
2024 - 25	Rs.12,73,331/-
2025 - 26	Rs.13,36,997/-
2026 - 27	Rs.14,03,847/-

Note: Cost inclusive of 5% cost inflation anticipated every year

In order to implement the environmental protection measures, an amount of Rs. 21.80 lakhs as capital cost and recurring cost as Rs.11.54 lakhs as recurring cost is proposed considering present market price considering present market scenario.

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**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.

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## 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. Ilangovan, Dindigul district vide G.O. 3(D). No. 89, dated 17.10.1996 for a period of 20 years from 04.03.1997 to 03.03.2017 and the lease deed was executed on 04.03.1997.

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/64252/2017 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 vide online proposal number SIA/TN/MIN/223069/2018 Dated 03.04.2018.

ToR was issued vide Lr.No.SEIAA-TN/F.No.6254/TOR-335/2018 Dated: 11.05.2018.

Proponent applied for the extension for the existing ToR vide online proposal No SIA/TN/MIN/268110/2022 Dated 15.04.2022. The proposals were considered in 319<sup>th</sup> SEAC – TN Meeting held on 12.10.2022 and issued Terms of Reference (ToR) vide Lr.No.SEIAA-TN/F.No.6254/TOR-335/Ext/2018 Dated: 28.10.2022,

Again, the proposal was placed in 369<sup>th</sup> SEAC meeting held on 24.04.2023 and SEAC decided to constitute a subcommittee to make an on-site inspection to assess the present Status of the project site and Environmental settings as the proposal falls under violation category and submit the report along with the recommendations to the committee.

Further the committee called for the following additional details:

- A letter from the PP justify that the project activity is covered under category B2 of Item 1(a) “Mining of Minerals Project” of the schedule to the EIA notification 2006 as amended
- Valid Mine plan approved by the competent authority for the proposed period of quarrying.

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- The PP shall furnish the copy of receipt of the penalty levied by Department of Geology and Mining for the exploitation of mineral without Prior EC

After the receipt of Additional details from the PP and the evaluation report by the subcommittee, SEAC will deliberate on the issue of environmental clearance under violation category. SEAC also decided to request SEIAA-TN to initiate action under sec-19 of the Environment (Protection) act, to be taken for violation cases, in accordance with law and the proposal was placed in 616<sup>th</sup> SEIAA meeting held on 10.05.2023.

The view of the above, the authority accepts the decision of SEAC and decided to request the member secretary SEIAA to communicate the SEAC minutes to the PP and to write to the state govt\TNPCB to take credible action under the provision of Sec – 19 of the Environment (Protection) act, 1986 against the Project Proponent as per the EIA notification dated 14.03.2017 and 08.03.2018

The Proposal was placed in 422<sup>nd</sup> SEAC meeting held on 09.11.2023 and as per the 422<sup>nd</sup> SEAC & 657<sup>th</sup> SEIAA Minutes of Meeting During the meeting, SEAC noted that the PP had not carried out the public hearing for the above proposal.

Therefore after the long deliberation and discussions in the 422<sup>nd</sup> SEAC meeting, The SEAC has observed that the Public hearing is mandatory for all mining projects of Major Minerals category irrespective of the area for ensuring the scientific and systematic mining and the conservation minerals. The SEAC decided to direct the PP to conduct the Public hearing as per the procedure described in EIA notification 2006 and submit the minutes of the public hearing with action plan for considering the application\proposal towards the grant of EC.

Subsequently, the proponent requested to extend the validity of ToR to conduct Public Hearing and to update the EIA Report accordingly. since the validity of ToR issued is about to expire on 27.10.2023. The Committee after detailed discussion, accepted the request of the PP and extended the validity of ToR further for a Period of I year, i.e., up to 27.10.2024. After the receipt of the minutes of the Public Hearing along with updated Final EIA Report submitted by the PP along with a valid Mining Lease, and approved Mining Plan/Scheme of Mining including the PMCP/FMCP for the proposed mining operations, the SEAC may deliberate the future course of action.

This proposal was placed in 677<sup>th</sup> SEIAA meeting and after detailed discussions, the Authority decided to grant extension of ToR for further period of 1 year i.e. up to 27.10.2024 .as recommended by SEAC. All the other conditions stipulated in the ToR Letter No. SEIAA-TN/F.No.6254/ToR-335/2018/ dated 28.10.2022 issued under violation category

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Now, as per MMDR Amendment Act 2015, the validity of lease period is extended upto 03.03.2047 and the Review of Mining Plan & Progressive Mine Closure Plan was prepared by RQP and submitted to Regional Controller of Mines, Indian Bureau of Mines, Chennai and approved vide Lr.No TN/DGL/RST/ROMP-1714.MDS dated 13.10.2023

“All mining lease area in respect of minor mineral mining leases and  $\leq$  250 ha mining lease area in respect of major mineral mining lease other than coal”.

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 15 people directly and indirectly around 10 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:0.94.0 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, Advaita Ashram Road,

Alagapuram, Salem – 636 004

Tamil Nadu, India

Email: info@geoexploration@gmail.com

Web: [www.gemssalem.com](http://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/ Empaneled	EIA Coordinator		FAE	
			Sector	Category	Sector	Category
1	<b>Dr. M. Ifthikhar Ahmed</b>	<b>In-house</b>	<b>1</b>	<b>A</b>	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 0.94.0 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:




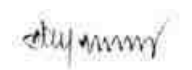



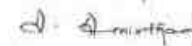


Period of Involvement: **Jan 2017 to till date**




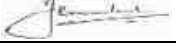
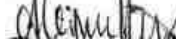


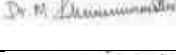
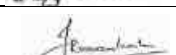

**Associated Team Member with EIA Coordinator:**

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

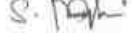
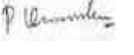

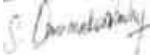

#### **FUNCTIONAL AREA EXPERTS ENGAGED IN THE PROJECT**



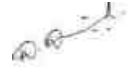


Sl. No.	Functional Area	Involvement	Name of the Expert/s	Signature
1	AP	<ul style="list-style-type: none"> <li>▪ Identification of different sources of air pollution due to the proposed mine activity</li> <li>▪ Prediction of air pollution and propose mitigation measures / control measures</li> </ul>	Mr. A. Jagannathan	
2	WP	<ul style="list-style-type: none"> <li>▪ Suggesting water treatment systems, drainage facilities</li> <li>▪ Evaluating probable impacts of effluent/waste water discharges into the receiving environment/water bodies and suggesting control measures.</li> </ul>	Dr. M. Ifthikhar Ahmed	
			Mr. N. Senthilkumar	
3	HG	<ul style="list-style-type: none"> <li>▪ Interpretation of ground water table and predict impact and propose mitigation measures.</li> <li>▪ Analysis and description of aquifer Characteristics</li> </ul>	Dr. P. Thangaraju	
4	GEO	<ul style="list-style-type: none"> <li>▪ Field Survey for assessing the regional and local geology of the area.</li> <li>▪ Preparation of mineral and geological maps.</li> <li>▪ Geology and Geo morphological analysis/description and Stratigraphy/Lithology.</li> </ul>	Dr. M. Ifthikhar Ahmed	
			Dr. P. Thangaraju	
5	SE	<ul style="list-style-type: none"> <li>▪ Revision in secondary data as per Census of India, 2011.</li> <li>▪ Impact Assessment &amp; Preventive Management Plan</li> <li>▪ Corporate Environment Responsibility.</li> </ul>	Mrs. K. Anitha	
6	EB	<ul style="list-style-type: none"> <li>▪ Collection of Baseline data of Flora and Fauna.</li> <li>▪ Identification of species labelled as Rare, Endangered and threatened as per IUCN list.</li> </ul>	Mrs. Amirtham	



		<ul style="list-style-type: none"> <li>Impact of the project on flora and fauna.</li> <li>Suggesting species for greenbelt development.</li> </ul>	Mr. Alagappa Moses	
7	RH	<ul style="list-style-type: none"> <li>Identification of hazards and hazardous substances</li> <li>Risks and consequences analysis</li> <li>Vulnerability assessment</li> <li>Preparation of Emergency Preparedness Plan</li> <li>Management plan for safety.</li> </ul>	Mr. N. Senthilkumar	
			Mr. S. Pavel	
			Mr. J. R. Vikram Krishna	
8	LU	<ul style="list-style-type: none"> <li>Construction of Land use Map</li> <li>Impact of project on surrounding land use</li> <li>Suggesting post closure sustainable land use and mitigative measures.</li> </ul>	Mr. A. Allimuthu	
9	NV	<ul style="list-style-type: none"> <li>Identify impacts due to noise and vibrations</li> <li>Suggesting appropriate mitigation measures for EMP.</li> </ul>	Mr. A. Jagannathan	
10	AQ	<ul style="list-style-type: none"> <li>Identifying different source of emissions and propose predictions of incremental GLC using AERMOD.</li> <li>Recommending mitigations measures for EMP</li> </ul>	Mr. N. Senthilkumar	
11	SC	<ul style="list-style-type: none"> <li>Assessing the impact on soil environment and proposed mitigation measures for soil conservation</li> </ul>	Dr. M. Iftikhar Ahmed	
12	SHW	<ul style="list-style-type: none"> <li>Identify source of generation of non-hazardous solid waste and hazardous waste.</li> <li>Suggesting measures for minimization of generation of waste and how it can be reused or recycled.</li> </ul>	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	<ul style="list-style-type: none"> <li>Site Visit with FAE</li> <li>Provide inputs &amp; Assisting FAE with sources of Air Pollution, its impact and suggest control measures</li> <li>Provide inputs on Geological Aspects</li> <li>Analyse &amp; provide inputs and assist FAE with meteorological data, emission estimation, AERMOD modelling and suggesting control measures</li> </ul>	
2	Mr. P. Viswanathan	AP; WP; LU	<ul style="list-style-type: none"> <li>Site Visit with FAE</li> <li>Provide inputs &amp; Assisting FAE with sources of Air Pollution, its impact and suggest control measures</li> <li>Assisting FAE on sources of water pollution, its impacts and suggest control measures</li> <li>Assisting FAE in preparation of land use maps</li> </ul>	
3	Mr. Santhoshkumar	GEO; SC	<ul style="list-style-type: none"> <li>Site Visit with FAE</li> <li>Provide inputs on Geological Aspects</li> <li>Assist in Resources &amp; Reserve Calculation and preparation of Production Plan &amp; Conceptual Plan</li> <li>Provide inputs &amp; Assisting FAE with soil conservation methods and identifying impacts</li> </ul>	
4	Mr. Umamahesvaran	GEO	<ul style="list-style-type: none"> <li>Site Visit with FAE</li> <li>Provide inputs on Geological Aspects</li> <li>Assist in Resources &amp; Reserve Calculation and preparation of Production Plan &amp; Conceptual Plan</li> </ul>	
5	Mr. A. Allimuthu	SE	<ul style="list-style-type: none"> <li>Site Visit with FAE</li> </ul>	

			<ul style="list-style-type: none"> <li>▪ Assist FAE with collection of data's</li> <li>▪ Provide inputs by analysing primary and secondary data</li> </ul>	
6	Mr. S. Ilavarasan	LU; SC	<ul style="list-style-type: none"> <li>▪ Site Visit with FAE</li> <li>▪ Assisting FAE in preparation of land use maps</li> <li>▪ Provide inputs &amp; Assisting FAE with soil conservation methods and identifying impacts</li> </ul>	
7	Mr. E. Vadivel	HG	<ul style="list-style-type: none"> <li>▪ Site Visit with FAE</li> <li>▪ Assist FAE &amp; provide inputs on aquifer characteristics, ground water level/table</li> <li>▪ Assist with methods of ground water recharge and conduct pump test, flow rate</li> </ul>	
8	Mr. D. Dinesh	NV	<ul style="list-style-type: none"> <li>▪ Site Visit with FAE</li> <li>▪ Assist FAE and provide inputs on impacts due to proposed mine activity and suggest mitigation measures</li> <li>▪ Assist FAE with prediction modelling</li> </ul>	
9	Mr. Panneer Selvam	EB	<ul style="list-style-type: none"> <li>▪ Site Visit with FAE</li> <li>▪ Assist FAE with collection of baseline data</li> <li>▪ Provide inputs and assist with labelling of Flora and Fauna</li> </ul>	
10	Mrs. Nathiya	EB	<ul style="list-style-type: none"> <li>▪ Site Visit with FAE</li> <li>▪ Assist FAE with collection of baseline data</li> <li>▪ Provide inputs and assist with labelling of Flora and Fauna</li> </ul>	

**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 0.94.0 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. Ifthikhar Ahmed**

Designation:

**Managing Partner**

Name of the EIA Consultant Organization:

**M/s. Geo Exploration and Mining Solutions**

NABET Certificate No & Issue Date:  
Validity

**NABET/EIA/2225/RA 0276 Dated: 20-2-2023**  
Validity till 06.08.2025

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

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**13.0 BACKGROUND OF THE PROJECT**

Initially, the mining lease for limestone was granted to Thiru. S. Ilangovan, Dindigul District vide G.O. 3(D).No. 89, Dated 17.10.1996 for a period of 20 years from 04.03.1997 to 03.03.2017 and the lease deed was executed on 04.03.1997.

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.170 Industries (MMA1) Department, Dated: 03.11.2014.

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/64252/2017 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 vide online proposal number SIA/TN/MIN/23069/2018 Dated 03.04.2018 and accepted by SEIAA on 11.07.2018.

ToR was issued vide Lr.No.SEIAA-TN/F.No.6254/TOR-335/2018 Dated: 11.05.2018.

Now, as per MMDR Amendment Act 2015, the validity of lease period is extended upto 03.03.2047 and the Review of Mining Plan & Progressive Mine Closure Plan was prepared by RQP and submitted to Regional Controller of Mines, Indian Bureau of Mines, Chennai for approval.

Again, the proposal was placed in 369<sup>th</sup> SEAC meeting held on 24.04.2023 and SEAC decided to constitute a subcommittee to make an on-site inspection to assess the present Status of the project site and Environmental settings as the proposal falls under violation category and submit the report along with the recommendations to the committee.

Further the committee called for the following additional details:

- A letter from the PP justify that the project activity is covered under category B2 of Item 1(a) “Mining of Minerals Project” of the schedule to the EIA notification 2006 as amended
- Valid Mine plan approved by the competent authority for the proposed period of quarrying.

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- The PP shall furnish the copy of receipt of the penalty levied by Department of Geology and Mining for the exploitation of mineral without Prior EC

After the receipt of Additional details from the PP and the evaluation report by the subcommittee, SEAC will deliberate on the issue of environmental clearance under violation category. SEAC also decided to request SEIAA-TN to initiate action under sec-19 of the Environment (Protection) act, to be taken for violation cases, in accordance with law and the proposal was placed in 616<sup>th</sup> SEIAA meeting held on 10.05.2023.

The view of the above, the authority accepts the decision of SEAC and decided to request the member secretary SEIAA to communicate the SEAC minutes to the PP and to write to the state govt\TNPCB to take credible action under the provision of Sec – 19 of the Environment (Protection) act, 1986 against the Project Proponent as per the EIA notification dated 14.03.2017 and 08.03.2018

The Proposal was placed in 422<sup>nd</sup> SEAC meeting held on 09.11.2023 and as per the 422<sup>nd</sup> SEAC & 657<sup>th</sup> SEIAA Minutes of Meeting During the meeting, SEAC noted that the PP had not carried out the public hearing for the above proposal.

Therefore, after the long deliberation and discussions in the 422<sup>nd</sup> SEAC meeting, The SEAC has observed that the public hearing is mandatory for all mining projects of Major Minerals category irrespective of the area for ensuring the scientific and systematic mining and the conservation minerals. The SEAC decided to direct the PP to conduct the public hearing as per the procedure described in EIA notification 2006 and submit the minutes of the public hearing with action plan for considering the application\proposal towards the grant of EC.

Subsequently, the proponent requested to extend the validity of ToR to conduct Public Hearing and to update the EIA Report accordingly. since the validity of ToR issued is about to expire on 27.10.2023. The Committee after detailed discussion, accepted the request of the PP and extended the validity of ToR further for a Period of I year, i.e., up to 27.10.2024. After the receipt of the minutes of the Public Hearing along with updated Final EIA Report submitted by the PP along with a valid Mining Lease, and approved Mining Plan/Scheme of Mining including the PMCP/FMCP for the proposed mining operations, the SEAC may deliberate the future course of action.

This proposal was placed in 677<sup>th</sup> SEIAA meeting and after detailed discussions, the Authority decided to grant extension of ToR for further period of 1 year i.e. up to 27.10.2024 .as recommended by SEAC. All the other conditions stipulated in the ToR Letter No. SEIAA-TN/F.No.6254/ToR-335/2018/ dated 28.10.2022 issued under violation category

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Now, as per MMDR Amendment Act 2015, the validity of lease period is extended upto 03.03.2047 and the Review of Mining Plan & Progressive Mine Closure Plan was prepared by RQP and submitted to Regional Controller of Mines, Indian Bureau of Mines, Chennai and approved vide Lr.No TN/DGL/RST/ROMP-1714.MDS dated 13.10.2023

The mining operation was commenced in the year of 1997 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 1.0m height and 1.5width with 45° slope.
- In mineral, seven benches are proposed with 3m height & 3m 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

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

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- 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).

<p>Damage Assessment and Significance</p>	<ul style="list-style-type: none"> <li>• Pre-incident resource status</li> <li>• Scale of damage</li> <li>• Impact assessment</li> <li>• Significance of damage</li> </ul>
<p>Primary Restoration Options (to restore the initial damage)</p>	<ul style="list-style-type: none"> <li>• Setting primary restoration targets</li> <li>• Identification and categorisation of technical options</li> <li>• Selection of restoration options</li> <li>• Estimation of interim losses</li> <li>• Cost-effectiveness and cost-benefit analyses</li> </ul>
<p>Compensatory Restoration Options (to supplement primary restoration options when these are not sufficient and to compensate for interim losses)</p>	<ul style="list-style-type: none"> <li>• Objectives of compensatory measures</li> <li>• Monetary compensation and the value of damage</li> <li>• Resource compensation measures</li> <li>• Classification and selection of compensatory measures</li> <li>• Assessing the scale of compensatory measures</li> <li>• Cost-effectiveness and cost-benefit analyses</li> </ul>

### 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	0.56.4*	60.0
	2	Infrastructures including, office and labor rest shelter	Nil	Nil
	3	Greenbelt	0.04.0	4.25
	4	Dumps of ores and waste	0.03.5*	3.72
	5	Mine roads	0.02.0*	2.12
	6	Un utilized area	0.28.1	29.91
	<b>Total</b>			<b>0.94.0</b>

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 0.61.9 ha

Considering compensation @ Rs 30,000/- per hectare of damaged land i.e., 0.61.9 ha \* 30,000 = Rs 18,570/-

**Damage due to loss of vegetation / Plant cover:**

The mining operation is carried out from the year of 1997 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 0.61.9 ha. Considering option if the damaged land was not subjected to mining and utilized for plantation and considering rate of plantation at 500 trees/plants per ha and Value shall be Rs. 20 per tree/plant for its biomass.

Thus, considering effective loss of 500 trees/plants per hectare, the damage cost shall be 500 trees / ha x 0.61.9 ha x Rs 20 per tree = Rs 6,190/-

**Damage due to Air pollution:**

All the air quality parameters like particulate matters (PM<sub>10</sub>& PM<sub>2.5</sub>) and SO<sub>2</sub>, NO<sub>2</sub> 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.



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**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 dendritic to sub-dendritic 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, these 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**

<b>Conceptualization :</b> Preliminary Environmental assessment	Baseline Monitoring studies should have been carried out
<b>Planning:</b> Detailed studies of Environmental 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
<b>Execution:</b> Implementation of environmental safety measures	Once the mine commences its operations after obtaining EC, all measures should be practiced and implemented immediately.
<b>Operation:</b> Monitoring of effectiveness of built-in safeguards	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	<b>Liquid Effluents</b>			
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. <b>Interpretation:</b> 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	<b>Air Pollution</b>			
A	The emission levels of pollutants should conform to the standards prescribed as perNAAQ.	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 <sub>10</sub> and PM <sub>2.5</sub> 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	<b>Solid Wastes</b>			
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	<b>Noise and Vibration</b>			
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	<b>Occupational safety and Health</b>			
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	<b>Medical Check-Up</b>			
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	<b>House –Keeping</b>			
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	<b>Human Settlements</b>			
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	<b>Transport systems</b>			
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 due to heavy vehicular traffic due to movement of tippers / dumpers from the subject mine	No Damage Cost is involved.
10	<b>Recovery – Reuse of waste products</b>			
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 interms of solid waste	Not applicable	No Damage Cost is involved.
11	<b>Greenbelt</b>			
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	<b>Emergency plan</b>			
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	<b>Environment Management Cell</b>			
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	<b>CSR Activities</b>			
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 &amp; EIA Coordinator

**TABLE 13.4: TOTAL DAMAGE COST**

Activity		Damage cost (Rs.)
Ecological Damage Cost		
Due to change in Land-use/Land cover		Rs 18,570/-
loss of Vegetation /Plant cover		Rs 6,190/-
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/-
<b>TOTAL</b>		<b>Rs 84,760/-</b>

Source: Proposed by FAE's &amp; 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	1 <sup>st</sup> Year (in Rs)	2 <sup>nd</sup> Year (in Rs)	3 <sup>rd</sup> 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
<b>Total</b>					<b>50,000</b>

Source: Proposed by FAE's &amp; EIA Coordinator



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

Environment Component	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> 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
<b>Total</b>				<b>50,000</b>

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	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> Year	Total (Rs.)
Water Environment	Rain water harvesting structures at prominent place in the Sirugudi village	5,000			5,000
Air Environment	Providing trees in three tier system around project area as air barrier	5,000			5,000
Land / Soil Environment	Providing Agricultural needs for 2 families	10,000			10,000
<b>TOTAL</b>					<b>20,000</b>

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	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> Year	Total (Rs.)
1	Improving Sanitation Facilities at Sirugudi Village Government School	15,000	-	-	15,000
<b>TOTAL</b>					<b>15,000</b>

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 85,000/-. The 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	20,000/-
3	Community Resources Augmentation Plan	15,000/-
Total Budgetary Provision		85,000/-

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.85,000/-** 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 – 0.94.0ha**

**S.F.Nos 616/1B (P), 1C, 618/1 (P) & 619**

**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)	I A	1 AA - 5 AA
3	Copy of Proceeding Letter	II	24A – 25A
4	Copy of last permit issued by the Dept. Of Geology and Mining, Salem	III	26A – 27A
5	Approval Letter – Review of Mining plan	V	28A – 29A
6	Approved Review of Mining Plan	VI	30A – 160A
7	Baseline Studies	VII	161A-185A
8	Copy of NABET Certificate	VIII	186A



**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.6254/TOR-335/2018 Dated:11.05.2018**

**To**

M/s. Sivam Mines  
6/209, Main Road, Sirungudi post  
Nathanm Taluk  
Dindigul

**Sir / Madam,**

**Sub:** SEIAA, Tamilnadu – Terms of Reference (ToR) under violation for the Existing Limestone mine over an extent of 0.94.0 Ha at S.F. No. 616/1B (P), 1C, 618/1(P) & 619, 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/MINE/23069/2018 dated: 03.04.2018
  4. Minutes of the 107<sup>th</sup> SEAC Meeting held on 13.04.2018
  5. Minutes of the 297<sup>th</sup> SEIAA Meeting held on 11.05.2018

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

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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 Limestone mine over an extent of 0.94.0 Ha at S.F. No. 616/1B (P), 1C, 618/1(P) & 619, Sirugudi Village, Natham Taluk, Dindigul District, Tamilnadu seeking ToR under the MoEF & CC Notification cited under reference 1<sup>nd</sup> & 2<sup>nd</sup>.

The proposal seeking ToR was placed before the 107<sup>th</sup> SEAC meeting held on 13.04.2018. 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.



  
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The proposal was considered as recommended by SEAC in 297<sup>th</sup> SEIAA meeting held on 11.05.2018 vide Item No.297 – 09 and after detailed discussion, the authority decided to issue ToR for considering the mining period from 2018-19 onwards only for the preparation of EIA report along with additional ToR. Excess quantity mined during the mining period shall be furnished to assess the ecological and other damages from the Department of Mining and Geology.

**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



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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



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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.



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- 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: 05<sup>th</sup> 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)



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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 areashould 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 givenwith information



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- as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.
- 7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.
  - 8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.
  - 9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.
  - 10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
  - 11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.
  - 12) 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



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the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.

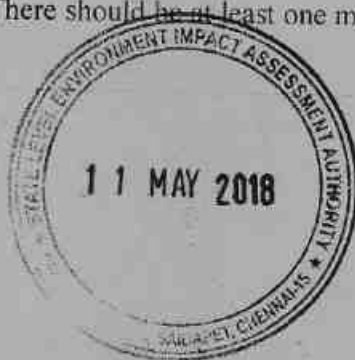
- 13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.
- 14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.
- 15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.
- 16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.
- 17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.
- 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 alongwith budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details



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- furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.
- 19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.
  - 20) Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease 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 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



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- provided both in AMSL and bgl. A schematic diagram may also be provided for the same.
- 31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.
- 32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.
- 33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.
- 34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.
- 35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
- 36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.





- 37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
- 38) Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.
- 39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.
- 40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
- 41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
- 42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.
- 43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
- 44) Besides the above, the below mentioned general points are also to be followed:-
  - a) Executive Summary of the EIA/EMP Report
  - b) All documents to be properly referenced with index and continuous page numbering.
  - c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.
  - d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.
  - e) Where the documents provided are in a language other than English, an English translation should be provided.
  - f) The Questionnaire for environmental appraisal of mining projects as devised

earlier by the Ministry shall also be filled and submitted.

- g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.
- h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.
- i) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.
- j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

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

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

- 1) Project name and location (Village, District, State, Industrial Estate (if applicable).
- 2) 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



*[Signature]*  
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- 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 its 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
  - 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.



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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, 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 29<sup>th</sup> August, 2017.

The receipt of this letter may be acknowledged.

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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, Parivesh Bhavan, CBD Cum-Office Complex, East Arjun Nagar, New Delhi 110032.
3. The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-600 032.
4. The APCCF (C), Regional Office, Ministry of Environment & Forest (SZ), 34, HEPC Building, 1<sup>st</sup> & 2<sup>nd</sup> Floor, Cathedral Garden Road, Nungampakkam, Chennai -34.
5. Monitoring Cell, I A Division, Ministry of Environment & Forests, Paryavaran Bhavan, CGO Complex, New Delhi 110003
6. Stock File.




**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																					
	<table border="1"> <thead> <tr> <th rowspan="2">Year and quantity</th> <th colspan="2">2010-11*</th> <th colspan="2">2011-12*</th> <th colspan="2">2012-13*</th> </tr> <tr> <th>Planned</th> <th>Actual</th> <th>Planned</th> <th>Actual</th> <th>Planned</th> <th>Actual</th> </tr> </thead> <tbody> <tr> <td>Ore/mineral</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Year and quantity	2010-11*		2011-12*		2012-13*		Planned	Actual	Planned	Actual	Planned	Actual	Ore/mineral							
Year and quantity	2010-11*		2011-12*		2012-13*																	
	Planned	Actual	Planned	Actual	Planned	Actual																
Ore/mineral																						



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	/granite 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															



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	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 generated from 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.										
	<table border="1"> <thead> <tr> <th></th> <th>Capacity (m<sup>3</sup>)</th> <th>Numbers</th> </tr> </thead> <tbody> <tr> <td>Excavator</td> <td></td> <td></td> </tr> <tr> <td>Trucks</td> <td></td> <td></td> </tr> </tbody> </table>		Capacity (m <sup>3</sup> )	Numbers	Excavator			Trucks			
	Capacity (m <sup>3</sup> )	Numbers									
Excavator											
Trucks											
	(viii) Impact of excess deployment of loading equipments (excavators) and transporting equipments on environment.										



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	(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 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	



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	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 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

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	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 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	
	(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	



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

STATE LEVEL ENVIRONMENT IMPACT  
ASSESSMENT AUTHORITY-TAMILNADU

3<sup>rd</sup> 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.6254/ToR-335/Ext/2018/ dated:28.10.2022**

To

M/s. Sivam Mines  
6/209, Main Road, Sirungudi post  
Nathanm Taluk  
Dindigul

Sir/Madam,

**Sub:** SEIAA-TN – Extension of validity of the Terms of Reference granted under Violation category for the Existing Limestone quarry over an Extent 0.94.0Ha located at S.F.No 616/1B(p), 1C, 618/1(p), 619 , Sirungudi Village, Nathanm Taluk, Dindigul District, Tamil Nadu by M/s. Sivam Mines –Issued– Regarding.

- Ref:**
1. Earlier ToR issued by SEIAA-TN vide Letter No.SEIAA-TN/F.No.6254/ToR-335/2018/ dated 11.05.2018
  2. Amendment to ToR Letter No. SEIAA-TN/F-6254/SEAC- CXVIII/TOR-335(A)/2018 dt 30.07.2018
  3. 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.
  4. MoEF&CC Notification S.O. 221(E) 18.01.2021
  5. Online Proposal No. SIA/TN/MIN/268110/2022 dated: 15.04. 2022
  6. Your Application for Extension of Validity of Terms of Reference dated: 15.04.2022.
  7. Minutes of the 319th Meeting of SEAC held on 12.10.2022

  
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8. Minutes of the 564th meeting of Authority held on 28.10.2022.

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In the reference 1<sup>st</sup> cited above, the Terms of Reference under Violation category was accorded to M/s. Sivam Mines for the Existing Limestone quarry over an Extent 0.94.0Ha located at S.F.No 616/1B(p), 1C, 618/1(p), 619 , Sirungudi Village, Natham Taluk, Dindigul District, Tamil Nadu vide T.O. Letter No. SEIAA-TN/F.No.6254/ToR-335/2018/ dated 11.05.2018.

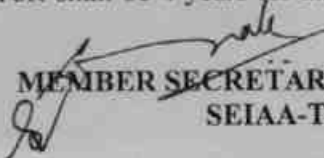
Now the proponent has applied online through Parivesh portal vide Proposal No. No. SIA/TN/MIN/268110/2022 dated: 15.04. 2022 for the Extension of validity of ToR with all required documents.

**SEAC Remarks:**

**Existing Limestone quarry over an Extent 0.94.0Ha located at S.F.No 616/1B(p), 1C, 618/1(p), 619 , Sirungudi Village, Natham Taluk, Dindigul District, Tamil Nadu by M/s. Sivam Mines for Extension of validity of the Terms of Reference "Under Violation". (SIA/TN/MIN/268110/2022 dated: 15.04. 2022)**

The proposal was placed in this 319<sup>th</sup> Meeting of SEAC held on 12.10.2022. The details of the project furnished by the proponent are available on the website (parivesh.nic.in). The SEAC noted the following:

1. The project proponent, M/s. Sivam Mines has applied seeking Extension of validity for Terms of Reference under Violation for the Existing Limestone quarry over an Extent 0.94.0Ha located at S.F.No 616/1B(p), 1C, 618/1(p), 619 , Sirungudi 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, as amended.
3. The Proponent had applied for ToR to carry out the EIA study under violation vide dated 03.04.2018.
4. The ToR for carrying out the EIA study under violation was issued vide Letter No. SEIAA-TN/F.No.6254/ToR-335/2018/ dated 11.05.2018.
5. Further, Amendment to ToR Letter No. SEIAA-TN/F-6254/SEAC- CXVIII/TOR-335(A)/2018 dt 30.07.2018 and the ToR Extension under violation was issued vide SEIAA. Lr. No. SEIAA-TN/F.No. 6254/TOR- 335/2018/A/ dated: 29.10.2021.
6. As per MoEF&CC O.M Dt:29.08.2017, the validity of ToR shall be 4 years for all

  
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the projects/activities and 5 years for River Valley and HEP Projects.

7. Now the PP has applied online through Parivesh portal vide Proposal No. **SIA/TN/MIN/268110/2022 dated: 15.04. 2022** for the extension of validity of ToR with all required documents.
8. The proponent had cited the reasons of the outbreak of the Corona virus (covid-19) and subsequent lockdowns which had put the studies initiated as a part of EIA on hold and they were unable to proceed further to submit the final EIA report in time.

The SEAC had observed the MoEF&CC Notification S.O. 1247(E), dated the 18 March, 2021, stating that *".....the period from the 1st April, 2020 to the 31st March, 2021 shall not be considered for the purpose of 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... "*.

Hence, the SEAC after detailed discussions confirmed that the ToR issued is valid up to 10.05.2023 as per the aforesaid MoEF Notification dated 18.01.2021.


Therefore, the project proponent is requested to submit EC application, Public Hearing minutes, EIA/EMP report along with required details during the EIA appraisal on the following –

The Proponent shall furnish the DFO letter stating the proximity distance of nearest RF , WLS & Tiger reserve etc.,

With the above remarks, the proposal is placed before the Authority to decide on the above minutes by SEAC.

**SEIAA Remarks:**

The proposal was placed before the 56<sup>th</sup> meeting of Authority held on 28.10.2022. The Authority noted that the subject was placed in the 319<sup>th</sup> Meeting of SEAC held on 12.10.2022. the SEAC after detailed discussions confirmed that the ToR issued is valid up to 10.05.2023 as per the aforesaid MoEF Notification dated 18.01.2021. Therefore, the project proponent is requested to submit EC application, Public Hearing minutes, EIA/EMP report along with the following additional details during the EIA appraisal on the following:

  
MEMBER SECRETARY  
SEIAA-TN

The proponent shall furnish the DFO letter stating the proximity distance of nearest RF , WLS & Tiger reserve etc.

The Authority, after detailed deliberations accepted the aforesaid recommendations of the SEAC and decided to grant extension of ToR under violation category for the period up to 10.05.2023. subject to the ToR as recommended by the SEAC in addition to the following ToR:

1. The proponent shall furnish the DFO letter stating the proximity distance of nearest RF , WLS & Tiger reserve etc.
2. The project proponent shall submit valid mining lease and scheme of mining plan obtained from the competent authority.
3. The project proponent shall submit excess mined out quantity during the violation period after 15.01.2016 along with details of existing pit within the proposed mining area and the copy of remittance of fine levied for the same from the concerned AD/DD, Geology & Mining Dept.
4. The project proponent shall submit details of case filed against the project proponent under Section 19 of the Environment (Protection) Act, 1986.
5. 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.
6. What are the green mining technologies to be adopted for reducing GHG/CO<sub>2</sub> emissions and lowering the carbon footprint in the limestone mining.
7. Strategies adopted for safety and healthy mining operations.
8. What are the transparency and accountability system in place during the operation and post-operation period of the project.
9. What are the In-House environmental performance and evaluation tools to understand negative impacts of mining.
10. Detailed study to be made on material flow analysis and Life Cycle Assessment (LCA) in the process of production.
11. 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.

  
MEMBER SECRETARY  
SEIAA-TN

12. Project Proponent to study impacts on human health viz respiratory impacts, toxicity impacts and radiation impacts.
13. Study to be made on aquatic, terrestrial toxicity, aquatic eutrophication including detailed terrestrial toxicity and their impacts of wildlife and biodiversity.
14. What is the total water withdrawal consumption, likely temperature rises and climate change impacts.
15. 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 and Forests Department, Tamil Nadu.
3. The Principal Secretary to Government, Industries Department, Tamil Nadu.
4. The Additional Principal Chief Conservator of Forests, Regional Office (SZ), 34, HEPC Building, 1<sup>st</sup> & 2<sup>nd</sup> 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.





**ABSTRACT**

Industries - Mines and Minerals – Major Mineral - Limestone – Dindigul District – Natham Taluk – Sirugudi Village – S.F. Nos. 616/1B (Part), 1C, 618/1 (Part) and 619 – Over an extent of 0.94.0 hectare – Transfer of mining lease granted to Thiru. S. Ilangovan to M/s. Sivam Mines – Orders - Issued.

INDUSTRIES (MMA.1) DEPARTMENT

G.O. (D) No. 170

Dated: 03.11.2014

திருவள்ளூர் ஆண்டு 2045  
ஜய வருடம், ஐப்பசி திங்கள் 17

Read:

1. G.O. (3D) No.89, Industries (MMA.2) Department, dated: 17.10.1996.
2. Representation of Thiru. S.Ilangovan, Letter dated: 25.01.2010.
3. From the District Collector, Dindigul, Roc. No.51/2010/(Mines), dated: 03.03.2010.
4. From the Commissioner of Geology and Mining, Letter Rc. No. 3008/MM4/2010, dated: 9.4.2010.

-0-

**ORDER:**

In the Government Order first read above, orders have been issued granting mining lease in favour of Thiru. S. Ilangovan, Dindigul District for mining limestone over an extent of 0.94.0 hectares of patta lands in S.F. Nos. 616/1B (Part), 1C, 618/1 (Part) and 619 of Sirugudi Village, Natham Taluk, Dindigul District for a period of 20 years from 04.03.1997 to 03.03.2017.

2. In his letter second read above, Thiru. S. Ilangovan 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. Asai Alangaram 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. Ilangovan 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 leases in the State of Tamil Nadu. Further, the lessee has also produced no mining dues certificate in respect of Dindigul District and the transferee firm have also produced the affidavit to bear the liabilities of the lessee and the partnership firm has been registered on 25.1.2010 by the Registrar of Firms, Dindigul. The District Collector, Dindigul has recommended the application for name transfer from Thiru.S. Ilangovan to the partnership concern that is in the name of "M/s. Sivam Mines".

*(Signature)*

DR. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
RECOGNISED QUALIFIED PERSON  
RQP/MAS/206/2007/A

4. Based on the recommendation of the District Collector, Dindigul, the Commissioner of Geology and Mining in his letter fourth read above has recommended the application preferred by Thiru. S. Ilangoval for transfer of mining lease granted to him in the Government Order first read above for mining limestone over an extent of 0.94.0 hectares of patta lands in S.F. Nos. 616/1B (Part), 1C, 618/1 (Part) and 619 of Sirugudi Village, Natham Taluk, Dindigul District for a period of 20 years from 04.03.1997 to 03.03.2017 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 the Indian Bureau of Mines in respect of the said leasehold area as provided under rule 37 of Mineral Concession Rules, 1950.

5. After careful examination, the Government have decided to accept the recommendations of the District Collector, Dindigul and the Commissioner of Geology and Mining. Accordingly, the mining lease granted in the Government Order first read above for limestone over an extent of 0.94.0 hectares of patta lands in S.F. Nos. 616/1B (Part), 1C, 618/1 (Part) and 619 of Sirugudi Village, Natham Taluk, Dindigul District for a period of 20 years to Thiru.S. Ilangoval is transferred to M/s. Sivam Mines upto the valid lease period, (i.e. 04.03.1997 to 03.03.2017) subject to the condition that the transferee should scrupulously follow the Mining Plan/scheme of mining approved by the Indian Bureau of Mines in respect of the said leasehold area as provided under rule 37 of Mineral Concession Rules, 1950.

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

(BY ORDER OF THE GOVERNMENT)

C.V. SANKAR

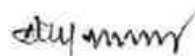
PRINCIPAL SECRETARY TO GOVERNMENT

To  
The Commissioner of Geology and Mining, Dindigul, Chemical-00 032.  
The District Collector, Dindigul (w.c).  
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.  
Thiru. S. Ilangoval, 6/208, Main Road,  
Sirugudi Post, Natham Taluk, Dindigul District.  
M/s. Sivam Mines, 6/209, Pudupatti,  
Sirugudi Village, Natham Taluk, Dindigul District.

Copy to:

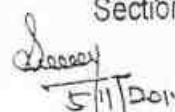
Office of the Hon'ble Minister (Industries), Chemical-00 009.  
Industries (OP.II) Department, Chemical-00 009.  
SF/SC

1. Forwarded to B, order //



DR. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
RECOGNISED QUALIFIED PERSON  
RQP/MAS/206/2007/A

  
Section Officer

  
5/11/2014

## 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. 616/1பி மற்றும் சிலவற்றில் 0.94.0 ஹெக்டேர் பரப்பு - சுண்ணாம்புக்கல் குவாரி உரிமம் வழங்கப்பட்டது - சுற்றுச்சூழல் இசைவு சமர்ப்பிக்காமல் குவாரிப்பணி மேற்கொண்டது - கனிமத் தொகை செலுத்தக் கோருவது - தொடர்பாக.

- பார்வை : 1. அரசாணை 3(டி) எண்.89, தொழில்(எம்.எம்.ஏ2) துறை நாள்: 17.10.1996
2. அரசாணை 3(டி) எண்.170, தொழில்(எம்.எம்.ஏ2) துறை நாள்: 03.11.2014
3. அரசாணை எண். (MS) எண் 79 தொழில் (MMC.1) துறை நாள் 06.04.2015.
4. மாண்பும 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.

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திண்டுக்கல் மாவட்டம், நத்தம் வட்டம், சிறுகுடி கிராமம், புல எண்கள். 616/1பி மற்றும் சிலவற்றில் 0.94.0 ஹெக்டேர் பரப்பில் பார்வை 1-ல் கண்டுள்ள அரசாணையின்படி 04.031997 முதல் 03.03.2017 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.

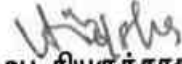
எனவே, 1959ம் வருட தமிழ்நாடு சிறுகனிம விதி 42 ன்படி மத்திய/மாநில சுற்றுச்சூழல் பாதுகாப்பு குழுமத்தின் இசைவினைப் பெற்று சமர்ப்பிக்குமாறு பார்வை 3ல் காணும் குறிப்பாணையில் கேட்டுக்கொள்ளப்பட்டது.

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.

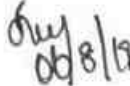
அதன்படி தாங்கள் 15.01.2016 முதல் 10.01.2017 முடிய சுற்றுச்சூழல் இசைவு இன்றி குவாரிப்பணி மேற்கொண்டு குவாரியிலிருந்து எடுத்துச் சென்ற கனிமத்திற்கு உண்டான கனிமத்தொகை பின்வருமாறு கணக்கிடப்பட்டுள்ளது.

வ. எண்	கால வரையறை	எடுத்துச் செல்லப்பட்ட கனிமத்தின் அளவு	செலுத்த வேண்டிய கனிமத் தொகை
1.	15.01.2016 முதல் 10.01.2017	1600	2043000
	மொத்தம்	1600	2043000

எனவே மேற்படி கனிமத் தொகையான ரூ.2043000/- (ரூபாய் இரண்டு இலட்சத்து நாற்பத்து மூன்றாயிரம் மட்டும்) இக்குறிப்பாணை கிடைக்கப்பெற்ற 15 தினங்களுக்குள் கீழ்க்கண்ட தலைப்பில் செலுத்தி அசல் சலாணை இவ்வலுவலகத்தில் சமர்ப்பிக்குமாறு கேட்டுக்கொள்ளப்படுகிறது.

  
 மாவட்ட ஆட்சியருக்காக,  
 உதவி இயக்குநர்,  
 புவியியல் மற்றும் சுரங்கத்துறை,  
 திண்டுக்கல்

பெறுநர்:  
 தி/ள்.சிவம் மைன்ஸ்,  
 சிறுகுடி கிராமம்,  
 நத்தம் வட்டம்,  
 திண்டுக்கல் மாவட்டம்.

  
 09/8/19

Speed Post

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

Telephone no.: 044-24914461/1570  
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/LST/ROMP/~~1407~~ MDS

Dated: 17/03/2017



To :

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

Sub : Approval of Review of Mining Plan (including Progressive Mine Closure Plan) for Sirugudi Limestone Mine over an area of 0.94.0 hectares in S.F. nos. 616/1B(P), 1C, 618/1(P) & 619 in Sirugudi Village, Natham Taluk, Dindigul District submitted under Rule 17(1) of MCR, 2016.  
Ref. : Qualified Person's letter no. nil dated 7.03.2017.


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 18.5.2016 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. 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, 1960, 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 / 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. 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 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 1<sup>st</sup> 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 the date of approval of the document for the mining activities to be carried out within the mining leasehold.
- 13) As per rule 27(2) of MCDR, 2017 the financial assurance of Rs. 500000/- in respect of Cat. B mines to be submitted within a period of 90 days from the date of notification of the rules i.e. 27.02.2017, the bank guarantee for the balance amount may be submitted within the time.
- 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.

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

Yours faithfully,  
  
17.03.17  
(V. Jaya Krishna Babu)  
Regional Controller of Mines

Copy for information to:-

- 1) Sri P. Thangaraju, Qualified Person, Old No. 260-B, New No. 17, Advaita 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.

Encl : As above.

  
(V. Jaya Krishna Babu)  
Regional Controller of Mines



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

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

**MINING PLAN PERIOD - [2017-18 to 2021-22]**

**[Lease period: 20 Years (from 04.03.1997 to 03.03.2017)]**

**[Date of Expiry-03.03.2017 (Work Continuing under Deemed Extension)]**

**Mine Code: 38TMN06010**

(SUBMITTED UNDER RULE 17(1) OF MCR, 2016 AND RULE 23(B) OF MCDR, 1988)

**Registration Number Under Rule 45 - IBM /5276/2011, Dated: 25.11.2011.**

**LOCATION OF THE MINE**

EXTENT : 0.94.0 HA.  
S.F.NOS : 616/1B (P), 1C,  
618/1 (P) & 619

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**

**Dr. P. THANGARAJU, M.Sc., M.M.E.A., Ph.D.,**  
RQP/MAS/206/2007/A

Old.No.260-B, New No: 17,  
Advaitha Ashram Road, Alagapuram, Salem - 636 004.  
Cell: 94422 78601, 94433 56539.  
E-mail: ifthiahmed@gmail.com, geothagam@gmail.com



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

OVER AN EXTENT OF 0.94.0 HA IN S.F.NOS. 616/1B (Part), 1C, 618/1 (Part) & 619 IN  
SIRUGUDI VILLAGE, NATHAM TALUK, DINDIGUL DISTRICT

**Mining plan period - [2017-18 to 2021-22]**

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

(SUBMITTED UNDER RULE 17(1) OF MCR, 2016 AND RULE 23(B) OF MCDR, 1988)

Registration Number under Rule 45: IBM /5276/2011, Dated: 25.11.2011.

**Mine Code: 38TMN06010**

**INTRODUCTION**

This Review of Mining Plan and Progressive Mine Closure Plan for Sirugudi Limestone Mine, over an extent of 0.94.0 hectares in S.F. Nos: 616/1B (Part), 1C, 618/1 (Part) & 619 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. Ilangoan, Thiru. I.Vijay Alangar and Selvi. I. Sempon manickam. Thiru. S. Ilangoan 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.IX).

Initially, the mining lease for limestone was granted to Thiru. S. Ilangoan, Dindigul district vide G.O. 3(D).No. 89, dated 17.10.1996 for a period of 20 years from 04.03.1997 to 03.03.2017 and the lease deed was executed on 04.03.1997.

The mining plan was approved by Indian Bureau of Mines vide letter no. TN/D-Anna/MP/LST-873-MDS, dated 12.12.1995.

The first scheme of mining was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS-128-MDS, dated 02.07.2002.

The second scheme of mining was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS-450-MDS, dated 10.09.2007.

The third scheme of mining (2012-13 to 2016-17) was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS-765.MDS, dated 27.03.2013 and it is valid upto 03.03.2017 and a Copy of SOM approval letter of the same is enclosed as Annexure No.X.

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.170 Inds (MMA.1) dept., dated 03.11.2014. (Please refer Annexure No.II & VI).

As the lease period is going to get expired on 03.03.2017. The lessee has decided to renew the mining lease, the renewal application was submitted on 22.02.2016 to The State Government Authorities, Tamilnadu for a further period of Thirty years (from 04.03.2017 to 03.03.2047) and hence, this Review of Mining Plan along with Progressive Mine Closure Plan [2017-18 to 2021-22] is being prepared now & submitted under Rule 17(1) of MCR, 2016 and Rule 23(B) of MCDR, 1988. Copy of renewal of mining lease application is enclosed as Annexure No.VIII.

TR: *Romp*  
Subject: *Review of Mining Plan and Progressive Mine Closure Plan*  
No. *LST/MS-1407* Dt: *17/03/2017*

TN/DGL/LST/Romp-1407, dt: 17/03/2017

**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. He does not hold any other mining leases outside Tamilnadu State.

Table - 1

Sl No	Lease reference no. & date	Area in Ha	Location	Type of mineral	Working/ Non-Working	Status of approval of MP/MS	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	Limestone	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	Limestone	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.173, dated 05.11.2014	1.70.0 Ha.	Sirugudi Village, Natham Taluk, Dindigul District	Limestone	Working	MP- TN/DGL/MP/ LST-1969.MDS dated, 30.03.2016	28.02.1996 & 27.02.2016	Period of 20 years
4.	G.O.(D).No.171, dated 03.11.2014	2.53.0 Ha.	Sirugudi Village, Natham Taluk, Dindigul District	Limestone	Working	SOM- TN/DGL/LST/M S-1103.MDS dated, 04.08.2014	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. Ilangoan, 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. : ilangoanmadhavi4.9@gmail.com

Rule 45 registration no. : **IBM /5276/2011**

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.IX).

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**

Not applicable.

**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 Recognized 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 Scheme of Mining only) preparing Mining Plan**

Name : Dr. P. Thangaraju M.Sc., M.M.E.A., Ph.D.,  
Recognized Qualified Person  
Address : Old.No.260-B, New No: 17,  
Advaita Ashram Road, Alagapuram,  
Salem – 636 004.  
Tele Fax : 0427- 2431989 (Office)  
Cell Phone Nos : 94433 56539 & 94422 78601  
Registration No : RQP/MAS/206/2007/A  
Date of Grant/Renewal : 31.01.2007



**2.0 LOCATION AND ACCESSIBILITY**

**a) Lease Details (Existing Mine)**

Name of the Mine : Sirugudi Limestone Mine  
Lat/long of boundary point : 10° 14' 54.81"N, 78° 17'34.28"E  
Date of grant of lease : 17.10.1996  
Period/Expiry Date : 20 years with effect from 04.03.1997  
(i.e. from 04.03.1997 to 03.03.2017)  
First renewal application submitted on : 22.02.2016  
Period for which renewal  
(First renewal) of mining lease is applied : 30 years (04.03.2017 to 03.03.2047).

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)		Area (ha)
	Nil	i). Waste land ✓ ii).Grazing land iii).Agriculture land iv).Other (specify)	0.94.0 Ha

Table-4

District & State	Village & Taluk	S.F.No.	Extent in hectares
Dindigul & Tamilnadu	Sirugudi & Natham	616/1B(P)	0.01.5
		616/1C	0.03.5
		618/1(P)	0.26.0
		619	0.63.0
<b>Total</b>			<b>0.94.0 Ha</b>

**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 about 2.5 km SW from Sirugudi. The area is located at a distance of about 3.5km 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	2.5
2	Nearest Town(D.H)	Dindigul	NW	36
3	Nearest Police Station	Natham	SW	7.0
4	Nearest Govt. Hospital	Sirugudi	NE	2.5
5	Nearest School	Thethampatti	NE	1.0
6	Nearest DSP Office	Dindigul	NW	36
7	Nearest Railway Station	Dindigul	NW	37
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 Southern Corner		
Point Id.	Latitude	Longitude
A	10 <sup>0</sup> 14'54.81"N	78 <sup>0</sup> 17'34.28" E
B	10 <sup>0</sup> 14'56.20"N	78 <sup>0</sup> 17'32.91" E
C	10 <sup>0</sup> 14'56.95"N	78 <sup>0</sup> 17'31.64" E
D	10 <sup>0</sup> 14'56.60"N	78 <sup>0</sup> 17'31.14" E
E	10 <sup>0</sup> 14'56.87"N	78 <sup>0</sup> 17'30.48" E
F	10 <sup>0</sup> 14'57.85"N	78 <sup>0</sup> 17'30.52" E
G	10 <sup>0</sup> 14'58.77"N	78 <sup>0</sup> 17'32.79" E
H	10 <sup>0</sup> 14'58.84"N	78 <sup>0</sup> 17'33.67" E
I	10 <sup>0</sup> 14'58.85"N	78 <sup>0</sup> 17'33.85" E
J	10 <sup>0</sup> 14'58.62"N	78 <sup>0</sup> 17'34.11" E
K	10 <sup>0</sup> 14'58.09"N	78 <sup>0</sup> 17'34.35" E
L	10 <sup>0</sup> 14'55.45"N	78 <sup>0</sup> 17'35.11" E
M	10 <sup>0</sup> 14'55.48"N	78 <sup>0</sup> 17'35.19" 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**

The mining plan was approved by Indian Bureau of Mines vide letter no. TN/D-Anna/MP/LST-873-MDS, dated 12.12.1995.

The first scheme of mining was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS-128-MDS, dated 02.07.2002.

The second scheme of mining was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS-450-MDS, dated 10.09.2007.

The third scheme of mining (2012-13 to 2016-17) was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS-765.MDS, dated 27.03.2013 and it is valid upto 03.03.2017 and a Copy of SOM approval letter of the same is enclosed as Annexure No.X.

As the lease period is going to get expired on 03.03.2017. The lessee has decided to renew the mining lease, the renewal application was submitted on 22.02.2016 to The State Government Authorities, Tamilnadu for a further period of Thirty years (from 04.03.2017 to 03.03.2047) and hence, this Review of Mining Plan along with Progressive Mine Closure Plan [2017-18 to 2021-22] is being prepared now & submitted under Rule 17(1) of MCR, 2016 and Rule 23(B) of MCDR, 1988. Copy of renewal of mining lease application is enclosed as Annexure No.VIII.

**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:**

In the previous approved scheme period (2012-13 to 2016-17), Six Wagon Drills (BH1-15m, BH2-15m, BH3-15m, BH4-20m, BH5-20m & BH6-15m depth was proposed from the existing pit surface level in the year 2012-13, 2013-14 & 2014-15, but three boreholes of 9.0m depth each was carried out by the lessee during the previous Scheme period, to find out the grade of limestone, lateral variations and vertical in homogeneities of the limestone formation and depth persistence. At Present there is one existing pit and its dimension is given below.

Existing Pit Geometry:

Table-7

Length In Meter	Width In Meter	Depth In Meter	Area In Ha.	Dip°	Strike
120 (max)	47 (avg)	25 (max)	0.56.4	85°SE	N60°E- S60°W

With the datas analyzed from the drilled boreholes and existing pit, the deposit has been proved upto 25m depth with an average of 1m topsoil. The boreholes logging datas are furnished below.



Litho log of drilled boreholes:

Table-8

No. of bore holes	Depth of boreholes (m)	Depth of deposition of Limestone	Strata
DBH-1	9	209.0m-208.2m	Mined out
		208.2m-200.0m	Limestone
DBH-2	9	216.0m-215.1m	Mined out
		215.1m-207.0m	Limestone
DBH-3	8.8	223.8m-215.0m	Limestone

Locations of drilled boreholes are marked in the geological plan and sections and year wise plan and sections (Refer Plate No.IV & V). Copy of Form J and K are enclosed as Annexure No.XII.

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 N60°E- S60°W direction with dipping 85°SE.

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 50% was discussed in the previous approved scheme period. But during the course of mining operation, increases in depths and also by the growth of technology and latest inventions in nearby lime based industries has been developed so as to use low grade limestone also, therefore the recovery percentage is gradually increase from 60% to 80% recovery was achieved by lessee during the previous approved scheme period. Hence the 80% recovery is discussed during the present 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 25m depth. The depth of the mineralization has been proved upto 25m depth with an average of 1m topsoil in north and western portion of the area by based on the existing pit and drilled bore hole, upto 22m depth with an average of 1m topsoil in Eastern portion and upto 10m depth with an average of 1m topsoil in Southeastern portion of the lease area by drilled bore holes.

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 [2017-18 to 2021-22]**

25m [1m topsoil + 21m limestone (proved 111) + 3m limestone (probable 221)]	Centre and East
25m [1m topsoil + 9m limestone (proved 111) + 15m limestone (probable 221)]	Southeast

The depth of mineralization has been already proved upto 25m depth, moreover the bench formation below 22m depth in the centre & east and below 10m depth in the Southeastern side of the lease area would be difficult as the lease area is narrow and irregular, and hence no further exploration is proposed during the present plan period.

**ii. Mine development:**

During the time of previous approved scheme period (2012-13 to 2016-17), mining operation was proposed to be carried out in the Northern portion of the lease area in East-West direction to a maximum upto a depth of 10.5m. The mining operation was carried out in north and western portion of the lease area. At present there is one existing pit and its dimension is [120m (max) x 47m (avg) x 25m (d) (max)].

Handling of waste and ore & Places of working:

The wastes include mineral rejects and Topsoil. The mineral rejects which includes rock fragments, impurities etc. The mineral rejects are generated during the previous plan period was stored in the southeastern side 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 scheme [2012-13 to 2016-17]:

Table -10

Year	Proposal (Tonnes)			Actual (Tonnes)		
	Rom	Mineral Rejects (50%) Ts	Limestone (50%) Ts	ROM (Ts)	Limestone Ts	Mineral Rejects Ts
2012-13	1950	975	975	3350	2010	1340
2013-14	1950	975	975	2754	1790	964
2014-15	1950	975	975	3957	2770	1187
2015-16	1950	975	975	4080	3060	1020
2016-17	1950	975	975	4878 (upto-7 <sup>th</sup> Jan-2017)	3902	976
<b>Total</b>	<b>23171</b>	<b>4875</b>	<b>4875</b>	<b>19019</b>	<b>13532</b>	<b>5487</b>

**iv. Reserves estimated in the earlier approved scheme of mining [2012-13 to 2016-17] with grade.**

During the previous approved mining scheme period (2012-13 to 2016-17), the reserves were estimated upto 16.5m depth with an average of 1.5m 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 scheme of mining [2012-13 to 2016-17]**

Description of reserves	ROM (tonnes)	Limestone (50%) Recovery (Ts)	Category	UNFC Code	Grade
Geological Resources (insitu)	220166	110083	Proved & Probable	111 & 222,333	Cement Grade Limestone
Mineable reserves	59032	29516	Proved	111	

Depletion of Reserves

The insitu reserve depleted during the previous approved scheme period [2012-13 to 2016-17]

Table -12

Year	ROM in Ts	Limestone in Ts	Recovery %
2012-13	3350	2010	@ 60%
2013-14	2754	1790	@ 65%
2014-15	3957	2770	@ 70%
2015-16	4080	3060	@ 75%
2016-17 (upto-7 <sup>th</sup> Jan-2017)	4878	3902	@ 80%
<b>Total</b>	<b>19019</b>	<b>13532</b>	-

Total Mineable reserves as per the previous approved Scheme period (2012-13 to 2016-17) @ 50% recovery = 29,516 Ts

Reserves depleted during the previous approved Scheme period (2012-13 to 2016-17 (upto 7<sup>th</sup> Jan-2017) = 13,532 Ts

**The reason for deviation in production of ROM/Limestone:**

Production during the previous approved scheme period was higher than the anticipated and the reason was due to Heavy demand for limestone in the market. Hence, the achieved production was increased.

**v. Afforestation programme:**

During the previous plan period, it was proposed to plant 15 neem/karuvela saplings covering an area of 75 sq.m with 50% survival rate every year in the northeastern boundary barrier of the lease area. Afforestation was carried out and the survival rate of the plants was about 20%, due to poor rainfall. The lessee ensures to compensate this afforestation during the present plan period.

Table-13

Year	Name of the Species	No. of trees Planned	Expected Survival Rate % & No.		Actual Survival Rate % & No.	
			%	No.	%	No.
2012-13	Neem	15	50	8	26	4
2013-14	Neem	15	50	8	26	4
2014-15	Neem	15	50	8	20	3
2015-16	Neem	15	50	8	20	3
2016-17 (upto-7 <sup>th</sup> Jan-2017)	Neem	15	50	8	20	3

**vi. Reclamation & rehabilitation:**

No reclamation and rehabilitation was proposed and hence neither reclamation nor rehabilitation was carried out during the previous approved scheme period. The mineral rejects are generated during the previous plan period was stored in the southeastern side 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 & vii. 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**

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 flat terrain. The general drainage pattern of the area is of sub-dendritic and dendritic 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 35m during summer and 30m during rainy season. The area exhibits a tropical climate and the temperature goes upto 38°C in summer and falls down to 25°C in December - January. The wind direction is NE-SW and vice-versa. Average annual rainfall is about 850 mm in northeast monsoon season.

**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 grade and in form Band running N60°E - S60°W with dipping 85° SW. Reddish soil cover upto a depth in about 1.0m. Recovery of minerals is estimated as 80% of the total excavation of the ore body. The recovery percentage is based on the knowledge gained from the present 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 general geological sequence of the limestone deposits is as follows:

↑	Order of Super position:		<u>ROCKFORMATION</u>
	<u>AGE</u>		
	Recent	-	Reddish Soil
	Archaean	-	Crystalline Limestone
		-	Calc-gneiss.

The physical attitude of the limestone band is demarked as follows:

Strike length (m)	: 130
Width (m)	: 69
Depth (m) Proved	:
	25m with an average of 1m topsoil - North and West
	22m with an average of 1m topsoil - Centre and East
	10m with an average of 1m topsoil - Southeast
Strike direction	: N60°E - S60°W
Dip amount and direction	: 85° SE.

The deposit is covered by 1.0m thickness of topsoil followed by 24m thickness of Limestone bed.

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 : 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 : geothingam@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

Boreholes No	Type	Diameter	Spacing	inclination	Strike/foliation
2 nos. of Boreholes (DBh1 to DBh-2)	DTH	110 mm	50m grid interval	Vertical	N60°E- S60°W

(iii). Details of samples analysis:

**Grade of Limestone:**

Samples were collected from the existing mining pit and drilled boreholes 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 the recovery percentage of limestone mineral is 80% and the bulk density is 2.6. The average analysis of the limestone from the lease area is given below.

Table - 15

LIMESTONE	
Parameter	Composition %
CaO	41.85
MgO	4.15
Fe <sub>2</sub> O <sub>3</sub>	0.36
Al <sub>2</sub> O <sub>3</sub>	0.85
SiO <sub>2</sub>	8.95
LOI	43.83

The quality of Limestone ranges between 40 to 42% of CaO, 8 to 9.0% of SiO<sub>2</sub> and 0.3 to 0.5% of Fe<sub>2</sub>O<sub>3</sub>. As analyzed by NABL laboratories limestone which has more than 80% CaCO<sub>3</sub> is best suited for cement and other lime based industries, the grade below 20% of CaCO<sub>3</sub> with contaminations of calc gneiss waste are considered as mineral rejects in these particular formations. Chemical analysis report of the limestone is enclosed as Annexure - V.

**(iv) Expenditure incurred in various prospecting operations.**

Total expenditure incurred for the exploration already carried out is given below:

Table-16

Total length of the hole/pit shaft :	3 holes [of 9.0m depth] - DTH drill DBh-1 - 9.0m DBh-2 - 9.0m DBh-3 - 8.8m <b>Total meterage - 26.8m</b>
Total operating expenditure incurred :	DTH drills - Rs. 400/m. (26.8m x Rs. 400) <b>= Rs.10,720/-</b>

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 28(1)(a) of MCDR 1988.

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 28 (1)(b) of MCDR 1988.

The mining lease area is a flat 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 No.V), the proposed production for the next five years [2017-18 to 2021-22] 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:

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
[2017-18 to 2021-22]	Nil	-	-	-	-

The depth of mineralization has been already proved upto 25m depth, moreover the bench formation below 22m depth in the centre & east and below 10m depth in the Southeastern side of the lease area would be difficult as the lease area is narrow and irregular, and hence no further exploration is proposed during the present plan period.

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 only one grade i.e. cement grade.

The recovery of 50% was discussed in the previous approved scheme period. But during the course of mining operation, increases in depths and also by the growth of technology and latest inventions in nearby lime based industries has been developed so as to use low grade limestone also, therefore the recovery percentage is gradually increase from 60% to 80% recovery was achieved by lessee during the previous approved scheme period. Hence the 80% recovery is discussed during the present plan period.

**Reassessed Mineral Reserves and Resources as per UNFC System as on 18.11.2016**

Table-18  
Summary of Reserves & Resources

Description	Section	ROM (Ts)	Limestone @ 80% recovery (Ts)	Mineral Rejects @ 20% (Ts)	Top Soil (Ts)
A. Mineral Reserves (111)	XY-CD	30264	24211	6053	-
	XY-EF	7574	6059	1515	-
	<b>Total</b>	<b>37838</b>	<b>30270</b>	<b>7568</b>	<b>-</b>
B. Mineral Resources locked up in benches (221)	XY-AB	12605	-	-	-
	XY-CD	53765	-	-	-
	XY-EF	40061	-	-	-
	<b>Total</b>	<b>106431</b>	<b>-</b>	<b>-</b>	<b>-</b>
C. Mineral Resources locked in 7.5m safety barrier (221)		187200	149780	37440	6000

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 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). The recovery percentage of limestone in this mine is 80% which is well inferred by the experience gained by the lessee during the previous mining activity and also by the field tests carried out in the lease area and analysis done in NABL Laboratories. The bulk density has been reckoned as 2.6.

As analyzed by NABL laboratories limestone which has more than 80% CaCO<sub>3</sub> is best suited for cement and lime based industries, the grade below 20% of CaCO<sub>3</sub> 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 [2017-18 to 2021-22]

25m [1m topsoil + 21m limestone (proved 111) + 3m limestone (probable 221)]	Centre and East
25m [1m topsoil + 9m limestone (proved 111) + 15m limestone (probable 221)]	Southeast

The depth of mineralization has been already proved upto 25m depth, moreover the bench formation below 22m depth in the centre & east and below 10m depth in the Southeastern side of the lease area would be difficult as the lease area is narrow and irregular, and hence no further exploration is proposed during the present plan period.

**Reassessed Mineral Reserves and Resources as per UNFC System as on 18.11.2016**

Table-20

## A. Mineral Reserves(111)

Section	Bench	Dimension			Volume (cum)	Bulk density	ROM (Ts)	Limestone @80% Recovery (Ts)	Mineral Rejects @ 20% (Ts)
		L(m)	W(m)	D(m)					
XY-CD	III	5	13	3	195	2.6	507	406	101
	IV	17	13	3	663	2.6	1724	1379	345
	V	51	20	3	3060	2.6	7956	6365	1591
	VI	52	25	3	3900	2.6	10140	8112	2028
	VII	59	16	3	2832	2.6	7363	5891	1473
	VIII	55	6	3	990	2.6	2574	2059	515
	<b>Total</b>							<b>30264</b>	<b>24211</b>
XY-EF	II	19	24	3	1368	2.6	3557	2845	711
	III	27	15	3	1215	2.6	3159	2527	632
	IV	22	5	3	330	2.6	858	686	172
	<b>Total</b>							<b>7574</b>	<b>6059</b>
<b>Grand Total</b>							<b>37838</b>	<b>30270</b>	<b>7568</b>

Table-21

## B. Mineral Resources locked up in benches (221)

Section	Bench	Dimension			Volume (m3)	Bulk density	ROM (Ts)
		L (m)	W(m)	D(m)			
XY-AB	II	1	15	3	45	2.6	117
	III	2	18	3	108	2.6	281
	IV	3	19	3	171	2.6	445
	V	4	21	3	252	2.6	655
	VI	4	22	3	264	2.6	686
	VII	5	25	3	375	2.6	975
	VIII	7	29	3	609	2.6	1583
	IX	12	84	3	3024	2.6	7862
	XY-CD	II	5	7	3	105	2.6
III		5	11	3	165	2.6	429
IV		17	18	3	918	2.6	2387
V		51	24	3	3672	2.6	9547
VI		5	33	3	495	2.6	1287
VII		9	42	3	1134	2.6	2948
VIII		14	52	3	2184	2.6	5678
IX		69	58	3	12006	2.6	31216
XY-EF		II	1	6	3	18	2.6
	III	5	16	3	240	2.6	624
	IV	10	25	3	750	2.6	1950
	V	32	30	3	2880	2.6	7488
	VI	32	30	3	2880	2.6	7488
	VII	32	30	3	2880	2.6	7488
	VIII	32	30	3	2880	2.6	7488
	IX	32	30	3	2880	2.6	7488
	<b>Total</b>						



Table-22  
C. Mineral Resources locked in 7.5m safety barrier (221)

Area in S.qm	Depth in (m)	Volume (m3)	Bulk Density	ROM (Ts)	Limestone @ 80% recovery (Ts)	Mineral Rejects @20% (Ts)	Top soil (Ts)
3000	1	3000	2	-	-	-	6000
3000	24	72000	2.6	187200	149760	37440	-
<b>Total</b>				<b>187200</b>	<b>149760</b>	<b>37440</b>	<b>6000</b>

Table-23

## Summary of Reserves &amp; Resources

Description	Section	ROM (Ts)	Limestone @ 80% recovery (Ts)	Mineral Rejects @ 20% (Ts)	Top Soil (Ts)
A. Mineral Reserves (111)	XY-CD	30264	24211	6053	-
	XY-EF	7574	6059	1515	-
	<b>Total</b>	<b>37838</b>	<b>30270</b>	<b>7568</b>	-
B. Mineral Resources locked up in benches (221)	XY-AB	12605	-	-	-
	XY-CD	53765	-	-	-
	XY-EF	40061	-	-	-
	<b>Total</b>	<b>106431</b>	-	-	-
C. Mineral Resources locked in 7.5m safety barrier (221)		187200	149760	37440	6000

The Mineral reserves still available in this mine would be 37,838 tonnes of ROM, 30,270 tonnes of Limestone (80% of 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	0.331	Cement grade
G2 - General Exploration	-	-
G3 - Prospecting	-	-
G4 - Reconnaissance	-	-

Table-25

	UNFC code	Quantity in million tons	Grade
<b>A.Total Mineral Reserve</b>			
Proved Mineral Reserve	111	0.038	Cement grade
Probable Mineral Reserve	121 and 122	-	-
<b>B.Total Remaining Resources</b>			
Feasibility mineral Resource	211	-	-
Prefeasibility mineral resource	221 and 222	0.293	Cement grade
Measured mineral resource	331	-	-
Indicated mineral resource	332	-	-
Inferred mineral resource	333	-	-
Reconnaissance mineral resource	334	-	-
<b>Total Reserves + Resources</b>		<b>0.331</b>	<b>Cement grade</b>

## 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.*

The method of mining is opencast manual method and the excavation is not made by the system of deep hole blasting along with heavy earth moving machinery. The pit geometry is designed according to the operating conditions of machinery. The drilling is carried out with jack hammer of small diameter (30-32 mm) at shallow depth is performed and blasted with class 2 slurry explosives with charge ratio as 0.7 to 0.9. The imitation system is done with controlled blasting techniques under the supervision of competent personnel's.

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 ratio 0.7 to 0.9 kgs 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 7, based on the above said parameters.

One bench is proposed on the topsoil with 1.0m height and 1.5width with 45° slope.

In mineral, seven benches are proposed with 3m height & 3m 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 [2017-18 to 2021-22], the mine working is proposed to be carried out in the centre and southern portion of the mining lease area, in Southeast - Northwest direction, to a depth of about 22m from RL 225.0m to RL 203.0m.

#### **Pit Dimension:**

Existing pit dimension = [120m (max) x 47m (avg) x 25m (d) (max)].

#### **Level of Working for development and extraction of ore during present plan period [2017-18 to 2021-22]:**

##### Proposed Level in R.L

Depth of the mine at present (maximum) : 25m

Average Depth proposed during the plan period:

Upto 22m [from RL 225.0m to RL 203.0m].

##### Working for development, Extraction of ore and Direction of advances of the faces

During the present plan period [2017-18 to 2021-22], working for development and extraction of ore is proposed to be carried out in the centre and southern portion of the mining lease area and direction of advances in Southeast - Northwest direction, upto a depth of about 22m. Please refer table nos.26 & 27 and plate No.V.

The proposed average annual production ROM will be about 7,568 tonnes with 264 working days in a year.

Place of disposal of waste

The anticipated waste during the present plan period [2017-18 to 2021-22] is about 7,568 tonnes (20% mineral rejects).

The existing mineral reject temporary dump is situated in the southeastern portion of the lease area will be removed and shifted to be temporarily dumped in the Northwestern side of the area.

The mineral reject that would be generated during the present plan period is also proposed to be temporarily dumped in the northwestern side of the lease area.

Table-25A

Existing and Proposed Mineral reject Temporary dump	82m X 18m (avg) X 3m(h) (max)	Northwest
---	-------------------------------	-----------

There is no generation of topsoil during the present plan period.

Afforestation

Afforestation is proposed in the 7.5m boundary barrier. Nearly 200 sqm/year is proposed for afforestation on the Eastern boundary barrier.

Table-25B

Year	Area to be covered (sq.m)	No of saplings	Type of saplings	Location	Space between saplings	Survival rate %
2017-18	200	15	Neem	7.5m safety distance on the Eastern boundary	3mx3m	70%
2018-19	200	15			3mx3m	70%
2019-20	200	15			3mx3m	70%
2020-21	200	15			3mx3m	70%
2021-22	200	15			3mx3m	70%

The waste/mineral rejects is proposed to be handled manually. Labours 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.

Since considerable quantity of mineral is available in the benches - bench loss and safety barrier, backfilling is not proposed. The mined out pit will be 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, when the mine reaches its ultimate pit limit.

Haul roads will be conformed to statutory standards for smooth transport of mineral and waste.

The sequence of working proposed for next five years is indicated in plate no. V. If there is any change in the system of mining, the same will be intimated to Indian Bureau of Mines and the modified mining plan will be suitably modified for subsequent clearance and approval.

**Ground Control Points:**

Table-25C

S.No	Name of the GCP	Latitude and longitude	Distance in (m)	Direction
1.	GCP-1-Bore well	10 <sup>o</sup> 14.921'N 78 <sup>o</sup> 17.588'E	10m	SE
2.	GCP-2-House	10 <sup>o</sup> 15.012'N 78 <sup>o</sup> 17.643'E	150m	NE
3.	GCP-3- H.T.Line	10 <sup>o</sup> 14.906'N 78 <sup>o</sup> 17.170'E	625m	W

Please refer plate No.II.

The year wise production and development schedule proposed for the present plan period under (UNFC 111) is tabulated below.

Table-26

Year	Section	Zone	Topsoil in m <sup>3</sup>				Side burden in m <sup>3</sup>				ROM Mineral				Low-grade to Beneficiation Plant	Recovery % in pit or bench-wise	Production		Mineral Rejects @ 20% (Ts)	Location of advancement	Ore to waste ratio		
			L (m)	W (m)	H (m)	Volume (m <sup>3</sup> )	Quantity (t)	L (m)	W (m)	H (m)	Volume (m <sup>3</sup> )	Quantity (t)	L (m)	W (m)			H (m)	Volume (m <sup>3</sup> )				Quantity (t)	Limestone @ 80% (Ts)
2017-18	XY-EF	II	-	-	-	-	-	-	-	-	13	24	3	936	2434	-	80%	1947	-	487	SE-NW	1:0.20	
		III	-	-	-	-	-	-	-	-	21	15	3	945	2457	-	80%	1966	-	491			
	XY-CD	III	-	-	-	-	-	-	-	-	16	5	3	240	624	-	80%	499	-	125			
		IV	-	-	-	-	-	-	-	-	5	13	3	195	507	-	80%	406	-	101			
2018-19	XY-EF	II	-	-	-	-	-	-	-	-	17	13	3	663	1724	-	80%	1379	-	345			
		III	-	-	-	-	-	-	-	-	6	24	3	432	1123	-	80%	899	-	225			
	XY-CD	IV	-	-	-	-	-	-	-	-	6	15	3	270	702	-	80%	562	-	140			
		V	-	-	-	-	-	-	-	-	6	5	3	90	234	-	80%	187	-	47			
2019-20	XY-CD	V	-	-	-	-	-	-	-	-	33	20	3	1980	5148	-	80%	4118	-	1030			
		VI	-	-	-	-	-	-	-	-	18	20	3	1080	2808	-	80%	2246	-	562			
2020-21	XY-CD	VI	-	-	-	-	-	-	-	-	25	25	3	1875	4875	-	80%	3900	-	975			
		VII	-	-	-	-	-	-	-	-	27	25	3	2025	5265	-	80%	4212	-	1053			
2021-22	XY-CD	VII	-	-	-	-	-	-	-	-	19	16	3	912	2371	-	80%	1897	-	474			
		VIII	-	-	-	-	-	-	-	-	40	16	3	1920	4952	-	80%	3994	-	998			
Total			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: Bulk density of mineral -2.6, topsoil-2.0, NW-Northwest, SE- Southeast



Table - 27  
Summary of yearwise [2017-18 to 2021-22]

Year	ROM(Ts)	Limestone @ 80% (Ts)	Mineral Rejects @ 20% (Ts)	Ore waste ratio
2017-18	7745	6196	1549	1:0.20
2018-19	7207	5766	1441	1:0.20
2019-20	7683	6146	1537	1:0.20
2020-21	7636	6109	1527	1:0.20
2021-22	7566	6053	1513	1:0.20
<b>Total</b>	<b>37838</b>	<b>30270</b>	<b>7568</b>	<b>1:0.20</b>



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 Rejects @20%) (cum)	ROM / waste Ratio
					Ore [Limestone @ 80% recovery] [cum]	Mineral reject [@ 20%] [cum]		
1	2	3	4	5	6	7	8	9
2017-18	1	2979	-	-	2383	596	596	1:0.20
2018-19		2772	-	-	2218	554	554	1:0.20
2019-20		2955	-	-	2364	591	591	1:0.20
2020-21		2937	-	-	2350	587	587	1:0.20
2021-22		2910	-	-	2328	582	582	1:0.20
<b>Total</b>		<b>14553</b>	<b>-</b>	<b>-</b>	<b>11642</b>	<b>2911</b>	<b>2911</b>	<b>1:0.20</b>

Note: Bulk density of mineral-2.6, topsoil-2.0.

**II. Dump rehandling (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)	Mineral Rejects @ 20% (Cum)
	Year	Ts		
Existing mineral reject temporary dump 35m X 10m X 3.5m(h) (Southeast)	2017-18	3,185 Ts	6196 Ts	1549 Ts

Note: Bulk density of mineral -2.6.

The yearwise production proposals for the present plan period [2017-18 to 2021-22] are given in the centre and southern portion of the lease area where the existing mineral rejects dumps of dimensions [35m x 10m x 3.5m (h)] is situated in the Southeastern portion of the lease area. Hence, the dump will be removed and proposed to be dumped on the Northwestern portion of the lease area, then the mineral will be removed. The yearwise proposal to rehandle the waste/topsoil 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 No.V.

**d) Describe briefly giving salient features of the proposed method of working indicating Category of mine.**

Category of Mine is "B". The method of mining is opencast manual method and the excavation is not made by the system of deep hole blasting along with heavy earth moving machinery. The pit geometry is designed according to the operating conditions of machinery. The drilling is carried out with jack hammer of small diameter (30-32 mm) at shallow depth is performed and blasted with class 2 slurry explosives with charge ratio as 0.7 to 0.9. The imitation system is done with controlled blasting techniques under the supervision of competent personals.

There is one existing pits and its dimension is [120m (max) x 47m (avg) x 25m (d) (max)].

One bench is proposed on the topsoil with 1.0m height and 1.5width with 45° slope.

In mineral, seven benches are proposed with 3m height & 3m 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 [2017-18 to 2021-22], the mine working is proposed to be carried out in the centre and southern portion of the mining lease area, in Southeast - Northwest direction, upto a depth of about 22m from RL 225.0m to RL 203.0m.

**Extent of mechanization**

Drilling machines:

Only jackhammer operated by compressor mounted to tractor will be used for drilling.

Table - 30

Type	No of Jack Hammer	Dia. Of hole	Compressor Capacity	Make	Motive power	H.P.
Tractor mounted compressor	1	32mm	140cfm	Atlas copco	Diesel	45
Portable Compressor	2	32 mm	250/150	Atlas copco	Diesel	210

Table - 31

Type	Nos.	Size/Capacity	Make	Motive power	H.P.
Comet Tipper	1	9 tonnes	Ashok Leyland	Diesel	90

A list of mining machinery under use/proposed along with projected norms of performance/output for individual main items of equipment/machinery.

No heavy earth machinery is deployed for excavation of Limestone; only tippers of 10 tonnes capacity are used for transporting the ROM from the working pit head to processing plant and to the dump yard.

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 required during the present MP Period [2017-18 to 2021-22]	Area at the end of life of Mine (Ha)
1.	Area under Mining	0.56.4	Nil	0.56.4
2.	Waste dump	Nil	-*	-*
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	0.31.6	0.23.5	0.20.6
10.	Total	<b>0.94.0</b>		<b>0.94.0</b>

\* Included Area under Mining

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 25m depth. The depth of the mineralization has been proved upto 25m depth with an average of 1m topsoil in north and western portion of the area by based on the existing pit and Drilled borehole, upto 22m depth with an average of 1m topsoil in Eastern portion and upto 10m depth with an average of 1m topsoil in Southeastern portion of the lease area by drilled bore holes.

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 [2017-18 to 2021-22]**

25m [1m topsoil + 21m limestone (proved 111) + 3m limestone (probable 221)]	Centre and East
25m [1m topsoil + 9m limestone (proved 111) + 15m limestone (probable 221)]	Southeast

The depth of mineralization has been already proved upto 25m depth, moreover the bench formation below 22m depth in the centre & east and below 10m depth in the Southeastern side of the lease area would be difficult as the lease area is narrow and irregular, and hence no further exploration is proposed during the present plan period.

There is one existing pits and its dimension is [120m (max) x 47m (avg) x 25m (d) (max)].

One bench is proposed on the topsoil with 1.0m height and 1.5m width with 45° slope.

In mineral, seven benches are proposed with 3m height & 3m 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 [2017-18 to 2021-22], the mine working is proposed to be carried out in the centre and southern portion of the mining lease area, in Southeast - Northwest direction, upto a depth of about 22m from RL 225.0m to RL 203.0m.

#### **ii).Recovery of ROM**

The mining lease area consists of 0.94.0Ha, after leaving 7.5m boundary barrier only 0.62.5Ha could be mined. Out of this only 0.31.3Ha is proposed for an optimum depth of maximum 22m from RL 225.0m to RL 203.0m 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 18.11.2016)	=	37838 tonnes
Proposed annual production ROM	=	7568 tonnes
Anticipated life of the mine	=	37838 /7568
		= 5 years
No. of working days in a year	=	264 days
Average Monthly production	=	7568/ 12
		= 631 tonnes
Anticipated Daily production	=	631/22
		= 29 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
OMS	=	$\frac{\text{Daily production}}{\text{No. of workers}}$ = 29 /10= 3.0 tonnes

#### **Geological plans and sections:**

The mining lease area is the part of crystalline formation of Sirugudi limestone mine. The area is almost a flat 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	Ultimate Pit Dimension at the end of life of mine
Length (m)	120 (max)	120 (max)	120 (max)
Width (m)	47 (avg)	47 (avg)	47 (avg)
Depth (m)	25 (max)	25 (max)	25 (max)

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 7,568 tonnes (20% mineral rejects).

The existing mineral reject temporary dump is situated in the southeastern portion of the lease area will be removed and shifted to be temporarily dumped in the Northwestern side of the area.

The mineral reject that would be generated during the present plan period is also proposed to be temporarily dumped in the northwestern side of the lease area.

This aspect has been considered and accordingly Conceptual Mining Plan is drawn.

### **Proposed generation of waste for next five years [2017-18 to 2021-22]**

Table-35

Year	ROM(Ts)	Limestone @ 80% (Ts)	Mineral Rejects @ 20% (Ts)	Ore waste ratio
2017-18	7745	6196	1549	1:0.20
2018-19	7207	5766	1441	1:0.20
2019-20	7683	6146	1537	1:0.20
2020-21	7636	6109	1527	1:0.20
2021-22	7566	6053	1513	1:0.20
<b>Total</b>	<b>37838</b>	<b>30270</b>	<b>7568</b>	<b>1:0.20</b>

### **Dimension of the waste dumps during the present plan period**

Table -36

Existing and Proposed Mineral reject Temporary dump	82m X 18m (avg) X 3m(h) (max)	Northwest
---	-------------------------------	-----------

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)
Proved 111	37838	7568

Dimension of dumps during the end of the life of the mine

Table -38

Existing and Proposed Mineral reject Temporary dump	82m X 18m (avg) X 3m(h) (max)	Northwest
---	-------------------------------	-----------

The waste does not consists any toxic substance in the form of solid, liquid and gas.

### **iv). Backfilling of voids**

There is no proposal for backfilling the mined out pit in this plan period.

### **v). Reclamation and rehabilitation**

Since considerable quantity of mineral is available in the benches - bench loss and safety barrier, backfilling is not proposed. The mined out pit will be 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, when the mine reaches its ultimate pit limit.

**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 850mm. There would not be any serious problem due to inundation. The water table is found at a depth of 30m in rainy season and at 35m 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 30m, 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 25m depth. It is proposed to carry out the mining operations upto a depth of about only 22m from RL 225.0m to RL 203.0m. The water table in this area is found at the depth of 30m during rainy seasons.

Depth of the mine at present (maximum) : 25m

Average Depth proposed during the plan period: 22m [from RL 225.0m to RL 203.0m]

**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 30m in the rainy season and 35m 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 1.0m. There is no generation of topsoil during the present plan period.

**(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 sub grade mineral in the mine. The anticipated waste during the present plan period is about 7,568 tonnes (20% mineral rejects).

The existing mineral reject temporary dump is situated in the southeastern portion of the lease area will be removed and shifted to be temporarily dumped in the Northwestern side of the area.

The mineral reject that would be generated during the present plan period is also proposed to be temporarily dumped in the northwestern side of the lease area.

There is no generation of topsoil during the present plan period.

Table-39

Year	Topsoil (cum)		Mineral rejects (cum)			
	Reuse / spreading	Storage	Backfilling	Storage	Blending	Beneficial
2017-18	-	-	-	1549	-	-
2018-19	-	-	-	1441	-	-
2019-20	-	-	-	1537	-	-
2020-21	-	-	-	1527	-	-
2021-22	-	-	-	1513	-	-
Total	-	-	-	7568	-	-

Note: Bulk density of mineral rejects -2.6.

**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 [2017-18 to 2021-22] are given in the centre and southern portion of the lease area where the existing mineral rejects dumps of dimensions [35m x 10m x 3.5m (h)] is situated in the Southeastern portion of the lease area. Hence, the dump will be removed and proposed to be dumped on the Northwestern portion of the lease area, then the mineral will be removed. The yearwise proposal to rehandle the waste/topsoil is given in table no.29.

**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 dumped on the proposed temporary waste dump. 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 No. V.

## 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 entire mined out mineral is being sold to the nearby lime based industry 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 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. 82
3.	National Mineral Exploration Trust	Rs. 2
4.	Explosives expenses	Rs. 25
5.	Drilling expenses	Rs. 20
6.	Transport from mine head to Stockyard (loading & unloading)	Rs. 60
	<b>Total</b>	<b>Rs. 254</b>
7.	Miscellaneous and over heads	Rs. 28
	<b>Total</b>	<b>Rs. 282</b>

The cost of production is Rs. 282/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 entire mined out mineral is being sold to the nearby lime based industry 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 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 : 41.85%  
MgO : 4.15%

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. 264 days in a year are assumed as effective working days.

Table -41

Present Employment position		Additional requirements during the MP period
Mining engineer (part time)	1	-
Mines Office Clerk(full time)	1	-
Skilled Labour (Mate/Supervisor)	1	-
Semi-Skilled (Drivers)	2	-
Un skilled Labour	5	-
Total	10	-

The proposed output per man shift:

Table-42

Average ROM Production expected per year for the next five years		7568 Ts	
No. of days likely to be worked		264 days	
Average ROM production per day under UNFC 111 for insitu deposit		29 Ts	
OMS =	Daily Production	29	=3.0 Ts
	No. of Workers	10	

**8.0 PROGRESSIVE MINE CLOSURE PLAN UNDER RULE 23 OF MCDR'1988**

**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. Mining is only by opencast manual method, 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. The land use pattern in and around the mine have no adverse effect in the environment changes. 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 )	0.56.4
2.	Waste dump	Nil
3.	Office & infrastructure	-
4.	Processing plant	-
5.	Mineral stack processing yard	-
6.	Sub grade mineral stacks	-
7.	Mine roads	0.02.0
8.	Areas under plantation	0.04.0
9.	Un utilized area	0.31.6
10.	Total	<b>0.94.0</b>

**ii). Water Regime**

The water table is found at 30m in rainy season and 35m in dry season the area receives rainfall during north-east monsoon, the average being 850mm. There is no 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 is carried out manually with opencast manual method. Jack hammer drilling is done with diesel compressors for shallow drilling, pick-axes and crowbars are used for picking, fragmentation of limestone. Moreover, the collection of the mineral stacked to temporary stockyard and waste dump is 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 from water tanker and the quantity of water requirement for this purpose is 1 KL/D. The generation of dust during the course of drilling will be suppressed at source by means of wet drilling or dust extractors. The periodical environmental monitoring test has been proposed to carry out by accredited laboratories situated at Chennai 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. 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 38<sup>o</sup>C in summer and falls down to 25<sup>o</sup>C 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 2.5kms 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	Population	Direction
1	Sirugudi	2.5	950	Northeast
2	Samudrapatty	3.5	550	Southeast
3	Uralipatti	5.0	500	Southwest
4	Avichchipatti	3.5	450	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 [2017-18 to 2021-22]	Area at the end of life of Mine (Ha)
1	Area under Mining	0.56.4	Nil	0.56.4
2.	Waste dump	Nil	-*	-*
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	0.31.6	0.23.5	0.20.6
10.	Total	<b>0.94.0</b>		<b>0.94.0</b>

\* Included Area under Mining

**ii) Air quality**

The Atmospheric air in the area is quite fresh; the mining is carried out manually with opencast manual method. Jack hammer drilling is done with diesel compressors for shallow drilling, pick-axes and crowbars are used for picking, fragmentation of limestone. Moreover, the collection of the mineral stacked to temporary stockyard and waste dump is 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 from water tanker and the quantity of water requirement for this purpose is 1 KL/D. The generation of dust during the course of drilling will be suppressed at source by means of wet drilling or dust extractors. The periodical environmental monitoring test has been proposed to carry out by accredited laboratories situated at Chennai 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. 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.

**vi) Water regime**

The water table is found at 30m in rainy season and 35m in dry season the area receives rainfall during north-east monsoon, the average being 850mm. There is no 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 : 0.56.4Ha  
 b) Area covered in next five years of Mining plan period : -

It is a working mine. Since considerable quantity of mineral is available in the benches - bench loss and safety barrier, backfilling is not proposed. The mined out pit will be 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, when the mine reaches its ultimate pit limit.

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 also there is no proposal for backfilling, reclamation and rehabilitation.

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 [2017-18 to 2021-22]	Area to be reclaimed at the end of life of mine
Nil	0.564 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 1.0m. There is no generation of topsoil during the present plan period.

### 8.3.3 Tailings Dam Management:

There is no proposal of tailing dam in the mine. The mining operation is carried out by simple opencast manual mining with 3m bench height with 3m bench width, the mining operation for the proposed plan period is restricted only upto 22m depth from ground level, the water table in the area is around 30m - 35m. 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 [2017-18].

#### Summary of Yearwise Proposal

Table-47

Items	Details	Proposed	Actual	Remarks
Dump Management	Area afforested (ha)			Backfilling, reclamation and rehabilitation is not proposed in the present plan period. It will be carried out at the end of the life of the mine when the mine reaches its ultimate pit limit.
	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 Rehabilitation by backfilling	Void available for Backfilling (L x B x D) pit wise /stope wise			
	Void filled by waste /tailings			
	Afforestation 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-15 neem saplings		Rs.1200/-
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 [2018-19].**

**Summary of Yearwise Proposal**

Table-49

Items	Details	Proposed	Actual	Remarks
Dump Management	Area afforested (ha)			
	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)			Backfilling, reclamation and rehabilitation is not proposed in the present plan period. It will be carried out at the end of the life of the mine when the mine reaches its ultimate pit limit.
	Afforestation done(ha)			
	No of saplings planted in the year			
	Cumulative no of plants			
	Any other method of rehabilitation (specify)			
Reclamation and Rehabilitation by backfilling	Cost including watch and care during the year			
	Void available for Backfilling (L x B x D) pit wise /slope wise			
	Void filled by waste /tailings			
	Afforestation on the backfilled area			
	Rehabilitation by making water reservoir			
Rehabilitation of waste land within lease	Any other means (specify)			
	Area available (ha)			
	Area rehabilitated			
	Method of rehabilitation	Afforestation (Green land building) 200 sq.m-15 neem saplings		Rs.1200/-
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 [2019-20].****Summary of Yearwise Proposal**

Table-51

Items	Details	Proposed	Actual	Remarks
Dump Management	Area afforested (ha)			
	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)			Backfilling, reclamation and rehabilitation is not proposed in the present plan period. It will be carried out at the end of the life of the mine when the mine reaches its ultimate pit limit.
	Afforestation done (ha)			
	No of saplings planted in the year			
	Cumulative no of plants			
	Any other method of rehabilitation (specify)			
Reclamation and Rehabilitation by backfilling	Cost including watch and care during the year			
	Void available for Backfilling (L x B x D) pit wise /stope wise			
	Void filled by waste /tailings			
	Afforestation on the backfilled area			
	Rehabilitation by making water reservoir			
Rehabilitation of waste land within lease	Any other means (specify)			
	Area available (ha)			
	Area rehabilitated			
	Method of rehabilitation	Afforestation (Green land building) 200 sq.m-15 neem saplings		Rs.1200/-
Others (specify)	-	-	-	-

## Environmental monitoring (core zone &amp; 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 [2020-21].**

**Summary of Yearwise Proposal**

Table-53

Items	Details	Proposed	Actual	Remarks
Dump Management	Area afforested (ha)			
	No of saplings planted			
	Cumulative no of plants			
	Cost including watch and care during the year			
Management of worked benches	Area available for rehabilitation (ha)			Backfilling, reclamation and rehabilitation is not proposed in the present plan period. It will be carried out at the end of the life of the mine when the mine reaches its ultimate pit limit.
	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 Rehabilitation by backfilling	Void available for Backfilling (L x B x D) pit wise /stope wise			
	Void filled by waste /tailings			
	Afforestation on the backfilled area			
	Rehabilitation by making water reservoir			
	Any other means (specify)			
Rehabilitation of waste land within lease	Area available (ha)			Rs.1200/-
	Area rehabilitated			
	Method of rehabilitation	Afforestation (Green land building) 200 sq.m-15 neem saplings		
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 [2021-22].**

**Summary of Yearwise Proposal**

Table-55

Items	Details	Proposed	Actual	Remarks
Dump Management	Area afforested (ha)			
	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)	Backfilling, reclamation and rehabilitation is not proposed in the present plan period. It will be carried out at the end of the life of the mine when the mine reaches its ultimate pit limit.		
	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 Rehabilitation by backfilling	Void available for Backfilling (L x B x D) pit wise /stope wise			
	Void filled by waste /tailings			
	Afforestation on the backfilled area			
	Rehabilitation by making water reservoir			
	Any other means (specify)			
Rehabilitation of waste land within lease	Area available (ha)	Afforestation (Green land building) 200 sq.m-15 neem saplings		Rs.1200/-
	Area rehabilitated			
	Method of rehabilitation			
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 [2017-18 to 2021-22]**

Table-57

ITEMS	DETAILS	AREA (Ha)	QUANTITY	EXPENDITURE (Rs.)
		Proposal	Proposal	Proposal
A)	Reclamation & Rehabilitation of mined out area	Nil		
B)	Stabilisation & Rehabilitation of dumps	Nil		
C)	i) Afforestation (Green land building on boundary barrier)	1000 Sq.m	75 saplings	Rs.6000/-
	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. 6000/-
Air Quality Sampling	=	Rs. 15000/-
Water Quality Sampling	=	Rs. 8500/-
Noise Monitoring	=	Rs. 9000/-
Ground vibration test	=	Rs. 7500/-
Total Cost	=	Rs. 46000/-

**a. Disaster Management and Risk Assessment:**

The mining operation is very small in nature and is in an flat terrain with opencast workings, the anticipated mining depth is limited. There is no nullah or river near the area, the stratigraphy is hard in nature, the chances for disaster due to landslide, subsidence, flood, inundation etc., is to the barest minimum and is almost nil.

Thiru.S.Ilangovan (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.

- Watchman will be posted round the clock to prevent any unauthorized or inadvertent entry of public.
- Works on stabilization of dumps to provided vegetal cover would be taken up.

- c. Construction of garland or retraining walls around the dumps will be attempted.
- d. Watering of plants in the afforested area will be considered.

### 8.6 Financial Assurance:

Table indicating the break-up of areas in the Mining Lease for calculation of Financial Assurance.

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	0.56.4	-	0.56.4	-	0.56.4
2.	Storage for top soil	-	-	-	-	-
3.	Waste dump site	-	-*	-*	-	-*
4.	Mineral storage	-	-	-	-	-
5.	Infrastructure – workshop, administrative building etc.	-	0.01.0	0.01.0	-	0.01.0
		-	-	-	-	-
		-	-	-	-	-
		-	-	-	-	-
6.	Roads	0.02.0	-	0.02.0	-	0.02.0
7.	Railways	-	-	-	-	-
8.	Tailing pond	-	-	-	-	-
9.	Effluent Treatment Plant	-	-	-	-	-
10.	Mineral Separation Plant	-	-	-	-	-
11.	Township area	-	-	-	-	-
12.	Others (to specify) Green belt	0.04.0	0.10.0	0.14.0	-	0.14.0
Grand total		0.62.4	0.11.0	0.73.4	-	0.73.4

\* Included area under Mining.

The mining lease area put to use for mining and allied activities is about 0.73.4 Ha. The financial assurance for 0.73.4 hectares at the rate of Rs. 15,000/- per ha works out to Rs. 11,010/-.

As per the injection order of the high court of judicature, Madras, dated 27.12.2004 in WPMP 46277 of 2004 in WP 38724 of 2004, refraining the respondents (IBM, State Government, etc.,) from firing effect to rule 23F, (Minimum One Lakh) Amended Rules of MCDR-1988, in respect of Mining Leases which were executed prior to 10.04.2003. (Please refer Annexure No.XI).

Hence, the financial assurance in the form of Bank Guarantee for Rs. 15,000/- is enclosed as Annexure No.XIV.

### Certificate:

The lessee undertakes a closure plan certificate to comply all statutory rules and regulations, order made by the Central or State Government, statutory organizations, court etc. all these will be taken into consideration and wherever any specific permission is required the lessee will approach the concerned authorities. The lessee also undertakes to implement all the measures proposed in the closure plan in a time bound manner.



**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 No.V)
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)

*Kindly*  
*17-03-17*  
REGIONAL CONTROLLER OF MINES  
INDIAN BUREAU OF MINES  
CHENNAI REGION

Signature of the RQP

*Dr. P. Thangaraju*  
Dr. P. THANGARAJU, M.Sc., M.M.E.A., Ph.D.,  
RQP /MAS/206/2007/A

Place: Salem

Date: 07.03.2017

**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 0.94.0Ha, in Sirugudi Village, Sirugudi Post Office, Dindigul District, Tamilnadu, under Rule 17(1) of MCR 2016 & 23(B) of MCDR, 1988 has been prepared by Dr. P. Thangaraju, M.Sc., M.M.E.A., Ph.D.,

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 Recognized Person at his address below:

Dr. P. Thangaraju, M.Sc., M.M.E.A., Ph.D.,  
RQP/MAS/206/2007/A  
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 Recognized 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 0.94.0Ha. 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 0.94.0Ha 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.170 Industries (MMA.1) Department, dated 03.11.2014 for a period upto 03.03.2017 for the Mining Lease in Sirugudi Village, Nattam Taluk, Dindigul District, Tamil Nadu State, over an extent of 0.94.0Ha. 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 : 07.10.2016

Dr. P. Thangaraju, M.Sc., M.M.E.A., Ph.D.,  
RQP/MAS/206/2007/A  
Old.No.260-B, New No: 17,  
Advaitha Ashram Road, Alagapuram,  
Salem – 636 004.



**CERTIFICATE FROM THE RECOGNIZED QUALIFIED PERSON**

The provisions of the Mineral Conservation and Development Rules, 1988 have been observed in the preparation of the Review of Mining Plan for Sirugudi Limestone Mine over an area of 0.94.0Ha 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 Recognized Qualified Person

Dr. P. Thangaraju, M.Sc., M.M.E.A., Ph.D.,  
RQP/MAS/206/2007/A

Place: Salem  
Date: 07.03.2017

**FEASIBILITY REPORT OF SIRUGUDI LIMESTONE MINE****PREAMBLE:**

This abstract of feasibility report is Sirugudi Limestone Mine, over an extent of 0.94.0 hectares in S.F. Nos: 616/1B (Part), 1C, 618/1 (Part) & 619 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, 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. Ilangovan, Dindigul district vide G.O. 3(D).No. 89, dated 17.10.1996 for a period of 20 years from 04.03.1997 to 03.03.2017 and the lease deed was executed on 04.03.1997.

The mining plan was approved by Indian Bureau of Mines vide letter no. TN/D-Anna/MP/LST-873-MDS, dated 12.12.1995.

The first scheme of mining was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS-128-MDS, dated 02.07.2002.

The second scheme of mining was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS-450-MDS, dated 10.09.2007.

The third scheme of mining (2012-13 to 2016-17) was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS-765.MDS, dated 27.03.2013 and it is valid upto 03.03.2017 and a Copy of SOM approval letter of the same is enclosed as Annexure No.X.

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.170 Inds (MMA.1) dept., dated 03.11.2014. (Please refer Annexure No.II & VI).

As the lease period is going to get expired on 03.03.2017. The lessee has decided to renew the mining lease, the renewal application was submitted on 22.02.2016 to The State Government Authorities, Tamilnadu for a further period of Thirty years (from 04.03.2017 to 03.03.2047) and hence, this Review of Mining Plan along with Progressive Mine Closure Plan [2017-18 to 2021-22] is being prepared now & submitted under Rule 17(1) of MCR, 2016 and Rule 23(B) of MCDR, 1988. Copy of renewal of mining lease application is enclosed as Annexure No.VIII.

**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.	: <b>IBM /5276/2011</b>

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.IX).

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:**

In the previous approved scheme period (2012-13 to 2016-17), Six Wagon Drills (BH1-15m, BH2-15m, BH3-15m, BH4-20m, BH5-20m & BH6-15m depth was proposed from the existing pit surface level in the year 2012-13, 2013-14 & 2014-15, but three boreholes of 9.0m depth was carried out by the lessee during the previous Scheme period, to find out the grade of limestone, lateral variations and vertical in homogeneities of the limestone formation and depth persistence. At Present there is one existing pit and its dimension is given below.

Existing Pit Geometry:

Table-2

Length In Meter	Width In Meter	Depth In Meter	Area In Ha.	Dip°	Strike
120 (max)	47 (avg)	25 (max)	0.56.4	85°SE	N60°E- S60°W

With the datas analyzed from the drilled boreholes and existing pit, the deposit has been proved upto 25m depth with an average of 1m topsoil. The boreholes logging datas are furnished below.

Litho log of drilled boreholes:

Table-3

No. of bore holes	Depth of boreholes (m)	Depth of deposition of Limestone	Strata
DBH-1	9	209.0m-208.2m	Mined out
		208.2m-200.0m	Limestone
DBH-2	9	216.0m-215.1m	Mined out
		215.1m-207.0m	Limestone
DBH-3	8.8	223.8m-215.0m	Limestone

Locations of drilled boreholes are marked in the geological plan and sections and year wise plan and sections (Refer Plate No.IV & V).

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 N60°E- S60°W direction with dipping 85°SE.

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 50% was discussed in the previous approved scheme period. But during the course of mining operation, increases in depths and also by the growth of technology and latest inventions in nearby lime based industries has been developed so as to use low grade limestone also, therefore the recovery percentage is gradually increase from 60% to 80% recovery was achieved by lessee during the previous approved scheme period. Hence the 80% recovery is discussed during the present 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 25m depth. The depth of the mineralization has been proved upto 25m depth with an average of 1m topsoil in north and western portion of the area by based on the existing pit and drilled bore hole, upto 22m depth with an average of 1m topsoil in Eastern portion and upto 10m depth with an average of 1m topsoil in Southeastern portion of the lease area by drilled bore holes.

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 [2017-18 to 2021-22]**

25m [1m topsoil + 21m limestone (proved 111) + 3m limestone (probable 221)]	Centre and East
25m [1m topsoil + 9m limestone (proved 111) + 15m limestone (probable 221)]	Southeast

The depth of mineralization has been already proved upto 25m depth, moreover the bench formation below 22m depth in the centre & east and below 10m depth in the Southeastern side of the lease area would be difficult as the lease area is narrow and irregular, and hence no further exploration is proposed during the present plan period.

**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 grade and the recovery percentage of limestone mineral is 80% 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 No.V.

Table - 5

LIMESTONE	
Parameter	Composition %
CaO	41.85
MgO	4.15
Fe <sub>2</sub> O <sub>3</sub>	0.36
Al <sub>2</sub> O <sub>3</sub>	0.85
SiO <sub>2</sub>	8.95
LOI	43.83

The quality of Limestone ranges between 40 to 42% of CaO, 8 to 9.0% of SiO<sub>2</sub> and 0.3 to 0.5% of Fe<sub>2</sub>O<sub>3</sub>. As analyzed by NABL laboratories limestone which has more than 80% CaCO<sub>3</sub> is best suited for cement and other lime based industries, the grade below 20% of CaCO<sub>3</sub> with contaminations of 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 25m, there is no additional formation of pits in the existing mine. The mining pit indicates the limestone deposit and direction of the band. The depth of mineralization has been already proved upto 25m depth, moreover the bench formation below 22m depth in the centre & east and below 10m depth in the Southeastern side of the lease area would be difficult as the lease area is narrow and irregular, and hence no further exploration is proposed during the present plan period. (Refer Plate No.IV & V).

#### 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 25m depth. The depth of mineralization has been already proved upto 25m depth, moreover the bench formation below 22m depth in the centre & east and below 10m depth in the Southeastern side of the lease area would be difficult as the lease area is narrow and irregular, and hence no further exploration is proposed during the present plan period. (Please refer Plate No.IV).

### 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.





### 5.0 Mining Method:

The method of mining is opencast manual method and the excavation is not made by the system of deep hole blasting along with heavy earth moving machinery. The pit geometry is designed according to the operating conditions of machinery. The drilling is carried out with jack hammer of small diameter (30-32 mm) at shallow depth is performed and blasted with class 2 slurry explosives with charge ratio as 0.7 to 0.9. The imitation system is done with controlled blasting techniques under the supervision of competent personnel's.

#### 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 ratio 0.7 to 0.9 kgs 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 7, based on the above said parameters.

There is one existing pits and its dimension is [120m (max) x 47m (avg) x 25m (d) (max)].

One bench is proposed on the topsoil with 1.0m height and 1.5width with 45° slope.

In mineral, seven benches are proposed with 3m height & 3m 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 [2017-18 to 2021-22], the mine working is proposed to be carried out in the centre and southern portion of the mining lease area, in Southeast - Northwest direction, upto a depth of about 22m from RL 225.0m to RL 203.0m.

The proposed average annual production ROM will be about 7,568 tonnes with 264 working days in a year.

The existing mineral reject temporary dump is situated in the southeastern portion of the lease area will be removed and shifted to be temporarily dumped in the Northwestern side of the area.

The mineral reject that would be generated during the present plan period is also proposed to be temporarily dumped in the northwestern side of the lease area.

There is no generation of topsoil during the present plan period.

Afforestation is proposed in the 7.5m boundary barrier. Nearly 200 sqm/year is proposed for afforestation on the Eastern boundary barrier.

The waste/mineral rejects is proposed to be handled manually. Labours 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.

Since considerable quantity of mineral is available in the benches - bench loss and safety barrier, backfilling is not proposed. The mined out pit will be 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, when the mine reaches its ultimate pit limit.

Haul roads will be conformed to statutory standards for smooth transport of mineral and waste.

The sequence of working proposed for next five years is indicated in plate no. V. If there is any change in the system of mining, the same will be intimated to Indian Bureau of Mines and the modified 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 entire mined out mineral is being sold to the nearby lime based industry 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 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.82
3.	National Mineral Exploration Trust	Rs.2
4.	Explosives expenses	Rs.25
5.	Drilling expenses	Rs. 20
6.	Transport from mine head to Stockyard (loading & unloading)	Rs.60
	<b>Total</b>	<b>Rs.254</b>
7.	Miscellaneous and over heads	Rs.28
	<b>Total</b>	<b>Rs.282</b>

The cost of production is Rs. 282/ton. Hence, the mining is economically viable at present market conditions.

## 8.0 INFRASTRUCTURE:

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	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.

## 9.0 ENVIRONMENTAL REQUIREMENTS:

### Environmental impact assessment (EIA) studies/environmental(EMP)

#### Base Line Information:

##### i) Existing Land Use Pattern:

The mining lease area is an existing mine. The mining is by opencast manual method. The land use pattern in and around the mine have no adverse effect in the environment changes. An Environment Management Plan will be prepared if required.

##### ii) Water Regime:

The water is found to be potable. The water available in nearby village public bore wells is used for drinking and other domestic purpose for ages without any adverse health effects.

Water table is found at a depth of 35mts in summer and at 30mts in rainy seasons. Average annual rainfall is about 850mm during NE monsoon.

##### iii) Flora and Fauna:

The mining 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.

##### iv) Quality of Air, Ambient Noise level and Water:

The Atmospheric air in the area is quite fresh, wet drilling is carried out when and where if required during the mining operation, hence the dust is very minimal and the air quality will not be affected by mining operation. Hence, the control of dust does not arise.

The mining operation was carried out by opencast manual method. Moreover, the minimal change in the noise level is during the movement of tipper and jackhammer drilling & blasting. Hence, the noise level was minimal.

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 topsoil from the ground surface, there will be no problem to the ground water. But any how minor pollutant may occur during mining operation and it will be within the permissible limits. Moreover periodically water samples will be collected and analyzed as per statutory norms of IBM.

v) Climatic Conditions

The area exhibits a subtropical climate and the temperature goes upto 38°C in summer and falls down to 25°C in December - January. The wind direction is NE-SW and vice-versa.

vi) Human Settlement

Basic amenities and local administrative office are found in Sirugudi village which is about 2.5kms 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 - 9

S.NO	Name of Hamlets	Distance in Km	Population	Direction
1	Sirugudi	2.5	950	Northeast
2	Samudrapatty	3.5	550	Southeast
3	Uralipatti	5.0	500	Southwest
4	Avichchipatti	3.5	450	West

vii) Public Building, Places and Monuments:

There is no public building, places of worship or archaeological or national monuments near the area.

viii) Whether the lease area falls under notified water (Prevention & Control of Pollution) act of 1974

No. There is no toxic effluent discharge due to mining, hence the surface water or ground water is not contaminated in any means. Water is not used for any beneficiation, the water table in and around the area is 30m during rainy season which is observed from the nearby agricultural wells. Periodically water samples will be collected and analyzed as per statutory norms of IBM.

**Environment impact assessments 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 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, 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.

i) Existing Land Use Pattern

The mining lease area is an existing mine. The land use pattern in and around the mine have no adverse effect in the environment changes. The mining is by opencast method. 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. An Environment Management Plan will be prepared if required.

#### ii) Air Quality

The Atmospheric air in the area is quite fresh; the mining is carried out with opencast method. Jack hammer drilling driven with diesel compressors are proposed for shallow drilling, axes and crow bars are used for picking fragmentation of limestone and the collection of the mineral stacked to temporary stockyard and waste dump is 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 situated at Chennai 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 topsoil, there will be no problem to the ground water. But, minor pollutant may occur during mining operation and it will be within the permissible limits. Moreover 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 is proposed to be carried out by opencast manual method. The mining operations involve minimum shot hole drilling, having 1.5 meter depth, and controlled blasting technique will be adopted with low VOD 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 area applied for renewal of mining lease during the course of mining operations. Besides, noise and ground vibration monitoring will be carried out as per the statutory standards.

#### vi) Water Regime

Water table is found at a depth of 35m in summer and at 30m in rainy seasons. Average annual rainfall is about 850mm during NE monsoon. There is no 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 and also one borehole will be proposed if required within the site area.

#### vii) Socio-economics

The mining operation will create awareness of 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, it is an avenue of employment. It will improve the standard of living and will change the life style of village habitants.

#### viii) 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 topsoil

The topsoil is red gravelly earth. It occurs to a depth of 1.0m. There is no generation of topsoil during the present plan period.

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 upto a depth of 22m from RL 225.0m to RL 203.0m in the centre and southeastern portion of the mining lease area. The mined out pit will be 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, when the mine reaches its ultimate pit limit.

Programme of afforestation:

During the first five years it is proposed to plant 15 neem saplings in the Eastern boundary of the lease area. The plantation is shown in the table below.

Table-10

Year	Area to be covered (sq.m)	No of saplings	Type of saplings	Location	Space between saplings	Survival rate %
2017-18	200	15	Neem	7.5m safety distance on the Eastern boundary	3mx3m	70%
2018-19	200	15			3mx3m	70%
2019-20	200	15			3mx3m	70%
2020-21	200	15			3mx3m	70%
2021-22	200	15			3mx3m	70%

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°. These dumps will be cleared and utilized for construction of bunds around the mined out pits 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 side. Nearly 1000 sqm 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 and around the area is about 35m below the ground level. The present working has reached maximum 25m depth. The maximum depth proposed for mining is about upto 22m from RL 225.0m to RL 203.0m, hence the water table will not encounter during the course of mining activity.

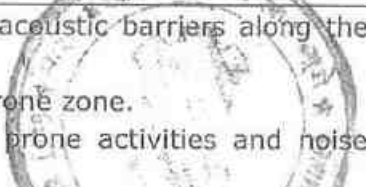
There will be seepage of ground water during the rainy season, the same will be pumped out with the help of 5HP motor pumps when there is a considerable accumulation of seepage water. Mining operation or mineral rejects does not produce any harmful effluent in the form of liquid, which will affect the water regime.

Measures For Minimizing Adverse Effects On Water Regime

Does not arise.

Protective Measures For Ground Vibrations/Air Blast Caused By Blasting

Since it is a very small open cast manual mine, the mining operation are proposed to be carried out by manual opencast method. Jackhammer and tractor mounted compressors are deployed for development activities. The pit geometry is designed according to the operating conditions of machinery. The drilling of hole is carried out with jack hammer and small diameter (30-32 mm) at shallow depth and blasted with class 2 slurry explosives with charge ratio as 0.7 to 0.9. The initiation system is done with controlled blasting techniques under the supervision of competent personnel's. During blasting minimal vibration will be created and it will be within permissible limits.

- 
- 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.

#### Measures For Protecting Historical Monuments

There are no public buildings or places of historical monuments near the area. 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. There is no river, reservoir, lake and stream near the area.

##### d. Land

Since mineral rejects are the solid waste generated and that too will be utilized for construction of bunds 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:**

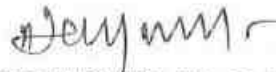
The cost of land/Ha. is Rs. 2,00,000 X 0.94.0 ha. = 1,88,000/-

The total cost production/ton is Rs. 282.

Total Mineral reserves (proved 111) @ 80% recovery will be 30,270 Ts.

The entire mined out mineral is being sold to the nearby lime based industry 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 lime based industries which are located within a radius of 35Km from the mine site. Limestone is being proposed for exploitation and transportation by the trucks. Depending upon the market demand for cement, the limestone mine is economically viable at present market conditions.

Signature of the RQP



Dr. P. THANGARAJU, M.Sc., M.M.E.A., Ph.D.,  
RQP /MAS/206/2007/A

Place: Salem

Date:07.03.2017

## 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 REGULAR 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-sedimentary limestone** sequences, thick bauxite cappings, regional chromite lodes in large ultramtics, **limestone**, dolomite, barites, gypsum, evaporates including polish 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. Ilangoan, Dindigul district vide G.O. 3(D).No. 89, dated 17.10.1996 for a period of 20 years from 04.03.1997 to 03.03.2017 and the lease deed was executed on 04.03.1997.

The mining plan was approved by Indian Bureau of Mines vide letter no. TN/D-Anna/MP/LST-873-MDS, dated 12.12.1995.

The first scheme of mining was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS-128-MDS, dated 02.07.2002.

The second scheme of mining was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS-450-MDS, dated 10.09.2007.

The third scheme of mining (2012-13 to 2016-17) was approved by Indian Bureau of Mines vide letter no. TN/DGL/LST/MS-765.MDS, dated 27.03.2013 and it is valid upto 03.03.2017 and a Copy of SOM approval letter of the same is enclosed as Annexure No.X.

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.170 Inds (MMA.1) dept., dated 03.11.2014. (Please refer Annexure No.II & VI).

As the lease period is going to get expired on 03.03.2017. The lessee has decided to renew the mining lease, the renewal application was submitted on 22.02.2016 to The State Government Authorities, Tamilnadu for a further period of Thirty years (from 04.03.2017 to 03.03.2047) and hence, this Review of Mining Plan along with Progressive Mine Closure Plan [2017-18 to 2021-22] is being prepared now & submitted under Rule 17(1) of MCR, 2016 and Rule 23(B) of MCDR, 1988. Copy of renewal of mining lease application is enclosed as Annexure No.VIII.

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: 616/1B (Part), 1C, 618/1 (Part) & 619, 0.94.0Ha.) 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 existing mining pit, drilled boreholes 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 the recovery percentage of limestone mineral is 80% and the bulk density is 2.6. Please refer annexure -V. The average analysis of Limestone as analyzed in the NABL laboratory is tabulated below:

Table - 1

LIMESTONE	
Parameter	Composition %
CaO	41.85
MgO	4.15
Fe <sub>2</sub> O <sub>3</sub>	0.36
Al <sub>2</sub> O <sub>3</sub>	0.85
SiO <sub>2</sub>	8.95
LOI	43.83

The quality of Limestone ranges between 40 to 42% of CaO, 8 to 9.0% of SiO<sub>2</sub> and 0.3 to 0.5% of Fe<sub>2</sub>O<sub>3</sub>. As analyzed by NABL laboratories limestone which has more than 80% CaCO<sub>3</sub> is best suited for cement and other lime based industries, the grade below 20% of CaCO<sub>3</sub> with contaminations of calc gneiss waste are considered as mineral rejects in these particular formations.

### 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 25m, there is no additional formation of pits in the existing mine. The mining pit indicates the limestone deposit and direction of the band. The depth of mineralization has been already proved upto 25m depth, moreover the bench formation below 22m depth in the centre & east and below 10m depth in the Southeastern side of the lease area would be difficult as the lease area is narrow and irregular, and hence no further exploration is proposed during the present plan period. (Refer Plate No.IV & V).

#### 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 25m depth. The depth of mineralization has been already proved upto 25m depth, moreover the bench formation below 22m depth in the centre & east and below 10m depth in the Southeastern side of the lease area would be difficult as the lease area is narrow and irregular, and hence no further exploration is proposed during the present plan period.

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 to ascertain the quality of Limestone. All the samples collected from the existing pit and drilled boreholes 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 sedimentary 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 the recovery percentage of limestone mineral is 80% and the bulk density is 2.6. Please refer annexure -V. The average analysis of Limestone as analyzed in the NABL laboratory is tabulated below:

Table - 2

LIMESTONE	
Parameter	Composition %
CaO	41.85
MgO	4.15
Fe <sub>2</sub> O <sub>3</sub>	0.36
Al <sub>2</sub> O <sub>3</sub>	0.85
SiO <sub>2</sub>	8.95
LOI	43.83

The quality of Limestone ranges between 40 to 42% of CaO, 8 to 9.0% of SiO<sub>2</sub> and 0.3 to 0.5% of Fe<sub>2</sub>O<sub>3</sub>. As analyzed by NABL laboratories limestone which has more than 80% CaCO<sub>3</sub> is best suited for cement and other lime based industries, the grade below 20% of CaCO<sub>3</sub> with contaminations of calc gneiss waste are considered as mineral rejects in these particular formations.

**Beneficiation:**

No beneficiation of ore is necessary for this mine.

**Pilot plant:**

The entire mined out mineral is being sold to the nearby lime based industry 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 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 N60°E – S60°W with Dip 85° SE. 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.

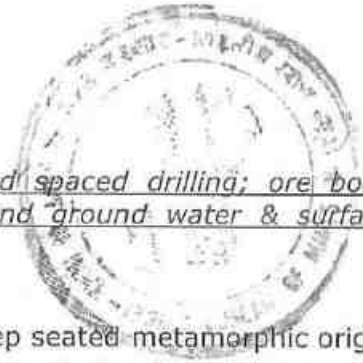
**6. Geostatistical analysis of borehole data thickness of ore waste encountered in holes, assay values of samples if considered necessary.**

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 25m depth. The depth of the mineralization has been proved upto 25m depth with an average of 1m topsoil in north and western portion of the area by based on the existing pit, upto 22m depth with an average of 1m topsoil in Eastern portion and upto 10m depth with an average of 1m topsoil in Southeastern portion of the lease area by drilled bore holes. Moreover the bench formation below 22m depth in the centre & east and below 10m depth in the Southeastern side of the lease area would be difficult as the lease area is narrow and irregular, and hence no further exploration is proposed during the present plan period. (Please refer Plate No.IV).

## 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 metamaorphosed 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 grade and in form Band running N60°E - S60°W with dipping 85° SE. Reddish soil cover upto a depth in about 1.0m. Recovery of minerals is estimated as 80% of the total excavation of the ore body. The recovery percentage is based on the knowledge gained from the present 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 general geological sequence of the limestone deposits is as follows:

Order of Super position:

<u>AGE</u>		<u>ROCKFORMATION</u>
Recent	-	Reddish Soil
Achaean	-	Crystalline Limestone
	-	Calc-gneiss.

The physical attitude of the limestone band is demarked as follows:

Strike length (m)	: 130
Width (m)	: 69
Depth (m) Proved	:
	25m with an average of 1m topsoil - North and West
	22m with an average of 1m topsoil - Centre and East
	10m with an average of 1m topsoil - Southeast
Strike direction	: N60°E - S60°W
Dip amount and direction	: 85° SE.

The deposit is covered by 1.0m thickness of topsoil followed by 24m thickness of Limestone bed.

### Grade of Limestone

Composite samples were taken from the mining lease area and after coining and quartering one representative sample were analyzed in the NABL laboratory.

The grade of Limestone is found to be of cement grade and the recovery percentage of limestone mineral is 80% and the bulk density is 2.6. The average analysis of Limestone as analyzed in the NABL laboratory is tabulated below:

Table - 3

LIMESTONE	
Parameter	Composition %
CaO	41.85
MgO	4.15
Fe <sub>2</sub> O <sub>3</sub>	0.36
Al <sub>2</sub> O <sub>3</sub>	0.85
SiO <sub>2</sub>	8.95
LOI	43.83

The quality of Limestone ranges between 40 to 42% of CaO, 8 to 9.0% of SiO<sub>2</sub> and 0.3 to 0.5% of Fe<sub>2</sub>O<sub>3</sub>. As analyzed by NABL laboratories limestone which has more than 80% CaCO<sub>3</sub> is best suited for cement and other lime based industries, the grade below 20% of CaCO<sub>3</sub> with contaminations of calc gneiss waste are considered as mineral rejects in these particular formations.

### 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 35m during summer and 30m depth during rainy season and upto maximum depth proposed for mining is 22m from RL 225.0m to RL 203.0m during the present plan period. 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 1.0m 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, safety measures; mining plan, mine recoveries and efficiency with variability due to structural complexities like close folds and faults; detailed estimates of manpower.

The method of mining is opencast manual method and the excavation is not made by the system of deep hole blasting along with heavy earth moving machinery. The pit geometry is designed according to the operating conditions of machinery. The drilling is carried out with jack hammer of small diameter (30-32 mm) at shallow depth is performed and blasted with class 2 slurry explosives with charge ratio as 0.7 to 0.9. The imitation system is done with controlled blasting techniques under the supervision of competent personnel's.



**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 ratio 0.7 to 0.9 kgs 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 7, based on the above said parameters.

There is one existing pits and its dimension is [120m (max) x 47m (avg) x 25m (d) (max)].

One bench is proposed on the topsoil with 1.0m height and 1.5width with 45° slope.

In mineral, seven benches are proposed with 3m height & 3m 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 [2017-18 to 2021-22], the mine working is proposed to be carried out in the centre and southern portion of the mining lease area, in Southeast - Northwest direction, upto a depth of about 22m from RL 225.0m to RL 203.0m.

The proposed average annual production ROM will be about 7,568 tonnes with 264 working days in a year.

The existing mineral reject temporary dump is situated in the southeastern portion of the lease area will be removed and shifted to be temporarily dumped in the Northwestern side of the area.

The mineral reject that would be generated during the present plan period is also proposed to be temporarily dumped in the northwestern side of the lease area.

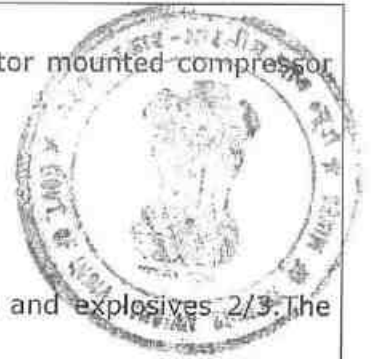
There is no generation of topsoil during the present plan period.

Afforestation is proposed in the 7.5m boundary barrier. Nearly 200 sqm/year is proposed for afforestation on the Eastern boundary barrier.

The waste/mineral rejects is proposed to be handled manually. Labours 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.

Since considerable quantity of mineral is available in the benches - bench loss and safety barrier, backfilling is not proposed. The mined out pit will be 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, when the mine reaches its ultimate pit limit.

Haul roads will be conformed to statutory standards for smooth transport of mineral and waste.



The sequence of working proposed for next five years is indicated in plate no. V. If there is any change in the system of mining, the same will be intimated to Indian Bureau of Mines and the modified 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/ reclamation ; detailed land use data.

Topsoil:-

The topsoil is red gravelly earth. It occurs to a depth of 1.0m. There is no generation of topsoil during the present plan period.

Mined Waste:

There is no sub grade mineral in the mine. The anticipated waste during the present plan period is about 7,568 tonnes (20% mineral rejects).

The existing mineral reject temporary dump is situated in the southeastern portion of the lease area will be removed and shifted to be temporarily dumped in the Northwestern side of the area.

The mineral reject that would be generated during the present plan period is also proposed to be temporarily dumped in the northwestern side of the lease area.

There is no generation of topsoil during the present plan period.

This aspect has been considered and accordingly Conceptual Mining Plan is drawn.

**Proposed generation of waste for next five years [2017-18 to 2021-22]**

Table-4

Year	ROM(Ts)	Limestone @ 80% (Ts)	Mineral Rejects @ 20% (Ts)	Ore waste ratio
2017-18	7745	6196	1549	1:0.20
2018-19	7207	5766	1441	1:0.20
2019-20	7683	6146	1537	1:0.20
2020-21	7636	6109	1527	1:0.20
2021-22	7566	6053	1513	1:0.20
<b>Total</b>	<b>37838</b>	<b>30270</b>	<b>7568</b>	<b>1:0.20</b>

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)
Proved 111	37838	7568

**Land chosen for disposal of waste:**

The mineral rejects will be dumped over the area ear-marked for the purpose. Please refer Plate Nos. VI, VII and VIII.

**Manner of disposal of waste:**

The waste will be loaded manually into tippers and occasionally by loaders and dumped in respective places ear-marked for the same. The dumps will be given steps if necessary.

### Stabilization of dumps

- i) Periodically sprinkling/spraying water on roads leading from working face to waste dumps, so that these areas are always kept wet to prevent emission of air borne dust.
- ii) The waste dumps has been maintained at the angle of 30° slope to prevent sliding.
- iii) The height and width of the waste dump will be maintained.

The size of the dumps for next five years will be as follows:

Table-6

### Dimension of the waste dumps during the present plan period

Existing and Proposed Mineral reject Temporary dump	82m X 18m (avg) X 3m(h) (max)	Northwest
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Table - 7

### Dimensions of the waste dumps during the end of the life of the mine

Existing and Proposed Mineral reject Temporary dump	82m X 18m (avg) X 3m(h) (max)	Northwest
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There is no proposal for backfilling the mined out pit in this Plan period. 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 entire mined out mineral is being sold to the nearby lime based industry 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 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 2.5 km SW from Sirugudi. The area is located at a distance of about 3.5km 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	2.5
2	Nearest Town(D.H)	Dindigul	NW	36
3	Nearest Police Station	Natham	SW	7.0
4	Nearest Govt. Hospital	Sirugudi	NE	2.5
5	Nearest School	Thethampatti	NE	1.0
6	Nearest DSP Office	Dindigul	NW	36
7	Nearest Railway Station	Dindigul	NW	37
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.

## 6. Costing:

### Detailed breakup of capital and operating costs details of working capital

Since it is an opencast mining, jack hammers, compressors, drill rods, hoses, spades, axes, showels and semi skilled labours are the only capital investment which is around Rs.3,00,000/- and the working capital may not exceed Rs. 5,00,000/-

## 7. Marketing:

### Overview, specific market aspects.

The entire mined out mineral is being sold to the nearby lime based industry 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 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.82
3.	National Mineral Exploration Trust	Rs.2
4.	Explosives expenses	Rs.25
5.	Drilling expenses	Rs. 20
6.	Transport from mine head to Stockyard (loading & unloading)	Rs.60
	<b>Total</b>	<b>Rs.254</b>
7.	Miscellaneous and over heads	Rs.28
	<b>Total</b>	<b>Rs.282</b>

The cost of production is Rs. 282/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 carried out by simple opencast manual method. The taxes for the wages and mineral will be paid as per government norms.

## ECONOMIC AXIS

E1

(Economic)

### 1. Detailed exploration.

In the previous approved scheme period (2012-13 to 2016-17), Six Wagon Drills (BH1-15m, BH2-15m, BH3-15m, BH4-20m, BH5-20m & BH6-15m depth was proposed from the existing pit surface level in the year 2012-13, 2013-14 & 2014-15, but three boreholes of 9.0m depth was carried out by the lessee during the previous Scheme period, to find out the grade of limestone, lateral variations and vertical in homogeneities of the limestone formation and depth persistence. At Present there is one existing pit and its dimension is given below.

Existing Pit Geometry:

Table-10

Length In Meter	Width In Meter	Depth In Meter	Area In Ha.	Dip°	Strike
120 (max)	47 (avg)	25 (max)	0.56.4	85°SE	N60°E- S60°W

With the datas analyzed from the drilled boreholes and existing pit, the deposit has been proved upto 25m depth with an average of 1m topsoil. The boreholes logging datas are furnished below.

Litho log of drilled boreholes:

Table-11

No. of bore holes	Depth of boreholes (m)	Depth of deposition of Limestone	Strata
DBH-1	9	209.0m-208.2m	Mined out
		208.2m-200.0m	Limestone
DBH-2	9	216.0m-215.1m	Mined out
		215.1m-207.0m	Limestone
DBH-3	8.8	223.8m-215.0m	Limestone

Locations of drilled boreholes are marked in the geological plan and sections and year wise plan and sections (Refer Plate No.IV & V).

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 N60°E- S60°W direction with dipping 85°SE.

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 50% was discussed in the previous approved scheme period. But during the course of mining operation, increases in depths and also by the growth of technology and latest inventions in nearby lime based industries has been developed so as to use low grade limestone also, therefore the recovery percentage is gradually increase from 60% to 80% recovery was achieved by lessee during the previous approved scheme period. Hence the 80% recovery is discussed during the present 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 25m depth. The depth of the mineralization has been proved upto 25m depth with an average of 1m topsoil in north and western portion of the area by based on the existing pit and drilled bore hole, upto 22m depth with an average of 1m topsoil in Eastern portion and upto 10m depth with an average of 1m topsoil in Southeastern portion of the lease area by drilled bore holes.

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 [2017-18 to 2021-22]**

25m [1m topsoil + 21m limestone (proved 111) + 3m limestone (probable 221)]	Centre and East
25m [1m topsoil + 9m limestone (proved 111) + 15m limestone (probable 221)]	Southeast

The depth of mineralization has been already proved upto 25m depth, moreover the bench formation below 22m depth in the centre & east and below 10m depth in the Southeastern side of the lease area would be difficult as the lease area is narrow and irregular, and hence no further exploration is proposed during the present plan period.

**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 and drilled bore hole 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 the recovery percentage of limestone mineral is 80% 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 No.V.

Table - 13

LIMESTONE	
Parameter	Composition %
CaO	41.85
MgO	4.15
Fe <sub>2</sub> O <sub>3</sub>	0.36
Al <sub>2</sub> O <sub>3</sub>	0.85
SiO <sub>2</sub>	8.95
LOI	43.83

The quality of Limestone ranges between 40 to 42% of CaO, 8 to 9.0% of SiO<sub>2</sub> and 0.3 to 0.5% of Fe<sub>2</sub>O<sub>3</sub>. As analyzed by NABL laboratories limestone which has more than 80% CaCO<sub>3</sub> is best suited for cement and other lime based industries, the grade below 20% of CaCO<sub>3</sub> with contaminations of 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 25m, there is no additional formation of pits in the existing mine. The mining pit indicates the limestone deposit and direction of the band. The depth of mineralization has been already proved upto 25m depth, moreover the bench formation below 22m depth in the centre & east and below 10m depth in the Southeastern side of the lease area would be difficult as the lease area is narrow and irregular, and hence no further exploration is proposed during the present plan period. (Refer Plate No.IV & V).

**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 25m depth. The depth of mineralization has been already proved upto 25m depth, moreover the bench formation below 22m depth in the centre & east and below 10m depth in the Southeastern side of the lease area would be difficult as the lease area is narrow and irregular, and hence no further exploration is proposed during the present plan period. (Please refer Plate No.IV).

The entire mined out mineral is being sold to the nearby lime based industry in the name of M/s. Air Mineral Enterprises which is located in Strugudi, 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 lime based industries which are located within a radius of 35Km from the mine site.

The anticipated annual production ROM (proved 111) would be about 7568 tonnes/year (avg.) and for the end of the life of the mine is 37838 Ts of ROM (proved 111), when the Mine is fully developed.

## 2.0 Mining report /mining plan / working mines.

The method of mining is opencast manual method and the excavation is not made by the system of deep hole blasting along with heavy earth moving machinery. The pit geometry is designed according to the operating conditions of machinery. The drilling is carried out with jack hammer of small diameter (30-32 mm) at shallow depth is performed and blasted with class 2 slurry explosives with charge ratio as 0.7 to 0.9. The imitation system is done with controlled blasting techniques under the supervision of competent personnel's.

### 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 ratio 0.7 to 0.9 kgs 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 7, based on the above said parameters.

There is one existing pits and its dimension is [120m (max) x 47m (avg) x 25m (d) (max)].

One bench is proposed on the topsoil with 1.0m height and 1.5width with 45° slope.

In mineral, seven benches are proposed with 3m height & 3m 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 [2017-18 to 2021-22], the mine working is proposed to be carried out in the centre and southern portion of the mining lease area, in Southeast - Northwest direction, upto a depth of about 22m from RL 225.0m to RL 203.0m.

The proposed average annual production ROM will be about 7,568 tonnes with 264 working days in a year.

The existing mineral reject temporary dump is situated in the southeastern portion of the lease area will be removed and shifted to be temporarily dumped in the Northwestern side of the area.

The mineral reject that would be generated during the present plan period is also proposed to be temporarily dumped in the northwestern side of the lease area.

There is no generation of topsoil during the present plan period.

Afforestation is proposed in the 7.5m boundary barrier. Nearly 200 sqm/year is proposed for afforestation on the Eastern boundary barrier.

The waste/mineral rejects is proposed to be handled manually. Labours 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.

Since considerable quantity of mineral is available in the benches - bench loss and safety barrier, backfilling is not proposed. The mined out pit will be 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, when the mine reaches its ultimate pit limit.

Haul roads will be conformed to statutory standards for smooth transport of mineral and waste.

The sequence of working proposed for next five years is indicated in plate no. V. If there is any change in the system of mining, the same will be intimated to Indian Bureau of Mines and the modified 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 entire mined out mineral is being sold to the nearby lime based industry 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 lime based industries which are located within a radius of 35Km from the mine site. No sub-grade mineral is encountered.

#### 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 the recovery percentage of limestone mineral is 80% and the bulk density is 2.6. Please refer annexure -V. The average analysis of Limestone as analyzed in the NABL laboratory is tabulated below:



Table - 14

LIMESTONE	
Parameter	Composition %
CaO	41.85
MgO	4.15
Fe <sub>2</sub> O <sub>3</sub>	0.36
Al <sub>2</sub> O <sub>3</sub>	0.85
SiO <sub>2</sub>	8.95
LOI	43.83



The quality of Limestone ranges between 40 to 42% of CaO, 8 to 9.0% of SiO<sub>2</sub> and 0.3 to 0.5% of Fe<sub>2</sub>O<sub>3</sub>. As analyzed by NABL laboratories limestone which has more than 80% CaCO<sub>3</sub> is best suited for cement and other lime based industries, the grade below 20% of CaCO<sub>3</sub> with contaminations of calc gneiss waste are considered as mineral rejects in these particular formations.

**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% which was well inferred by the experience gained by the lessee during the previous mining activity 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 [2017-18 to 2021-22]**

25m [1m topsoil + 21m limestone (proved 111) + 3m limestone (probable 221)]	Centre and East
25m [1m topsoil + 9m limestone (proved 111) + 15m limestone (probable 221)]	Southeast

**Reassessed Mineral Reserves and Resources as per UNFC System as on 18.11.16**

Table-16

**A. Mineral Reserves(111)**

Section	Bench	Dimension			Volume (cum)	Bulk density	ROM (Ts)	Limestone @80% Recovery (Ts)	Mineral Rejects @ 20% (Ts)
		L(m)	W(m)	D(m)					
XY-CD	III	5	13	3	195	2.6	507	406	101
	IV	17	13	3	663	2.6	1724	1379	345
	V	51	20	3	3060	2.6	7956	6365	1591
	VI	52	25	3	3900	2.6	10140	8112	2028
	VII	59	16	3	2832	2.6	7363	5891	1473
	VIII	55	6	3	990	2.6	2574	2059	515
<b>Total</b>							<b>30264</b>	<b>24211</b>	<b>6053</b>
XY-EF	II	19	24	3	1368	2.6	3557	2845	711
	III	27	15	3	1215	2.6	3159	2527	632
	IV	22	5	3	330	2.6	858	686	172
<b>Total</b>							<b>7574</b>	<b>6059</b>	<b>1515</b>
<b>Grand Total</b>							<b>37838</b>	<b>30270</b>	<b>7568</b>

**Table-17**  
**B. Mineral Resources locked up in benches (221)**

Section	Bench	Dimension			Volume (m <sup>3</sup> )	Bulk density	ROM (Ts)
		L (m)	W(m)	D(m)			
XY-AB	II	1	15	3	45	2.6	117
	III	2	18	3	108	2.6	281
	IV	3	19	3	171	2.6	445
	V	4	21	3	252	2.6	655
	VI	4	22	3	264	2.6	686
	VII	5	25	3	375	2.6	975
	VIII	7	29	3	609	2.6	1583
	IX	12	84	3	3024	2.6	7862
	XY-CD	II	5	7	3	105	2.6
III		5	11	3	165	2.6	429
IV		17	18	3	918	2.6	2387
V		51	24	3	3672	2.6	9547
VI		5	33	3	495	2.6	1287
VII		9	42	3	1134	2.6	2948
VIII		14	52	3	2184	2.6	5678
IX		69	58	3	12006	2.6	31216
XY-EF		II	1	6	3	18	2.6
	III	5	16	3	240	2.6	624
	IV	10	25	3	750	2.6	1950
	V	32	30	3	2880	2.6	7488
	VI	32	30	3	2880	2.6	7488
	VII	32	30	3	2880	2.6	7488
	VIII	32	30	3	2880	2.6	7488
	IX	32	30	3	2880	2.6	7488
	<b>Total</b>						

**Table-18**  
**C. Mineral Resources locked in 7.5m safety barrier (221)**

Area in S.qm	Depth in (m)	Volume (m <sup>3</sup> )	Bulk Density	ROM (Ts)	Limestone @ 80% recovery (Ts)	Mineral Rejects @ 20% (Ts)	Top soil (Ts)
3000	1	3000	2	-	-	-	6000
3000	24	72000	2.6	187200	149760	37440	-
<b>Total</b>				<b>187200</b>	<b>149760</b>	<b>37440</b>	<b>6000</b>

**Table-19**  
**Summary of Reserves & Resources**

Description	Section	ROM (Ts)	Limestone @ 80% recovery (Ts)	Mineral Rejects @ 20% (Ts)	Top Soil (Ts)
A. Mineral Reserves (111)	XY-CD	30264	24211	6053	-
	XY-EF	7574	6059	1515	-
	<b>Total</b>	<b>37838</b>	<b>30270</b>	<b>7568</b>	<b>-</b>
B. Mineral Resources locked up in benches (221)	XY-AB	12605	-	-	-
	XY-CD	53765	-	-	-
	XY-EF	40061	-	-	-
	<b>Total</b>	<b>106431</b>	<b>-</b>	<b>-</b>	<b>-</b>
C. Mineral Resources locked in 7.5m safety barrier (221)		187200	149760	37440	6000

The Mineral reserves still available in this mine would be 37,838 tonnes of ROM, 30,270 tonnes of Limestone (80% of ROM).

The actual Mineral reserves @ 80% recovery is estimated about 30,270 tonnes after giving due allowance for boundary barriers of the lease area. The recovery percentage of Limestone is calculated as 80% with an annual production of about 6109 tonnes, the life of the mine is expected to be around  $30270 / 6054 = 5.0$  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

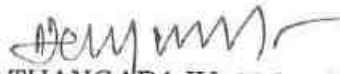
Table -20

S.No	Description	Present Area (Ha)	Additional Area required during the present MP Period [2017-18 to 2021-22]	Area at the end of life of Mine (Ha)
1	Area under Mining	0.56.4	Nil	0.56.4
2.	Waste dump	Nil	-*	-*
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	0.31.6	0.23.5	0.20.6
10.	Total	<b>0.94.0</b>		<b>0.94.0</b>

\* Included Area under Mining

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 RQP



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RQP /MAS/206/2007/A

Place: Salem

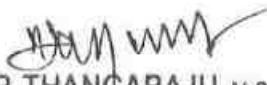
Date: 07.03.2017

Existing Pit



Overall view with Environmental status of the area



  
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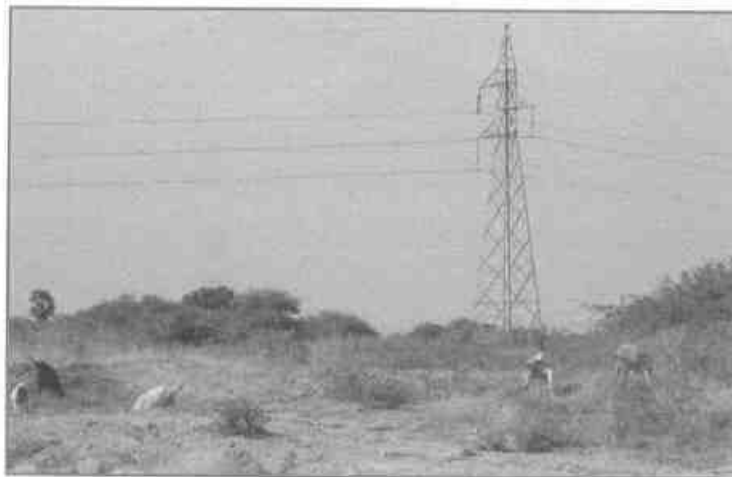
**Ground Control Points**



**GCP-1 - Bore well-10m southeast from the lease area**



**GCP-2 – House-150m northeast from the lease area**



**GCP-3 – H.T.Line-625m west from the lease area**

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**ABSTRACT**

Industries - Mines and Minerals – Major Mineral - Limestone – Dindigul District – Natham Taluk – Sirugudi Village – S.F. Nos. 616/1B (Part), 1C, 618/1 (Part) and 619 – Over an extent of 0.94.0 hectare – Transfer of mining lease granted to Thiru. S. Ilangovan to M/s. Sivam Mines – Orders - Issued.

**INDUSTRIES (MMA.1) DEPARTMENT**

G.O. (D) No. 170

Dated: 03.11.2014

திருவள்ளூர் ஆண்டு 2045  
ஐய வருடம், ஐப்பசி திங்கள் 17

Read:

1. G.O. (3D) No.89, Industries (MMA.2) Department, dated: 17.10.1996.
2. Representation of Thiru. S. Ilangovan, Letter dated: 25.01.2010.
3. From the District Collector, Dindigul, Roc. No.51/2010/(Mines), dated: 03.03.2010.
4. From the Commissioner of Geology and Mining, Letter Rc. No. 3008/MM4/2010, dated: 9.4.2010.

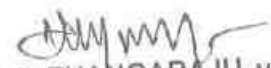
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**ORDER:**

In the Government Order first read above, orders have been issued granting mining lease in favour of Thiru. S. Ilangovan, Dindigul District for mining limestone over an extent of 0.94.0 hectares of patta lands in S.F. Nos. 616/1B (Part), 1C, 618/1 (Part) and 619 of Sirugudi Village, Natham Taluk, Dindigul District for a period of 20 years from 04.03.1997 to 03.03.2017.

2. In his letter second read above, Thiru. S. Ilangovan 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. Asai Alangaram 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. Ilangovan 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 leases in the State of Tamil Nadu. Further, the lessee has also produced no mining dues certificate in respect of Dindigul District and the transferee firm have also produced the affidavit to bear the liabilities of the lessee and the partnership firm has been registered on 25.1.2010 by the Registrar of Firms, Dindigul. The District Collector, Dindigul has recommended the application for name transfer from Thiru.S. Ilangovan to the partnership concern that is in the name of "M/s. Sivam Mines".

  
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4. Based on the recommendation of the District Collector, Dindigul, the Commissioner of Geology and Mining in his letter fourth read above has recommended the application preferred by Thiru. S. Ilangovan for transfer of mining lease granted to him in the Government Order first read above for mining limestone over an extent of 0.940 hectares of patta lands in S.F. Nos. 616/1B (Part), 1C, 618/1 (Part) and 619 of Sirgudi Village, Natham Taluk, Dindigul District for a period of 20 years from 04.03.1997 to 03.03.2017 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 the Indian Bureau of Mines in respect of the said leasehold area as provided under rule 37 of Mineral Concession Rules, 1950.

5. After careful examination, the Government have decided to accept the recommendations of the District Collector, Dindigul and the Commissioner of Geology and Mining. Accordingly, the mining lease granted in the Government Order first read above for limestone over an extent of 0.940 hectares of patta lands in S.F. Nos. 616/1B (Part), 1C, 618/1 (Part) and 619 of Sirgudi Village, Natham Taluk, Dindigul District for a period of 20 years to Thiru. S. Ilangovan, is granted to M/s. Sivam Mines upto the valid lease period, (i.e. 04.03.1997 to 03.03.2017) subject to the condition that the transferee should scrupulously follow the Mining Plan/Scheme of mining approved by the Indian Bureau of Mines in respect of the said leasehold area as provided under rule 37 of Mineral Concession Rules, 1950.

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

(BY ORDER OF THE GOVERNMENT)

C.M. SANKAR  
PRINCIPAL SECRETARY TO GOVERNMENT

To  
The Commissioner of Geology and Mining, Dindigul, 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-600 011.  
Thiru. S. Ilangovan, 6/208, Main Road,  
Sirgudi Post, Natham Taluk, Dindigul District.  
M/s. Sivam Mines, 6/209, Pudukkottai.  
Sirgudi 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/SC

7. Enclosed in 3 copies //

Dr. P. THANGARAJU, M.Sc., Ph.D., M.A.,  
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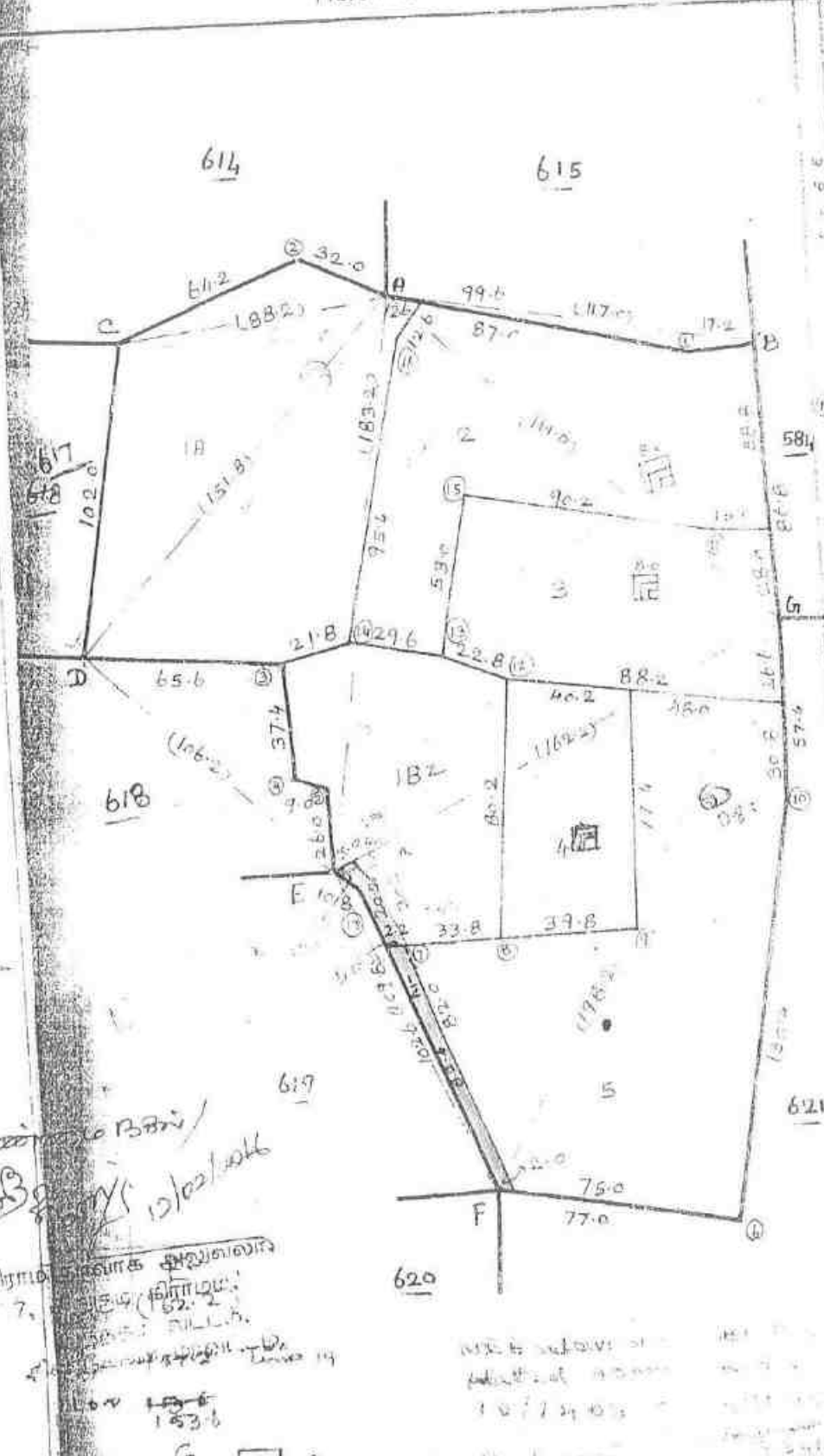
Classified  
5/11/2014  
Section Officer

*[Handwritten signature]*

Price 100000  
 9/9/80

No. Village Name  
 Area 470 Acres

Field No. 616



E	109.8		
F	121.8		
B	86.8		
	30.2	55.0	
	24.8	46.6	
	35.4	18.2	
	35.2	10.0	
G	186.2		
A	168.0	3.2	(18)
	121.6	27.4	(15)
	12.4		
	69.2	27.2	(18)
	65.2	47.2	(12)
E	161.0		
A	31.0	7.4	(11)
G	198.2		
	148.4	28.6	(16)
	87.0	3.0	(9)
B	32.6	70.0	
F	62.0	53.2	
	26.0	12.6	(6)
F			
E	106.2		
B	17.0	87.4	
F	13.8	78.8	
B	40.0	51.8	
D			
A	89.2		
	16.6	61.4	
C			
B	117.0		
	99.6	2.0	(1)
A			

2000 to 1380  
 803  
 12/02/2016

Dr. P. Thangaraju  
 8/6/81

Scale Inch = One Chain

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LEASE AREA



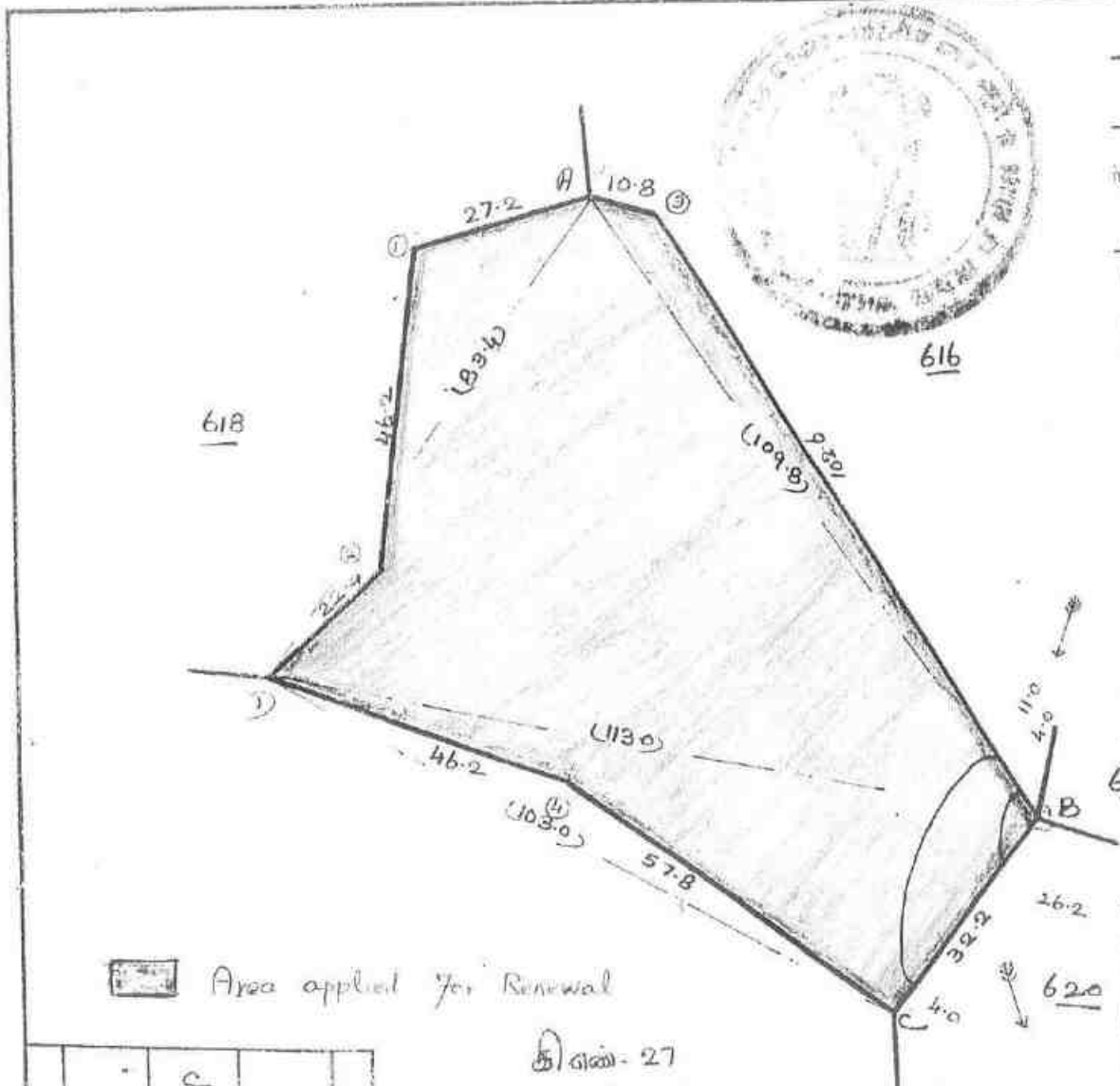


District Madurai

Taluk Madurai

Village { No. 8  
 Name சிறகு  
 Area 0-30-63-0 10

Field No. 619



Area applied for Renewal

தினம் - 27  
 சனவரி 1981

		C		
		103.0		
④	8.0	45.4		
		B		
		H		
		109.8		
		101.8	7.0	③
		B		
		D		
		83.4		
②	5.0	61.8		
		20.4	16.6	①
		A		

2 மீட்டர் கை பிசினர்

*[Signature]*  
 12/2/2016

கிராம நிர்வாக அலுவலர்  
 V. சீமசுந்தர கிராமம்  
 சிவகாம சாலை  
 சிவகாம சாலை

Prepared by: K. Venkatesan  
 8/6/81

Scale: 1 inch = 1000 feet

Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
 RECOGNISED QUALIFIED PERSON  
 RQP/MAS/206/2007/A

LEASE AREA



தமிழக அரசு

வருவாய்த் துறை

நில உரிமை விபரங்கள் : இ. எண் 10(1) பிரிவு

மாவட்டம் : திண்டுக்கல்

வட்டம் : நத்தம்

வருவாய் கிராமம் : சிறுகுடி

பட்டா எண் : 156

உரிமையாளர்கள் பெயர்

1. செம்பன செட்டியார்

மகன்

இளங்கோவன்

	நன்செய்		புன்செய்		மற்றவை		
	பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
புல எண்	உட்பிரிவு	ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை
✓ 618	18	0 - 96.00	6.53	--	--	--	--
641	2	0 - 30.00	2.31	--	--	--	--
696	4	0 - 23.50	1.81	--	--	--	--
696	7	0 - 27.50	2.12	--	--	--	--
698	1	0 - 14.00	1.09	--	--	--	--
698	11	0 - 8.50	0.66	--	--	--	--
698	6	0 - 23.50	1.81	--	--	--	--
699	10	0 - 3.00	0.22	--	--	--	--
699	6	0 - 34.00	2.62	--	--	--	--
699	7	0 - 6.00	0.47	--	--	--	--
✓ 616	181	--	--	0 - 1.50	0.06	--	--
631	10	--	--	0 - 36.50	1.01	--	--
687	2	--	--	0 - 17.00	0.47	--	--
689	1	--	--	0 - 39.00	1.08	--	--
689	3	--	--	0 - 60.00	1.66	--	--
		2 - 66.00	19.64	1 - 54.00	4.26		

குறிப்பு :

Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
RECOGNISED QUALIFIED PERSON  
RQP/MAS/206/2007/A

2/16/2016 4:18:1



தமிழக அரசு

வருவாய்த் துறை

நில உரிமை விபரங்கள் : இ. எண் 10(1) பிரிவு



மாவட்டம் : திண்டுக்கல்

வட்டம் : நத்தம்

வருவாய் கிராமம் : சிறுகுடி

பட்டா எண் : 1749

உரிமையாளர்கள் பெயர்

1.	செம்பன்	மகன்		இளங்கேவன்		மற்றவை	
		நன்செய்		புன்செய்			
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை
புல எண்	உட்பிரிவு	ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை
618	2	0 - 3.50	0.21	--	--	--	--
✓618	1C	--	--	0 - 3.50	0.10	--	--
✓619	-	--	--	0 - 63.00	1.75	--	--
		0 - 3.50	0.21	0 - 66.50	1.85		

குறிப்பு :



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை, இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 13/13/007/01749/10721 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 25-01-2001 வரை வட்டாட்சியர் அலுவலகத்தில் இருந்து பெறப்பட்டவை.
3. இத் தகவல்கள் 16-02-2016 அன்று 04:14:52 PM நேரத்தில் அச்சடிக்கப்பட்டது.
4. கைப்பேசி கேமராவின 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்.



பெரிய கட்டிடம்

13



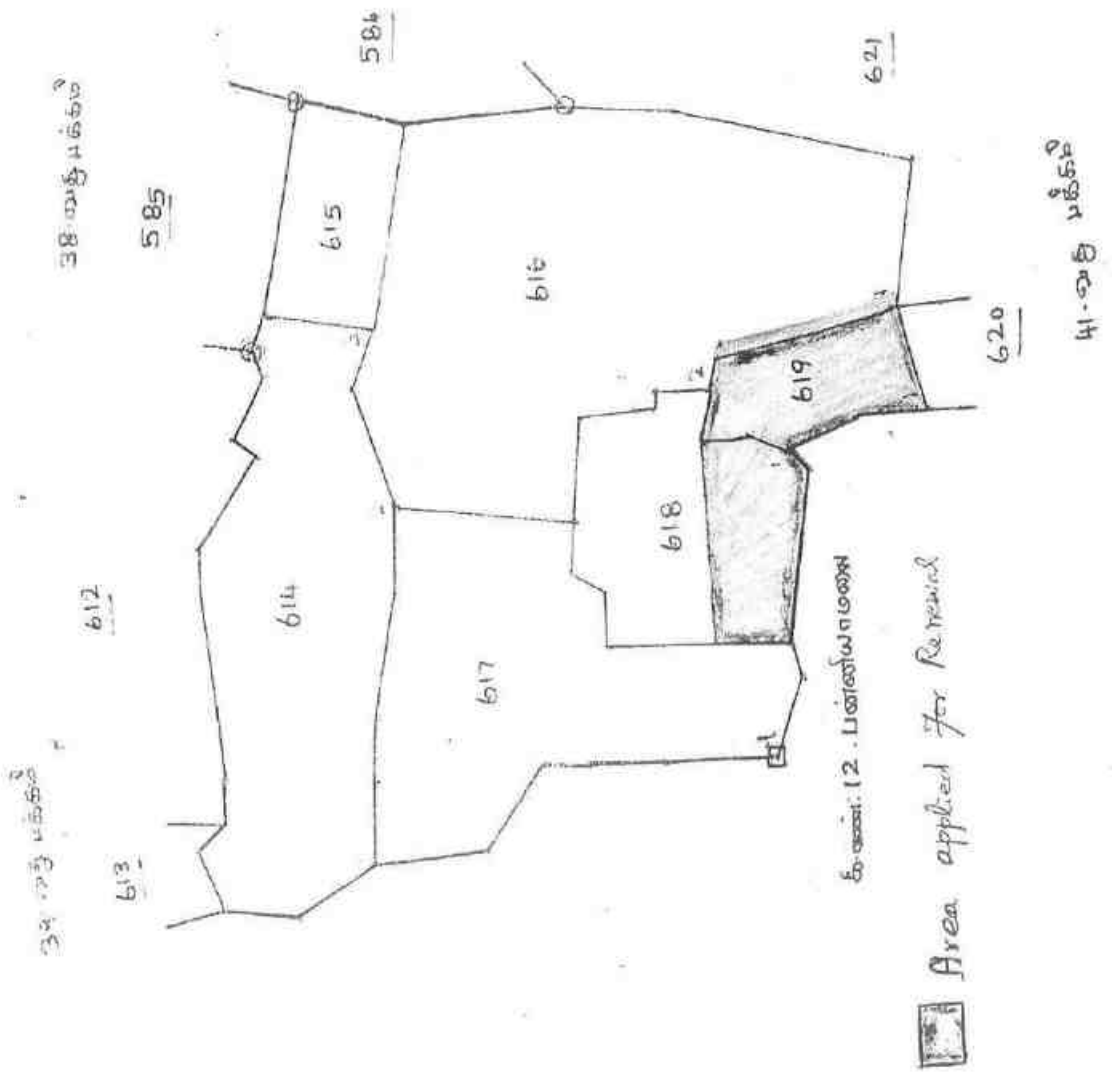
2 மீட்டர் மட்டுமே

17/2/2016

சிறப்பு நிர்வாக அலுவலர்  
17, சபைத் திட்டம்,  
சென்னை வட்டம்,  
தமிழ்நாடு அரசு

ANNEXURE- IV

சென்னை நகராட்சி  
மேயர் அலுவலகம்



LEASE AREA

*Dr. P. Thangaraju*  
Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
RECOGNISED QUALIFIED PERSON  
RQP/MAS/206/2007/A



# EKDANT ENVIRO SERVICES (P) LIMITED

NABL Accredited & MoEF Recognised Laboratory  
An ISO 9001 : 2008 and OHSAS 18001 : 2007 Certified Company

No.R-7/1, AVK Tower, North Main Road, Anna Nagar West Extn., Chennai-600 401, India

Phone : 044 - 26153349 Mobile : 9444411178

E-mail : ekdantlab@gmail.com / info@ekdantlab.co.in

Web : www.ekdantlab.co.in



## TEST REPORT

Sample Ref No: JEES/AM/021/11	Report No. : 569/11
Issued To: M/s. Sivam Mines., 6/209, Main Road, Sirugudi Post, Natham (Tk), Dindigul District.	Report Date : 29.11.16 Page: 1 of 1
Sample Description : Limestone	Received On : 24.11.16
Sample Drawn By : Customer, 24.11.16	Commenced On : 24.11.16
Customer Reference : Letter Dated On 24.11.16	Completed On : 29.11.16
S.F.Nos. : 616/1B (Part), 1C, 616/1 (Part) & 619	
Extent : 0.94.0Ha	
Village : Sirugudi	
Taluk : Natham	
District : Dindigul	

Sl. No	PARAMETERS	RESULTS (%)	Procedure
1	Calcium as CaO	41.85	IS 712 : 1984 R. 2009
2	Magnesium as MgO	4.15	IS 1514:1990 R.2010
3	Iron as Fe <sub>2</sub> O <sub>3</sub>	0.36	IS 1514:1990 R.2010
4	Alumina as Al <sub>2</sub> O <sub>3</sub>	0.85	IS 1750.P.1 1991 R.2008
5	Silica as SiO <sub>2</sub>	8.95	IS 1760.P.1 1991 R.2008
6	Loss On Ignition (LOI)	43.93	IS 1760 P-1-1991 R. 2008

End of Report

Analyzed By

*S. Sathishkumar*  
S. Sathishkumar

Incharge Agri & Mineral Division

for EKDANT ENVIRO SERVICES (P) LTD



*M. Maria Frank Omer*  
Authorized Signatory

\* M. Maria Frank Omer - Quality Cum Tech Manager

- NOTE:
1. Test results shown in this test report relate only to the items tested.
  2. This test report shall not be reproduced anywhere except in full and in same format without the Approval of the laboratory.
  3. Unless informed by the customer the test items will not be retained for more than 10 days from The date of issue of (test) report (exceptional for Microbiology and waste water for which retaining time 7 days.)

*Dr. P. Thangaraju*  
Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
RECOGNISED QUALIFIED PERSON  
RQP/MAS/206/2007/A

भारतीय गैर न्यायिक  
भारत INDIA

रु. 500



FIVE HUNDRED  
RUPEES

पाँच सौ रुपये

सत्यमेव जयते

Rs. 500

INDIA NON JUDICIAL

தமிழ்நாடு தமில்நாடு TAMILNADU 5589

Y 932926

13-12-2014

M/S SIVAM MINES  
SIRUGUDI

P. RadhaSelvi

ப. ராதாசெல்வி  
முத்திரைத்தாள் விற்பனையாளர்,  
134, பெரிய கடை வீதி,  
திண்டிக்குவ-1, தமிழ்நாடு  
உரிமை எண்: 24531/ஆ-1/1997-39

FORM O  
TRANSFER OF MINING LEASE  
(See rule 37-A)

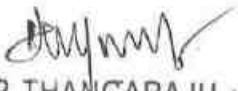


When the transferor is an individual, S.ILANGO VAN, This indenture made this 13<sup>th</sup> day of DECEMBER 2014 between S.ILANGO VAN.B.E., S/o K.A.Semaban(Late), 6/208, Main Road, Sirugudi(Po), Natham(Tk), Dindigul(Dt), Pin code: 624404 and the Occupation as Engineer.

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),

  
LESSEE

  
DISTRICT COLLECTOR  
DINDIGUL.  
Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.  
RECOGNISED QUALIFIED PERSON  
RQP/MAS/206/2007/A



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.89,Ind(MMA.2) Dept /dt :17.10.96 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.170/Industries/(MMA.1)Dept/dated.03.11.2014 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]

1. M. Pothiraj (M. POTHIRAJ)

Soruthnall  
KODAI ROAD  
Numbakkottai TK  
Dindigul DT

2.


  
D. Nagaraj  
S/o Shanmugam,  
Nillakkottai  
4<sup>th</sup> ward chinnampalayam

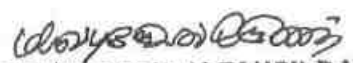
Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.  
RECOGNISED QUALIFIED PERSON  
RQP/MAS/206/2007/A

  
LESSOR/  
DISTRICT COLLECTOR

1.   
ASSISTANT DIRECTOR  
GEOLOGY AND MINING  
DINDIGUL.

2.

  
Assistant Geologist,  
Geology and Mining,  
Dindigul.

3.   
SPECIAL DEPUTY TAHSIIL DAR  
GEOLOGY AND MINING  
DINDIGUL



தகவலளிக்கும் பெயர் / முகவரி		2. சிவனாடர் எண்ணிக்கை	
08 4A ப. எண் : 6/208 செ		இல்லை	
நகரம் (வ), 624404 நகரம் (வ) திண்டுக்கல்		3. குடும்பத்திலுள்ள நபர்கள்	
		பெரியவர்கள்	4
		சிறியவர்கள்	0
பெயர்	வயது	பெயர்	வயது
இளங்கோவன் செ	49		
மா தவி இ	39		
விஜய் அனந்தன் இ	21		
சிதம்பரமணி கீதன் இ	17		

*Signature*

குடும்ப அட்டை Family Card  
2005 - 2009

உணவுப்பொருள் வழங்கல் மற்றும் நுகர்வோர்  
பாதுகாப்புத்துறை

Civil Supplies and Consumer Protection  
Department

அரசி

நகரம் (வ)			
கோட்டம்/வார்டு	தொகு எண்	பண்டிய கதவு எண்	முதிய கதவு எண்
003	001	4/144A	6/208
கடை எண்	கடையின் பெயர்		அபிதிவேடு எண்
EP020	சிறுசூடி வைகை		171

- 4620389 - 22HEP020013 - 22G022980 - May 2005

*Signature*  
Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
RECOGNISED QUALIFIED PERSON  
RQP/MAS/206/2007/A

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 22<sup>nd</sup> day of February 2016

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,

We 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 :

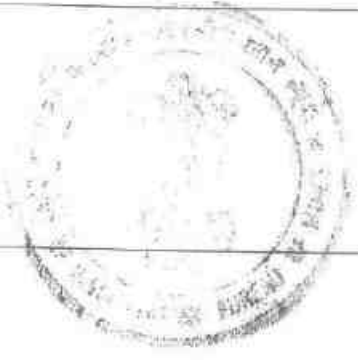
(i) Name of the applicant with complete Address	<b>M/s. SIVAM MINES,</b> 6/209 ,Main Road,Sirugudi(Po),Natham(Tk), Dindigul(Dt)-624404,Tamilnadu state.
ii) Is the applicant a Private individual/ Private Company/Public Company/Firm or Association ?	Partnership Firm.
iii) In case applicant is :	
a. an 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.

  
**Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,**  
 RECOGNISED QUALIFIED PERSON  
 RQP/MAS/206/2007/A

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)	---
c. No. and date of the valid clearance certificate of payment of mining dues (Copy enclosed).	K.Dis 607/2015(Mines) dated 11.9.2015 valid upto 31.3.2016 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.	First Renewal of mining Lease
b. Details of Previous Renewal granted, if any.	Does not arise
ix) Period for which renewal of mining lease is required.	<b>Thirty Years.</b>
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.	Yes - Consent letter is obtained from the pattadar.
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.	Does not arise



<p>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.</p>	<p>→Affidavits enclosed</p> 
<p>a. already holds under mining lease b.has already applied for but not granted or c. being applied for simultaneously</p>	<p>→ Affidavits enclosed.</p>
<p>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 data gathered by the applicant, a tentative scheme of mining (for the first five years of the lease).</p>	<p>Details will be furnished in the Mining Plan.</p>
<p>b)the details of geology and lithology of the area, the extent of manual mining and through machines.</p>	<p>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 silicious in composition and impure and intercalated.</p> <p>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 this 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.</p> <p>The bands of limestone in this area striking in NE-SW direction. The bands have almost vertical dip.</p>

c)annual programme and plan for excavation (for five years) and	2016-2017 - 5,500 MT 2017-2018 - 6,500 MT 2018-2019 - 6,000 MT 2019-2020 - 6,000 MT 2020-2021 - 6,000 MT									
d)the plan of the area showing natural water courses : limit or reserved and 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.	 <p>Details will be furnished in the Mining Plan</p>									
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)	<p>Yes,The Govt issued order vide G.O.Ms.No:166/Ind.Dept.dt.27.2.85 to set up the proposed industry with in a period of one year.Based on that G.O, we have floated an Industry during 1985 in the name and style of "M/s.AIR MINERAL ENTERPRISES" ;</p> <p>The partners are as Follows :</p> <table border="0"> <tr> <td>Managing Partner : S.Ilangovan.B.E.,</td> <td>:</td> <td>60%</td> </tr> <tr> <td>Partner : I.Vijay alangar.B.E.,</td> <td>:</td> <td>20%</td> </tr> <tr> <td>Parnter : I.Sempon Manickam.B.E.,</td> <td>:</td> <td>20%</td> </tr> </table> <p>The Mineral Limestone is ground and utilized in our own industry.</p> <p>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.</p>	Managing Partner : S.Ilangovan.B.E.,	:	60%	Partner : I.Vijay alangar.B.E.,	:	20%	Parnter : I.Sempon Manickam.B.E.,	:	20%
Managing Partner : S.Ilangovan.B.E.,	:	60%								
Partner : I.Vijay alangar.B.E.,	:	20%								
Parnter : I.Sempon Manickam.B.E.,	:	20%								
xi) In case the renewal applied for is only for part of the lease hold.	<b>Whole Area.</b>									
a) the area applied for renewal	<b>0.94.0 Hect.</b>									



b) description of the area applied for renewal (description should be adequate for purpose of demarcating the plot)	<b>S.F.No.</b> :	<b>Extent</b>
	616/1B(P) :	0.01.5 Hect.
	616/1C :	0.03.5 Hect.
	618/1(P) :	0.26.0 Hect.
	619 :	0.63.0 Hect.
	<b>TOTAL</b> :	<b>0.94.0 Hect.</b>
	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 Sketches are 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 raised, ie. by hand labour or mechanical or electric power.	Limestone – Manual mining.	
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 endusers.	
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.	2013– 2014 - 1790.000 MT 2014 – 2015 - 2770.000 MT 2015 – 2016 - 2790.000 MT 2016 – 2017 - 5,500.000 MT 2017 – 2018 - 6000.000 MT 2018 – 2019 - 6,500.000 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 First renewal is granted by the govt is a great boom to our venture towards the semi-mechanisation and we hope that our 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 the other details including accurate plans as required by you before the grant of renewal of the lease.

Place: Sirugudi  
Date: 22/02/2016

Yours faithfully,  
For M/S SIVAM MINES

  
Managing Partner  
(S. ILANGO VAN B.E.)

Encl:

1. Application in triplicate.
2. Challan for Rs.2,500/- paid at SBI, Dindigul on 16/02/2016 towards the application fee.
3. Challan for Rs.1,000/- paid at SBI, Dindigul on 16/04/2016 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, Mining Leases , Income-Tax and copy of the ITR for firm and all Partners.
8. Copy of the Partnership Deed.
9. Copy of the Company Registration in Form-C.
10. Copy of the Partnership firm for captive industry-G.O enclosed.
11. Copy of Government Orders-2Nos.
12. Consent from Pattadar-1No.
13. Report from RQP.
14. Location plan, Key Plan, Mine Lease Plan, Geological plan and sections.
15. Scheme of Mining valid upto 3-3-2017.

  
Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
RECOGNISED QUALIFIED PERSON  
RQP/MAS/206/2007/A

भारतीय नैर न्यायिक

पचास  
रुपये

रु.50

FIFTY  
RUPEES

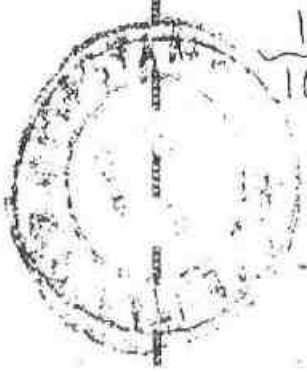
Rs.50

INDIA

INDIA NON JUDICIAL

தமிழ்நாடு தமில்நாடு TAMILNADU

K 744876



136

16.1.2010

M/s சிவம் கமலம்  
சிந்திரி

P. Radhalekshmi Rs.

பி. ராதலக்ஷ்மி,  
பி. ராதலக்ஷ்மி சிந்திரி,  
136, பி. ராதலக்ஷ்மி வீதி,  
தமிழ்நாடு, தமில்நாடு  
பி. ராதலக்ஷ்மி : 2453/ ஆ. V 57, 30

## 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 at Door No 1/174, Main Road, Sirugudi Post, Natham Taluk, Dindigul District  
.....1
2. Thiru. S.Ilangovan son of Thiru K.A.Semban chettiar aged about 54 years residing at Door No.6 / 208, Main Road, Sirugudi Post, Natham Taluk, Dindigul District  
.....2
3. Thiru. I.Vijay Alangar son of Thiru S. Ilangovan aged about 26 years residing at Door No -6 / 208, Main Road, Sirugudi Post, Natham Taluk, Dindigul District  
.....3

and

Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
RECOGNISED QUALIFIED PERSON  
RQP/MAS/206/2007/A

भारतीय नैर न्यायिक

पचास  
रुपये  
रु.50

FIFTY  
RUPEES

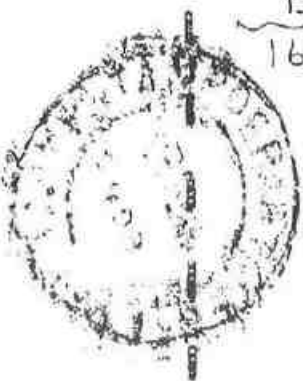
Rs.50

INDIA

INDIA NON JUDICIAL

தமிழ்நாடு தமில்நாடு TAMILNADU

K 744877



137  
16-1-2010

M/S சிவம் மைன்ஸ்  
சிவ சிவ

P. Radhaselvi

L. ராகாசெல்வி,  
முத்தியார்க்கால் விற்பனையாளர்,  
134, பெரிய கடை வீதி,  
திரைக்கல்-1, தமிழ்நாடு.  
பதிவு எண் : 2453/ ஆ, V 97, 39

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

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.

*[Handwritten signature]*

*[Handwritten signature]*

*[Handwritten signature]*

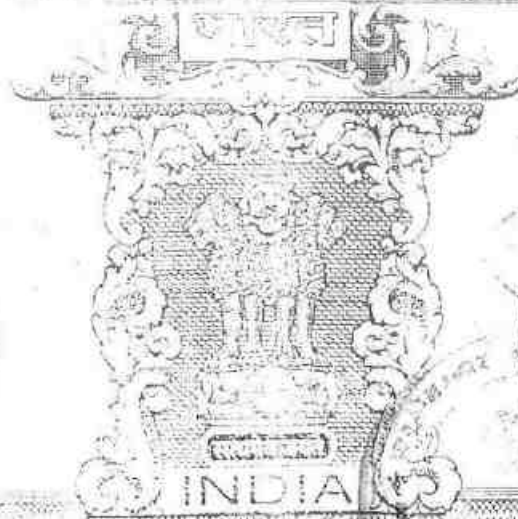
भारतीय नैऋत्यायिक

पचास  
रुपये

रु.50

FIFTY  
RUPEES

Rs.50



INDIA NON JUDICIAL

தமிழ்நாடு தமிழ்நாடு TAMILNADU

K 744878

138

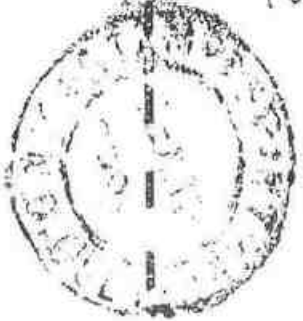
16.1.2010

M/S சிவம் ஸ்டீல்ஸ்

சிந்தி

P. RadhaSelvi R55

ப. ராதாசெல்வி,  
முத்திரைச்சாள் வீடுபாளையம்,  
124, பெரிய கடை வீதி,  
திண்டுக்கல்-1 தமிழ்நாடு.  
உரிம எண் : 2453/ ஆய் 97\_30



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 (4.21 acres) 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

I. vijayalakshmi

S. S. S. S.

भारतीय नैर न्यायिक

पचास  
रुपये  
रु. 50

FIFTY  
RUPEES

Rs. 50

INDIA NON JUDICIAL

தமிழ்நாடு தமிழ்நாடு TAMILNADU

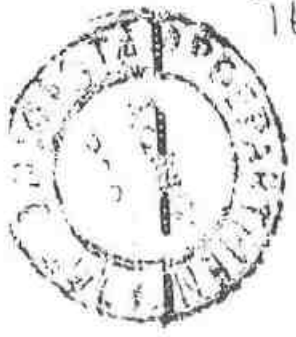
K 744879

139  
16.1.2010

M/s சிவம் ஓய்வு  
சிறுதிர

P. Radhadevi Rs 50/-

ப. ராதாசெல்வி,  
முத்திரைப்பாடி விற்பனையாளர்,  
134, பெரிய கடை வீதி,  
திருட்டுக்கல்-1, தமிழ்நாடு.  
பேரவை எண் : 2453/ ஆ.வ. 07.39



Partner Thiru S. Ilangovan who is holding the Mining lease for Limestone granted by the Govt. of Tamilnadu vide

- i) G.O.Ms No318 / IND (MMA2)Deptt.d. 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)Deptt.d.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. All the partners do hereby agree to do the Mining Operations in the name of the firm in the event of 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 and such credit balance in the accounts of the partners shall carry interest at the rate of 12% per annum. This rate can be changed from time to time as decided by the partners at such other rates as may be prescribed by the Income Tax Act 1961 may be adopted.

S. Aswathy  
Name

Signature  
P. Radhadevi

भारतीय न्यायिक

पचास  
रुपये

रु. 50

FIFTY  
RUPEES

Rs. 50

INDIA NON JUDICIAL

தமிழ்நாடு தமிழ்நாடு TAMILNADU

K 744880

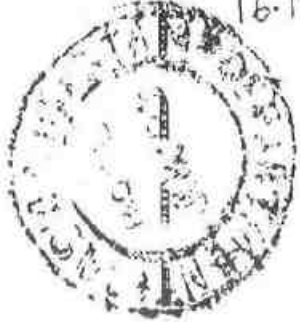
140

16.1.2010

M/s கி.எம். காமசுந்தரி  
பிரைவட்

P. Radhaselvi

பி. ராதாகிருஷ்ணி,  
முத்தியார்த்தலி வீட்டுமன்றம்,  
134, சென்னை கனல் வீதி,  
சென்னை-600 011, தமிழ்நாடு.  
பதிவு எண் : 24521 ஆ.வி 97/30



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. Ilangoan 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.

S. Anil Kumar

P. Radhaselvi

P. Radhaselvi

भारतीय रिज़र्व ब्यायिक

पचास  
रुपये

रु. 50

FIFTY  
RUPEES

RS. 50

INDIA

DICIAL

தமிழ்நாடு தமில்நாடு TAMILNADU

K 744881

141

16.1.2010

P. Radhakelvi 23

L. ராதாகெல்வி,

குந்திமங்கலம் வீதி, கையாபாசா

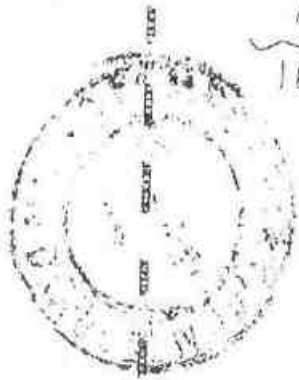
13A, பெரிய சாலை வீதி,

திண்டுக்கல்-1, தமிழ்நாடு.

டிரிடம் எண் : 2453/ சூ.1/ 97, 39

M/S சி.வி. சி.வி. சி.வி.

சி.வி. சி.வி.



- 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. Asialangaram 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.

S. Asialangaram

I. vijayalaya

Asialangaram

I. vijayalaya



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 31<sup>st</sup> March every Year. The profits and losses 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. ASAI LANGARAM	-	10%
S. ILANGAMAN	-	50%
I. VIJAY LANGAR	-	20%
I. SEMPOUN 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. *[Signature]*
2. *[Signature]*
3. *[Signature]*
4. *[Signature]*

WITNESSES

1. N. Anburani w/o - Vallarathan Sirogudi  
2/45 West Street Sirogudi Po., Natham Tk.  
Dindigul - Dt., Pin - 624001
2. V.K. Vengalrangan S/O V. K. V. Rangan  
V.K. VENGALRANGAN 2/47, Bazar Street Natham Po  
Dindigul - Dt., Pin - 624001

Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
RECOGNISED QUALIFIED PERSON

भारतसरकार / GOVERNMENT OF INDIA  
 खानमंत्रालय / MINISTRY OF MINES  
 भारतीय खानब्यूरो / INDIAN BUREAU OF MINES  
O/O THE REGIONAL CONTROLLER OF MINES



Fax No.044-24911295  
 Email ID:rcmchennai@yahoo.co.in

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

No.TN/DGL/LST/MS-765.MDS

Date : 27.03.2013

To:

Shri ER. S. Ilangovan  
 No.4/122, Main Road, Sirugudi (PO)  
 Natham Taluk  
 Dindigul district, Tamilnadu State.

1 APR 2013.

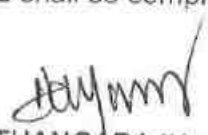
Sub : Approval of Scheme of Mining including Progressive Mine Closure Plan for Sirugudi Limestone Mine(G.O.No.89) over an area of 0.94.0 Hect.in S.FNo.616/1B(P), 1C, 618/1(P) & 619 in Sirugudi Village, Natham Taluk, Dindigul District, Tamilnadu submitted under rule 12 & 23(B) of MCDR, 1988 in favour of ER. S. Ilangovan.

Ref : RQP letter No.Nil dated 18.01.2013.

Sir,

In exercise of the power conferred by sub-rule (4) of rule 12 of Mineral Conservation and Development Rules, 1988, I hereby **approve** the aforesaid Scheme of Mining including Progressive Mine Closure Plan for **Limestone** mineral only. This approval is subjected to the following conditions.

1. The scheme of mining (including Progressive Mine Closure Plan) is approved without prejudice to any other laws applicable to the mine / area from time to time whether made by the Central Government, State Government or any other authority.
2. The scheme of mining (including Progressive Mine Closure Plan) is approved without prejudice to any other order or direction from any court of competent jurisdiction.
3. It is also clarified that the approval of your aforesaid scheme of mining (including Mine Closure Plan) does not in any way imply the approval of the Government in terms of any other provisions of the Mines & Minerals ( Development Regulation) Act, 1957 or the rules framed there under and any other laws.
4. It is further clarified that the approval of the Scheme of Mining (including Progressive Mine Closure Plan) is subject to the provisions of Forest (Conservation) Act, 1980, Forest Conservation Rules, 2003 and other relevant statutes, orders and guidelines as may be applicable to the lease area from time to time.
5. Provisions of the Mines Act, 1952 and Rules and Regulations made there under including submission of notice of opening, appointment of manger and other statutory officials as required under the Mines Act, 1952 shall be complied with.

  
 Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
 RECOGNISED QUALIFIED PERSON  
 RQP/MAS/206/2007/A

6. The execution of mining plan / scheme of mining shall be subjected to vacation of prohibitory orders / notices, if any.

7. If anything is found to be concealed as required under the Mines Act in the contents of the Scheme of Mining and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect, further at any stage, if it is observed that the information furnished in the document are incorrect or misrepresent facts, the approval of the document shall be revoked with immediate effect.

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. Indian Bureau of Mines does not take any responsibility regarding correctness of the boundaries of the lease shown on the ground with reference to lease map and other plans furnished by the applicant / lessee.

9. This approval is given for the received proposals as applicable from this date.

10. 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 1<sup>st</sup> July of every year to the regional office, IBM, Chennai.

11. This scheme of mining is valid upto 03.03.2017.

12. The validity period of the financial assurance should be renewed before the expiry of the same.

13. The contents of Circular No.2/2010 issued by the Chief Controller of Mines, Indian Bureau of Mines, Nagpur vide his letter No.11013/3/M/P/90-COM.Vol.VII dated 06.04.2010 shall be complied with, within a period of six months from the date of approval of this document falling which the approval shall be deemed to have been withdrawn.

Encl : Copy of approved scheme of mining (including PMCP)

Yours faithfully,  
Regional Controller of Mines,  
(T.K.Rath))  
21.2.15

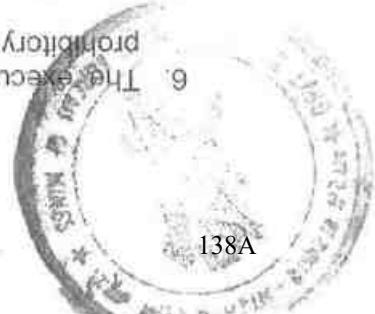
Copy to :  
1. Shri N. Sankara Subbu, RQP, 5, Navin's Silver Oak Apts., 75-C, North Avenue, Srinagar Colony, Saidapet, Chennai - 600 015.

2. The Commissioner of Geology & Mining, Government of Tamilnadu, Guindy, Chennai - 600 032, along with a copy of the approved scheme of mining.  
3. The Director of Mines Safety, No.46(old), New No.5, 2<sup>nd</sup> street, block AA, Anna Nagar, Chennai - 600 040, along with a copy of the approved scheme of mining.  
4. The Controller of Mines (S), Indian Bureau of Mines, Bangalore along with a copy of the approved scheme of mining.

Encl : As above.

Regional Controller of Mines,  
(T.K.Rath))

DR. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
RECOGNISED QUALIFIED PERSON  
RQP/MAS/206/2007/A



IN THE HIGH COURT OF JUDICATURE AT MADRAS

(Special Original Jurisdiction)

Monday, the Twenty Seventh day of December Two Thousand Four

PRESENT

THE HON'BLE MR JUSTICE D.MURUGESAN

W.P. MISCELLANEOUS PETITION No. 46277 of 2004

in WP.38724 of 2004

TAMILNADU SMALL MINE OWNERS [ PETITIONER]  
FEDERATION (REGISTRED) NO.171  
/97 BY ITS PRESIDENT  
V. THIRUNAVUKKARASU

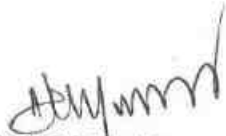
Vs

UNION OF INDIA REP BY ITS [ RESPONDENTS]  
SECRETARY MINISTRY OF MINES  
GOVERNMENT OF INDIA SASTRI  
BHAVAN NEW DELHI

- R- 2 THE SECRETARY TO  
GOVERNMENT OF INDIA  
MINISTRY OF MINES, SASTRI  
BHAVAN, NEW DELHI
- R- 3 THE STATE OF TAMILNADU  
REP BY SECRETARY  
INDUSTRIES DEPARTMENT  
CHENNAI-600 009
- R- 3 THE CONTROLLER GENERAL  
OF INDIA BUREAU OF MINES,  
INDIA BHAVAN, CIVIL LION,  
NAGPUR 440 001

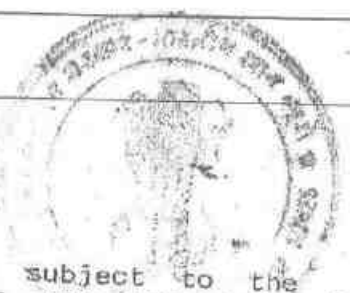
Petition praying that in the circumstances stated therein and in the affidavit filed therewith the High Court will be pleased to interim injunction restraining the respondents restraining the respondents from giving effect to Rule 23F of the amend rules in respect of the leases which were executed prior to 10./4.2003 pending disposal of the W.P.38724 of 2004.

ORDER :- This petition coming on for orders upon perusing the petition and the affidavit filed in support thereof and upon hearing the arguments of MR.M. MUTHAPPAN Advocate for the petitioner the court made the following order :-

  
Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
RECOGNISED QUALIFIED PERSON  
RQP/MAS/206/2007/A

W


007168



There will be an interim injunction subject to the petitioner complying with the first part of Rule 23F of the Minerals conservation and Development Rules, 1988, which reads 'the amount of financial assurance shall be rupees twenty five thousand for A category mines and rupees fifteen thousand for B Category Mines per hectare of the mining lease area put to use for mining and allied activities" . Notice.

-sd/-  
27/12/2004

TRUE COPY

  
Sub-Assistant Registrar (Statistics/C.S)  
High Court, Madras - 600 104.

To.

- 1 THE SECRETARY TO THE UNION OF INDIA  
MINISTRY OF MINES  
GOVERNMENT OF INDIA SASTRI  
BHAVAN NEW DELHI
- 2 THE SECRETARY TO THE GOVERNMENT UNION OF INDIA  
MINISTRY OF MINES, SASTRI  
BHAVAN, NEW DELHI
- 3 THE SECRETARY TO THE GOVERNMENT OF TAMILNADU  
INDUSTRIES DEPARTMENT  
CHENNAI-600 009
- 4 THE CONTROLLER GENERAL OF INDIA BUREAU OF MINES,  
INDIA BHAVAN, CIVIL LION,  
NAGPUR 440 001

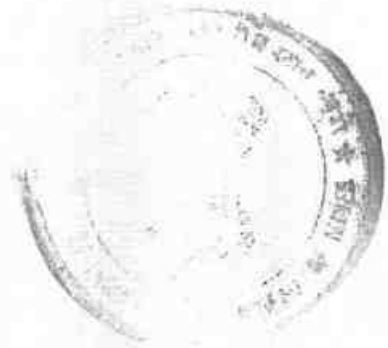
C.C. to MR.M. MUTHAPPAN, Advocate  
on Payment of Necessary Charges

ORDER  
in  
WPMP.46277 of 2004  
in  
WP.38724 of 2004

From 26-2-2001 the Registry is issuing Certified Copies of the Interim orders in this format  
ns. 3.1.205

W

107  
9371086



From

**S. Ilangovan, B.E.,**  
 (Managing Partner of M/s. Sivam Mines)  
 6/209, Main Road, Sirugudi Post,  
 Natham (Tk),  
 Dindigul District.

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 J & Form K in respect of our Sirugudi Limestone Mine over an extent of 0.94.0 hectares in S.F. Nos: 616/1B (Part), 1C, 618/1 (Part) & 619 in Sirugudi Village, Natham Taluk, Dindigul District, Tamilnadu State - Reg.

Sir,

With reference to the subject cited, we herewith enclose Form J & Form K in respect of Sirugudi Limestone Mine over an extent of 0.94.0 hectares in S.F.Nos: 616/1B (Part), 1C, 618/1 (Part) & 619 in Sirugudi Village, Natham Taluk, Dindigul District, Tamilnadu State, for your kind perusal.

Thanking You,

Yours faithfully

For M/s. Sivam Mines  
For M/S SIVAM MINES
  
 Managing Partner  
 S. Ilangovan, B.E.,  
 (Managing Partner)

Place: Dindigul

Date: 4.01.2017

Encl: as above.

  
 Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
 RECOGNISED QUALIFIED PERSON  
 RQP/MAS/206/2007/A



**FORM -J**  
(Notice of sinking shafts and boreholes)  
(See rule 47)

MINE CODE - 38 TMN00010

To

1. The Controller General,  
Indian Bureau of Mines,  
Nagpur - 440 001.
2. The Controller of Mines,  
Indian Bureau of Bangalore.  
PIN: 560 022
3. The Regional Controller of Mines,  
Indian Bureau of Chennai  
PIN: 600 090
4. State Government concerned.

1.	Name of prospect mine and mineral worked prospected	Sirugudi Limestone Mine
2.	Name and address of Licensee / Lessee	<b>M/s. Sivam Mines.,</b> 6/209, Main Road, Sirugudi Post, Natham (Tk), Dindigul District.
3.	Location	Sirugudi Village

Toposheet Numbers	S.F. Nos & Village	Extent Ha	Taluk	District	State
58-J/08	616/1B (Part), 1C, 618/1 (Part) & 619- Sirugudi	0.94.0	Natham	Dindigul	Tamil Nadu

4.	Number of shafts boreholes intended to be sunk of extended (Attach a plan on a scale not less than 1 centimeter = 40 metres indicating the precise location of the shafts boreholes).	DTH Hole-3 Nos, From R.L.223.8m
5.	Purpose for which each of the shafts boreholes is intended to be sunk extended.	To find the depth of mineralization and the ultimate pit limit.
6.	Type of shafts(S) contemplated and its their dimension(s).	Vertical DTH Hole Dia = 110 mm
7.	Type of drill used and size of core to be obtained.	DTH-No Core



8.	Intended depth up to which shafts boreholes is to extended.	of 9 metres depth each bore hole. [3 DTH Hole - of 9 meters (maximum)] from working pit level DTH-1 - 9m DTH-2 - 9m DTH-3 - 8.8m <b>Total meterage - 26.8m</b> Total operating expenditure incurred DTH drills - Rs. 400/m. (26.8m x Rs. 400) = <b>Rs.10,720/-</b>
9.	If the shaft boreholes commences from underground the depth of the level at which the shaft borehole is sunk.	Not applicable
10.	Name and qualification of the geologist or mining engineer in charge of the operation.	Lessee's Officials
11.	Date of commencement of proposed shaft sinking drilling operation.	2016-17

Your's faithfully

**For M/S SIVAM MINES**

Signature : **Managing Partner**

Name in full: S. Ilangoan

Designation: Managing Partner

Place: Dindigul

Date: 4/1/2017



FORM - K

(Particulars to be recorded in a durable bound paged book in respect of each bore - hole/pit/ shaft)

MINE CODE = 38 JMN06010



1.	Name of the Mineral for which the license of lease is granted :	Limestone
2.	Name and address of Licensee / Lessee	<b>M/s. Sivam Mines.,</b> 6/209, Main Road, Sirugudi Post, Natham (Tk), Dindigul District.
3.	Name of the prospect mine :	Sirugudi Limestone Mine
4.	Location	Sirugudi Village

Toposheet Number	Cadastral Survey of Khasra number :	Village	Taluk	District	State
58-J/08	616/1B (Part), 1C, 618/1 (Part) & 619 (0.94.0 Ha)	Sirugudi	Natham	Dindigul	Tamil Nadu

5.	Type and make of the drill and size of core.	Vertical DTH Hole Dia = 110 mm DTH-No Core
6.	Bore hole pit number its location : (a) Reduced levels at the collar of the borehole pit. (b) Inclination and bearing of the hole (c) Altitude of the formation,	From R.L.223.8m  Vertical Banded Formation
7.	Duration of drilling pitting : (a) Date of commencement (b) Date of completion	2016-17 16.11.2016 17.11.2016
8.	Total length of the hole/pit shaft :	of 9 metres  [3 DTH Holes - of 9 meters (maximum)]from working pit level DTH-1 - 9m DTH-2 - 9m DTH-3 - 8.8m <b>Total meterage - 26.8m</b>
9.	Purpose of drilling pitting :	To find the depth of mineralization and ultimate pit limit, the estimation of resource and reserve as per UNFC norms.

10.	Total operating expenditure incurred :	DTH Hole - Rs. 400/m. (26.8m x Rs. 400) = Rs. 10,720
11.	Details of intersection (as given below) :	

Sr. 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	209.0m	200.0m	-	-	110mm	100%	Please Refer Table no.1 for details	CaCO <sub>3</sub>	
2	216.0m	207.0m	-	-	110mm	100%			
3	223.8m	215.0m	-	-	110mm	100%			

**Details of Exploration:**

Locations of DTH are marked in the geological plan and sections. (Refer the Geological Plan & Sections).

**LITHOLOG OF THE DTH**

Table-1

No. of bore holes	Depth of boreholes (m)	Depth of deposition of Limestone	Strata
DBH-1	9	209.0m-208.2m	Mined out
		208.2m-200.0m	Limestone
DBH-2	9	216.0m-215.1m	Mined out
		215.1m-207.0m	Limestone
DBH-3	8.8	223.8m-215.0m	Limestone

\*DTH-Down The Hole

Your's faithfully

For M/S SIVAM MINES

*S. Ilangovan*

Managing Partner

Signature :  
Name in full: S. Ilangovan  
Designation: Managing Partner

Place: Dindigul

Date: 4/1/2017

*Dr. P. Thangaraju*  
Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
RECOGNISED QUALIFIED PERSON  
RQP/MAS/206/2007/A



**CERTIFICATE OF RECOGNITION AS  
QUALIFIED PERSON TO PREPARE MINING PLANS  
(Under Rule 22 C of Mineral Concession Rules, 1960)**

*Shri P.Thangaraju resident of H.No: 77 D-3, Cauvery Avenue,  
M.D.S.Nagar, Salem – 636 Tamil Nadu, son of Late S.Periyasamy having given  
satisfactory evidence of his qualifications and experience is hereby granted  
recognition under Rule 22C of the Mineral Concession Rules, 1960 as a Qualified  
Person to prepare Mining Plans.*

*His registration number is*

RQP/MAS/206/2007/A

*The recognition is valid for a period of ten years ending 30-01-2017*

*Babu Rao*

(B. Babu Rao)

Regional Controller of Mines

Indian Bureau of Mines

Chennai Region

Place : Chennai

Date : 31.01.2007

*Thangaraju*  
Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
RECOGNISED QUALIFIED PERSON  
RQP/MAS/206/2007/A



தமிழ்நாடு தமில்நாடு TAMILNADU 402  
6-1-17

BL 454435

Canara Bank  
Sirugudi

சு.ர.நாதாசாமிச்சாமி  
புத்தியாத்தான் நிர்வாகியர்  
தீர்மானம்  
உ.எண்: 763/உ.1/2004,  
20/1.வாழ்க வளமுடன் தென்  
L.G.சி.தாம்பலம்  
Y.M.R.சி.பி. சிவாமிச்சாமி



Bank Guarantee

Form No. 01/2017

The Regional Controller of Mines,  
Indian Bureau of Mines,  
CHENNAI

Dear Sirs,

Guarantee No. 01/2017  
Amount of Guarantee Rs.15,000/-  
Guarantee Period from 07.01.2017 TO 31.03.2022  
Last date for lodgment of claim 31.03.2022

This Deed of guarantee executed on 07<sup>th</sup> Day of January, 2017 by Canara Bank 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.15,000/- (Rs. Fifteen thousand only) at the request of M/s. Sivam Mines.

This guarantee is issued subject to the condition that the liability of the bank under this guarantee is limited to maximum of Rs.15,000/- (Rs. Fifteen thousand only) and the guarantee shall remain in full force up to 31.03.2022 and cannot be renewed on or before 31.03.2022 by the Bank/applicant.

कृते कनरा बैंक  
For CANARA BANK

अधिकारी/वरिष्ठ प्रबंधक  
Officer/Senior Manager,  
NATHAM.

For CANARA BANK

Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
RECOGNISED QUALIFIED PERSON  
Manager (FAS/206/2007/A)  
SIRUGUDI, (Dindigul Dt)

BANK GUARANTEE AND CO-ACCEPTANCE BOND



1. Agreement on production of a Bank guarantee for Rs. 15,000/- (Rs. Fifteen thousand only) under rule 23F of MCDR, 1988.

2. We Canara Bank at the request of **M/s. Sivam Mines**, 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.15,000/- (Rs. Fifteen thousand 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 23A, B & 23E of MCDR, 1988 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 **0.94.0 Ha.** Granted by State Government to **M/s. Sivam Mines**, situated in S.F. Nos: **616/1B (Part), 1C, 618/1 (Part) & 619** in **Sirugudi Village, Natham Taluk, Dindigul District, Tamilnadu State (G.O.(D) No.170 Industries (MMA.1) dept., dated 03.11.2014)** 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 do hereby undertake to pay the amount due and payable under this guarantee without any demure, to the authority merely on a demand 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. 15,000/- (Rs. Fifteen thousand only)**.

4. We undertake to pay to the authority on a demand to 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 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/Scheme of Mining period 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 and accordingly discharge this guarantee. Unless a demand or claim under this guarantee is made on us in writing on or before **31.03.2022** we shall be discharged from all liability under this guarantee thereafter.

कृते केनरा बैंक  
For CANARA BANK

  
अधिकारी/बरिष्ठ प्रबंधक  
Officer/Senior Manager.  
नथम NATHAM.

For CANARA BANK

J. BALAJI  
P.No: 48013  
MANAGER

  
Manager,  
SIRUGUDI. (Dindigul Dt)

6. We 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, <sup>Sirugudi</sup> 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 :

- Our liability under this Bank guarantee shall not exceed Rs.15,000/- (Rs. Fifteen thousand only)
- The bank guarantee shall be valid up to 31.03.2022
- The period of bank guarantee submitted is valid for the period of the proposals given in the mining plan/Scheme of mining/PMCP etc. We are liable to pay the guarantee amount or any part thereof under this Bank guarantee and only if served upon us a written claim or demand or before 31.03.2022

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 07<sup>th</sup> day of January, 2017 at Sirugudi

For CANARA BANK

  
SIRUGUDI, (District Office)

Email: cb1305@canarabank.com

कृते केनरा बैंक  
For CANARA BANK

  
अधिकारी/वरिष्ठ प्रबंधक  
Officer/Senior Manager  
नथम NATHAM.

नथम NATHAM.  
Officer/Senior Manager  
अधिकारी/वरिष्ठ प्रबंधक

J. BALAJI  
SP.No: 48013

MANAGER  
OF CANARA BANK  
कृते केनरा बैंक

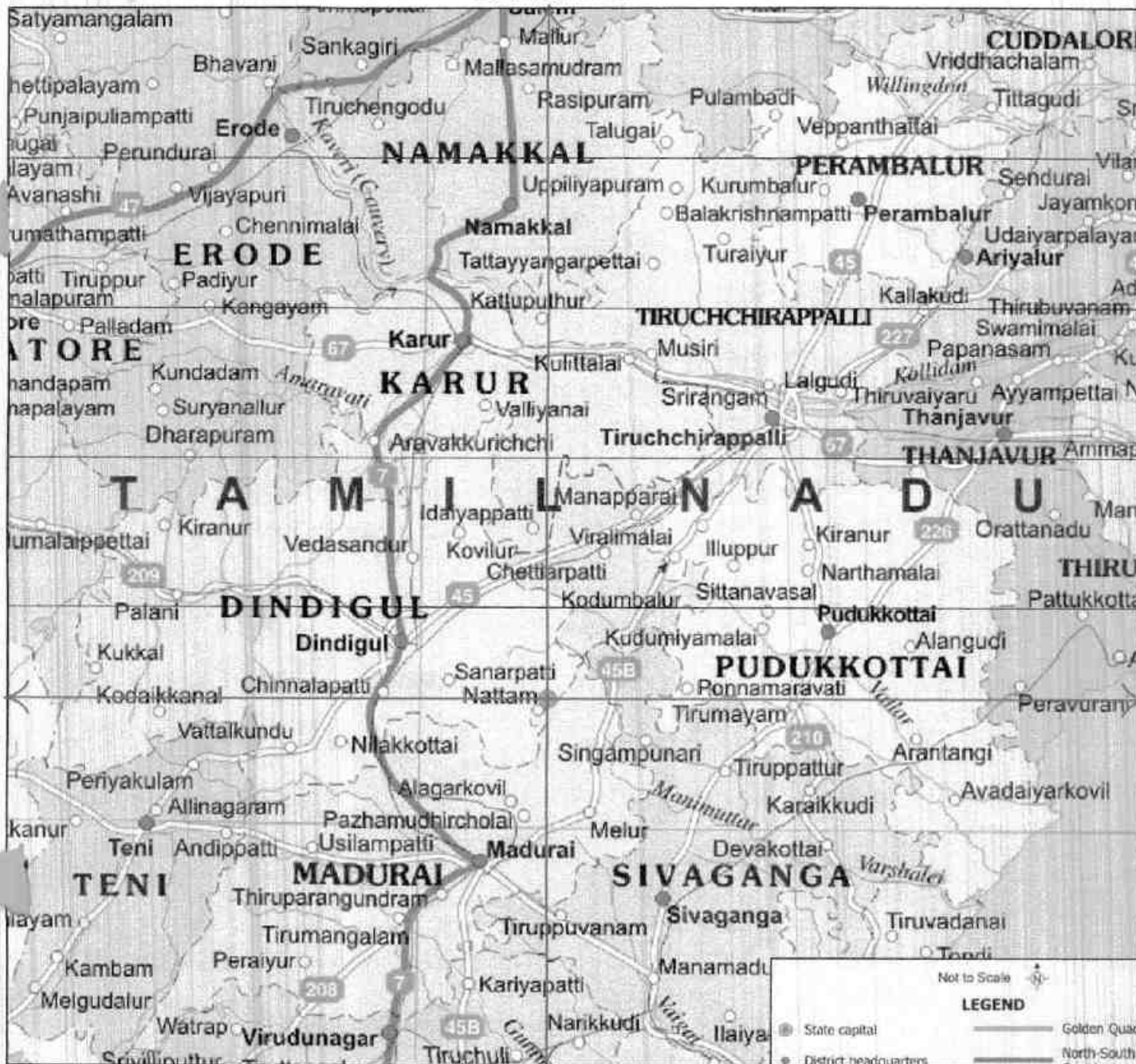
  
Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
RECOGNISED QUALIFIED PERSON  
RQP/MAS/206/2007/A

**SIRUGUDI LIMESTONE MINE**

Lessee: M/s. Sivam Mines.

**PLATE NO : I**

10°14'58.77"N



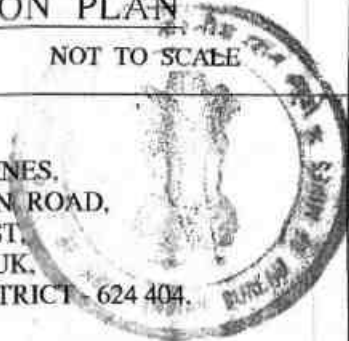
78°17'32.79"E

78°17'32.79"E

10°14'58.77"N

**LOCATION PLAN**

NOT TO SCALE



**LESSEE :**

M/s. SIVAM MINES,  
No. 6/209, MAIN ROAD,  
SIRUGUDI POST,  
NATHAM TALUK,  
DINDIGUL DISTRICT - 624 404.

**LOCATION OF MINE:**

S.F.NO : 616 /1B(P), 1C, 618/1(P), 619  
EXTENT : 0.94.0 Ha  
VILLAGE : SIRUGUDI  
TALUK : NATHAM  
DISTRICT : DINDIGUL,  
STATE : TAMILNADU.

**INDEX**

MINE LEASE AREA ●

TOPO SHEET No. : 58 J-08

LATITUDE : 10°14'58.77"N

LONGITUDE : 78°17'32.79"E

**PREPARED BY:**

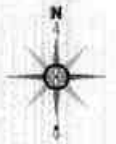
THIS IS TO CERTIFY THAT THE INFORMATION IN THIS  
PLATE IS TRUE AND CORRECT TO THE BEST OF MY  
KNOWLEDGE BASED UPON THE LEASE MAP  
AUTHENTICATED BY STATE GOVERNMENT

Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
RECOGNIZED QUALIFIED PERSON  
RQP/MAS/206/2007/A

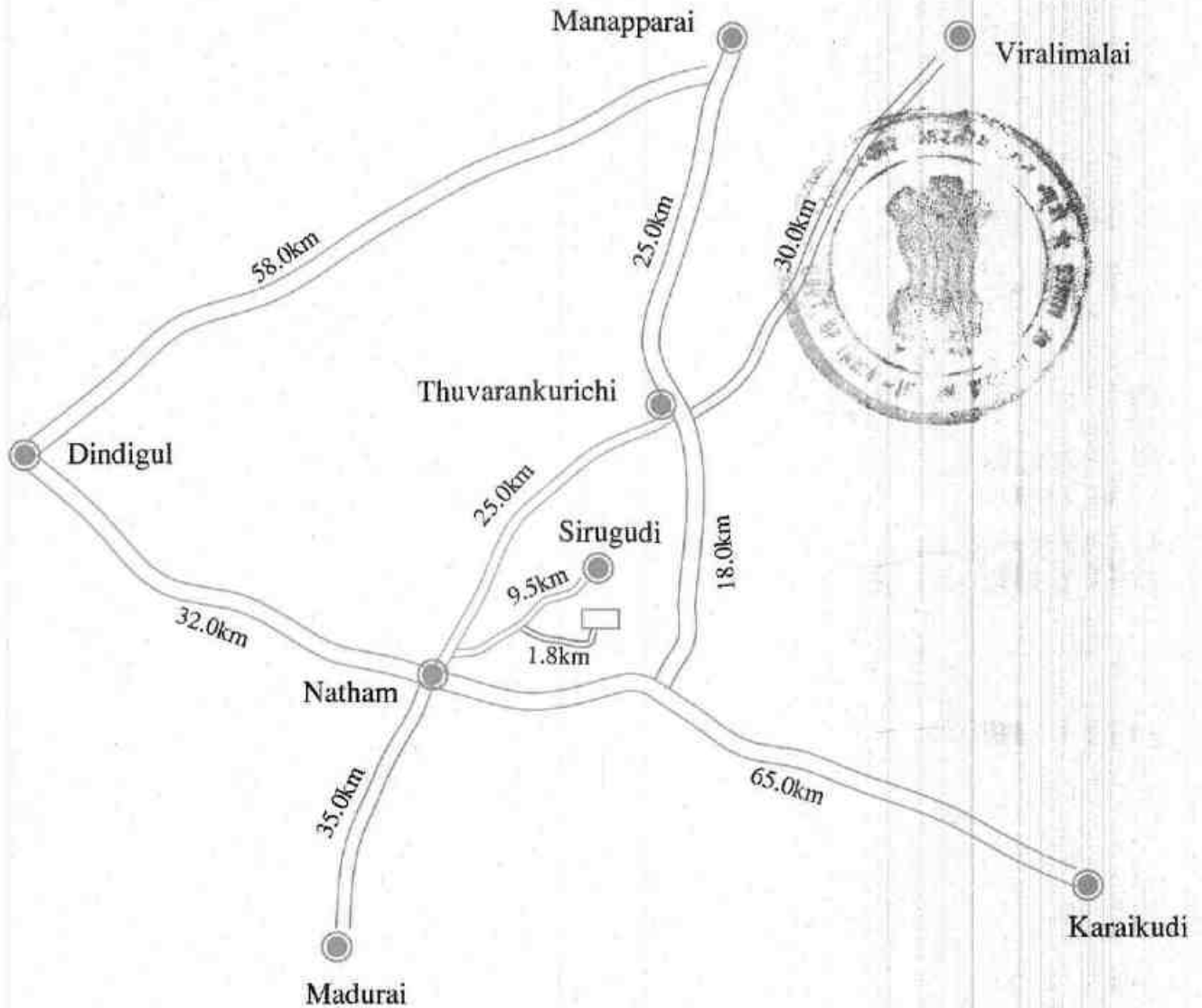
**LEGEND**

- State capital
- District headquarters
- Other town
- 45 National Highway number
- Golden Quadrilateral
- North-South & East-West Corridors
- National Highway
- Railway

PLATE NO: 1A  
ROUTE MAP



**SIRUGUDI LIMESTONE MINE**  
Lessee: M/s. Sivam Mines.



<u>INDEX</u>	
MINE LEASE AREA	
NATIONAL HIGHWAY	
STATE HIGHWAY	
PANCHAYAT ROAD	
APPROACH ROAD	

**LESSEE :**  
M/s. SIVAM MINES,  
No. 6/209, MAIN ROAD,  
SIRUGUDI POST,  
NATHAM TALUK,  
DINDIGUL DISTRICT - 624 404.

**LOCATION OF MINE:**  
S.F.NO : 616 /1B(P), 1C,  
618/1(P), 619  
EXTENT : 0.94.0 Ha  
VILLAGE : SIRUGUDI  
TALUK : NATHAM  
DISTRICT : DINDIGUL,  
STATE : TAMILNADU.

**SCALE :**  
NOT TO SCALE

**PREPARED BY:**  
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AUTHENTICATED BY STATE/GOVERNMENT  
  
Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
RECOGNIZED QUALIFIED PERSON  
RQP/MAS/206/2007/A



OCTOBER TO DECEMBER



SIRUGUDI LIMESTONE MINE

Lessee: M/s. Sivam Mines.

10° 14'58.77"N  
78° 17'32.79"E

**LESSEE :**

M/s. SIVAM MINES,  
No. 6/209, MAIN ROAD,  
SIRUGUDI POST,  
NATHAM TALUK,  
DINDIGUL DISTRICT - 624 404.

**LOCATION OF MINE:**

S.F.NO : 616/1B(P), 1C, 618/1(P), 619  
EXTENT : 0.94.0 Ha  
VILLAGE : SIRUGUDI  
TALUK : NATHAM  
DISTRICT : DINDIGUL,  
STATE : TAMILNADU.

PLATE NO : IB

TOPOSHEET NO: 58 J-08

KEY PLAN

SCALE- 1:50000

**INDEX**

- LEASE AREA
- 5KM RADIUS
- WIND DIRECTION
- ROAD

Land forms	Vegetation
Contour	Undergrowth: slow running
Index contour	Forest: difficult to run
Form line	Undergrowth: difficult to run
Slope line	
Contour value	
Earth bank	
Earth wall	
Small earth wall	
	<b>Man-made features</b>
	Motorway
	Major road
	Minor road
	Road
	Vehicle track
	Footpath
	Small path
	Railway
	Power line
<b>Water and marsh</b>	
Lake	
Pond	
Waterhole	
Uncrossable river	
Crossable watercourse	
Crossable small watercourse	

10° 14'57.85'N  
78° 17'30.52'E

10° 14'55.45'N  
78° 17'35.11'E



10° 14'54.81"N  
78° 17'37.28"E

JULY TO SEPTEMBER

**PREPARED BY:**

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PLATE IS TRUE AND CORRECT TO THE BEST OF MY  
KNOWLEDGE BASED UPON THE LEASE MAP  
AUTHENTICATED BY STATE GOVERNMENT

Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
RECOGNIZED QUALIFIED PERSON  
ROP/MAS/206/2007/A

152A

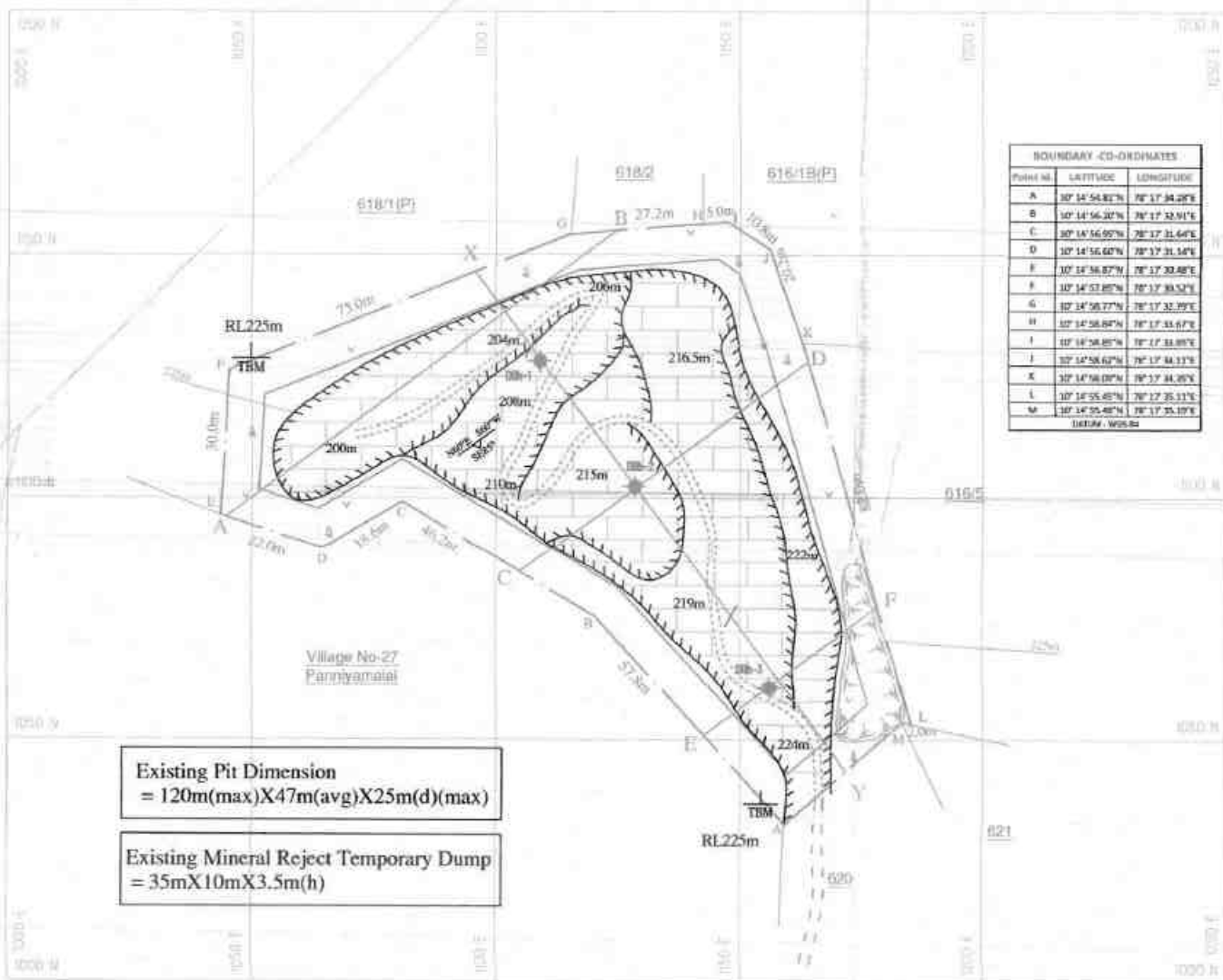






**SIRUGUDI LIMESTONE MINE**  
Lessee: M/s. Sivam Mines.

POINT NO	LATITUDE	LONGITUDE
A	10° 14' 54.82"N	78° 17' 34.28"E
B	10° 14' 56.20"N	78° 17' 32.91"E
C	10° 14' 56.95"N	78° 17' 31.64"E
D	10° 14' 56.60"N	78° 17' 31.54"E
E	10° 14' 56.87"N	78° 17' 30.48"E
F	10° 14' 53.80"N	78° 17' 30.52"E
G	10° 14' 56.77"N	78° 17' 32.09"E
H	10° 14' 56.84"N	78° 17' 33.67"E
I	10° 14' 56.85"N	78° 17' 34.80"E
J	10° 14' 56.62"N	78° 17' 35.13"E
K	10° 14' 56.00"N	78° 17' 34.80"E
L	10° 14' 55.45"N	78° 17' 35.31"E
M	10° 14' 55.80"N	78° 17' 35.10"E



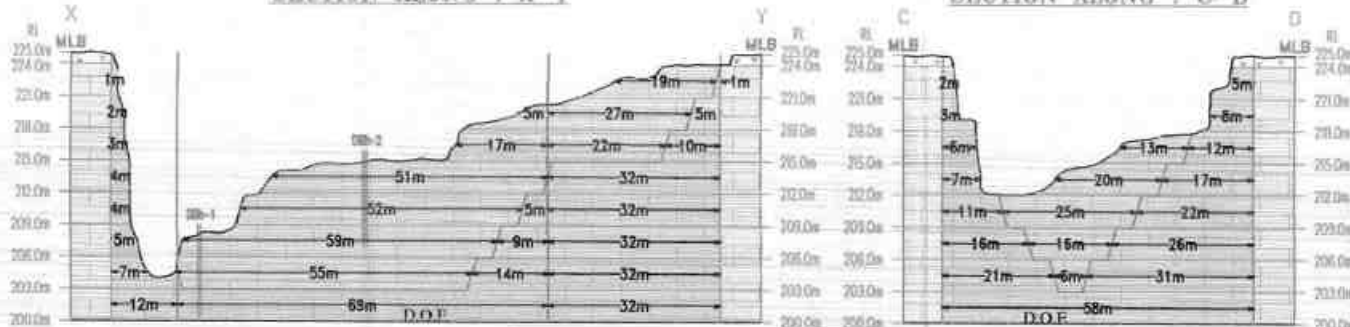
Existing Pit Dimension  
= 120m(max)X47m(avg)X25m(d)(max)

Existing Mineral Reject Temporary Dump  
= 35mX10mX3.5m(h)

INDEX	
	MINE LEASE BOUNDARY
	7.5m SAFETY BARRIER
	TEMPORARY BENCH MARK
	TOP SOIL
	LIMESTONE
	STRIKE & DIP (Limestone)
	EXISTING PIT
	DUMP
	CONTOUR LINE
	MINE ROAD
	APPROACH ROAD
	ULTIMATE PIT LIMIT (Temporary)
	MID POINT
	DRILLED BOREHOLE
	DEPTH OF ESTIMATION

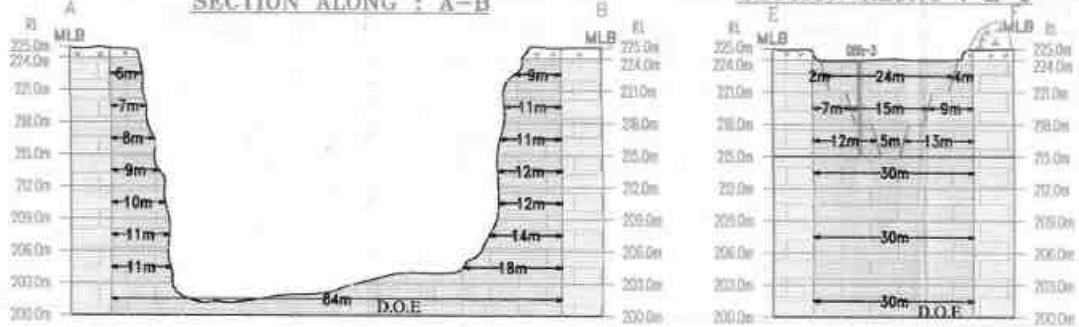
SECTION ALONG : X-Y

SECTION ALONG : C-D



SECTION ALONG : A-B

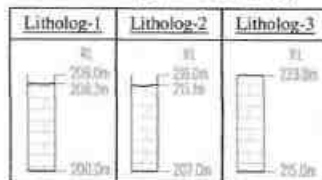
SECTION ALONG : E-F



MINERAL RESOURCES & RESERVES AS PER UNFC SYSTEM

DESCRIPTION	RSMTs	UNFC CODE	Color index
Mineral reserves	37838	111	
Mineral resource locked up in benches	106431	221	
Mineral resource locked up in safety barrier	187200	221	

Borehole litholog (drilled at 9.0m (d))



LESSEE :

M/s. SIVAM MINES,  
No. 6/209, MAIN ROAD,  
SIRUGUDI POST,  
NATHAM TALUK,  
DINDIGUL DISTRICT

LOCATION OF MINE

S.P.NO : 61671B(P), 61671B(P), 61671B(P)  
EXTENT : 0.9101Ha  
VILLAGE : SIRUGUDI  
TALUK : NATHAM  
DISTRICT : DINDIGUL  
STATE : TAMILNADU

PLATE NO : IV

DATE OF SURVEY: 18.11.2016

**GEOLOGICAL PLAN & SECTIONS**

SCALE : PLAN : 1 : 1000  
SEC-HOR : 1 : 1000  
VER : 1 : 500

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

*[Signature]*  
D.P. THANGARAJU, M.Sc., Ph.D., V.M.E.A.,  
RECOGNIZED QUALIFIED FREEMAN  
RGP/MAS/206/2007/A155A

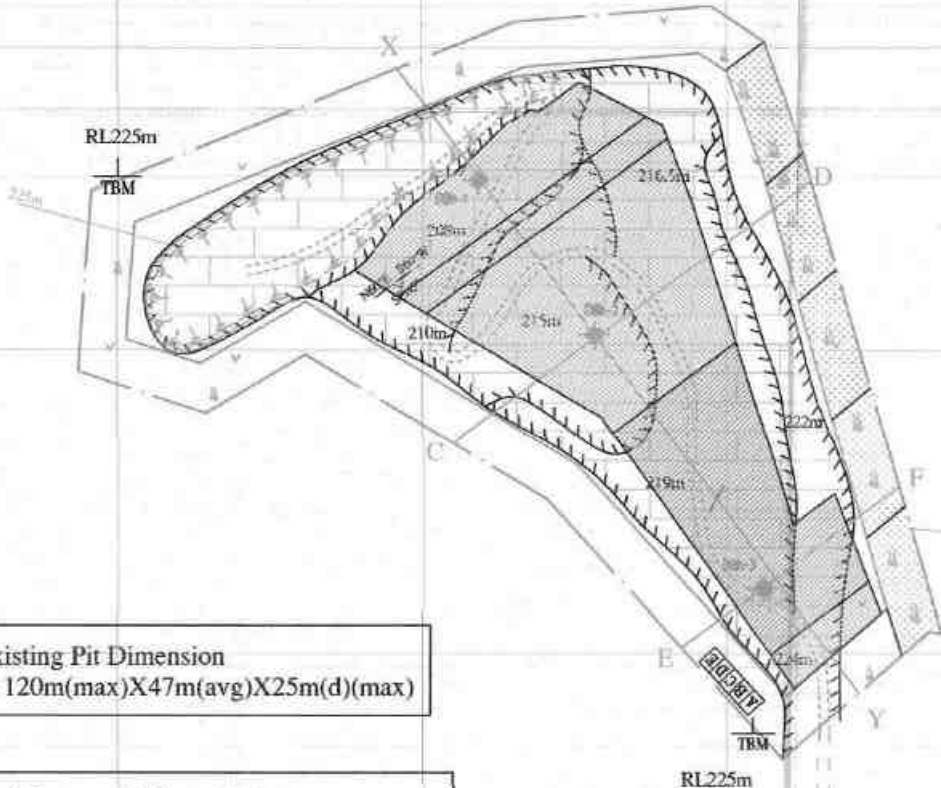


**SIRUGUDI LIMESTONE MINE**  
 Lessee: M/s. Sivam Mines.

**SITE SERVICES**  
 A - OFFICE  
 B - STORE ROOM  
 C - FIRST AID ROOM  
 D - REST SHELTER  
 E - TOILET

Point No.	LATITUDE	LONGITUDE
A	10° 14' 54.83"N	78° 17' 34.28"E
B	10° 14' 56.20"N	78° 17' 32.90"E
C	10° 14' 56.95"N	78° 17' 31.64"E
D	10° 14' 55.00"N	78° 17' 31.14"E
E	10° 14' 56.87"N	78° 17' 30.48"E
F	10° 14' 57.85"N	78° 17' 30.52"E
G	10° 14' 58.77"N	78° 17' 32.79"E
H	10° 14' 58.84"N	78° 17' 33.67"E
I	10° 14' 58.95"N	78° 17' 33.85"E
J	10° 14' 58.62"N	78° 17' 34.11"E
K	10° 14' 58.09"N	78° 17' 34.36"E
L	10° 14' 55.45"N	78° 17' 35.11"E
M	10° 14' 55.48"N	78° 17' 35.19"E

DATUM - WGS84



Existing Pit Dimension  
 = 120m(max)X47m(avg)X25m(d)(max)

Existing & Proposed Mineral Reject  
 Temporary Dump = 82mX18m(avg)X3m(h)(max)

**INDEX**

- MINE LEASE BOUNDARY
- 7.5m SAFETY DISTANCE
- TOP SOIL
- TEMPORARY BENCH MARK
- LIMESTONE
- STRIKE & DIP
- EXISTING PIT
- DRILLED BOREHOLE
- CONTOUR
- MINE ROAD
- APPROACH ROAD
- MID POINT
- DUMP

**LESSEE :**  
 M/s. SIVAM MINES,  
 No. 6/209, MAIN ROAD,  
 SIRUGUDI POST,  
 NATHAM TALUK,  
 DINDIGUL DISTRICT 624 404.

**LOCATION OF MINE:**  
 S.F.NO : 6/209/B(P), TC: 618/11/8  
 EXTENT : 0.34 Ha  
 VILLAGE : SIRUGUDI  
 TALUK : NATHAM  
 DISTRICT : DINDIGUL,  
 STATE : TAMILNADU.

**PLATE NO : V**

DATE OF SURVEY: 18.11.2016

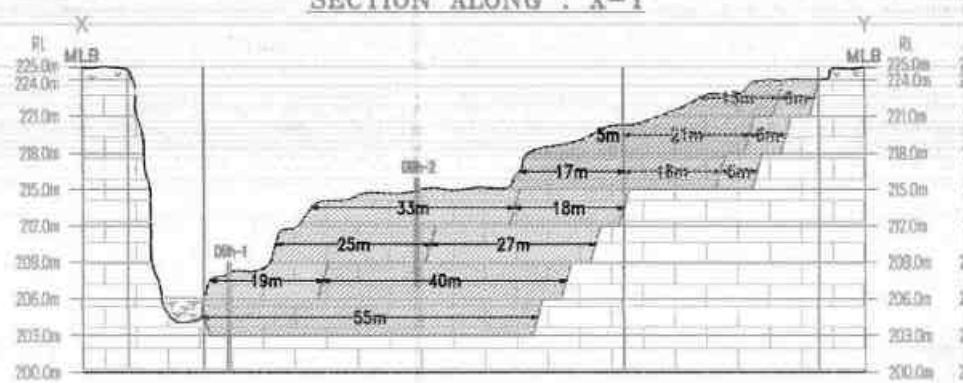
**YEARWISE DEVELOPMENT & PRODUCTION PLAN & SECTIONS**

SCALE - PLAN: 1 : 1000  
 SEC-HOR: 1 : 1000  
 VER : 1:500

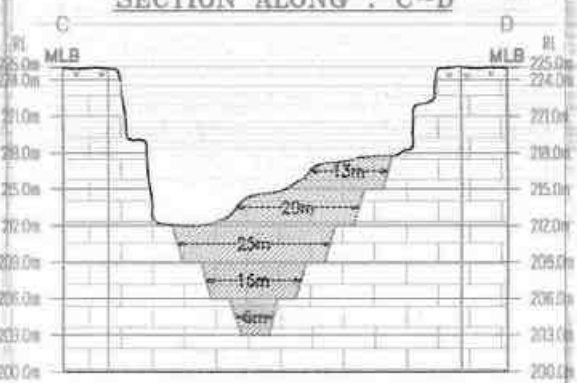
**PREPARED BY:**  
 THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.  
 RECOGNIZED QUALIFIED PERSON  
 ROP/M/S/206/2007/A156A

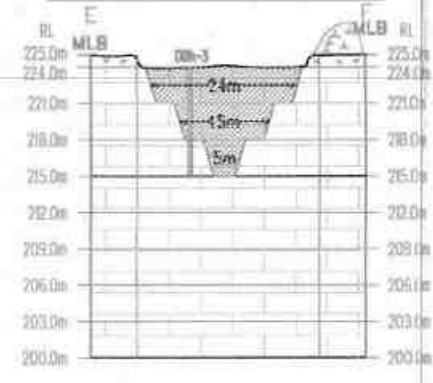
**SECTION ALONG : X-Y**



**SECTION ALONG : C-D**



**SECTION ALONG : E-F**



2017-18 Year Proposed to be Excavated	2017-18 Year Proposed to be Planted
2018-19 Year Proposed to be Excavated	2018-19 Year Proposed to be Planted
2019-20 Year Proposed to be Excavated	2019-20 Year Proposed to be Planted
2020-21 Year Proposed to be Excavated	2020-21 Year Proposed to be Planted
2021-22 Year Proposed to be Excavated	2021-22 Year Proposed to be Planted



**SIRUGUDI LIMESTONE MINE**  
 Lessee: M/s. Sivam Mines.



- MINE LEASE BOUNDARY
- 7.5m SAFETY DISTANCE
- TOP SOIL
- TEMPORARY BENCH MARK
- EXISTING & PROPOSED PIT
- CONTOUR
- MINE ROAD
- APPROACH ROAD
- DUMP

**LESSEE :**  
 M/s. SIVAM MINES,  
 No. 6/209, MAIN ROAD,  
 SIRUGUDI POST,  
 NATHAM TALUK,  
 DINDIGUL DISTRICT - 624 404.

**LOCATION OF MINE:**  
 S.F.NO : 616 /IB(P), 1C, 618/1(P), 619  
 EXTENT : 0.94.0 Ha  
 VILLAGE : SIRUGUDI  
 TALUK : NATHAM  
 DISTRICT : DINDIGUL,  
 STATE : TAMILNADU.

**PLATE NO : VI**

DATE OF SURVEY: 18.11.2016

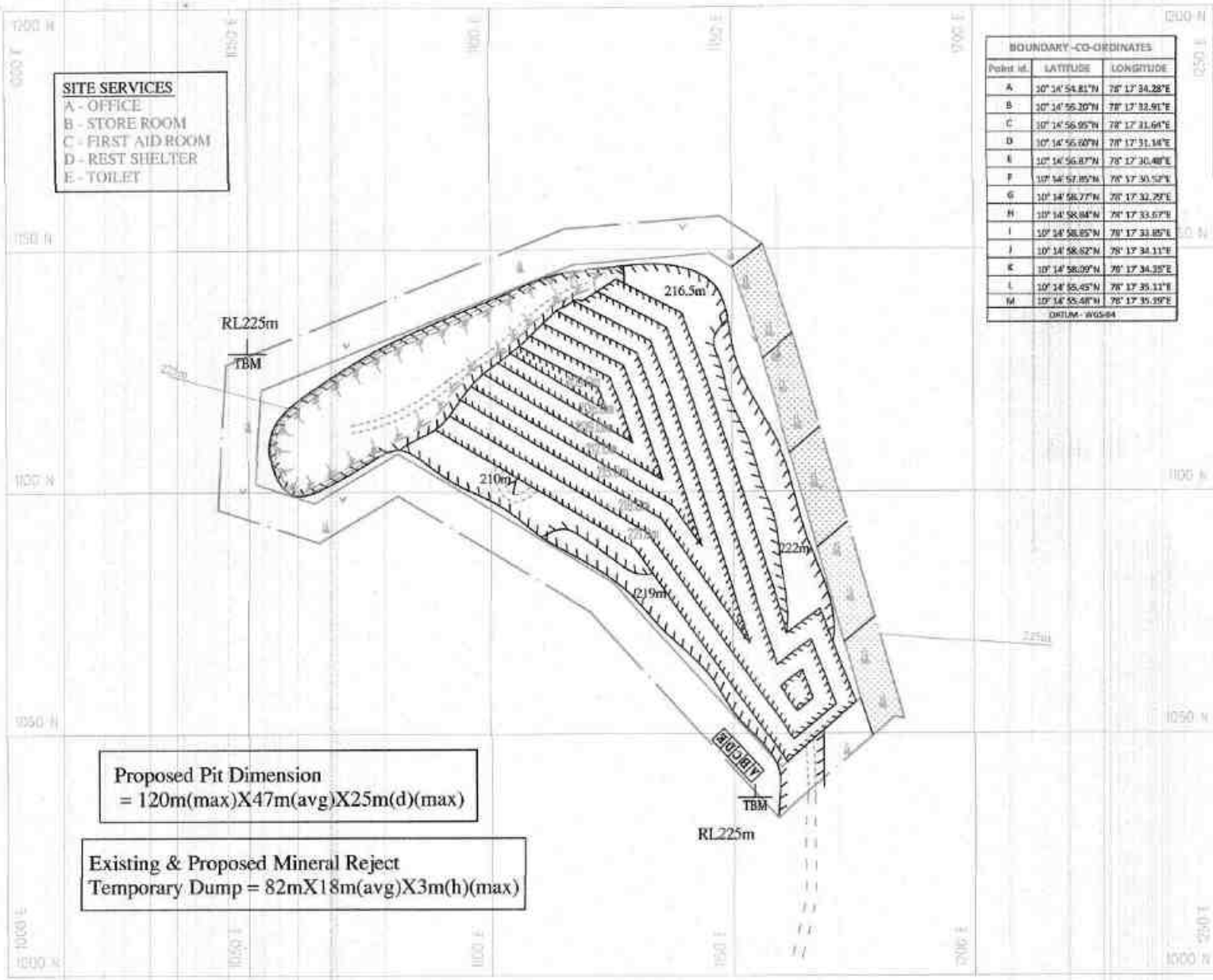
**MINE LAYOUT - LAND USE & AFFORESTATION PLAN**

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

*(Signature)*

Dr.P.THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
 RECOGNIZED QUALIFIED PERSON  
 ROP/MAS/206/2007/A



**Proposed Pit Dimension**  
 = 120m(max)X47m(avg)X25m(d)(max)

**Existing & Proposed Mineral Reject**  
**Temporary Dump = 82mX18m(avg)X3m(h)(max)**

**PRESENT & POST MINING LAND USE PATTERN**

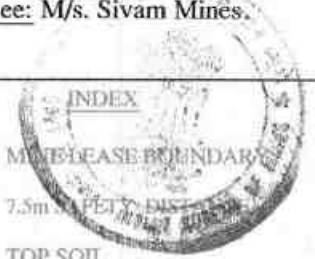
DESCRIPTION	PRESENT AREA (Ha)	ADDITIONAL AREA TO BE REQUIRED AT THE MINING PLAN PERIOD (Ha)	AREA AT THE END OF LIFE OF MINE (Ha)
AREA UNDER MINING	0.56.4	NIL	0.56.4
DUMPS	NIL	NIL*	NIL*
INFRASTRUCTURE	NIL	0.01.0	0.01.0
ROADS	0.02.0	NIL	0.02.0
GREEN BELT	0.04.0	0.10.0	0.14.0
UN UTILIZED AREA	0.31.6	0.23.5	0.20.6
TOTAL	0.94.0		0.94.0

\* Included Area under mining

2017-18 Year Proposed to be Planted	
2018-19 Year Proposed to be Planted	
2019-20 Year Proposed to be Planted	
2020-21 Year Proposed to be Planted	
2021-22 Year Proposed to be Planted	



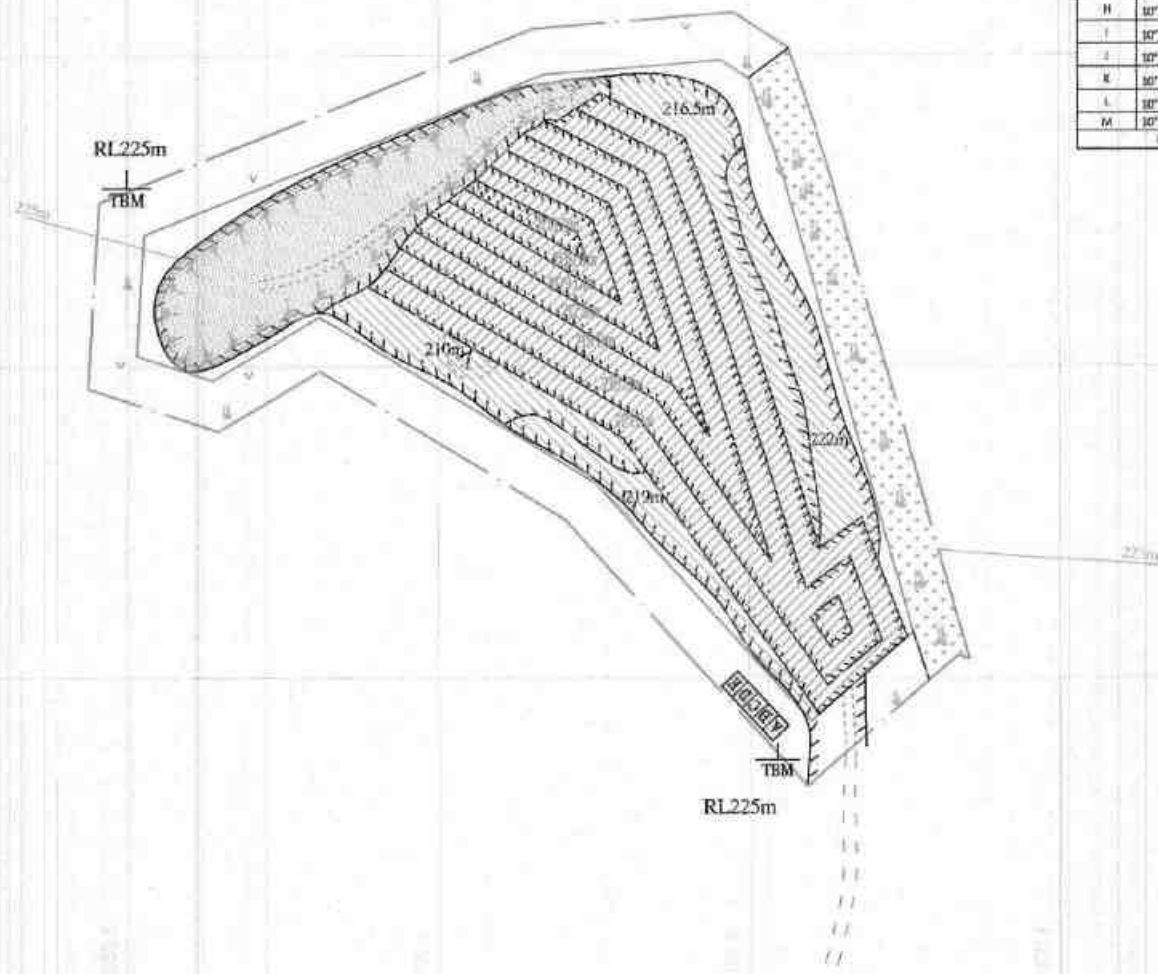
**SIRUGUDI LIMESTONE MINE**  
 Lessee: M/s. Sivam Mines.



**SITE SERVICES**  
 A - OFFICE  
 B - STORE ROOM  
 C - FIRST AID ROOM  
 D - REST SHELTER  
 E - TOILET

BOUNDARY CO-ORDINATES		
Point No.	LATITUDE	LONGITUDE
A	10° 14' 54.81"N	78° 17' 34.28"E
B	10° 14' 56.20"N	78° 17' 32.91"E
C	10° 14' 56.95"N	78° 17' 31.64"E
D	10° 14' 56.60"N	78° 17' 31.14"E
E	10° 14' 56.87"N	78° 17' 30.48"E
F	10° 14' 57.85"N	78° 17' 30.52"E
G	10° 14' 56.77"N	78° 17' 32.79"E
H	10° 14' 58.84"N	78° 17' 33.67"E
I	10° 14' 58.85"N	78° 17' 33.85"E
J	10° 14' 58.62"N	78° 17' 34.11"E
K	10° 14' 58.09"N	78° 17' 34.85"E
L	10° 14' 55.45"N	78° 17' 35.11"E
M	10° 14' 55.48"N	78° 17' 35.19"E

DATE: 11-05-2016



- MINE LEASE BOUNDARY
- 7.5m SAFETY DISTANCE
- TOP SOIL
- TEMPORARY BENCH MARK
- EXISTING & PROPOSED PIT
- CONTOUR
- MINE ROAD
- APPROACH ROAD
- DUMP

**LESSEE :**  
 M/s. SIVAM MINES,  
 No. 6/209, MAIN ROAD,  
 SIRUGUDI POST,  
 NATHAM TALUK,  
 DINDIGUL DISTRICT - 624 404.

**LOCATION OF MINE:**  
 S.F.NO : 616 /IB(P), 1C, 618/1(P), 619  
 EXTENT : 0.94.0 Ha  
 VILLAGE : SIRUGUDI  
 TALUK : NATHAM  
 DISTRICT : DINDIGUL,  
 STATE : TAMILNADU.

**PLATE NO : VII**  
 DATE OF SURVEY: 18.11.2016

**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

Dr. P. THANGARAJU, M.Sc., Ph.D., M.M.E.A.,  
 RECOGNIZED QUALIFIED 158A  
 ROP/MAS/206/2007/A

**AREA CONSIDERED FOR FINANCIAL ASSURANCE**

DESCRIPTION	Area Put on use at Start of Plan (Ha)	Additional Area Requirement during this M.P. period (Ha)	Net Area Considered for Calculation (Ha)	Color code
AREA UNDER MINING	0.56.4	NIL	0.56.4	
DUMPS	NIL	NIL*	NIL*	
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	
<b>TOTAL</b>	<b>0.62.4</b>	<b>0.11.0</b>	<b>0.73.4</b>	

\* Included Area under mining

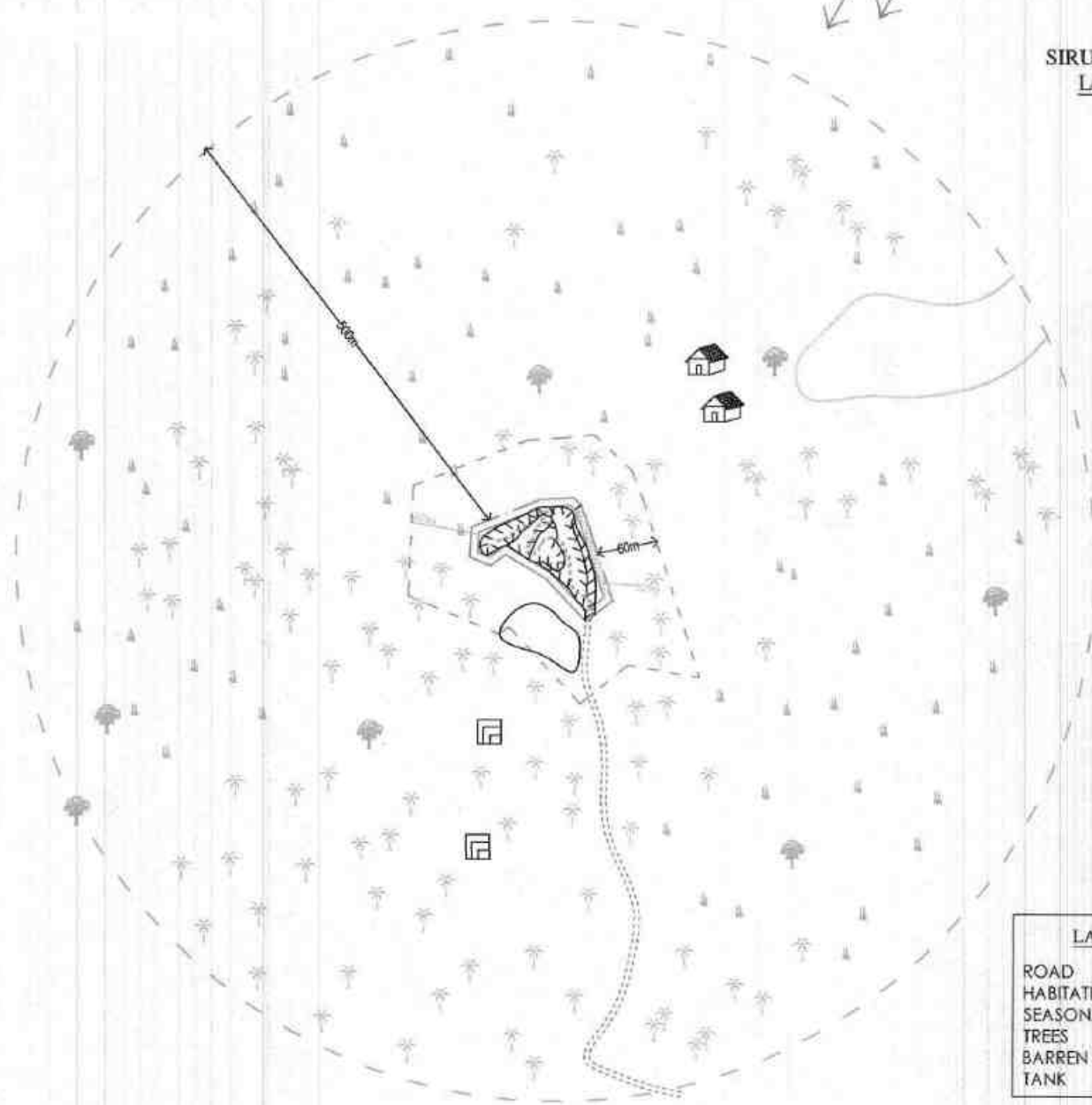
**Proposed Pit Dimension**  
 = 120m(max)X47m(avg)X25m(d)(max)

**Existing & Proposed Mineral Reject Temporary Dump** = 82mX18m(avg)X3m(h)(max)

OCTOBER TO DECEMBER



**SIRUGUDI LIMESTONE MINE**  
Lessee: M/s. Sivam Mines.



JULY TO SEPTEMBER

SEASONAL AGRICULTURE LAND	
BARREN LAND	

LAND USE PATTERN	
ROAD	(06%)
HABITATION	(01%)
SEASONAL AGRICULTURE LAND	(58%)
TREES	(09%)
BARREN LAND	(20%)
TANK	(06%)

**LOCATION OF MINE:**  
 S.F.NO : 616/1B(P), 1C, 618/1(P), 619  
 EXTENT : 0.94.0 Ha  
 VILLAGE : SIRUGUDI  
 TALUK : NATHAM  
 DISTRICT : DINDIGUL,  
 STATE : TAMILNADU.

**LESSEE :**  
 M/s. SIVAM MINES,  
 No. 6/209, MAIN ROAD,  
 SIRUGUDI POST,  
 NATHAM TALUK,  
 DINDIGUL DISTRICT - 624 404.



(i) LEASE BOUNDARY	
(ii) CONTOUR 10m INTERVAL	
(iii) DRAINAGE PATTERN	
(iv) ROADS & PATHS	
(v) TOURIST HISTORICAL PLACE OF MONUMENT	
(vi) FORESTS, SANCTUARIES, WASTE LAND, AGRICULTURAL LAND	
(vii) VILLAGE BOUNDARY & POPULATION	
(viii) WIND DIRECTION	
(ix) MINE WORKING, WASTE PUMP, AFFORESTATION, PROSES PLANT, SURFACE BUILDING, WORKSHOP & TOWNSHIP	
(x) RECLAIMED AREA, CHECK DAM, BENEFICATION OPERATION, BORE WELL (Drinking) STATION & DISCHARGE OF WATER	
60m RADIUS	
300m RADIUS	
TREES / COCONUT FORM	
APPROACH ROAD	
PANCHAYAT ROAD	
10m & 7.5m SAFETY DISTANCE	
HOUSE	
SEASONAL AGRICULTURE LAND	

PLATE NO - VIII

DATE OF SURVEY: 18.11.2016

**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.

*(Signature)*  
 Dr. P. THANGARAJU, M.Sc., Ph.D., M.A. 159A  
 RECOGNIZED QUALIFIED PERSON  
 HQP/MAS/208/2007/A



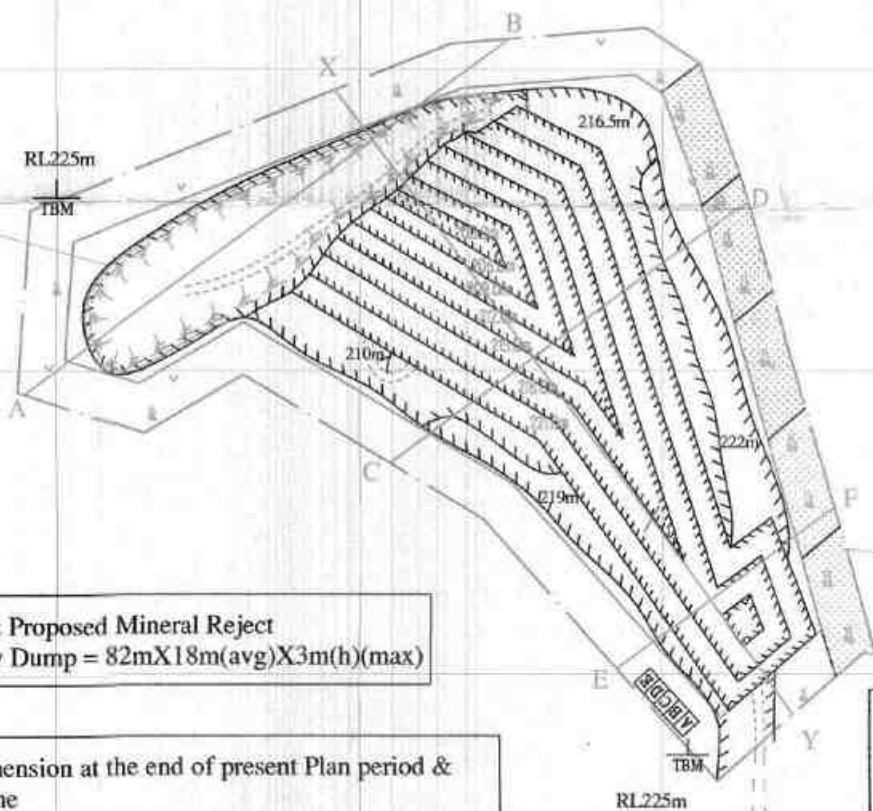


**SIRUGUDI LIMESTONE MINE**  
 Lessee: M/s. Sivam Mines.

Point M.	LATITUDE	LONGITUDE
A	10° 14' 58.81"N	78° 17' 34.28"E
B	10° 14' 58.20"N	78° 17' 32.91"E
C	10° 14' 56.96"N	78° 17' 31.64"E
D	10° 14' 56.07"N	78° 17' 31.54"E
E	10° 14' 56.50"N	78° 17' 30.68"E
F	10° 14' 57.85"N	78° 17' 30.52"E
G	10° 14' 58.77"N	78° 17' 31.79"E
H	10° 14' 58.84"N	78° 17' 31.67"E
I	10° 14' 58.85"N	78° 17' 31.85"E
J	10° 14' 58.52"N	78° 17' 34.11"E
K	10° 14' 58.09"N	78° 17' 34.25"E
L	10° 14' 55.40"N	78° 17' 35.11"E
M	10° 14' 55.48"N	78° 17' 35.19"E

DATE: wqs-14

**SITE SERVICES**  
 A - OFFICE  
 B - STORE ROOM  
 C - FIRST AID ROOM  
 D - REST SHELTER  
 E - TOILET



Existing & Proposed Mineral Reject  
 Temporary Dump = 82mX18m(avg)X3m(h)(max)

Ultimate Pit Dimension at the end of present Plan period &  
 end of life of mine  
 = 120m(max)X47m(avg)X25m(d)(max)

2017-18 Year	Proposed to be Planted	
2018-19 Year	Proposed to be Planted	
2019-20 Year	Proposed to be Planted	
2020-21 Year	Proposed to be Planted	
2021-22 Year	Proposed to be Planted	

**INDEX**

- MINE LEASE BOUNDARY
- 7.5m SAFETY DISTANCE
- TOP SOIL
- TEMPORARY BENCH MARK
- LIMESTONE
- STRIKE & DIP
- EXISTING & PROPOSED PIT
- CONTOUR
- MINE ROAD
- APPROACH ROAD
- MID POINT
- DUMP

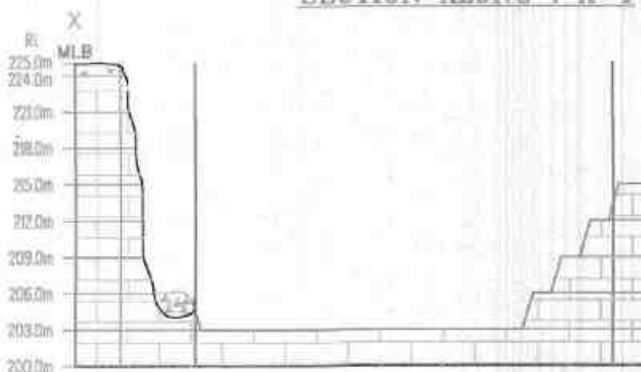
**LESSEE :**  
 M/s. SIVAM MINES,  
 No. 6/209, MAIN ROAD,  
 SIRUGUDI POST,  
 NATHAM TALUK,  
 DINDIGUL DISTRICT - 625 001

**LOCATION OF**

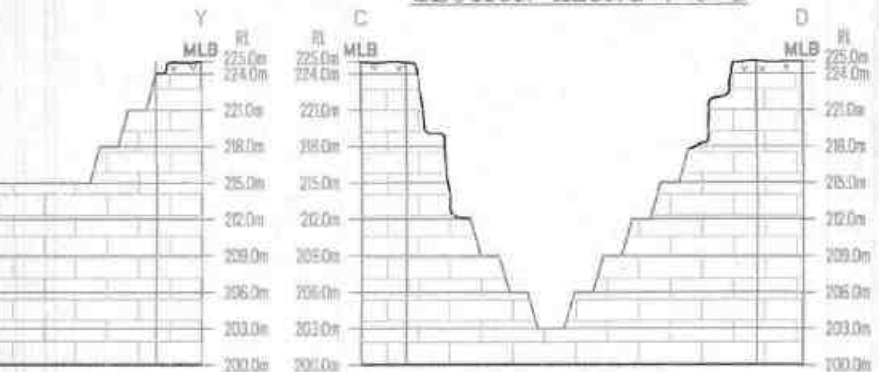
S.F.NO : 616/1B(P), 1C, 618/1(P), 619  
 EXTENT : 0.94.0 Ha  
 VILLAGE : SIRUGUDI  
 TALUK : NATHAM  
 DISTRICT : DINDIGUL  
 STATE : TAMILNADU.



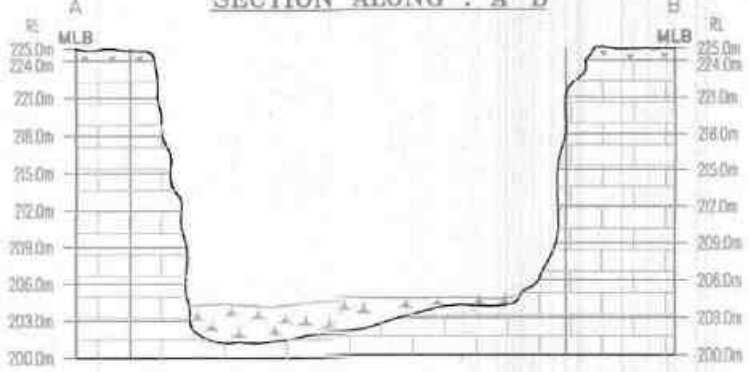
**SECTION ALONG : X-Y**



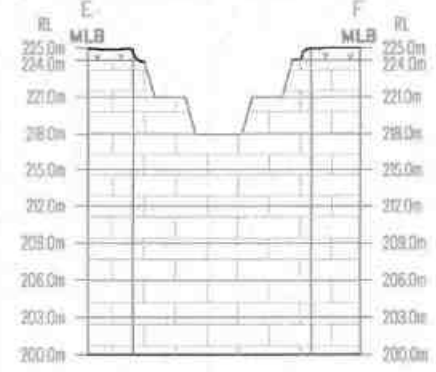
**SECTION ALONG : C-D**



**SECTION ALONG : A-B**



**SECTION ALONG : E-F**



**PLATE NO : IX**

DATE OF SURVEY: 18.11.2016

**CONCEPTUAL PLAN &  
 SECTIONS**

SCALE - PLAN: 1 : 1000  
 SEC-HOR: 1 : 1000  
 VER : 1:500

**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

*(Signature)*

Dr.P.THANGARAJU, M.Sc., Ph.D., M.M.E.A.  
 RECOGNIZED QUALIFIED PERSON  
 ROP/MA/206/2007/A160A

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/001	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	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		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/001
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	AAQ 1 – Near Lease 2, 10°14'31.42"N 78°17'43.09"E		

Date	Period. hrs	PM10( $\mu\text{g}/\text{m}^3$ )	PM2.5( $\mu\text{g}/\text{m}^3$ )	SO2 ( $\mu\text{g}/\text{m}^3$ )	N02 ( $\mu\text{g}/\text{m}^3$ )	O3 ( $\mu\text{g}/\text{m}^3$ )	NH3 ( $\mu\text{g}/\text{m}^3$ )	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)
<b>NAAQ* Standard</b>		<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.

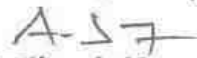
\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

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.

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/001	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	<b>M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES</b> 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		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/001
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ 1 – Near Lease 2, 10°14'31.42"N 78°17'43.09"E</b>		

Date	Period. hrs	As (ng/m <sup>3</sup> )	C6H6 (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )
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)
<b>NAAQ* Standard</b>		<200	<100	<60	<80	<80


\*\*\*\*\*End of Report\*\*\*\*\*

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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.

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/002	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	<b>M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES</b> 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		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/002
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ 2 – Near Lease 1, 10°14'32.59"N 78°17'46.66"E</b>		

Date	Period. hrs	PM10(µg/m <sup>3</sup> )	PM2.5(µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/ m <sup>3</sup> )
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)
<b>NAAQ* Standard</b>		<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\*\*\*\*\*

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Authorised Signatory

*AS7*

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.

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/002	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	<b>M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES</b> 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		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/002
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ 2 – Near Lease 1, 10°14'32.59"N 78°17'46.66"E</b>		

Date	Period. hrs	As (ng/m <sup>3</sup> )	C6H6 (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )
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)
<b>NAAQ* Standard</b>		<200	<100	<60	<80	<80

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

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Authorised Signatory

*AS7*

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.

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/003	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	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		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/003
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	AAQ 3 – Near Lease 2, 10°14'29.65"N 78°17'43.25"E		

Date	Period. hrs	PM10( $\mu\text{g}/\text{m}^3$ )	PM2.5( $\mu\text{g}/\text{m}^3$ )	SO2 ( $\mu\text{g}/\text{m}^3$ )	N02 ( $\mu\text{g}/\text{m}^3$ )	O3 ( $\mu\text{g}/\text{m}^3$ )	NH3 ( $\mu\text{g}/\text{m}^3$ )	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)
<b>NAAQ* Standard</b>		<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\*\*\*\*\*

Page 1 of 1

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Authorised Signatory

Name: Santhosh Kumar A  
Designation: Quality Manager

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Ashok Nagar, Chennai - 600083.

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/003	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	<b>M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES</b> 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		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/003
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ 3 – Near Lease 2, 10°14'29.65"N 78°17'43.25"E</b>		

Date	Period. hrs	As (ng/m <sup>3</sup> )	C6H6 (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )
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)
<b>NAAQ* Standard</b>		<200	<100	<60	<80	<80

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

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Authorised Signatory

*AS7*

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.

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/004	<b>Report Date</b>	0
<b>Site Location</b>	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		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/004
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	AAQ 4 – Near Lease 4, 10°14'48.60"N 78°17'48.60"E		

Date	Period. hrs	PM10( $\mu\text{g}/\text{m}^3$ )	PM2.5( $\mu\text{g}/\text{m}^3$ )	SO2 ( $\mu\text{g}/\text{m}^3$ )	N02 ( $\mu\text{g}/\text{m}^3$ )	O3 ( $\mu\text{g}/\text{m}^3$ )	NH3 ( $\mu\text{g}/\text{m}^3$ )	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)
<b>NAAQ* Standard</b>		<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.

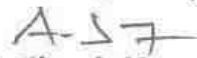
\*\*\*\*\*End of Report\*\*\*\*\*

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Authorised Signatory



Name: Santhosh Kumar A  
Designation: Quality Manager

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/004	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	<b>M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES</b> 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		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/004
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ 4 – Near Lease 4, 10°14'48.60"N 78°17'48.60"E</b>		

Date	Period. hrs	As (ng/m <sup>3</sup> )	C6H6 (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )
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)
<b>NAAQ* Standard</b>		<200	<100	<60	<80	<80

\*\*\*\*\*End of Report\*\*\*\*\*

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Authorised Signatory

*AS7*

Name: Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/005	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	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		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/005
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	AAQ 5 – Near Lease 4, 10°14'46.32"N 78°17'49.98"E		

Date	Period. hrs	PM10( $\mu\text{g}/\text{m}^3$ )	PM2.5( $\mu\text{g}/\text{m}^3$ )	SO2 ( $\mu\text{g}/\text{m}^3$ )	N02 ( $\mu\text{g}/\text{m}^3$ )	O3 ( $\mu\text{g}/\text{m}^3$ )	NH3 ( $\mu\text{g}/\text{m}^3$ )	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)
<b>NAAQ* Standard</b>		<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\*\*\*\*\*

Page 1 of 1

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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.

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/005	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	<b>M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES</b> 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		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/005
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ 5 – Near Lease 4, 10°14'46.32"N 78°17'49.98"E</b>		

Date	Period. hrs	As (ng/m <sup>3</sup> )	C6H6 (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )
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)
<b>NAAQ* Standard</b>		<200	<100	<60	<80	<80

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

Verified by



Authorised Signatory

*AS7*

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.

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/006	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	<b>M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES</b> 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		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/006
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ 6 – Near Lease 5, 10°14'57.78"N 78°17'34.06"E</b>		

Date	Period. hrs	PM10( $\mu\text{g}/\text{m}^3$ )	PM2.5( $\mu\text{g}/\text{m}^3$ )	SO2 ( $\mu\text{g}/\text{m}^3$ )	N02 ( $\mu\text{g}/\text{m}^3$ )	O3 ( $\mu\text{g}/\text{m}^3$ )	NH3 ( $\mu\text{g}/\text{m}^3$ )	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)
<b>NAAQ* Standard</b>		<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.

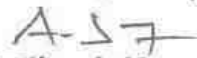
\*\*\*\*\*End of Report\*\*\*\*\*

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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.

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/006	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	<b>M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES</b> 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		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/006
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ 6 – Near Lease 5, 10°14'57.78"N 78°17'34.06"E</b>		

Date	Period. hrs	As (ng/m <sup>3</sup> )	C6H6 (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )
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)
<b>NAAQ* Standard</b>		<200	<100	<60	<80	<80

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

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Authorised Signatory

*AS7*

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.

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/007	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	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		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/007
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	AAQ 7 – Sirugudi, 10°15'46.94"N 78°18'29.24"E		

Date	Period. hrs	PM10( $\mu\text{g}/\text{m}^3$ )	PM2.5( $\mu\text{g}/\text{m}^3$ )	SO2 ( $\mu\text{g}/\text{m}^3$ )	N02 ( $\mu\text{g}/\text{m}^3$ )	O3 ( $\mu\text{g}/\text{m}^3$ )	NH3 ( $\mu\text{g}/\text{m}^3$ )	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)
<b>NAAQ* Standard</b>		<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\*\*\*\*\*

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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.

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/007	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	<b>M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES</b> 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		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/007
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ 7 – Sirugudi, 10°15'46.94"N 78°18'29.24"E</b>		

Date	Period. hrs	As (ng/m <sup>3</sup> )	C6H6 (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )
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)
<b>NAAQ* Standard</b>		<200	<100	<60	<80	<80

\*\*\*\*\*End of Report\*\*\*\*\*

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Authorised Signatory

*AS7*

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.

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Ashok Nagar, Chennai - 600083.

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/008	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	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		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/008
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	AAQ 8 – Samudrapatti, 10°13'19.98"N 78°18'34.47"E		

Date	Period. hrs	PM10( $\mu\text{g}/\text{m}^3$ )	PM2.5( $\mu\text{g}/\text{m}^3$ )	SO2 ( $\mu\text{g}/\text{m}^3$ )	N02 ( $\mu\text{g}/\text{m}^3$ )	O3 ( $\mu\text{g}/\text{m}^3$ )	NH3 ( $\mu\text{g}/\text{m}^3$ )	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)
<b>NAAQ* Standard</b>		<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\*\*\*\*\*

Page 1 of 1

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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.  
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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/009	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	<b>M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES</b> 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		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/009
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ 9 – V.Pudur, 10°13'30.08"N 78°19'59.39"E</b>		

Date	Period. hrs	As (ng/m <sup>3</sup> )	C6H6 (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )
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)
<b>NAAQ* Standard</b>		<200	<100	<60	<80	<80

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

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Authorised Signatory

*AS7*

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.

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Ashok Nagar, Chennai - 600083.

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/010	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	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		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/010
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	AAQ 10 – Uralipatti, 10°13'2.82"N 78°15'1.28"E		

Date	Period. hrs	PM10( $\mu\text{g}/\text{m}^3$ )	PM2.5( $\mu\text{g}/\text{m}^3$ )	SO2 ( $\mu\text{g}/\text{m}^3$ )	N02 ( $\mu\text{g}/\text{m}^3$ )	O3 ( $\mu\text{g}/\text{m}^3$ )	NH3 ( $\mu\text{g}/\text{m}^3$ )	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)
<b>NAAQ* Standard</b>		<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\*\*\*\*\*

Page 1 of 1

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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.  
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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.

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/010	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	<b>M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES</b> 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		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/010
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ 10 – Uralipatti, 10°13'2.82"N 78°15'1.28"E</b>		

Date	Period. hrs	As (ng/m <sup>3</sup> )	C6H6 (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )
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)
<b>NAAQ* Standard</b>		<200	<100	<60	<80	<80

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

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Authorised Signatory

*AS7*

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.

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/011	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	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		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/11
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	AAQ 11- Panniamalai, 10°16'45.84"N 78°16'36.52"E		

Date	Period. hrs	PM10( $\mu\text{g}/\text{m}^3$ )	PM2.5( $\mu\text{g}/\text{m}^3$ )	SO2 ( $\mu\text{g}/\text{m}^3$ )	N02 ( $\mu\text{g}/\text{m}^3$ )	O3 ( $\mu\text{g}/\text{m}^3$ )	NH3 ( $\mu\text{g}/\text{m}^3$ )	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)
<b>NAAQ* Standard</b>		<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.

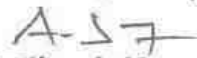
\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

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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.

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Ashok Nagar, Chennai - 600083.

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/011	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	<b>M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES</b> 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		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/011
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ 11- Panniamalai, 10°16'45.84"N 78°16'36.52"E</b>		

Date	Period. hrs	As (ng/m <sup>3</sup> )	C6H6 (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )
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)
<b>NAAQ* Standard</b>		<200	<100	<60	<80	<80

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

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Authorised Signatory

*AS7*

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.

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/012	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	<b>M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES</b> 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		
<b>Sampling Method</b>	SOP	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Water	<b>Sample Code</b>	EHS360/012
<b>Sample</b>	Water	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>W1 - Project Site Lease 1 - Mine pit water - 10°14'27.98"N 78°17'42.80"E</b> <b>W2 - Project Site Lease 3 - Bore water - 10°14'35.66"N 78°17'55.58"E</b> <b>W3 - Project site Lease 4 - Pit water - 10°14'43.75"N 78°17'49.77"E</b> <b>W4 - Project site Lease 5 - Pit water - 10°14'57.33"N 78°17'34.83"E</b> <b>W5 – Sirugudi – Ground Water - 10°15'47.45"N 78°18'26.16"E</b>		

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 <sub>3</sub>	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 <sup>-</sup>	mg/l	260	265	95	192	200	250 / 1000
10	Sulphate as SO <sub>4</sub> <sup>-</sup>	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 <sub>4</sub>	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 <sub>2</sub>	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\*\*\*\*\*

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Authorised Signatory

*ASJ*

Name: Santhosh Kumar A  
Designation: Quality Manager

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TEST REPORT

<b>Report No</b>	EHS360/TR/2024-25/013	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	<b>M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES</b> Sirugudi Village, Natham Taluk, Dindigul District		
<b>Sampling Method</b>	SOP	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Water	<b>Sample Code</b>	EHS360/013
<b>Sample</b>	Water	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>W1 - Samudrapatti - Ground Water - 10°13'20.25"N 78°18'35.50"E</b> <b>W2 - V.Pudur - Ground Water - 10°13'31.90"N 78°19'59.29"E</b> <b>W3 - Uralipatti - Ground Water - 10°13'2.66"N 78°15'1.61"E</b> <b>W4 - Panniamalai - Ground Water - 10°16'46.65"N 78°16'36.79"E</b> <b>W5 - Odugampatti - Ground Water - 10°17'12.01" N 78°19'18.76"E</b> <b>W6 - Avichipatti - Ground Water - 10°14'47.39"N 78°16'46.65"E</b>		

S.N O	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 <sub>3</sub>	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 <sup>-</sup>	mg/l	178	125	155	146	155	50	250 / 1000
10	Sulphate as SO <sub>4</sub> <sup>-</sup>	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 <sub>4</sub>	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 <sub>2</sub>	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

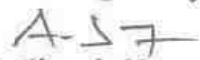
\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

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Authorised Signatory



Name: Santhosh Kumar A  
Designation: Quality Manager

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## TEST REPORT

<b>Report No</b>	EHS360/TR/2024-25/014	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	<b>M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES</b> Sirugudi Village, Natham Taluk, Dindigul District		
<b>Sampling Method</b>	SOP	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Soil	<b>Sample Code</b>	EHS360/014
<b>Sample</b>	Soil	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>S1 – Mine Lease 1 - 10°14'31.47"N 78°17'40.46"E</b> <b>S2 - Mine Lease 2 - 10°14'30.55"N 78°17'45.27"E</b> <b>S3 - Mine Lease 3 - 10°14'46.59"N 78°17'49.17"E</b> <b>S4 - Mine Lease 4 - 10°14'57.22"N 78°17'33.27"E</b> <b>S5 – Mine Lease 5 - 10°14'34.56"N 78°17'53.85"E</b>		

Sl. No.	Parameter	S1	S2	S3-	S4	S 5	Desirable Range	Interpretation
1	pH @ 25°C	8.31	8.09	7.98	8.16	8.04	5.5-9.0	Strongly alkaline
2	Electrical Conductivity @ 25°C, 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 <sup>-</sup> , 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 <sub>4</sub> <sup>-</sup> ,mg/100g	18.6	20.4	18.6	16.4	14.6	0.2 - 1	Low
12	Calcium Carbonate as CaCO <sub>3</sub> , %	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\*\*\*\*\*

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*AS7*

Name: Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**



TC-9583

<b>Report No</b>	EHS360/TR/2024-25/016	<b>Report Date</b>	04.01.2024
<b>Site Location</b>	<b>M/s.SIRUGUDI LIMESTONE MINE OF M/s. SIVAM MINES</b> Sirugudi Village, Natham Taluk, Dindigul District		
<b>Sampling Method</b>	IS 9989	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Noise Level Monitoring	<b>Sample Code</b>	EHS360/016
<b>Sample</b>	Noise Level Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	-		

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
<b>Buffer Zone :</b>							
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\*\*\*\*\*

Page 1 of 1

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Authorised Signatory

Name: Santhosh Kumar A  
Designation: Quality Manager

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## National Accreditation Board for Education and Training

# Certificate of Accreditation

### Geo Exploration & Mining Solutions, Salem

No. 17, Advaita 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.