REPORT ON CHECK INSPECTION OF MELVENKATESWARAPURAM LIMESTONE MINE OF M/S. THE RAMCO CEMENTS LIMITED

Name and designation of inspecting officer: Shri V. Jaya Krishna Babu,
Controller of Mines (South Zone),
Indian Bureau of Mines, Bengaluru.

Date of Inspection : 07.03.2023

1. General information of the mine :

i)	Name of mine	:	Melvenkateswarapuram Limestone Mine
ii)	Owner	:	Shri. P.R.Venketrama Raja (Lessee – M/s.The Ramco Cements Limited)
iii)	Nominated owner	:	Shri. P.R.Venketrama Raja
iv)	Mining Engineer	:	Masoom Basha MD S
v)	Agent	:	S. RAMALINGAM
vi)	Mine Manager	:	Masoom Basha MD S
vii)	Total Lease area	:	98.62 Ha
viii)	Location	:	Villages: Sennayampatti, Pudur & Nadukkatur Taluk : Vilathikulam District : Thoothukudi State : Tamilnadu
ix)	Lease period	:	50 Years
x)	Date of Expiry	:	28/07/2033
xi)	Date of approval of mining plan:		18/02/2003
xii)	Date of approval of Review of Mining Plan	:	06.11.2017
xiii)	Period of Mining Plan/ Scheme of Mining	:	2018-19 to 2022-23 (RoMP)
xiv)	Production (Year 21 to 22)	:	460932 Tonnes of Limestone
	Mineral rejects generated	:	Proposed Quantity – Nil Actual Quantity - Nil
	Despatches	:	Limestone - 460932 Tonnes

2. Brief Description of the mine :

a) A brief description of the mine covering location, geology, problems Associated with mining of the deposit etc. may be given.

Location of the Mine :

Latitudes : N 09°17'31.5" – N 09°18'08.1"

Longitudes : E 78°09'48.7"- E 78° 11'04.0"

Geology of the Area:

The entire area comprises of Archaean formations completely covered by 0.40 to 1.00 meter of thick black cotton soil. Below this soil cover, the rocks namely Charnockite, Granite, Granulite, Syenite and pegmatite as intrusion besides limestone as ore body occur. Charnockite, Pyroxene Granulite and granite occur as hang wall and footwall rock for limestone band.

The entire limestone band is completely concealed under the black cotton soil except in one or two places, where outcrops are seen. The country rock is Charnockite of Archaean age. The limestone varies from dull white to milky white and grey in colour, coarse to medium grain and is crystalline. Pyroxene granulite, Charnockite, hornblende gneiss and Syenite pegmatite occur as associated rock. Presently, the limestone band is exposed in the mine of The Ramco Cements Limited. The rocks have undergone repeated folding as seen from the existing quarry faces.

The crystalline limestone band occurs as a linear band within the Archaean rock which has also undergone folding and recrystallization. This is evident from the mine faces and irregular behavior of the hang wall and foot wall contact of the limestone band on the surface. Lot of intrusions and inclusions viz., granulite, granites, charnockites, pegmatite, and pyroxene patches etc., occur within the limestone band.

The hanging wall and foot wall rocks are weathered up to about 15 to 20 meter depth and are harder below this depth. Limestone is bouldery at the top for 3 to 4 meters and become massive below, with joints. There is a small discontinuity in the band near ML11. The deposit is divided into two blocks namely western and eastern block with respect to this discontinuity. The area between ML 0–11 is named as 'Eastern Block' and the area between ML 12 to 22 is named as 'Western Block'.

The strike is almost East-West and the strike length of the deposit is about 2.1 K.M with width varying from 40 meters to 90 meters. The dip varies from 30^0 to 50^0 towards North. The footwall contact of the limestone band has gentler dip than that of hang wall. The limestone is white and greyish white in colour, coarse grained and crystalline.

The limestone is traversed by Pyroxene mica granulite and Charnockite intrusive. Inclusions of pegmatite, granulite, Charnockite and quartz of varying dimensions are seen scattered throughout the deposit.

Western Block:

The limestone body occurs in the form of a narrow linear band within the banded granulites following the general East-West foliation trend of the country rocks. The width of the band varies from 40 m to 90 m in different sections, the average being around 50-65m. The limestone body shows a general dip of 30 to 50° in north direction, the footwall showing flatter inclination than the hanging wall margin in the higher levels.

Eastern Block:

The limestone body occurs in the form of a narrow linear band within the foliated granulites following the general foliation trend of the country rocks. The trend of limestone band varies from East to West, the dip being generally moderate in the range of 30 to 50° in north direction. The variation in attitude and inclination at the hanging wall or footwall contact results in local bulging or pinching of the carbonate body both along strike and in depth which appear to pinch out completely at the northern end.(Footwall, Hang wall and Intrusive Rocks in both the blocks): Archaean Rocks(wall rocks) - Charnockites, granulites, granites & pegmatites.

b) Description on deployment of mining machinery given in the following format:

Sl. No	Machineries Deployed	Capacity	No. of units	In use	Ideal	Percentage of utilization	Brief Description	Remarks
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1	Front End Loader	3.00 Cu.M	1	1	-	85	Wheel Mounted	Outsourced
2	Back-Hoe/Bull clam	0.90 Cu.M	3	3	-	85	Diesel (Hydraulic)	Outsourced
3	Haulers/Dumpers /Tippers	25 Tons	6	6	-	80	AMW/TATA Make	Outsourced
4	Drill/Blast holes & Wagon drills	115 mm Dia	1	1	-	80	BVB 25 drill (Atlas Copco make)	Outsourced
5	Air Compressor	400 cfm	1	1	-	80	Diesel Portable Stationery (Atlas Copco make)	Outsourced
6	Rock Breaker	100 TPH	1	1	-	85	For Secondary breaking	Outsourced

3. Implementation of Mining Plan or Review of Mining Plan:

S. No.	Proposal in the approved Review of Mining Plan (period from 2021-22)	Observations regarding implementation of proposals given in approved Review of Mining Plan	Remarks
1	**CONSERVATION OF MINERALS**		
Optical Sorting is one of the most advanced versions of mineral beneficiation methods Iadopted in Pandalgudi Crushing Plant for Mineral beneficiation. The principle behind the system is to recognize the minerals/rocks in terms of their colours (RGB values) and reject the wanted/unwanted minerals/rocks. In this case, the limestone comprises unwanted black colored rocks which dilute the quality of limestone. These black rocks need to be removed to improve the limestone quality. In the Optical sorting method, the main hardware comprises an optical line scan camera and air-nozzles. As the rock pieces fall through the visibility-field of the camera, the colors are recognized, processed by software, compared with pre-stored values and suitable command is passed to the actuators of the air nozzle to shoot the rock pieces which are to be ejected off the falling stream. All these happen in real time, in a matter of few seconds. Only the dry beneficiation is being practiced by simple primary screening and optical sorting for removal of black stone.			
a)	**Exploration:** No exploration proposal was made during the plan period.	Entire Lease area already explored	Sufficient exploration has already been carried out by drilling 72 nos. of core bore holes with the total drilling of 2998.15m. Besides 148 DTH bore holes for a total meterage of 1942.50 m is drilled. Hence no further boreholes is proposed during the plan period
b)	**Utilisation of sub-grade mineral:** Nil	Not Applicable	Entire Limestone produced is being utilized for cement manufacturing. Hence, no sub grade limestone is proposed to utilize.

c)	**Any other proposal for monitoring** – Nil	Not Applicable	No other proposal made during the plan period
2	**SCIENTIFIC MINING**		
a)	**Mine Development and method of mining-** Opencast Fully Mechanised "A Category". **Production:** 714781 Tonnes of Limestone.	Fully Mechanised "A Category". 460932 Tonnes of Limestone	Less Production based on Plant Requirement.
b)	**Handling of Waste/ subgrade material -** **Waste –** 360385 Cub.M (1030702 T) **Sub-Grade** - Nil	Waste – 225631 Cub.M (645,305 T) Sub-Grade - Nil	Actual development quantity is Less than the proposed quantity due to Less production. Entire Limestone produced is being utilized for cement manufacturing. Hence, no sub grade limestone is proposed to utilize.
c)	**Area reclamation & rehabilitation:** 1.00 Ha (1000 Nos Saplings - Rehabilitation of waste land within lease).	1.15 Ha (1350 Nos of saplings - Rehabilitation of waste land within lease.)	Location of the Afforested area as follows Lat: N 9° 18' 04'' Long: E 78° 09' 55''
3	**PROTECTION OF ENVIRONMENT**		
a)	**Afforestation:** 1.00 Ha (1000 Nos Saplings proposed over the waste land within lease)	About 1.15 Ha (1350 Nos Saplings planted over the waste land within lease).	Location of the Afforested area as follows Lat: N 09° 18' 04'' Long: E 78° 09' 55''

b)	**Quality of air –** PM 10 – 100 µg/m^3 PM 2.5 – 60 µg/m^3 SO2 – 80 µg/m^3 NO2 – 80 µg/m^3	PM 10 – 45.3 to 61.2 µg/m^3 PM 2.5 – 18.8 to 29.4 µg/m^3 SO2 – 3.4 to 6.1 µg/m^3 NOx – 7.1 to 11.2 µg/m^3	The existing Ambient Air Quality levels for PM10, PM 2.5, SO2 and NO2 are within the prescribed CPCB limits for "Industrial, Residential, Rural & other areas".
c)	**Quality of water –** pH Value – 6.5 to 8.5 °C TDS – 2000 mg/L Cl – 1000 mg/L Ca – 200 mg/L Mg – 100 mg/L SO4 – 400 mg/L F – 0.3 mg/L	pH Value – 6.87 to 7.89 °C TDS – 290 to 1224 mg/L Cl – 74.8 to 366 mg/L Ca – 21.7 to 139 mg/L Mg – 11.5 to 51.4 mg/L SO4 – 20.1 to 318 mg/L F – 0.26 to 0.57 mg/L	The water quality of ground waters were found to be well within the prescribed IS: 10500 Norms for Drinking water.
d)	**Noise level –** Day & Night equivalent in the core zone area - 90 dB(A) 55 dB(A) for day time and 45 dB(A) for night time in the Residential Area	Day & Night equivalent Level – 63.5 to 63.8 dB (A) Day & Night equivalent Level – 45.4 to 48.6 dB (A)	The Noise level values were found to be well within the limit as per MoEF Norms.
e)	**Vibration –**. Peak particle velocity - 12.5 mm/s for each blast.	Peak particle velocity – 0.53 mm/s for each blast.	Vibrations are monitored regularly with an imported vibration monitoring equipment Minimate .The peak particle velocity is found to be within the prescribed limit by DGMS Norms.
f)	**Any other proposal for monitoring** - Nil	Nil	No other proposal made during the approved plan period.

4. History of Violations after approval of Mining Plan or Review of Mining Plan:

Sl. No	Date of inspection	Name of inspecting officer	Violations of MCDR, 88 observed and pointed out	Rectification of violations	Remarks
1	11.03.2019	V. Jaya Krishna Babu, RCoM – Chennai.	(a) As per the proposals given in the Modified Mining Plan No.TN/TKD/MP/ LST- 1949. MDS dt. 18.05.2015, the ROM proposed for the year 2017-18 was 7,26,950 tonnes (between ML 14.50 to ML 21.50) whereas you have reported 1,00,827 tonnes during the year 2017-18. Similarly during the year 2018-19 as per the proposals given in the document TN/TKD/ LST/ROMP-1450.MDS dt.31.11.2017, 7,14,250 tonnes of ROM proposed for excavation (between ML 16 to 21), the actual production upto January, 2019 is 82,064 tonnes upto the month of February, 2019. During the inspection of the mines the excavation as proposed in the modified mining plan for the years 2017-18 and Review of Mining Plan for the year 2018-19 was cross-checked with that of updated plans and sections prepared under Rule 31(4) of MCDR 2017. The quantum of excavation shown in the updated plans and sections is not matching with that of excavation reported. Thus, the actual production given in the Review of Mining Plan document was	The Approved Mining Plan production quantity not achieved due to process delay for obtaining of Environmental Clearance from MoEF. We have applied for Environmental clearance for a production capacity of Limestone 0.50MTPA (Clean) / 0.72 MTPA (ROM), for which Terms of reference was also received via letter J- 11015/ 136/2013-IA.II(M)dt.09.09.2013 over an extent of 103.53 Ha. Since the extent has been changed to 98.62 ha we have also obtained amendment in the TOR for the revised extent. Environmental Clearance obtained for Limestone 0.50MTPA (Clean) / 0.72 MTPA (ROM), from MoEF & CC vide F.No.J-11015/136/2013-IA.II(M) dt. 11.01.2019. Afterwards we have applied for Consent for Establishment to TNPCB. The proposed production quantity may be achieved after obtaining of Consent to Operate from TNPCB.	Violation has been rectified within 45 days from the date of issue of violation letter.

			lacking behind the actual production reported which is having cascading effect on the production of ensuing years and change in the area of proposals given. (b) In the Review of Mining Plan document it is proposed to plant 1000 saplings during the year 2018-19. During the inspection, it is observed that though the plantation was carried out the survival rate is very poor and proper care has not been taken for growth of the plants.	A dedicated water tanker 10 KLD is being used for Afforestation & Dust Suppression purpose. Drip irrigation may be installed for increasing the Survival Rate.	

5. Socio-Economic Development Plan : 2021 - 22

Sl. No.	Proposed Action Plan towards socio Economic Development	Expenditure proposed (In Rs, Lakh)	Expenditure incurred in (in Rs, Lakh)	Remarks
1	General Development in the area	-	-	-
	i) Housing			
	ii) Water Supply	1.5	1.5	Drinking water, Bore wells & Hand pumps.
	iii) Sanitation	2.0	2.0	General Medical Camps & Eye Camps
	iv) Health, Safety and Medical Facilities	2.0	2.0	Financial contribution to medical help to near-by villagers
2	Education and Training	3.0	3.0	Tuition Centre, Tailoring School & Donation of Note Books
3	Employment to local inhabitants	Nil	Nil	No Proposal mad during the approved plan period.
4	Public Transportation and communication	5.0	13.66	Donations provided for Construction of Road, Covid related etc.
5	Recreation and other sports activities	5.0	5.0	Financial Contribution Towards Temple Construction & renovation.

6	Expenditure for environment management	1.50	1.50	Cleaning of bushes, Nallahs and leveling of Village Areas.
7	Other Old age pension	Nil	Nil	No Proposal mad during the approved plan period.
	Total	**20**	**28.66**	