

# ENVIRONMENTAL IMPACT ASSESSMENT

FOR

THE PROPOSED PERSODA LIMESTONE MINE WITH TOTAL EXCAVATION OF 2.9 MTPA [2.0 MTPA OF LIMESTONE (ROM), WASTE AND DOLOMITE OF 0.815 MTPA AND TOPSOIL OF 0.085 MTPA] FOR PRODUCTION OF 2.0 MTPA LIMESTONE (ROM), LOCATED AT VILLAGES: PERSODA, KOTHODA KHURD, KOTHODA BUZURG, GOVINDPUR, KORPANA TEHSIL, CHANDRAPUR DISTRICT, MAHARASHTRA (ML AREA OF 756.14 HA)

## EXECUTIVE SUMMARY

**TOR Reference No.** : J-11015/22/2019-IA.II (M) dated 09<sup>th</sup> April 2019  
**UIN** : VLL/ENV/2018/01/RCCPL/026  
**Baseline Period** : December 2018 to February 2019

**Environmental Consultant:**



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NABET Accreditation No. : QCI/NABET/ENV/ACO/19/0957 date 16.04.2019



(Approved Consultant)



**Project Proponent:**

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## **1.0 INTRODUCTION**

M/s. RCCPL Private Limited proposed Persoda limestone mine lease area spreads over an area of 756.14 ha with a production capacity of 2.0 MTPA of limestone (ROM) from total excavation of 2.9 MTPA (2.0 MTPA of limestone, waste & dolomite of 0.815 MTPA and top soil of 0.085 MTPA) at villages Persoda, Kothoda Khurd, Kothoda Buzurg and Govindpur, tehsil Korpana, district Chandrapur, Maharashtra.

### ➤ **Justification of the Project**

RCCPL Private Ltd. is executing a cement plant with production capacity of 2.9 MTPA clinker, 4.8 MTPA cement at Mukutban village, Yavatmal district, Maharashtra. EC was issued for this project by MoEF&CC vide letter no. J-11011/145/2009-IA-II(I) dated 25<sup>th</sup> February 2013. Consent to Establish was issued by Maharashtra Pollution Control Board for Mukutban mine and Mukutban plant vide letter no. CH0563-11/CAC/CAC-2035 dated 05.12.2014 and CAC-CELL/RO (Chandrapur)/ CAC-170300021 dated 03.03.2017.

### ➤ **Project Description**

The mine will spread over an area of 756.14 ha. The expected life of the mine is 23 years with mineral reserves of 40.77 million tonnes, based on the present level of exploration. However, after detailed exploration in future, the mineral reserves and life may go up to 56 years. The estimated cost for the proposed mining project including utilities, offsite, auxiliary services etc., is about Rs. 352 crores.

## **1.1 Environmental Setting**

The environmental setting of the proposed mining project is presented in **Table-1.0**. The index map and study area map is shown in **Figure-1** & **Figure-2** respectively.

### ➤ **ML Area Coordinates:**

Latitude: 19°43'54.10" N to 19°46'09.78" N  
Longitude: 78°50'41.18" E to 78°52'23.39" E

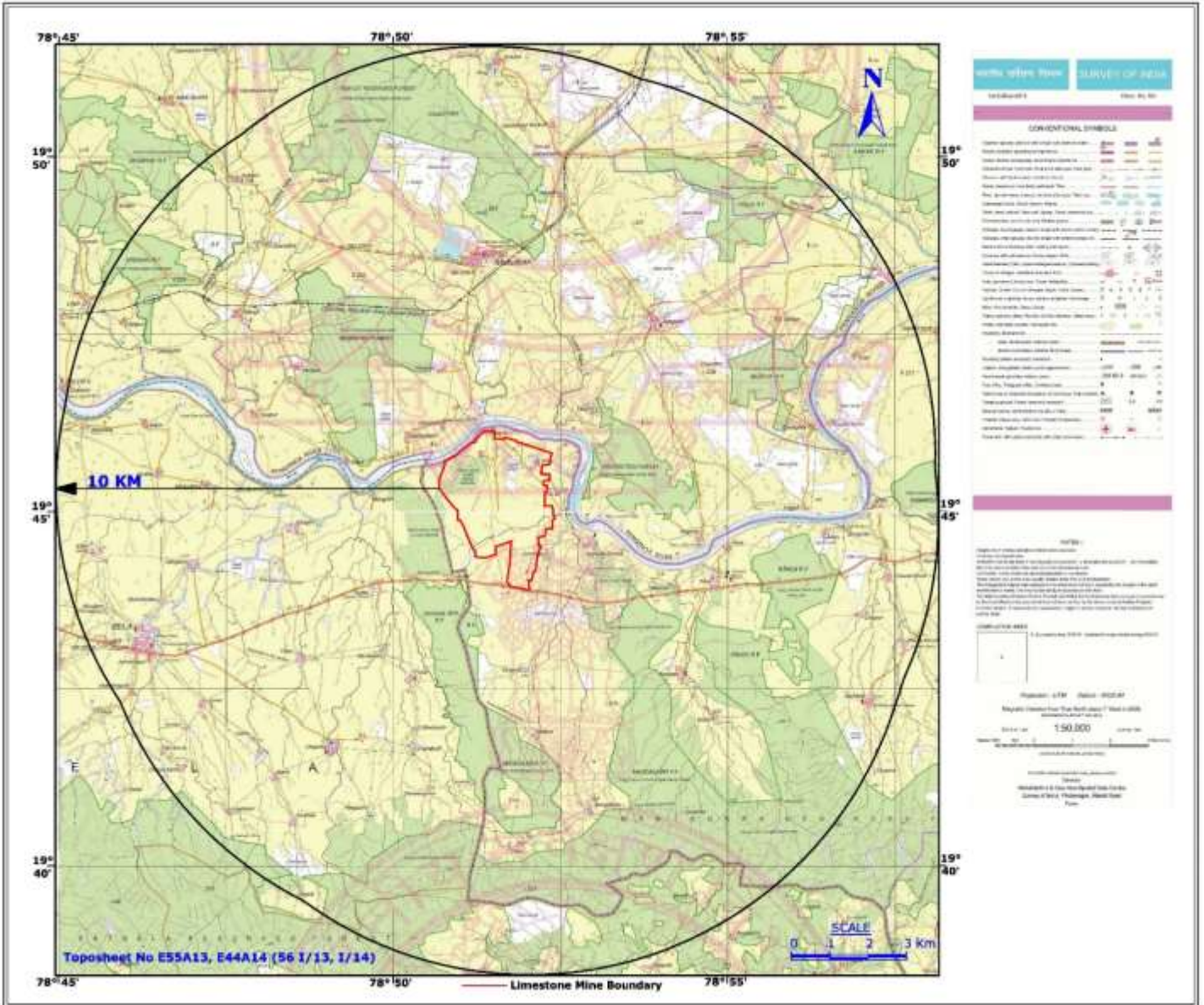
- Mine site elevation: 196 – 219 m above MSL;
- Study area – 10 km from ML boundary
- Major water bodies are : Penganga river (Adjacent, N), Mukutban pond (4.5 km, N), Vaidarbha river (9.9 km, NE);
- Forests: Mangalhira RF (0.8 km, SW), PF near Yedsi (0.8 km, E), RF near Pimprod (1.7 km, NW), Pardi RF (4.4 km, E), Akapur RF (4.8 km, NE), Ruikot RF (4.6 km, N), Manikgarh RF (6.2 km, SSE), Satnala RF (6.3 km, S), Chilai RF (6.6 km, NE), Ardwan RF (7.8 km, NW), Kannargoan RF (8.8 km, E), Sekarpur RF (9.5 km, NW);
- Ecological Sensitive Locations: Nil within study area; and
- Archaeological monuments & defense installations: Nil within study area.



**FIGURE-1  
INDEX MAP**

**Environmental Impact Assessment for the Proposed Persoda Limestone Mine with Total Excavation of 2.9 MTPA [2.0 MTPA of Limestone (ROM), Waste and Dolomite of 0.815 MTPA and Topsoil of 0.085 MTPA] for Production of 2.0 MTPA Limestone (ROM), Located at Villages: Persoda, Kothoda Khurd, Kothoda Buzurg, Govindpur, Korpana Tehsil, Chandrapur District, Maharashtra (ML Area of 756.14 ha)**

**Executive Summary**



**FIGURE-2  
STUDY AREA MAP**

## **2.0 PROJECT DESCRIPTION**

### **2.1 Salient Features of Limestone Mine**

The salient features of Limestone Mine are given below in **Table-1**.

**TABLE-1  
SALIENT FEATURES OF LIMESTONE MINE**

<b>Sr. No.</b>	<b>Description</b>	<b>Details</b>
1	Name of the mine lease	Persoda Limestone Mine
2	Mining lease (ML) area	756.14 ha
3	Elevation MSL	196 – 219 m, amsl
4	Type of ML area	Opencast mine
5	Method of mining	Fully mechanized opencast
6	Rated capacity of mine	2.0 MTPA limestone production (ROM)
7	Total Excavation	Total excavation: 2.9 MTPA [2.0 MTPA limestone (ROM), Waste & Dolomite: 0.815 MTPA and topsoil: 0.085 MTPA
8	Expected life of mine	23 Years (based on reserves) and 56 Years (based on total resources)
9	Total Geological Reserves	134.88 million tonnes
10	Mineable Reserve	106.60 million tonnes
11	Extractable reserves	40.77 million tonnes
12	Percentage of extraction	38.25%
13	Average stripping ratio	1:0.45(ore: waste) for total reserves during the mining period and 1:2.17 for total resources during conceptual period
14	Overburden	~0.9 MTPA during mining plan period
15	Ultimate bottom level	22.2 m (first five years), 64.4 m (for entire life of the mine)
16	Working hours	2 shift per day of 8 hrs in 300 days of operation in a year
17	Bench parameters	Mining activity will be carried out in two pits with benches of 6-8 m height and minimum 25 m width.
18	Bench height in OB/Ore	The height of top soil bench will be negligible. The height of OB bench will be 3.35 to 8 m. The height of benches in limestone will be 6-8 m.
19	Bench width	Minimum working bench width would be kept as 25-30 m
20	Bench slope	80°
21	Overall final pit slope	45°
22	Bottom mRL proposed during plan period	195.8 mRL (about 22.20 m)
23	Water requirement	234 KLD

Sr. No.	Description	Details
24	Power requirement	~1.8 MW
25	Manpower requirement	105 nos during operational phase

Source: Approved Mine Plan

## 2.2 Resource Requirement

- Land Requirement

The total area for mining lease of limestone is 756.14 ha for which approval had been obtained from Maharashtra government.

- Water Requirement

The total water requirement for mine is estimated to be 234 KLD. It is proposed to meet this requirement through ground water during initial years of operation after obtaining necessary clearances/permissions from the concerned authorities. An application has been submitted to CGWA and it is in progress.

- Power requirement

The power requirement for the mines will be ~1.8 MW and the same will be met through Grid power. One DG set (250 KVA) will be installed to meet the demand required during the emergency period for lighting and pumping purposes.

## 2.3 Method of Mining

The choice of mining method has been considered as opencast mining for quarrying the limestone from the mine. The mining operation will be fully mechanized. The sequence of operation in quarrying will be drilling, blasting, loading, hauling, crushing and transportation.

## 2.4 Land use

The detail of land use pattern during conceptual stage of the lease area is given below in **Table-2**.

**TABLE-2**  
**LAND USE BREAKUP- CONCEPTUAL PERIOD**

Sr. No.	Land Use Category	Pre-Operational	Operational	Post-Operational
		(Present)	(At the end of 1 <sup>st</sup> 5 Year Plan)	(At the end of Life of Mine)
1	Soil Dump Area	0.00	2.00	0.00
2	Waste Dump Area	0.00	16.74	0.00
3	Excavation including protective bund	0.00	47.48	557.70
4	Mine pit Backfilled and utilized for Community Farming	0.00	0.00	418.84
5	Mine pit converted to Water Reservoir and utilized for Community Use	0.00	0.00	138.86
6	Public roads & Mine Road	2.69	3.59	2.61
7	Infrastructure (Crusher, Office, Workshop etc)	0.00	6.90	0.00

Sr. No.	Land Use Category	Pre-Operational	Operational	Post-Operational
		(Present)	(At the end of 1 <sup>st</sup> 5 Year Plan)	(At the end of Life of Mine)
8	Water Streams	7.16	7.16	6.11
9	Built-up area (village, farm, colony, school etc)	7.70	7.70	7.70
10	Mineral Storage (Sub-grade/mineral)	0.00	1.00	0.00
11	Plantation & Greenbelt on safety barriers, along lease, road and other areas	0.00	20.00	126.33
12	Undisturbed area	738.59	643.57	55.69
TOTAL	(excluding Sr.No. 4 and 5, which are included in Sr.No. 3)	<b>756.14</b>	<b>756.14</b>	<b>756.14</b>

Source: Approved Mine Plan

### **3.0 DESCRIPTION OF THE ENVIRONMENT**

The baseline data monitoring studies have been carried out for three months covering winter season 2018 – 19 (1<sup>st</sup> December 2018 to 28<sup>th</sup> February 2019).

#### **3.1 Land Use**

Land use break-up of study area representing 10 km from the project boundary based on NRSC IRS RS-2 LISS IV FX Satellite Imagery – October 2018 is given below:

- Built-up-land: The total built-up-land constitutes 2.2% of total study area.
- Forest Land: 17.9% of land is occupied by scrub forest land;
- Agricultural land: The part of the study is occupied by agricultural land which constitutes about 60.7%;
- Waste Land: 12.6% of land is waste land; and
- Water Body: 6.6% of land is covered by water body.

#### **3.2 Soil Quality**

Soil samples were collected and analysed from eight locations in and around the mine lease area to assess the present soil quality of the region. The results are compared with standards of Indian Council of Agricultural Research, New Delhi.

- The pH of the soil indicates that the soil is slightly alkaline to strongly alkaline in nature. Available potassium was observed as 186.3 kg/ha to 590.7 kg/ha in the study region indicating that the soil falls under medium to more than sufficient category;
- Available nitrogen was observed as 48.4 kg/ha to 82.4 kg/ha and the values of the soil fall under very less to less; and
- Available phosphorous was observed as 55.4 kg/ha to 69.7 kg/ha in the study region. It shows the soil falls under very less to on an avg. sufficient.

Based on the results, it is evident that the soils are not contaminated by any external pollution sources.

### 3.3 Meteorology

Meteorological data at the site was monitored during December 2018 to February 2019 representing winter season. It was observed that during study period, temperature ranged from 15.2°C to 31.6°C and the relative humidity recorded in the range of 24% to 55%.

### 3.4 Ambient Air Quality

Ambient Air Quality Monitoring (AAQM) was carried out at eight locations with a frequency of two days per week for three months during study period. The minimum and maximum values of different parameters are as under:

<u>Parameter</u>		<u>Observation (<math>\mu\text{g}/\text{m}^3</math>)</u>
PM <sub>2.5</sub>	-	12.2 – 31.5
PM <sub>10</sub>	-	17.7 – 47.7
SO <sub>2</sub>	-	9.1 – 14.1
NO <sub>2</sub>	-	11.1 – 18.6
CO	-	137 – 435

The results thus obtained indicate that the concentrations of PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>2</sub> and CO in the ambient air are well within the National Ambient Air Quality (NAAQ) standards for Residential and Rural areas.

### 3.5 Water Quality

To assess the physical and chemical properties of water in the region, water samples from eight ground water and two surface water locations were collected and analysed from various water sources around the mine lease area. The water quality results are given below:

<u>Parameter</u>	<u>Ground Water</u>	<u>Surface Water</u>
pH	7.1 – 7.5	7.4 – 7.6
Total Hardness (mg/L)	380 – 774	185 – 415
Chlorides (mg/L)	85.1 – 312.4	89.2 – 109
Sulphates (mg/L)	28.1 – 95.7	9.4 – 15

The results indicate ground water is in conformity with IS-10500 standards. The water quality does not indicate any industrial contamination.

### 3.6 Noise Levels

Ambient noise levels were measured at eight locations around the mine lease area. The daytime (L<sub>day</sub>) noise levels at all the locations are observed to be in the range of 41.4 dB (A) to 49.5 dB (A). The night time (L<sub>night</sub>) noise levels at all the locations were observed to be in the range of 38.4 dB (A) to 44.9 dB (A). The daytime and night time noise levels in all the residential locations were observed to be within the permissible limits.



### **3.7 Ecological Environment**

The study area is fragmented owing to the anthropogenic pressures and the floristic diversity and faunal diversity of the study area enumerated. There are no Scheduled – I species in the 10 km study area of the buffer zone of the mine lease area.

### **3.8 Social Environment**

The study area (10 km radius) area has a total population of 64,092 according to 2011 census. Total male population is about 51.31% and total female population is around 48.69%. The data of study area reveals that literacy rate of 72.72% as per 2011 census, which is found to be less than the state rate of literacy (Maharashtra 82.3%).

## **4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

The environmental impacts due to the proposed mining project, associated activities have been assessed and adequate management plan has been developed to mitigate the impacts.

### **4.1 Topography**

The area is almost plain terrain with some undulations. The altitude varies from 196 m amsl near Penganga River to 219 m amsl in the central part. The general slopes are towards north & north-eastern direction. However, no major impacts on topography due to proposed project are envisaged.

### **4.2 Air Quality**

Ore loading activities and vehicular movement are the sources to air pollution on the surface. The AERMOD modeling tool have been carried out to predict the likely dust concentrations due to mining activities which are found to be well within the norms.

Apart from trucks plying on the haul roads within the ML area, mining activities will also contribute mainly to dust generation and it is anticipated that marginal increase will occur in the PM level at the mine site. Raised limestone will be supplied to cement plant at Mukutban from crusher through Over Land Belt Conveyer (OLBC) system. Mine traffic on internal haul roads and mining activities like drilling, blasting, loading, hauling, crushing and transportation activities have been considered in assessing the impact of air pollution.

Further, mitigation measures like wet drilling, controlled blasting, bag filter to crusher, regulation of vehicle speeds, regular water sprinkling, covered truck movement and development of greenbelt / green cover will be implemented.

### **4.3 Noise Levels**

With the mining operations, due to machinery for mine development, excavation, transportation and crushing of ore, it is imperative that noise levels would increase. However, the expected noise levels will not have any significant adverse effect on the outside community as habitation area is away from the working area.

#### **4.4 Water Resources**

About 234 m<sup>3</sup>/day of water will be required for mining operations, domestic purpose, sprinkling purposes to suppress the dust and for green belt purposes.

##### Impact on Surface Water

Adequate drainage systems will be planned in the mining area and work shop for allowing the water to flow in the pre-determined path. The drainage system will be designed in such a way even to meet excess rainfall. All along the mine roads drainage will be provided and bench floors will be properly sloped so as to avoid stagnation of water.

Natural drains in the ML area will not be disturbed and no wastewater is sent to the surface water bodies. No siltation of drains from mine operations is envisaged. Hence, no significant impact on surface water bodies due to mining operations is envisaged.

With the above measures, no adverse impact is envisaged on the surface water quality in proposed limestone mine.

##### Impact on Ground Water

The average ground water fluctuation in dug wells between pre and post monsoon in the study area has been considered to estimate recharge by increment in ground water storage. Ground water recharge by ground water level fluctuation method in the study area works out to 32.69 MCM. Recharge by rainfall infiltration factor method in the study area works out to 25.96 MCM. Ground water recharge by ground water level fluctuation method in the core zone spread in 756.14 ha with a water level fluctuation of 5.00 m works out to 0.567 MCM. Recharge by rainfall infiltration factor method in the core zone for an average monsoon rainfall of 1069.8 mm works out to 0.485 MCM. The present stage of ground water development in the buffer zone and core zone is estimated as 15.90% and 13.75% and can be categorized as "Safe".

#### **4.5 Soil Environment**

The top soil will be scraped or dozed as far as possible. The soil will be loaded into dumpers/tippers by shovels/ pay loaders. The top soil is fertile in nature which will be stored temporarily and will be used for plantation purpose.

#### **4.6 Flora and Fauna**

As the mining activity is restricted to core zone, no significant impact on the flora of the buffer zone due to the proposed mining is anticipated. With proposed green belt development and afforestation plan around the mine, the aesthetics will be improved.

Extensive plantation comprising of pollutant resistant trees will be carried out surrounding the mine site, which will serve not only as pollution sink but also as a noise barrier. It is expected that with the adoption of these mitigation measures, the impact due to operation of the mines will be minimal on the terrestrial ecosystem.

#### **4.7 Socio-Economic Aspects**

The project will definitely help for the improvement of the socio-economic status of the society in the region by extending the direct / indirect employment opportunities. The project will also increase the development of ancillary and related small-scale industries in the adjoining areas.

#### **5.0 OCCUPATIONAL SAFETY AND HEALTH**

Occupational safety and health is very closely related to productivity and good employer-employee relationship. The main factors affecting occupational health are fugitive dust and noise. Safety of employee during operation and maintenance will be taken care of as per mine regulations. PPEs such as dust mask, ear plugs/earmuffs etc. will be provided to workmen.

All working personnel will be medically examined as per the statutory requirement. This is in addition to the pre-employment medical examination. Safety training will be provided by the safety officers with the assistance of faculty members called from professional safety institutions and universities. Hence, no significant impact on health of workmen is envisaged.

#### **6.0 PROJECT BENEFITS**

The proposed project will result in improvement in the social infrastructure in following manner:

- Generation of employment and improved standard of living;
- Establishment of small and medium scale engineering ancillaries;
- Revenue to government;
- Change in the socio-economic scenario of the area;
- Direct and in direct employment. Recruitment for the unskilled and semiskilled workers for the proposed project will be from the nearby villages;
- Development of the basic amenities viz. roads, transportation, electricity, drinking water, proper sanitation, educational institutions, medical facilities, entertainment; and
- Overall the project will change living standards of the people and improve the socio-economic conditions of the area.

The total cost of the proposed project will be Rs. 352 Crores. About Rs. 5.0 crores will be spent as a capital cost for CER activities in three years.

#### **7.0 CONCLUSIONS**

- The mining operations will meet the compliance requirements of MPCB/MoEF&CC and other statutory organizations;
- Community impacts will be beneficial, as the project will improve the significant economic benefits to the region;
- With the effective implementation of the Environment Management Plan (EMP) during the mining and production activities, the proposed project can proceed without any significant negative impact on environment.