
EXECUTIVE SUMMARY

THENMALAI LIMESTONE MINE OF M/s. JANATHACEM INDUSTRIES LIMITED,

EXTENT = 1.11.0 Ha

Available Mineable Reserves = 3, 15,027 (ROM + Topsoil + Side Burden)

Year wise Reserves = 2, 65,114 tonnes (ROM + Topsoil + Side Burden)

Lease valid upto =31.03.2030 (As per MMDR Amendment Act 2015)

Project Cost: Rs. 17.65 Lakhs	EMP Cost: Rs.2.29 Lakhs
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ToR No.

Lr.No.SEIAA-TN/F.No.6523/TOR – 394/2018 Dated: 16.05.2018

Project Proponent

**M/s. JANATHACEM INDUSTRIES LIMITED,
799/2, Sankarankoil Road, Rajapalayam,
Virudhunagar – 626 117.**

EIA Consultant

GEO EXPLORATION AND MINING SOLUTIONS

Old No. 260-B, New No. 17,
Advaitha Ashram Road, Alagapuram,
Salem – 636 004, Tamil Nadu, India



Accredited for sector 1, 28 & 38 Category 'A'



QUALITY COUNCIL OF INDIA

NATIONAL ACCREDITATION BOARD FOR EDUCATION & TRAINING

Certificate No : NABET/EIA/1821/RA0123

Phone: 0427-2431989,

Email: ifthiahmed@gmail.com, geothangam@gmail.com

Web: www.gemssalem.com

1. INTRODUCTION –

M/s Janathacem Industries Limited was granted Limestone Mining lease vide Proceeding order G.O.171 industries (D.II) Department dated 16.03.1989, over an extent of 1.11.0ha patta land in Thenmalai village, Sivagiri taluk, Tirunelveli District for the period of twenty years.

As per Gazette Notification S.O. 1705 (E) Dated: 10.05.2016 and S.O. 804 (E) Dated: 14.03.2017, the proponent for their Limestone Mines had submitted the Environmental Clearance Applications for ToR to MoEF & CC vide online proposal No. IA/TN/MIN/65534/2017 Dated 18.06.2017

Latter, as per Gazette Notification S.O. 3977 (E) Dated: 14.08.2018 Category “B” Projects was redirected to respective SEIAA. Thus, the proponent submitted online proposal for Environmental Clearance to SEIAA – TN vides Proposal No. IA/TN/MIN/27510/2018 Dated 18.06.2017

The above proposal seeking ToR was placed in the 109th SEAC – TN meeting item held on 25.04.2018 Based on the document furnished, the SEIAA observed that the project falls under the Category “B1” and Schedule 1(a) of the EIA Notification, 2006. The committee recommended the Terms of Reference for the project for assessment of Ecological Damage, remediation plan and natural & Community resource augmentation plan to be prepared an independent chapter in the Environment Impact Assessment report by Accredited consultant.

Public hearing is mandatory as per the Hon’ble high court of Madras order dated 13.10.2017 in W.P.No 1189 of 2017.

The authority prescribed the Terms of Reference (ToR) for preparation of EIA report for this mines and individual EMP of EIA report vide ToR Letter No. SEIAA-TN/F.No.6523/TOR-394/2018 Dated 16.05.2018

In order to abide the above said Gazette Notification, the proponent has applied for Grant of Environmental Clearance and the Mining Operations are stopped from January 2017.

2. PROJECT DESCRIPTION –

The Mine Lease area over an extent of 1.11.0ha is located in S.F.Nos. 1101/2B, 1101/4, 1101/5,1101/3B & 1101/6B Patta land, Thenmalai village, Sivagiri Taluk, Tirunelveli District and Tamil Nadu State.

- The Topography of the area is plain terrain with general gradient towards South East; the altitude of the lease area is RL.134.0m AMSL Latitude between 09⁰19'40.44'' N to 09⁰19'48.08''N, and Longitude 77⁰ 32'26.52''E to 77⁰ 32'30.12''E and ground water table occurrence at 134m – 88m AMSL.
- The Review of Mining Plan (2020-21 to 2024-25) was got approval for a quantity of available Geological Resources of 2,74,467 Ts of ROM, Mineable reserves is about 1,53,897Ts of ROM in this ROM 1,23,117 Ts of High Grade Limestone @ 80% and 30,779 Ts of Low grade limestone @ 20% recovery the quantity was approved by Indian Bureau of Mines vide Letter No. IMB / 871/2011 dated 14.10.2011.
- Anticipated Quantity of Limestone with 100% recovery is about 1,23,349Ts (98,679 Ts of high grade limestone 80% recovery and 24,670 Ts of Low grade limestone @ 20% recovery) anticipated waste is 1,37,535 Ts (side burden) for the present plan period (2020-21 to 2024-25).
- Dump dimension at the end of the life of the plan period

Existing Re-handled & Proposed

- The Lessee has obtained amalgamating of mine boundary permission under regulation 111 (1) of the MMR, 1961 from the Director General of Mines Safety. There is no area for dumping Side burden in this mine lease area, Hence the Non-mineralized area is available for dumping the side burden in the adjacent mining lease area, belonging to the lessee Vide G.O. 77. Hence the area is proposed to be utilized for dumping.
 - The mined out quantity of limestone will be transported to needy cement and lime based industries.
 - Opencast, category “A” is proposed
 - Proposed Bench Height, 1m Height, 1m Width with 45⁰ Slope in top soil 1st bench
 - 4m Height, 6m Width with 60⁰ Slope in Mineral 2nd to 10th bench (9 benches in mineral one bench in top soil)
 - Short-hole drilling of 32-35 mm diameter by jackhammer drills with Air Compressor.
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- Project has provided direct employment opportunities to 15 peoples and indirect employment opportunities within the surrounding region for about 20 peoples in the field of Mineral transport, service sector, garages, shops/canteen, etc.,
 - Existing Greenbelt area is about 200 sqm and proposal for the present plan period is about 500 sqm, at the end of the life of the mined the total green belt area is about 700Sqm. It is proposed to plant predominant local species of Neem with anticipated survival rate of 80%.
 - The Project Site is well connected to
 - National Highway - 208 Kollam – Thirumangalam–11Km west.
 - State Highway (SH 41) – Rajapalayam – Sankarankoil 600m East side
 - Railway Line – Rajapalayam – Sankarankoil – 3.0Km East
 - Railway station – Rajapalayam – 14Km North East
 - Airport – Madurai Airport – 82 Km North East.
 - There is No Protected Areas Notified under The Wild Life (Protection) Act, 1972, Critically Polluted Areas as notified by the Central Pollution Control Board constituted, Notified Eco-Sensitive Areas, Interstate boundaries and International Boundaries, besides there are No National Parks, Biosphere Reserves, Elephant Corridors, Mangrove Forest, Archeological Monuments, Heritage Site etc. within 10 Km Radius from Project Site.
 - The Nearest water bodies are Vaippar River 5.6 Km Southeast side, tank 100m North side.
 - The proponent has been carrying out CSR Activities in various fields for social welfare around the project site and will continue to do. The proponent has spent an amount of about Rs 10 Lakhs till date.
 - The Seismic Sensitivity of the project area is categorized as Zone II, Moderate Risk Zone as per BMTPC, Vulnerability Atlas of Seismic Zone of India IS: 1893 – 2002.

3. DESCRIPTION OF THE ENVIRONMENT –

Baseline data generation forms a part of the Environment Impact Assessment Study, which helps to evaluate the predicted impacts on the various environmental attributes and helps in preparing an Environmental Management Plan (EMP) outlining the measures for improving the environmental quality and scope of future expansions for environmentally sustainable development.

Baseline data was generated for various environmental parameters including air, water (surface and ground water), land and soil, ecology and socio-economic status to determine quality of the prevailing environmental settings. The Base Line Study was conducted during post-monsoon (October-December) season in 2018.

3.1 Land Environment

Existing land use pattern of the project area is dry barren land, proponent patta land, no forest land is involved. Land use pattern of the study area is studied through the Bhuvan (ISRO) by covering 10Km radius from the periphery of the project site.

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 0.25% are very small in nature. The proposed mining area is 1.11.0ha which covers about 1.34% from the total mining area within the study area which will not have any significant impact on the environmental.

Soil Environment

Six soil sampling locations were selected and analysed. The physical properties of the soil samples were examined for texture, bulk density, porosity and water holding capacity. It is observed that the pH of the Soil ranging from 7.18 to 7.86 indicating that the soils is strongly Alkaline in nature. The Electrical Conductivity of the Soil ranges from 536 to 576 indicating Low Conductivity. The concentration of Chlorides is ranging from 3.0 to 3.8 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 –

Around 7 ground water samples and 1 surface water sample were collected to assess the water quality. The ground water samples were drawn from bore wells of villages being used for domestic needs. Surface water sample were taken from the mine pit.

The mining operation is restricted above the Ground water table, the average pH value of the samples is 7.54 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 – Meteorology (Climate) –

The Tirunelveli lies on 48m above sea level the climate here is tropical. When compared with winter, the summers have much more rainfall. The climate here is classified as Aw by the Köppen-Geiger system. The average annual temperature is 29 °C | 84.1 °F. The annual rainfall here is around 752 mm | 29.6 inch. The driest month is February, with 4 mm | 0.2 Precipitation in February. The greatest amount of precipitation occurs in October, with an average of 189 mm | 7.4 inch. The warmest month of the year is May, with an average temperature of 31.2°C | 88.2 °F. The lowest average temperatures in the year occur in December, when it is around 26.3°C | 79.3°F. On average, December is the coldest month of the year. The difference in precipitation between the driest month and the wettest month is 182 mm | 7inch. The variation in annual temperatures throughout the year is 4.9°C | 40.8 °F. The nearest IMD station is Tirunelveli.

Air quality Monitoring -

Ambient Air quality Stations were selected based on the Predominant downwind direction with respect to the project site. Six Ambient Air Quality Monitoring (AAQM) Stations were selected by considering the wind rose pattern for pre-monsoon season and the accessibility of the selected sites.

- The 98th Percentile Value of PM₁₀ varies between 44.7 µg/m³ at Thenmalai Village to 42.8 µg/m³ at Project Area
- The 98th Percentile Value of PM_{2.5} varies between 19.6 µg/m³ at Thenmalai Village to 16.8 µg/m³ at Project Area
- The average concentration of SO₂ and NO_x varies between 9.70 µg/m³ and 5.2 µg/m³ at Thenmalai Village to 19.9 µg/m³ 18.4 µg/m³ in the Project Area; respectively.
- The concentrations of PM₁₀, PM_{2.5}, SO₂ and NO_x are observed to be well within the NAAQ standards prescribed by Central Pollution Control Board (CPCB) for industrial and rural/residential zone.
- All the values are found to be well within the prescribed standard as per CPCB norms.

3.4 Noise Environment –

Baseline noise levels were monitored at 8 locations, using continuous noise measurement device. Day levels were monitored during 6 AM to 10 PM and the night levels during 10 PM to 6 AM.

Ambient noise levels were ranging from 47.2 dB (A) to 51.5 dB (A) during day times and from 43.0 dB (A) to 44.5 dB (A) during night times on the monitoring day. Average Day Equivalent Noise (Leq-d) level was found to be 49.6 dB (A) and Night Equivalent Noise (Leq-n) level was 43.4 dB (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 –

Ecological survey has been carried out to understand baseline ecological status, important floristic elements and fauna structure.

There are No Schedule – I Species listed as per The Indian Wildlife (Protection) Act, 1972 or Threatened Species as per IUCN Red List noticed within the Study Area.

3.6 Socio Economics –

Sample survey was carried out to collect qualitative information about the socio-economic environment of the area. The Study area has all basic amenities such as roads, drinking water facilities, township, education institution, temples, medical facilities and electricity facilities and was evident during the site visit.

Though agriculture is the main occupation in the surrounding villages, it has provided employment opportunities to only 50-60% of the families. The remaining population is depended on the other type of employment opportunities mainly as laborers.

4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 Land Environment:

The mining lease out of total extent of 1.11.0ha only 0.76.8ha area is under mining operation about 0.23.5ha area is proposed additionally for this plan period totally 1.00.3ha area will be under mining operation in the end of the life of the mine. No forest land is involved in any mining activity. The maximum depth is proposed in the leases maximum a depth of 46m from the general ground profile without intersecting the ground water table.

There is no vegetation found in the project area at present, after the completion of the mining operation the rate of the green belt development will be increased.

4.2 Water Environment

The ultimate pit limit is 46m below the ground level; the water table in the area is 64m in summer and 58m in rainy season. The proposed depth for the mining operation is well above the water table and there is no intersection of surface water (streams, Canal, Odai etc.,) within the study area.

Mitigation Measures –

- Construction of garland drains to divert surface run – off in to the mining area
- Construction of retaining with weep holes around the Mineral reject dumps to prevent the siltation to the nearby lands.

4.3 Air Environment–

The air borne particulate matter generated by mining operations and transportation is the main air pollutant. The emissions of Sulphur Dioxide (SO₂), Nitrogen Oxides (NO_x) contributed by vehicles plying on haul roads will be marginal.

The Predicted maximum Ground level concentration of 24 Hour average of particulate matter concentration is superimposed on the maximum baseline concentration obtained during the study period to estimate the post project scenario, which would prevail at the post operational phase.

The maximum incremental ground level concentration of PM₁₀ is 44.7 µg/m³ at Thenmalai Village to 42.8 µg/m³ at Project Area (Non Operational). This shows that the adverse impact of mining outside the ML area is marginal and has no adverse effect on health of human and animals and also on the flora of the area.

Mitigation Measures –

- Water spraying on working face to control dust emission due to loading & handling operations
- Water sprinklers along the mine haulage roads to reduce dust generation during plying of HEMM
- Controlled blasting techniques will be implemented
- Periodic water sprinkling on waste dumps and haul roads to minimize dust emissions.
- Practicing wet drilling procedures & Dust mask provision to workers

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- Avoiding of overloading of tippers and covering of loaded tippers with tarpaulins during mineral transportation
 - Green belt development will be carried out to arrest the dust particles
 - Periodical monitoring of air quality to take steps to control the pollutants

4.4 Noise Environment

Noise pollution is mainly due to the blasting, Operation of machineries and Occasional plying of tippers in the mines and during transportation of mineral to needy customers.

Mitigation Measures –

- Controlled blasting techniques will be implemented, thus Noise due to the blasting from the mine site not going to be significant it will be upto a few seconds in the whole day.
- In the high noise intensity working areas, earmuffs or earplugs or any other suitable personal protective equipment will be provided to the workers.
- Regular noise level monitoring shall be done periodically for taking corrective action.
- Green belt development around the mine sites, office buildings and all along the internal road will be practiced as to create a barrier between the source and the receiver so that the noise is absorbed and the exposure level is minimized.

4.5 Biological Environment

The impact on biodiversity is minimal as there are no forest, wild life sanctuaries, and Eco sensitive zone within the radius of 10 Km.

The impact would be due to dust generated from drilling and blasting activities and emission of gaseous pollutant from HEMM and mineral transportation. Adequate dust control measures will be taken to control dust emission. Thick Greenbelt development will be carried out in the mine area and haul roads to control the dust emission. Besides the air quality standards for PM₁₀, PM_{2.5}, SO₂ and NO_x and all other values are well within the AAQ standards.

4.6 Socio Economic Environment.

Due to the mining activities in the three leases about 15 numbers of skilled and unskilled workers are benefitted through direct employment. About 30 numbers of peoples will be benefitted indirectly. Additional facilities such as medical, educational and infrastructural development will also take place under CSR/CER activities.

Considering the socio – economic and sociological impact it has been noticed that the economic level and living standard of the people will generally increase.

5 ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

Site Alternatives –

No alternative site has been proposed as Limestone occurrence is site specific in nature and the location of the proposed project is restricted to the geology and mineral deposition of the area.

Mining Technology alternatives –

Opencast, category “A” opencast Mechanized method and the excavator will be deployed for the formation of benches and loading. Excavator attached with rock breaker will be deployed for breaking and fragmentation to avoid blasting as the strata is medium hard in nature.

The project will follow opencast mining method because of surface mineral deposits and to ensure higher mineral conservation. The mining by opencast method will be highly productive & economical as compared to underground method.

6 ENVIRONMENT MONITORING PROGRAM –

Usually an impact assessment study is carried over short period of time and the data cannot bring out all variations induced by natural or human activities. Hence regular monitoring program of Environmental parameters is essential to take into account the changes in the Environment. The Objective of Monitoring -

- To check or assess the efficiency of the controlling measures;
- To establish a data base for future impact assessment studies.

7 ADDITIONAL STUDIES - RISK ASSESSMENT & HAZARD –

The components associated with risk and hazard in these mines include jackhammer drilling & blasting, waste dump and explosive storage. Measures to reduce and avoid any incidents occurring from the above mentioned components shall be planned and implemented as soon as the mine starts commissioning; this includes measures to avoid the above discussed risk factors. Proper risk management plan will be proposed to avoid any kind of accident/ disaster.

8 PROJECT BENEFITS –

- Improvement in physical infrastructure
- Improvement in Social Infrastructure
- Employment Potential
- Proponents will carry out CSR activities like community awareness program, health camps, Medical aid, family welfare camps etc.,
- A massive plantation will be done in the mine area to mitigate the ill-effects of mining and to improve the vicinity and environment of mine and its surrounding area.

9 ENVIRONMENTAL COST BENEFIT ANALYSIS.

Environmental cost benefit analysis is not recommended.

10 ENVIRONMENT MANAGEMENT PLAN –

The Environmental Management Plan (EMP) is a site-specific plan developed based on the base line environmental status, mining methodology and environmental impact assessment. 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.

The proponent shall organize an Environment Monitoring Cell in common which is responsible for the management and implementation of the environmental control measures. Basically, this department shall supervise the monitoring of environmental pollution levels like ambient air quality, water quality, soil quality and noise level by appointing approved external agencies.

The working conditions in the mines are governed by the enactments of the Director General of Mines Safety (DGMS). The proponent shall take all necessary precautions regarding health and safety of workers as per the guidelines of the Mines Act, sanitary facilities shall be provided within the lease area; carry out periodic health check-up of workers.

The proponent will carry out CSR activities for overall development of the people in the area. The activities shall include medical camps, water supply, improvement of school infrastructure, etc.

11 CONCLUSION –

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

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

- Since the mining operation have been stopped for last two years which has caused unemployment and affected the livelihood of the workers who were employed and a major loss to the infrastructure and machinery deployed.
- The livelihood of the proponent is very much dependent upon this mining operation which had been working from several years hence the Environmental Clearance shall be granted at the earliest.