
EXECUTIVE SUMMARY

1.0 INTRODUCTION:

1.1 GENERAL:

M/s.Madras Cements Limited (MCL), is operating a 1.2 MTPA limestone mine in Mining lease No.G.O.MS NO.662 over an extent of 63.60.0 Ha. & 31.372 ha of dump area in Reddipalayam village, Ariyalur district, Tamil Nadu, after obtaining various statutory clearances.

The entire lime stone produced from this mine is catering to part needs of Ariyalur Cement Plant (Govindapuram) of 3.0 MTPA capacity located about 24 km from the lease area. Considering the cement demand, MCL is in the process of expanding their Ariyalur cement plant at Govindapuram from the existing 3.0 MTPA to 5.50 MTPA capacity. To meet the increasing limestone demand due to this expansion, it is planned to increase the production capacity of limestone from 1.20 MTPA to 1.70 MTPA.

Terms of reference from MOEF for increase in lime stone production from 1.20 MTPA to 1.70 MTPA and additional marl production of 0.35 MTPA was obtained from MOEF vide letter no J-11-15/337/2009 – 1A-II(M) dated 13.1. 2010. However, as there is a delay in Govt of Tamil nadu for inclusion of marl in the mine lease , this was informed to MOEF. Subsequently, partial modified TOR excluding marl mineral from the project and TOR for enhancement of mine capacity from 1.20 MTPA TO 1.70 MTPA only was obtained from MOEF vide letter no J-11-15/337/2009 – 1A- II(M) dated 19th August 2011. This EIA/EMP report is submitted only for the enhanced lime stone production from 1.20 MTPA TO 1.70 MTPA to cater the additional requirement of lime stone for the proposed increased capacity of the cement plant.

1.2 SALIENT FEATURES OF THE PROJECT:

- | | |
|------------------------|-----------------------------------|
| a. Name of the project | : Reddipalayam Limestone Mines |
| b. District and State | : District: Ariyalur, Tamil Nadu. |
| c. Taluk | : Ariyalur |
| d. Villages | : Reddipalayam & Nagamangalam |

| | | |
|----|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| e. | Project area | : 94.972 Has, comprising 63.60 ha of ML area & 31.372 ha of dump area. |
| f. | Latitude | : 11°04'26.89" to 11°05'12.83" |
| g. | Longitude | : 79°09'31.40" to 79°09'44.73" |
| h. | Toposheet | : 58M/4 |
| i. | Elevation | : 57 to 53 m above MSL |
| j. | Topography | : Plain |
| k. | Type of land | : MCL own lands |
| l. | Forest land | : Nil |
| m. | Vegetation | : Bushes and shrubs |
| n. | Habitation | : Nil |
| o. | Nearest habitated village | : Muniyankurichchi hamlet-0.5m(NE) |
| p. | Nearest Road(NH) | : Trichy- Jayamkodam (2km- NW) |
| q. | Nearest Railway station | : Ariyalur -15 kms, NW |
| r. | Water courses in the area | : Marudaiyar – 1.5 Km |
| s. | Sensitive zones like National parks, Bio reserves, Tourist spots, historical Monuments etc nearby | : Nil |

Surface plan in shown in **Figure no. 1.**

2.0 BRIEF PROJECT DESCRIPTION:

a) PROJECT DETAILS

| | | |
|----|----------------------|--------------------------------------------|
| a) | Limestone Production | : 1.20 to 1.70 MTPA |
| b) | Ore to waste ratio | : Average 1:0.71 (T: (T: m ³). |
| c) | Method of Mining | : Mechanised Opencast |
| d) | Reserves | : Mineable reserves – 16.50 Mil.T |

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- | | | |
|------------------------------|---|-------------------------------------------------------------------------------------------------------------|
| e) Overburden/waste | : | 1.14 Mil cu.m (Top Soil) 8.82 Mil cu.m (Overburden waste) |
| f) Daily production | | |
| a. Limestone | : | 5667 Tonnes |
| b. Interstitial reject(Marl) | : | 1167 Tonnes |
| c. O.B | : | 3475 Cu.M(Avg) |
| g) Equipments deployed | : | Excavators, ripper, dumper, water Sprinkler Drill and compressor, Mobile service van, Fuel bowser etc |
| g) Man power | : | 30 |
| h) Mode of transport | : | By trucks to the cement plant located about 24 kms by dedicated roads. |
| i) Water requirement | : | 96 KLD(existing 56KLD+40 KLD additional) |
| j) Source of water | : | Bore well & Mine sump water |

b. SITE SERVICES :

All the existing service facilities will be suitably augmented to cater to the envisaged increase in production target.

3.0 EXISTING ENVIRONMENTAL SCENARIO:

Base line environmental data for various Environmental components were collected in the study area systematically and meticulously as per relevant IS codes, CPCB, MOEF guidelines and as per approved TOR during Winter season of 2010. For the purpose of the study, the study area is divided into two zones, namely, core zone and the buffer zone. The Core zone represents the entire Mining lease area while the buffer zone encompasses an area of 10 km from the periphery of core zone.

The study details are briefly given below:

- The expansion will be within the existing mine lease / project area and as such no additional land acquisition is involved.
- Totally there are 30 villages from 2 taluks namely Ariyalur ,and Udayarpalayam in Ariyalur district within the buffer zone.
- The study details based on the 2001 census show that there are 23039 households in buffer zone. The total population works out to 93838 of which 46670 are males and 47168 are female.
- Meteorological study shows that the temperature in the area during the study period ranged from 21.0°C to 34.0°C while the relative humidity varied between 44-91%. The wind speed during the study period ranged from <1.8 to 15.3 Km/hr. The predominant wind direction is from ENE/ESE.
- Ambient air quality data:

| Sl. No | Parameter | Buffer zone (10 locations) | | NAAQ standards (Nov.2009) |
|--------|------------------------------------|----------------------------|-------|---------------------------|
| | | Min | Max | |
| 1 | Suspended Particulate Matter (SPM) | 63.0 | 132.0 | - |
| 2 | Particulate Matter(PM10) | 30.0 | 59.0 | 100 |
| 3 | Particulate Matter(PM 2.5) | 18.0 | 34.2 | 60 |
| 4 | Sulphur Di oxide (SO2) | 6.0 | 16.0 | 80 |
| 5 | Oxides of Nitrogen (NOX) | 5.0 | 19.0 | 80 |

All, the monitored values of all pollutants levels in the areas were found to be within the limits.

- The results of the surface waters monitored in 6 locations & 7 ground waters samples in the bore wells and dug wells were found to be within the prescribed IS:10500 Norms for drinking in the absence of an alternative source. The mine pit water quality was found to be within the prescribed CPCB/TNPCB norms for discharge.
- The noise equivalent values in all the 10 observed locations shows that the day Equivalent Noise (Leq-d) level was found to be 39.8 to 46.3 dB(A) and Night Equivalent Noise (Leq-n) level was 38.0 to 41.7 dB(A). While comparing with the MOEF Norm of 55 dB(A) for day time and 45 dB(A) for night time, the monitored ambient noise levels were well within the limit values for Residential areas.
- Soil samples collected from 4 locations show that the soil pH values were found to be neutral and Nitrogen, Phosphorous and Potassium (NPK) values were in lower range.
- The land use map of the study area reveals that a major portion of the study area is dominated by agriculture landuse. Wet crop occupies 51.46% and it dry crops occupies 26.02% pockets. The plantation mostly of cashew which are found adjacent to the forest area covering 0.29% of the total area.
- In terms of flora, about 93 species were recorded at the study area. Among the species identified, Tamarind (*Tamrindus indicus*), Neem (*Azadirachta indica*), Kalli (*Euphorbia* spp.), Echam (*Phoenix sylvestris*), Mango (*Mangifera indica*), Palmyra (*Borassus flabellifer*) etc. were dominant with respect to other species.
- Among the faunal community birds are found in more numbers followed by other faunas found in the area. There is no Wildlife Sanctuary or National Park or Biosphere or Hotspots within a radius of 10 km from the study area. Also, there is no migratory path of avian fauna exist in the study area.
- The stage of ground water development as on year 2010 is 59.78 % and the projected stage of ground water development after 5 years (i.e. 2015) will be only 62.78 %. Therefore this area falls under "SAFE CATEGORY".

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES:

4.1 IMPACT PREDICTIONS:

As already mentioned, Reddipalayam Limestone is in operation and environmental control measures already in place are as follows:

- Planting 15,000 no. of sapling trees in various places like mine periphery, external dump, along roads etc
- Deployment of 1 no. of 12KL mobile water tankers for fugitive dust suppression
- Periodical maintenance of plant & machinery to avoid excessive noise and vibration
- Construction of garland drains & sedimentation ponds to arrest siltation and channelizing storm runoff water

The proposed expansion plan may slightly affect the existing environmental set up in the area on account of following factors, unless proper mitigation measures are planned and implemented:

1. Impact on air quality due to Gaseous and Particulate emission because of mining and HEMM operations, Limestone transportation to the Cement plant, etc.
2. Impact on water quality in the area due to effluents such as mine pit pumped water, domestic effluents, etc.
3. Impact on the existing hydrological status of the area.
4. Impact on noise level on account of mining, HEMM movement etc.
5. Impact on present land use pattern due to mining, dump formation, creation of mine voids, infrastructural set up of mine, etc.
6. Impact due to solid waste generated from mining operations.
7. Impact on biological factors of the area caused by project operations
8. Impact on socio-economic factors in the area

4.2 AIR ENVIRONMENT:

Impact on air quality due to fugitive emissions consequent to this project operation was estimated based on the latest computer model – **ISCST (Industrial Source Complex Short Term Model)**.

Peak hourly incremental concentrations under worst scenario have been computed using hourly meteorological data and from the study it is observed that the peak incremental 24 hourly SPM concentration works out to 25.37 $\mu\text{g}/\text{m}^3$.

The cumulative Ground Level Concentration of (GLC) (base line + incremental) after the implementation of the project under worst scenario is calculated and it is seen that on a post-project basis, the resultant added concentrations with baseline figures even at worst scenario, show values of ambient air quality well within the statutory stipulations.

Continuing various mitigative measures like Laying and maintenance of haul roads and other roads will be strictly as per standards, blacktopping of roads wherever necessary, to minimize air-borne dust, development of extensive green barrier around mine, workshop, around dump area along side roads, periphery of mine, etc., moderate loading of all dumpers carrying limestone, waste, frequent water spraying / sprinkling on the roads, stockpiles, OB dump areas, etc, Improved preventive maintenance practices of machinery, Using sharp teeth for shovel etc., will ensure that the impact on air quality due to this proposed mine expansion will not be appreciable.

4.3 WATER ENVIRONMENT:

Since this is a mining project, there will be no process effluent arising from the project. For domestic effluent, septic tank with soakpits are provided.

Besides, to avoid any impact due to mine discharge water and wash out from dumps, limestone piles various measures like, Providing sump of adequate capacity for settling of suspended solids, providing garland drains at the periphery of active edge of mine and around dumps , etc are and will be adopted.

At full expansion stage, the total water requirement for dust suppression, plantation etc will be 96 m³/day. (Existing – 56 m³ / day+ Expansion 40m³/day) and it will be met from own bore wells in the area and from mine sump after suitable treatment.

There are no surface water courses in the project area. A seasonal nala is passing through the western side of the lease area and it will not be disturbed. Marudaiyur river situated about 1.5 kms south of mining block. No effluent is or will be generated from the mine and as such there will not be any discharge of effluent water into these water courses.

4.4 NOISE ENVIRONMENT :

Due to mining and allied operations, noise will be felt only near the active working source within the mining lease area and at farther areas it will be insignificant. Thus due to natural attenuation effects, by proper green belt development, design / maintenance of machines, etc., the impact on noise levels will be negligible and are expected to be well within the limits prescribed by Environment Protection Rules 1986 and CPCB.

Avenue plantations and green belt are and will be created around mine periphery, around dump areas, around offices and other infrastructural buildings, etc, to abate noise levels in the area to the minimum.

In Reddipalayam mines periodical monitoring of noise level in the mine and the nearby areas are being done and reported to statutory authorities. All the observed values show that the values are well within statutory limits.

4.4.1 GROUND LEVEL VIBRATIONS:

As already mentioned, mining is primarily using rippers and excavators. Drilling and blasting will be used only for construction of garland drains, sumps and as such no ground vibration is expected.

4.5 LAND ENVIRONMENT :

The total project area of 94.972 Has, comprising 63.60 Ha. of mining lease area and 31.372 Ha. of dump area. Presently the entire land is in MCL's possession. No additional land is required for expansion.

During mining operations, about 51.50 Ha. will be used for mines, 31.372 Ha for external dumping. Out of 8.82 Mil.cu.m of waste removed, 3.323 Mil.cu.m of waste removed from the south block will be dumped externally over an area of 31.372 Ha outside the ML area. The remaining waste will be backfilled into the mined out void. Thus out of 51.50 Ha.

of mine area, about 24.00Ha of area will be backfilled and the remaining 27.50 Ha. will remain as water body.

The total green belt and plantation development in the area will be to the tune of 67.472 Ha, including reclaimed mined out areas, which reveals great augmentation of vegetated green belt reclaimed area to a percentage factor of 71.04%. OB dumps will be fully rehandled and backfilled into the mine voids at end of mine life. Afforestation will be done over backfilled areas.

4.6 BIOLOGICAL ENVIRONMENT :

The project proponent is already carrying out good green belt development in all possible areas to improve the biological status of the area.

In the expansion project also, extensive green belt cover, will be created in various areas around mine, OB dumps, in backfilled areas, along roads, etc. to boost the biological, visual and aesthetic outlook of the area. The backfilled mine area will be fully restored to better than original use, etc. with an ultimate land restoration to better than original conditions at more than 71.04%.

4.7 SOCIO-ECONOMIC ENVIRONMENT :

The project proponent has already spent a financial outlay of Rs.43.39 lakhs for social outreach programmes, under their social welfare oriented corporate policy as mentioned in EIA report. The social welfare activities will be continued in the some beneficial manner during the expansion operational phase also.

M/s. MCL will also ensure that adequate financial outlays are earmarked in future for social outreach purposes of the local area and local community.

The project will provide direct employment to about 30 persons and indirectly to more than 100 persons, the latter arising from various spheres like ancillary units, trading operations, contractual needs, casual labor, green belt development, etc. Financial gains will also be derived by Panchayats, State and Central Governments due to collection of royalties, VAT, cess, taxes, etc.

Various facilities in the area will be improved in great measure in different spheres like education, medical health care, infrastructural development, communication, drinking water supply, vocational training, etc.

5.0 ENVIRONMENTAL MONITORING PROGRAMME :

Regular monitoring programme for prescribed statutory environmental parameters are being carried out in the present working mines in the area. In case of proposed expansion project also, this programme will be implemented vigorously. Adequate budgetary allocation is made towards this objective.

6.0 CONCLUSION:

Efficient and effective implementation of environmental management plan, as described above, will ensure that all the post-project environmental parameters in respect of air quality, noise levels, water environment, socio-economic factors, biological outlook, land use status, etc. will be maintained well within statutorily sustainable levels. The project will impart positive socio-economic impacts due to improved employment prospects, financial gains to State and Central Governments, improved facilities in respect of educational, medical, infrastructural and communicational services in the area and improved life style of local population arising out of higher earnings.

In short the proposed project operations will not only improve the local area and local population, but will also play its own role in improving the overall infrastructural sectors in the State and the Country, due to envisaged of enhanced production levels of cement from the project-linked Govindapuram Cement Plant of M/s. Madras Cements Ltd.

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Figure no 1

LOCATION MAP

