

# EXECUTIVE SUMMARY OF DRAFT EIA-EMP REPORT

For

EXPANSION OF INTEGRATED CEMENT PLANT – CLINKER (1.98 MILLION TPA TO 5.0 MILLION TPA), CEMENT (5.0 MILLION TPA TO 6.0 MILLION TPA), CPP (20 MW TO 40 MW), WHRB (10MW TO 25 MW), DG SET FROM (1000 KVA TO 2000 KVA); LIME STONE (4.8 MILLION TPA TO 8.0, MILLION TPA) BY M/S JK LAKSHMI CEMENT LIMITED

LOCATED AT

VILLAGE - MALPURI KHURD, KHASADIH, PO.AHIWARA, TEHSIL DHAMDHA, DISTRICT- DURG, CHHATTISGARH

Terms of Reference File No. IA-J-11011/1170/2007-IA. II(I) dated 24th August 2020

Category: "A"; Sector: (3b) Cement Plant & (1d) Thermal Power Plant

Monitoring Period: Winter Season (1st Dec, 2023 – 29th Feb, 2024)

PROJECT PROPONENT



ENVIRONMENTAL CONSULTANT



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Report No. ANqr/PD/20A/2019/137

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## EXECUTIVE SUMMARY

### 1.0 INTRODUCTION

M/s JK Lakshmi Cement Ltd. (JKLCL) has an existing Integrated Cement Plant with capacities – Clinker -1.98 Million TPA (MTPA), Cement (OPC, PPC, PSC, COC) - 5.0 MTPA, CPP - 20 MW, WHRB- 10 MW & Limestone 4.8 MTPA at Villages: Malpuri Khurd, Khasadih, P.O. Ahiwara, Dist. Durg, Chhattisgarh and environmental clearance for the existing Cement Plant was issued by MoEF&CC, New Delhi vide their letter no. J-11011/1170/2007-IA II (I) dated 13<sup>th</sup> May, 2009 and amendments done thereafter.

JK Lakshmi Cement Ltd. has an integrated cement plant, interlinked with captive limestone mines Lease areas (ML-1 of 267.695 ha. and ML-2 of 252.105 ha.) having single EC. The clinker capacity was enhanced from 1.5 Million TPA to 1.98 Million TPA through optimization and modernization by obtaining EC amendment in F. No. J-11011/1170/2007-IA-II(I) dated 14<sup>th</sup> November 2018

M/s. JK Lakshmi Cement Ltd. is now proposing an expansion of its Integrated Cement Plant, details of which are as follows:

- Clinker from (1.98 Million TPA to 5.0 Million TPA)
- Cement (PSC, PPC, OPC & COC) from (5.0 to 6.0 Million TPA)
- Captive Power Plant from (20 MW to 40 MW)
- WHRB from (10 MW to 25 MW)
- DG sets (1000 to 2000 KVA).
- Limestone (4.8 MTPA to 8.0 MTPA)

As per EIA Notification dated 14<sup>th</sup> Sept. 2006 & as amended; this project falls under Category “A”; Project Activity ‘3(b)’ Cement Plants.

The company has made online application for Terms of Reference vide proposal no. IA/CG/IND/163618/2020 dated 15.07.2020 and ToR granted for proposed expansion by EAC (Industry – I), MoEFCC, New Delhi vide file No. IA-J-11011/1170/2007-IA-II(I), dated 24<sup>th</sup> August, 2020.

Being Integrated Cement Plant, interlinked with limestone mines (2 Nos.) with single EC as mentioned above, JKLCL received ToR for Captive Limestone mine from EAC (Non-Coal), MoEFCC, New Delhi to sustained continuous supply of Limestone from captive mines in conformity with Cement Plant expansion capacity. Thus following TOR are received separately for plant and mines, hence separate EIA is submitted as per TOR received. Details of ToR of for Plant and captive limestone mines are as under:

1. ToR granted for *M/S. JK Lakshmi Cement Ltd., Limestone mines (Mine Lease I of area 267.695 Ha.)* vide F. No. J-110105/72/2020-IA.II(M) dt. 20<sup>th</sup> Jan, 2021
2. ToR granted for *M/S. JK Lakshmi Cement Ltd., Limestone mines (Mine Lease II of area 252.105 Ha.)* vide F. No. J-110105/73/2020-IA.II(M) dt. 20<sup>th</sup> Jan, 2021.

Anacon Laboratories Pvt. Ltd., Nagpur, is QCI-NABET accredited in ‘Category A’ environment consultant organization has been assigned to undertake an Environmental Impact

Assessment (EIA) study and preparation of Environment Management Plan (EMP) for various environmental components, which may be affected due to the impacts arising out of the proposed project.

The Environmental Impact Assessment (EIA) and Environment Management Plan report is prepared for obtaining Environmental Clearance (EC) from MoEF&CC, New Delhi and the Consent for Establishment from the Chhattisgarh Environment Conservation Board (CECB) for the proposed expansion project.

### 1.1 IDENTIFICATION OF PROJECT

**M/s. JK Lakshmi Cement Limited (JKLCL)** proposes to install expansion of the existing manufacturing unit capacity of **Integrated Cement Plant**, Clinker (1.98 Million TPA to 5.0 Million TPA), Cement (5.0 Million TPA to 6.0 Million TPA), CPP (20 MW to 40 MW), WHRB (10 MW to 25 MW), DG Set (1000 KVA to 2000 KVA), Lime Stone (4.8 Million TPA to 8.0 Million TPA) at Villages Malpuri Khurd, Khasadih. PO. Ahiwara, Tehsil Dhamdha, District - Durg (Chhattisgarh). The plant also has a captive limestone mine. The existing plant is based on dry process technology which is single string - 5 stages preheater with inline calciner. The proposed plant will be based on dry manufacturing technology with single/double string – 5/6 stages pre-heater with inline/separate line pre-calciner.

The current proposal is for expansion of the existing manufacturing unit capacity of Integrated Cement Plant. Thus, the following capacities would require EC for expansion of the existing facilities.

The details of existing and expansion production capacity are shown in **Table 1**.

**TABLE 1: EXISTING AND EXPANSION PRODUCTION DETAILS**

Sr. No.	Particulars	Existing Capacity	Proposed Capacity addition	Total capacity after expansion
1.	Clinker (Million TPA)	1.98	3.02	5.0
2.	Cement (Million TPA)	5.0	1.0	6.0
3.	Captive Power Plant (MW)	20	20	40
4.	WHRB (MW)	10	15	25
5.	DG Set** (KVA)	1000	1000	2000
6.	Mining of Limestone (in million TPA)*	Total = 4.8 million TPA from both mines ML-I (267.695 ha) and ML-II (252.105 ha)	Total = 3.2 million TPA	8.0 million TPA (from both mines) <b>6.65 MTPA production</b> from ML-I (267.695 ha) and <b>1.35 MTPA</b> from ML-II (252.105 ha)

\*\*DG set is being/will be used as a backup for critical equipment's during emergency situations

### 1.2 LOCATION OF THE PROJECT

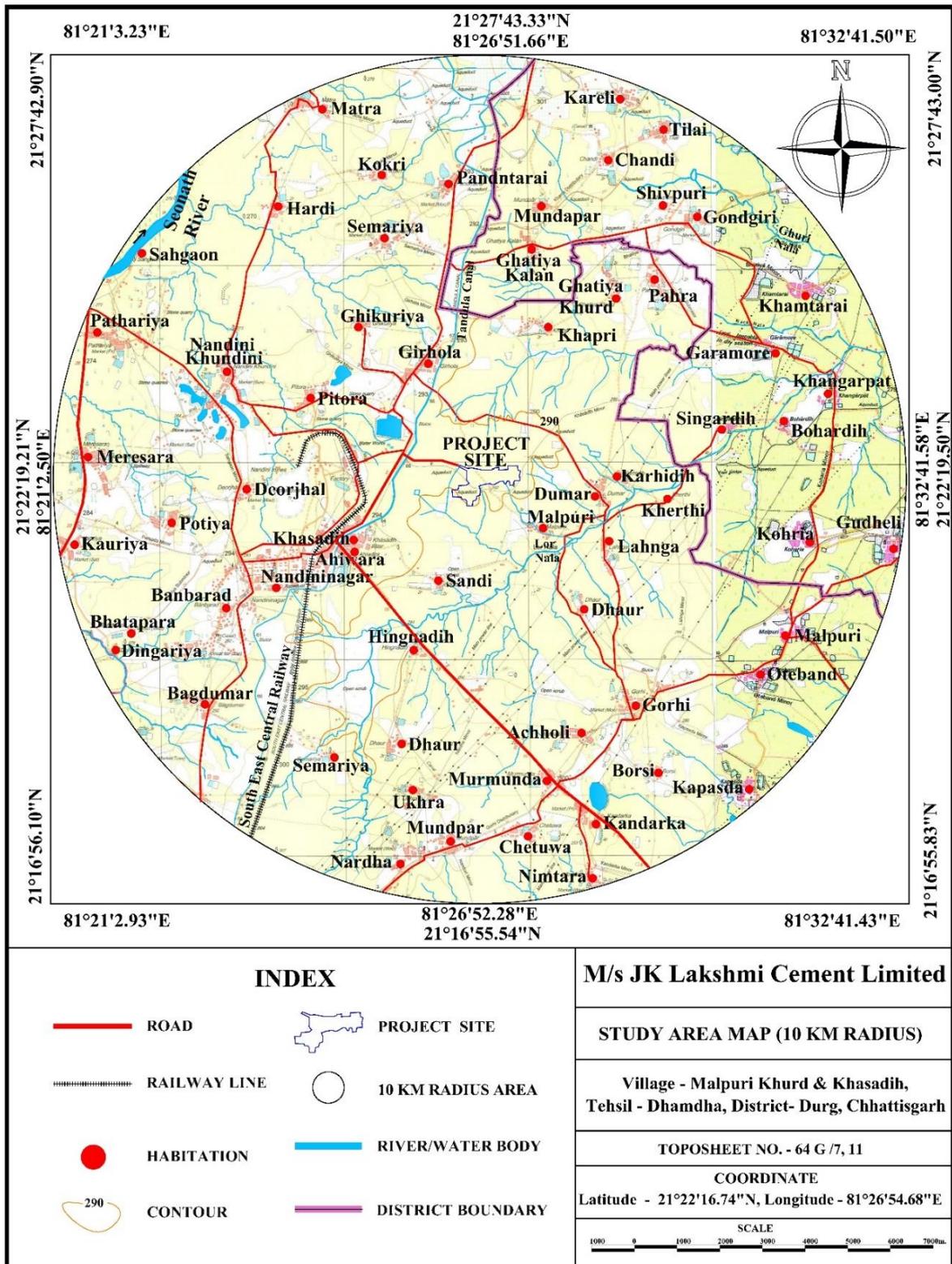
The proposed expansion project area located within the existing plant at Villages - Malpuri Khurd, Khasadih. P.O. - Ahiwara, Tehsil - Dhamdha, District - Durg, Chhattisgarh – 490036. The project site lies at the Latitude: 21°22'6.74"N ; Longitude: 81°26'54.68"E on the Survey of India (SOI) Topo sheet No. 64G/7; 64G/11. No additional land is required for the capacity expansion project. The existing land area of the project is 200.26 Ha as per existing ToR.

The nearest city Bilai is around 22.20 KM in SSW direction. Nearest airport is Swami Vivekananda Airport, Raipur is around 36 km at SE direction. The project site can be reached

through State Highway (SH7) is 8.6 km towards W direction. The project is well connected to all weather roads. Nearest railway station is Kumhari railway station which is 15.40 km SE direction. The details of environmental setting are given in **Table 2**.

### 1.3 EIA/EMP REPORT

In line with the approved ToR obtained from EAC (Industry –I), MoEF&CC, New Delhi, baseline environmental monitoring was conducted during Winter Season (**1<sup>st</sup> Dec 2023 – 29<sup>th</sup> Feb. 2024**) for determining the status of ambient air quality, ambient noise levels, surface and groundwater quality, soil quality, status of flora, fauna and eco-sensitive areas and socio-economic status of the villages within 10 km radius study area from the project site (**Figure 1**). The observations of the studies are incorporated in the EIA/EMP report. Impacts of the proposed project activities during construction and operation stages were identified and duly addressed in the report.



**FIGURE 1: STUDY AREA (10 KM RADIAL DISTANCE)**

**TABLE 2: DETAILS OF ENVIRONMENTAL SETTINGS**

Sl.	Particulars	Details			
1.	Project Location	<b>Village</b> - Malpuri Khurd, <b>District</b> - Durg, <b>State</b> - Chhattisgarh.			
2.	Latitude/Longitude	21° 22' 16.74" N, 81° 26' 54.68" E			
3.	Location covered in Toposheet No	64G/7 and 64G/11			
4.	Nearest representative IMD Station	IMD Raipur - 27.57 km/SE			
5.	Site elevation above Mean Sea Level	313m to 325m			
6.	Nearest roadway	1. Road connecting village Malpuri Khurd and Sandi-1.09km/SE 2. Road connecting village Girhola and Dumar-1km/NE 3. SH7-8.6km/W			
7.	Nearest Railway Station	1. Kumhari Railway Station - 15.40 km/SE 2. Bhilai Railway Station - 18.22 km/SSW			
8.	Nearest Air Port	Swami Vivekananda Airport, Raipur-36km/SE			
9.	Nearest village	1. Malpuri Khurd-0.93km/SE 2. Khasadih-2.07km/SW			
10.	Nearest Port	Gopalpur Port - 431.3km/SE			
11.	Distance from Sea Coast	Bay of Bengal - 427.80km/SE			
12.	Nearest major city with 2,00,000 population	Town Bhilai - 19km/SSW			
13.	Nearest State/National Boundaries	Madhya Pradesh - 73.83km/WNW			
14.	Hills/Valleys	None within study area			
15.	Ecologically sensitive zone	None within study area			
16.	National Parks, Wildlife Sanctuaries, etc.	None within study area			
17.	Nearest Reserved / Protected forests	None within study area			
18.	Historical/Tourist places	None within study area			
19.	Nearest Industries	<b>Sr. No.</b>	<b>Name</b>	<b>Distance (Km)</b>	<b>Direction</b>
		1	Sungaze Power Pvt Ltd.	0.56	NW
		2	Nandini Limestone Mines, Ahiwara	3.15	W
		3	VNR Seeds Pvt. Ltd.	5.3	WNW
		4	Shiva Industries	6.37	SE
		5	Metall Structures Pvt.	7.2	SSE
		6	Bhilai Ispat Pvt. Ltd.	7.24	SE
		7	Maha Ganpati Cotton and Oil Mill Private Limited	7.81	NNE
		8	Atmastco LTD Unit - 2	9.65	SW
		9	Balaji Polymers, Dhaba, Chhattisgarh	9.79	SSE
20.	Nearest Water Bodies	<b>Sr. No.</b>	<b>Name</b>	<b>Distance (Km)</b>	<b>Direction</b>
		1	Shivnath River	8.90	NW
		2	Lor Nala	1.72	SE

Sl.	Particulars	Details			
		3	Ghuri Nala	8.15	NE
		4	Sheetla Talab	2.84	SW
		5	Bada Talab	2.96	SW
		6	Ahiwara Talab	2.05	WSW
21.	Archaeological Sites	None			
22.	Religious Places	<b>Sr. No.</b>	<b>Name</b>	<b>Distance (Km)</b>	<b>Direction</b>
		1	Shree Ram Mandir, Dumar	2.1	ESE
		2	Durgeshwari Temple Nandini Mine	2.23	W
		3	Church of Christ Nandini Mines	2.32	WSW
		4	Hanuman Mandir	5.54	NNE
		5	Gurudwara Tilai Saheb	5.88	NE
		6	Shree Ram Mandir Godhi	5.88	SE
		7	Satnam Bhawan Banbarad	6.23	WSW
		8	Shri Vishnu Mandir	6.42	SW
		9	Mahadev Mandir	6.47	NE
		10	Mauli Mata Mandir Gondgiri	6.71	NE
		11	Shitla Mandir, Malpuri	7.74	SE
		12	Maa Mahamaya Mata Mandir Hasda	9.42	NE
23.	Hospitals and Education Institutions (Sensitive Manmade Landuse)	<b>HOSPITALS</b>			
		<b>Sr. No.</b>	<b>Name</b>	<b>Distance (Km)</b>	<b>Direction</b>
		1	Sub Health Center, Dumar	1.5	E
		2	Community Health Center (CHC), Girhola, Ahiwara	2	WSW
		3	BSP Hospital	4	WSW
		4	Maa Karma Hospital, Murmunda	7	SSE
		5	Upp Swasthya Kendra oatebandh, Malpurikala	7.23	SE
		6	Gudheli Primary Health Center	8.83	ESE
		<b>EDUCATIONAL INSTITUTIONS</b>			
		<b>Sr. No.</b>	<b>Name</b>	<b>Distance (Km)</b>	<b>Direction</b>
		1	Girls Middle School Ahiwara	1.85	WSW
		2	Govt. Middle School, Dumar	1.92	E
		3	Govt Primary School, Khasadih	2.3	WSW
		4	Govt Higher Secondary	3.4	SW

Sl.	Particulars	Details			
			School Ahiwara		
		5	DAV Ispat Public School	4.7	W
		6	Ghatiyakala School	5.3	N
		7	Gandhi Memorial Higher Secondary School, Ahiwara	5.5	WSW
		8	Govt Nagrik Kalyan College Nandini Nagar	5.5	SW
		9	High School Pahara	5.84	NE
		10	Godhi School	6.17	SSE
		11	Shaskiya Prathmik Shala, Moulibhata	6.84	NE
		12	Govt. Hr. Secondary School Limtara	9	SSE
		13	Global Public English Medium High School	9.14	SE
		14	Kosal Higher Secondary School Kapasda	9.29	SE
		15	Kosal Higher Secondary School Kapasda	9.3	SE
		16	Suyash College of Nursing	9.33	SE
24.	Community Places	<b>Sr. No.</b>	<b>Name</b>	<b>Distance (Km)</b>	<b>Direction</b>
		1	Samudayik Bhawan	5.56	WSW
25.	Seismic zone	The proposed expansion project site falls in zone-II as per IS 1893 (Part-I): 2002. Hence, seismically it is a stable zone.			

## 2.0 PROJECT DESCRIPTION

### 2.1 PROCESS DESCRIPTION

#### 2.1.1 Cement Manufacturing Process

The waste material such as fly ash, Slag shall be grinded with Clinker & Gypsum to manufacture PPC, OPC, PSC and COC cement depending on the market demand. The major steps involved in the cement manufacturing process are as follows:

- ✓ Clinker, Fly Ash, Slag and Gypsum Storage & Handling
- ✓ Clinker, Fly Ash, Slag and Gypsum Grinding
- ✓ Cement Production and Storage
- ✓ Cement Packing & Dispatch

#### 2.1.2 Captive Power Plants

Waste Heat Recovery Boiler (WHRB) power generation involves capturing and utilizing the excess heat produced during industrial processes to generate steam and subsequently produce electricity, enhancing overall energy efficiency which is based on AFBC (Atmospheric Fluidized Bed Combustion) boiler. Coal based/other fuel to produce power with FBC boiler in coal based thermal power plant is a common practice in FBC boiler.

The most alternative method involved burning the biomass to produce heat to generate steam in power plant. The steam then drives a turbine connected to a generator, converting mechanical energy into electricity.

## 2.2 LAND REQUIREMENT

The proposed project is brownfield involving capacity expansion. Total 200.26 Ha. land was allotted by CSIDC for 99 years to JKLCL for establishing the plant. The proposed expansion will be carried out in the existing premises of the plant and there is no requirement of acquiring additional land. Hence no alternative site is examined by project proponent.

The Integrated Cement Manufacturing Unit is spread in an area measuring 200.26 Ha. out of which greenbelt is already developed in 78.00 Ha.(i.e. 38.95%).

Proposed expansion – additional facilities will be installed near to existing setup of 5.0 ha.

The detail of land use planning is provided in **Table 3**.

**TABLE 3: AREA STATEMENT**

Sr. No.	Description	Area in (m <sup>2</sup> )	Area in Ha.	Area in %
1	Plant and Plant Building	76988	7.6988	3.84
2	Stock pile shed	51855	5.1855	2.59
3	Office building	15322	1.5322	0.77
4	WHRS	3722	0.3722	0.19
5	Road and Drain	89070	8.907	4.45
6	Railway	89516	8.9516	4.47
7	Clinker, Gypsum & Slag open yard	51190	5.119	2.56
8	Road and Drain( CPP area)	7000	0.7	0.35
9	Closed Pipe Conveyor route from Limestone mines to Plant passing through villages Ghikuriya, Pitaura, Girhola & Khasadih	176794	17.6794	8.83
10	Green Belt	780000	78.00	38.95
11	Solar power Project	80937.1	8.09371	4.04
12	For Project expansion	50000	5	2.50
13	Open area	530206	53.0206	26.48
<b>Total used area</b>		<b>2002600</b>	<b>200.26</b>	<b>100.00</b>

## 2.3 RAW MATERIALS REQUIREMENT, SOURCE & MODE OF TRANSPORT

Availability of raw material is abundant in a range of distance within 80 km area from project site. Estimated raw materials quantity likely to be sourced from outside, mode of transportation is given in **Table 4**.

**TABLE 4: RAW MATERIAL- FUEL REQUIREMENT, SOURCE AND MODE OF TRANSPORTATION**

Sr. No.	Name of Raw Material	Existing in MTPA	For Proposed Expansion in MTPA	Total after Expansion	Source	Mode of transportation
1.	Lime Stone	4.8	3.2	8	Own Captive limestone Mines. Nandini-Khundini & Ghikuria, Tehsil - Dhamdha	At present transportation of Limestone is being done through covered Trucks.  As construction work of closed pipe conveyor is not completed due to nearly 372 mtr piece of land is still to be acquired from SAIL + BSP. (Total length of closed pipe conveyor is 5.5 Km out of which 92% i.e 5.090 KM has been already completed).
2.	Flue dust	0.37	0.62	0.99	Local market: Bhilai Steel Plant	35 km / by road
3.	Silica Sand	0.54	0.9	1.4	Local markets	80 km / by road
4.	Redish pond ash	0.05	0.08	0.1	Local market: Bhilai Steel Plant	35 km / by road
5.	Gypsum Phospho	0.01	0.02	0.03	Indigenous/ Imported	Through Road/Rail
6.	LD SLAG	0.09	0.14	0.2	Local market: Bhilai Steel Plant	35 km / by road
7.	Sintered Sludge/ Crome Sludge	0.015	0.02	0.0	Local markets	By Road
8.	Pond Fly Ash	0.5	0.9	1.4	Local market: Bhilai Steel Plant	35 km / by road
9.	WASTE FOUNDRY SAND (LIGHT)	0.015	0.02	0.0	Local markets	By Road
10.	Clinker	1.98	3.02	5	Own Clinker Unit within plant premises	Truck/Rail
11.	Gypsum	0.29	0.35	0.64	Indigenous/ Imported	Through Road/Rail
12.	Fly ash	1.44	0.31	1.75	From Thermal Power plants and Own Power Plant within plant premises	Through bulkers by road

Sr. No.	Name of Raw Material	Existing in MTPA	For Proposed Expansion in MTPA	Total after Expansion	Source	Mode of transportation
13.	BF Slag	0.56	0.11	0.67	From Bhilai Steel plant and nearby steel plant	35 Km, By Road through covered trucks / rail.

**Fuel Requirement:**

Fuel will be sourced based on market availability and considering feasibility from outside, mode of transportation is given in **Tables 4 (A)**.

**TABLE 4 (A) :TYPE OF FUEL REQUIRMENT, SOURCE AND MODE OF TRANSPORTATION**

Sr. No.	Name of Raw Material	Existing in MTPA	For Proposed Expansion in MTPA	Total after Expansion	Source	Mode of transportation
1.	Pet coke	0.25	0.63	0.88	Imported pet coke will be transported from Visakhapatnam port to the cement plant by rail/road and indigenous pet coke will be transported by covered trucks by road / rail.	
2.	South African Coal	0.5	1.26	1.76	Import	30 Km by covered Trucks
3.	Washed Coal				Local market -SECL coal from open market	150 Km/ by covered Trucks
4.	HSD/KL	1000 - 1500 KLtr.	1500-2000	2500 - 3000 KLtrs.	HP/ BP/ Reliance	By Road
	FO	90-100 KL	100-150	190-250	HP/ BP/ Reliance	By Road
	LDO	70-75 KL	75-100	145-175	HP/ BP/ Reliance	By Road
5.	Dolachar	0.05	0.08	0.13	Local markets	By Road
6.	Carbon black	0.035	0.05	0.09	Local markets	By Road
7.	Plastic waste	0.005	0.01	0.01	Local markets	By Road
8.	Spent carbon	0.005	0.01	0.01	Local markets	By Road
10.	Bio mass / press mud / wood chips /	0.030	0.05	0.08	Local markets	By Road

### 2.3.1 Solid and Hazardous waste generation

The solid waste generated is stored properly in the designated storage facility, and then based on the property of solid waste it is either sold to CPCB/CECB authorized recyclers or sold in buy back method.

The detail of solid waste and hazardous waste generation are presented in Table 5 (A), Table 5 (B) and Table 5 (C).

**TABLE 5 (A): DETAILS OF HAZARDOUS WASTE GENERATION**

S. No.	Description	Existing Quantity per Annum	Total Quantity after Expansion per Annum	Method of Disposal
1.	Used Oil (in KL)	6.15 KL	10.45 KL	Sold to CPCB /CECB authorized recyclers
2	Grease (in Tonnes)	5.41 MT	8.60 MT	

**TABLE 5 (B): DETAILS OF SOLID WASTE GENERATION**

S. No.	Description	Existing Quantity (MT) per Annum	After Expansion (MT) per Annum	Method of Disposal
1.	Manganese Scrap	18.00	25	Sold to Recyclers
2.	Grinding Media Scrap	1.6	2	Sold to Recyclers
3.	MS Scrap	351	425	Sold to Recyclers
4.	Other Waste	388.5	460	Sold to Recyclers

**TABLE 5 (C): DETAILS OF OTHER WASTES GENERATION (ANNUAL QUANTITIES)**

S. No.	Description	Existing Quantity (Nos.)	After Expansion (Nos.)	Method of Disposal
1	E-Waste (Used Cartridge)	450	600	Sold in buy back Method
2	Battery Waste	35	50	Sold in buy back Method

### 2.4 WATER REQUIREMENT & SOURCE

Existing water requirement for plant and mine is 3295 KLD including 320 KLD for domestic uses. Company has taken permission from WRD, Raipur for use of Shivnath River water (4500 KLD). JKLCL has constructed an anicut as per the conditions of the Chhattisgarh State Government.

Company has also obtained permission from CGWA for ground water abstraction of 320 KLD from existing bore wells and 1860 KLD from mine sump for domestic and Green belt purpose.

Additional water requirement during proposed expansion is 3385 KLD which will be fulfilled through existing water permission (Shivnath River 4500 KLD, Mine Sump 1860 KLD and Ground water 320 KLD; Total 6680 KLD). Hence, no extra water allocation is required during expansion. The sanctioned water quantity is adequate for proposed expansion and no constraint is foreseen.

### 2.5 POWER REQUIREMENT & SUPPLY

Existing power requirement is 31 MW which is fulfilled through 20 MW from CPP and 10 MW from WHRB plant. In addition, existing plant already has 2 x 500 KVA DG sets for emergency power supply which is automatically switch on in case of power failure. It is planned to install additional 2 x 500 KVA DG sets to meet the enhanced demand. Thus, total capacity after expansion will be 4 x 500 KVA. Moreover company has proposed additional 20 MW coal based power plant and 15 MW WHRB under capacity expansion proposal. Thus, total capacity of power generation after expansion will be 65 MW. Besides this, JKLCCL have existing 5 MW Solar Power Plant within plant premises in addition to this the company have also setup 40 MW (open access) solar power plant in Mungeli District of Chhattisgarh. JKLCCL is further planning to install additional 15 MW solar plant based on feasibility to achieve our set target RE-100 towards pledge 100% renewable energy by 2024

## 2.6 MANPOWER REQUIREMENT

The company will provide employment to about 1223 persons (923 existing + 300 proposed). Preference will be given to local people depending upon their qualification and skill.

## 2.7 FIRE FIGHTING FACILITIES

In order to fight with emergency situation due to fire in plant premises, firefighting facilities are provided in various units of the plant. In addition to this, all plant units, office buildings, laboratories, etc. will be provided with adequate number of portable fire extinguishers to be used as first aid fire appliances.

## 2.8 PROJECT COST

The total project cost of the project is 3140 Crores (Existing Cost as on 2023-24 is of Rs. 1540 Crore and Proposed expansion cost is Rs. 1600 Crore)

## 3.0 EXISTING ENVIRONMENTAL SCENARIO

### 3.1 BASELINE ENVIRONMENTAL STUDIES

Baseline environmental studies were conducted at project site along with 10 km radial distance from the project site. The baseline environmental quality data for various components of environment, viz. Air, Noise, Water, and Land were monitored during **Winter Season (1<sup>st</sup> Dec 2023 – 29<sup>th</sup> Feb 2024)**

### 3.2 METEOROLOGY & AMBIENT AIR QUALITY

#### Summary of the Meteorological Data Generated at Site (1<sup>st</sup> Dec 2023 – 29<sup>th</sup> Feb 2024)

Predominant Wind Direction	Period: Winter Season (1 <sup>st</sup> Dec 2023 – 29 <sup>th</sup> Feb 2024)
First Predominant Wind Direction	E (21.47%)
Second Predominant Wind Direction	ENE (19.14%)
Calm conditions (%)	1.60
Avg. Wind Speed (m/s)	2.21

The status of ambient air quality within the study area was monitored for winter season at 8 locations. All these 8 sampling locations were selected based on the meteorological conditions considering upwind and downwind, cross wind directions and reference point. The levels of Respirable Particulate Matter (PM<sub>10</sub>), Fine Particulates (PM<sub>2.5</sub>), Sulphur Dioxide (SO<sub>2</sub>), Oxides of Nitrogen (NO<sub>x</sub>) and carbon monoxide (CO), Ammonia, Ozone, Benzene and

BAP were monitored. The details of Ambient Air Quality Monitoring Results are summarized and given in **Table 7**.

**TABLE 7: SUMMARY OF AMBIENT AIR QUALITY MONITORING RESULTS**

Sr. No.	Location		PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	Ozone	NH <sub>3</sub>
			µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>
1	Project Site	Min	57.5	27.9	9.5	18.1	0.327	6.3	7.9
		Max	83.6	43.0	18.2	28.2	0.426	9.8	12.6
		Avg	70.1	34.4	12.0	22.6	0.375	8.4	10.5
		98 <sup>th</sup>	82.3	42.4	16.6	27.1	0.420	9.7	12.6
2	Khasadih	Min	52.1	21.8	7.7	16.6	0.298	5.9	8.4
		Max	73.1	33.6	14.8	25.8	0.389	9.2	13.4
		Avg	63.2	26.9	9.8	20.7	0.342	7.9	11.2
		98 <sup>th</sup>	72.6	33.1	13.6	24.8	0.384	9.1	13.4
3	Khapri	Min	40.2	16.5	5.3	11.5	0.224	4.6	6.4
		Max	56.4	25.5	9.3	17.9	0.292	7.2	10.3
		Avg	48.8	20.5	6.8	14.4	0.257	6.1	8.6
		98 <sup>th</sup>	56.3	25.1	8.9	17.3	0.288	7.1	10.3
4	Karhidih	Min	49.2	18.6	7.4	13.4	0.219	4.8	6.0
		Max	66.2	27.4	12.9	20.9	0.285	7.6	9.7
		Avg	57.5	22.4	9.4	16.8	0.251	6.5	8.1
		98 <sup>th</sup>	66.0	27.0	12.3	20.1	0.282	7.5	9.7
5	Hingadih	Min	46.3	17.6	6.0	12.6	0.252	4.2	5.6
		Max	61.5	27.6	9.7	19.7	0.328	6.7	9.0
		Avg	53.6	21.5	7.6	15.8	0.289	5.8	7.5
		98 <sup>th</sup>	61.2	26.6	9.6	19.0	0.324	6.6	9.0
6	Deorjhal	Min	43.4	19.8	5.2	14.7	0.234	5.2	6.9
		Max	64.6	28.0	11.5	23.1	0.365	9.8	11.6
		Avg	54.2	23.4	8.3	18.5	0.300	7.7	9.1
		98 <sup>th</sup>	64.5	27.6	11.4	22.8	0.360	9.6	11.3
7	Hardi	Min	42.5	16.6	4.9	14.0	0.189	4.4	5.9
		Max	60.6	23.5	9.0	21.9	0.294	7.8	9.9
		Avg	51.7	19.8	7.1	17.6	0.244	6.3	7.8
		98 <sup>th</sup>	60.5	23.1	9.0	21.6	0.290	7.8	9.6
8	Girhola	Min	47.3	20.5	5.4	12.8	0.217	4.6	6.1
		Max	69.4	29.0	12.0	20.2	0.338	8.7	10.2
		Avg	58.1	24.2	8.7	16.2	0.278	6.8	8.0
		98 <sup>th</sup>	69.2	28.5	11.9	19.9	0.334	8.5	9.9
<b>CPCB Standards</b>			<b>100 (24hr)</b>	<b>60 (24hr)</b>	<b>80 (24hr)</b>	<b>80 (24hr)</b>	<b>2 (8hr)</b>	<b>100 (8hr)</b>	<b>400 (24hr)</b>

From the above results, it is observed that the ambient air quality at all the monitoring locations was within the permissible limits specified by CPCB.

### 3.3 AMBIENT NOISE LEVELS

Site of an area was selected to meet the manmade land use pattern as prescribed in the standard e.g. Industrial, Commercial, Residential and Silence Zone. Eight (8) locations were identified based on the activities in the village area, traffic and sensitive areas like hospitals and schools.

**TABLE 8: SUMMARY OF AMBIENT NOISE LEVEL MONITORING RESULTS**

Sr. No.	Monitoring Locations	Equivalent Noise Level	
		Leq <sub>Day</sub>	Leq <sub>Night</sub>
<b>Residential Area</b>			
1	Girhola	48.3	38.2
2	Khapri	51.7	42.9
<b>CPCB Standards dB(A)</b>		<b>55.0</b>	<b>45.0</b>
<b>Commercial Area</b>			
3	Khasadih	57.6	51.7
4	Malpuri	54.9	48.3
<b>CPCB Standards dB(A)</b>		<b>65.0</b>	<b>55.0</b>
<b>Silence Zone</b>			
5	Pitora	46.1	37.2
6	Karhidih	48.3	38.7
<b>CPCB Standards dB(A)</b>		<b>50.0</b>	<b>40.0</b>
<b>Industrial Area</b>			
7	Project Site-Plant Area	74.1	68.4
8	Project Site-Main Gate	65.4	53.7
<b>CPCB Standards dB(A)</b>		<b>75.0</b>	<b>70.0</b>

Source: Field monitoring and analysis by Anacon Laboratories Pvt. Ltd., Nagpur

### 3.4 SURFACE AND GROUND WATER RESOURCES & QUALITY

#### 3.4.1 Regional Geology

The Limestone and associated formations which are occurring near this village is a part of Chhattisgarh Synclinorium and belonging to Chandi formation of the Raipur Group at Chhattisgarh Supergroup. The limestone deposit is almost horizontally bedded with local dip from 2 to 5 degree towards north. The general strike of the limestone bed is east-west.

The intracratonic Chhattisgarh Basin is crescent-shaped and covers about 33,000 sq km area in Raipur, Durg, Rajnandgaon, Bilaspur and Raigarh District of Chhattisgarh and adjoining parts of Odissa. The basin has a maximum length of about 300km along ENE-WSW direction. The maximum thickness of sediments is estimated to more than 2 km and is epicontinental or stable shelf type.

#### Local Geology:

The Limestone is occurred around village: Semariya, Ghikuria and Nandini-Khundini etc. The Limestone is mostly light grey, purple in colour. It is medium grained, hard compact and massive in nature. The bedding planes are poorly developed. The Limestone breaks easily during blasting along these weak planes. Many old working Limestone mines are present around the area.

The limestone is occurring all over the area. It is a bedded formation striking almost east-west. The general slope of the area about 2° to 3°. Limestone is flaggy in nature predominantly grey/pink in colour, sacchroidal, stromatolitic, fine to medium grained, hard and compact. Deposition of lime stone formation is either due to erosion of gently sinus calcareous from underlain by friable shale or due to original sedimentation of calcareous facies in the discontinuous basins within the Synclinorium. Limestone is found to be associated with inter-

banded calcite veins at plaes. Limestone is a dominant rock in the area, well-exposed as outcrops and also seen in the working pit and nearby limestone mines.

### 3.4.2 Hydrogeology and Aquifer Systems

The ground water in these formations occurs under water table, semi-confined and confined conditions. The weathered, cavernous and fractured part of the formation constitutes the aquifers in the area. These formations are the most potential in regards to ground water yield and development of the district. The weathered zone is restricted to upper 5 m depth and in exceptional cases it is observed up to 10 m. Most of the cavernous zones occur between 10 and 70 m depth and fractures are productive down to 150 to 200m.

### Water Quality

A - Surface Water Quality			B - Groundwater Quality		
Parameters	Unit	Baseline Monitoring Period (1 <sup>st</sup> Dec, 2023 – 29 <sup>th</sup> Feb, 2024)	Parameters	Unit	Baseline Monitoring Period (1 <sup>st</sup> Dec, 2023 – 29 <sup>th</sup> Feb, 2024)
		Range			Range
pH	-	7.23 – 8.12	pH	-	6.85 – 8.25
EC	µs/cm	584.60 – 920.64	EC	µs/cm	782.80 – 1124.88
TDS	mg/l	370 – 548	TDS	mg/l	515 – 654
Total hardness	mg/l	148.77 – 254.39	Total hardness	mg/l	240.48 – 320.84
DO	mg/l	5.7 – 6.5	Chloride	mg/l	104.82 – 162.98
BOD	mg/l	2.35 – 3.51	Sulphate	mg/l	48.24 – 102.73
COD	mg/l	15.11 – 24.15	Nitrate	mg/l	19.54 – 41.34
Chloride	mg/l	91.72 – 154.42	Fluoride	mg/l	0.17 – 0.60
Sulphate	mg/l	37.69 – 97.87	Iron	mg/l	0.14 – 0.26
Nitrate	mg/l	5.19 – 9.62	Cadmium	mg/l	BDL (DL - 0.001)
Fluoride	mg/l	0.21 – 0.69	Arsenic	mg/l	BDL (DL - 0.01)
Iron	mg/l	0.38 – 0.62	Zinc	mg/l	BDL (DL - 0.01) – 0.16
Cadmium	mg/l	BDL (DL - 0.001)	Lead	mg/l	BDL (DL - 0.001)
Arsenic	mg/l	BDL (DL - 0.01)	Chromium	mg/l	BDL (DL - 0.03)
Zinc	mg/l	BDL (DL - 0.1)			
Lead	mg/l	BDL (DL - 0.001)			
Chromium	mg/l	BDL (DL - 0.03)			
Total Coliform	MPN/100 ml	43 – 109			

**BDL:** Below Detectable Limit.

### Location wise Water Quality Assessment

S. N.	Locations	WQI	Quality	Remark
1.0	Project site	66.79	Good	Water quality assessed based upon above physico-chemical parameters and
2.0	Khapri	73.86	Good	
3.0	Sandi	79.31	Good	

S. N.	Locations	WQI	Quality	Remark
4.0	Dumar	74.80	Good	samples were found to be physico-chemically good.
5.0	Pitora	72.32	Good	
6.0	Gorhi	74.49	Good	
7.0	Deorjhal	67.05	Good	
8.0	Semariya	72.16	Good	

### Bacteriological Characteristics

Coliform group of organisms are indicators of faecal contamination in water. All surface water samples were found to be bacteriologically contaminated. Presence of total coliforms in surface water indicates that a contamination pathway exists between any source of bacteria (septic system, animal waste, etc.) and the surface water stream. A defective well can often be the cause when coliform bacteria are found in well water. For surface water, treatment followed by chlorination or disinfection treatment is needed before use for domestic purpose. Groundwater samples were not found to be bacteriologically contaminated.

### 3.5 LAND USE LAND COVER CLASSIFICATION

The land-use & land cover map of the 10 km radial study area from the periphery of project site has been prepared using Resource SAT-1 (IRS-P6), sensor-LISS-3 having 23.5m spatial resolution and date of pass 15th March 2024 satellite image with reference to Google Earth data. In order to strengthen the baseline information on existing land use pattern, the following data covering 10 km radius is approximate about 21°16'55.45"N to 21°27'42.26"N latitude and 81°21'6.47"E to 81°32'46.79"E longitude and elevation 234 to 333 meters are used as per the project site confined within that area.

The Land Cover classes and their coverage are summarized in **Table 9**.

**TABLE 9: LU/LC AND ITS COVERAGE WITHIN 10 KM RADIUS**

LU/LC Classification System				
S. No.	Level-I	Level-II	Area (Sq. Km <sup>2</sup> )	Percentage (%)
1	Built-up land	Settlement	14.89	4.62
		Industrial Settlement	5.68	1.76
		Road Infrastructure	4.95	1.53
		Railway Line	1.85	0.57
2	Agricultural Land/ Crop Land	Single Crop	174.02	53.96
		Double Crop	56.82	17.62
3	Tree Outside Forest (TOF)	Dense (Block) Plantation	2.82	0.87
4	Scrubs/Wastelands	Open Scrub	27.01	8.37
		Wasteland	20.41	6.33
5	Waterbodies	River/Nala/Stream/Canal	4.56	1.41
		Dam/Pond/Lake	7.78	2.41
6	Mines Area	Stone Quarry/Limestone Mines	1.72	0.53
		<b>Total</b>	<b>322.51</b>	<b>100</b>

### 3.6 SOIL QUALITY

The project site and its terrain consist of flat to moderately steep slopes. The terrain is characterized by forest, agricultural land, land, various settlements, waterbody and open

scrub/wasteland. It is also observed that the open scrub area and barren land are dominant in North and North West Portion of the study area. The following observations are as follows:

Parameters	Unit	Results	Fertility Status
pH	-	7.54 – 7.84	Slightly Alkaline to moderately alkaline
Organic Carbon	%	0.65 – 1.26	Average sufficient to more than sufficient
Nitrogen	Kg/hect	140.87 – 350.10	Good to Sufficient
Phosphorus	Kg/hect	24.63 – 64.43	Less to average sufficient
Potassium	Kg/hect	232.72 – 429.44	Medium to more than sufficient
Sodium Absorption Ratio	-	0.95 – 1.48	Excellent (Little or No Hazard)

### 3.7 BIOLOGICAL ENVIRONMENT

No forest was observed within study area. Moreover, the vegetation pattern in the study area belongs to the Sub Group 5 A – Southern Tropical Dry Deciduous Forests as per revised classification of ‘Champion and Seth’. There were no National Park, Wildlife Sanctuary, Biosphere Reserve, Tiger Reserve, migratory corridors, etc. within the 10 km radial distance from the project site.

Details floristic observation has been made by Anacon team. However, the precise study is summarized as follows:

Habit	Trees	Shrubs	Herbs	Grasses	Climbers	Epiphytes	Parasites	Total
Plant Area	40	16	5	5	3	0	1	70
Buffer	63	38	9	11	9	1	1	132

#### RET Status

According to IUCN Status report 2024-1 out of total 136 plant species identified within study area. Among the observed species *Tectona grandis* Linn. (Teak) is Endangered (EN) category. *Aegle marmelos* (L.) and *Swietenia mahagoni* (L.) Jacq. (Indian Mahogany) are Near Threatened (NT) as per IUCN RED list 2024-1. Whereas, remaining species belongs to the Least Concern (LC), Data Deficient (DD) and Not Evaluated (NA), as per latest IUCN status report 2024-1.

#### Endemic Plants of the Study Area

De Candolle (1855) first used the concept of “Endemic”, which is defined as an area of a taxonomic unit, especially species which has a restricted distribution or habitat, isolated from its surrounding region through geographical, ecological or temporal barriers. Among recorded plant species none were assigned the status of endemic plant of this region.

#### Rare and Endangered fauna of the study area

##### ➤ As per IUCN RED (2024-1) list

The IUCN Red List is the world's most comprehensive inventory of the global conservation status of plant and animal species. It uses a set of criteria to evaluate the extinction risk of thousands of species and subspecies. These criteria are relevant to all species and all regions of the world. With its strong scientific base, the IUCN Red List is recognized as the most authoritative guide to the status of biological diversity.

Among the reported animals, all are categorized under least concern category as per IUCN

list except *Varanus bengalensis* (Bengal monitor) which is Near Threatened.

### As per Indian Wild Life (Protection) Amendment Act, 2022

Wild Life (Protection) Amendment Act, 2022, as amended on 20<sup>th</sup> December 2022, is an Act to provide for the protection of wild animals, birds and plants and for matters connected therewith or ancillary or incidental thereto with a view to ensuring the ecological and environmental security of the country. The Wild life (Protection) Amendment Act, 2022 has come into force since 1<sup>st</sup> April 2023.

Among mammals: Jackal (*Canis aureus*), Common Mongoose (*Herpestes edwardsi*), Indian fox (*Vulpes bengalensis*), are protected in Schedule-I. whereas, Common Langur (*Semnopithecus entellus*), Black-naped hare (*Lepus nigricollis*), Palm squirrel (*Funambulus pinnati*) protected in Schedule-II.

Among the Herpetofauna: Indian Monitor lizard (*Varanus bengalensis*), Indian Cobra (*Naja naja*), and Common Rat Snake (*Ptyas mucosa*) were provided protection as per Schedule-I; While Common Indian Krait (*Bungarus caeruleus*), Indian Toad (*Bufo parietalis*) were provided as per Schedule – II of Wildlife protection (Amendment) Act 2022 and as amended.

Among the Avifauna: All of the Avifauna were observed in the study are included in Schedule-II as per wildlife protection (Amendment) Act 2022.

### 3.8 SOCIO-ECONOMIC ENVIRONMENT

Information on socio-demographic status and the trends of the communities in the 10 km radius was collected through primary social survey and secondary data collection from Census data, Govt. Portals, administrative offices and various departments. Details regarding education and infrastructure facilities 2011 are presented in **Table 10(A)**, Predicted population details in study area (2020) are given in **Table 10(B)** & Summary of the socio-economic status of the study area is given in **Table 11**, respectively.

**TABLE 10(A): SUMMARY OF SOCIO-ECONOMIC ENVIRONMENT OF VILLAGES WITHIN 10 KM RADIUS AREA**

No. of villages	59
Total households	17323
Total population	83376
Male Population	41796
Female population	41580
SC Population	19439
ST Population	4696
Total literates	53006
Total Illiterates	30370
Total workers	38845
Total main workers	27850
Total marginal workers	10995
Total non-workers	44531

**Source:** Primary census abstract 2011, District Raipur, State Chhattisgarh.

**TABLE 10(B) : PREDICTED POPULATION DETAILS IN STUDY AREA (2020)**

Zones	Total Population	Total Male	Total Female
0-2 km	2798	1398	1400
2-5km	<b>18426</b>	<b>9215</b>	<b>9211</b>
5-10km	78062	39215	38847
<b>10 km</b>	99286	49828	49458
<b>In %</b>		<b>50.19</b>	<b>49.81</b>

*Source: GeolQ website (<https://geoiq.io/places/Chhattisgarh/zibvgpcXAF>)*

**TABLE 11: IN PERCENTAGE DETAILS REGARDING INFRASTRUCTURE FACILITIES WITHIN 10 KM RADIUS STUDY AREA**

Infrastructure facilities	Availability (In percentage) As per year 2011, Census District – Durg, Chhattisgarh
Educational Facilities	100
Drinking water	100
Road	100
Power	100
Communication	84.09
Transportation	100
Govt. PHC & SC	48.5
Bank & Society	25.45
Drainage	55.73
Recreation	92.64

*Source: Primary census abstract 2011, District Raipur, State Chhattisgarh.*

## 4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

### 4.1 Air Environment

#### Impact on Air Environment

The mathematical Model AERMOD was used for predicting the GLCs, which is entirely in line with the requirement of Central Pollution Control Board, New Delhi. In 1991, the U.S. Environmental Protection Agency (EPA) in conjunction with the American Meteorological Society (AMS) formed the AERMOD. AERMOD is a steady-state plume model aimed at short-range (up to 50 km) dispersion from stationary industrial-type sources.

#### Model Prediction

The model simulations are done for the air pollutants due to existing and proposed project. The maximum ground level concentrations (GLCs) for particulate matter and gaseous emission of SO<sub>2</sub>, NO<sub>x</sub> due to existing project has been carried out using hourly meteorological data for various scenarios as

#### PREDICTED INCREMENTAL GROUND LEVEL CONCENTRATIONS

Pollutant	Baseline Concentration at Project Site (µg/m <sup>3</sup> )	Incremental Concentration (µg/m <sup>3</sup> )	Resultant Concentration (µg/m <sup>3</sup> )	NAAQ Standards (µg/m <sup>3</sup> )
PM <sub>10</sub>	83.6	1.80	85.40	100
PM <sub>2.5</sub>	43	0.59	43.59	60

Pollutant	Baseline Concentration at Project Site ( $\mu\text{g}/\text{m}^3$ )	Incremental Concentration ( $\mu\text{g}/\text{m}^3$ )	Resultant Concentration ( $\mu\text{g}/\text{m}^3$ )	NAAQ Standards ( $\mu\text{g}/\text{m}^3$ )
SO <sub>2</sub>	18.2	2.80	21.00	80
NO <sub>x</sub>	28.2	15.20	43.40	80

### DETAILS OF AIR POLLUTION CONTROL SYSTEM/MITIGATION MEASURES

Sl. No.	Stack attached to	APC System
1	Raw Mill (RABH)	Bag House
2	Clinker Cooler	Electrostatic Precipitator (ESP)
3	Coal Mill	Bag House
4	Cement Mill – 1	Bag House
5	Cement Mill – 2	Bag House
6	Slag Mill	Bag House
7	CPP	Electrostatic Precipitator (ESP)
8	Mine Crusher	Bag House

#### Additional Measures to reduce/control pollution control

The following mitigation measures are in order to prevent any planned / unplanned impacts on air quality:

- Adequate pollution control equipment's are already installed in existing plant and all pollution control equipment shall be designed to meet out standard i.e. less than 30 mg/Nm<sup>3</sup> based on dust on dry basis. Covered sheds/Silos are already provided for raw materials and finished goods products.
- The site specific mitigation measures are already in place and it will be strengthened further after proposed expansion. The details are as under:
- Stacks at various points with adequate height for dispersion of gaseous emissions shall be provided.
- Online emission monitors will be provided for major stacks.
- The guideline issued by CPCB on measures for controlling of source and fugitive emission in cement plant will be followed.
- The stack emission control system will be regularly monitored and maintained.
- Better process control will be also help to keep the emission within the limit.
- Regular monitoring of air pollution concentrations.
- Silo for clinker storage, fly ash, cement and wind breakage wall for storage of gypsum.
- Roads are frequently sprinkled with water. Water sprinkling system shall be provided at the limestone crushing system.
- Transportation of clinker-to-clinker silo will be done through covered conveyor to prevent fugitive emission.
- Fly ash transportation will be done transported by closed tankers.
- Dust collected from air pollution control equipment's will be done being totally recycled in the process.

- Preventive maintenance of valves, flanges, joints, roof vents of storage vessels in practice. The fugitive dust emissions are controlled by installation of closed conveyor system along with suitable dust suppression measures.
- Regular maintenance of vehicles and machineries are carried out in order to control emissions.
- Greenbelt will be done developed all around the periphery of the plant to arrest the fugitive emissions.
- Roads and floors inside the plant will be done cleaned by vacuum sweeping machine.

In order to control the fugitive dust emissions due to transportation activity, major roads within the plant area will be asphalted. The road nearby the fly ash silo shall also be asphalted.

The modern set ups including scrubbers, de-dusting and bag filters for combating fugitive emissions and particulate matter have been installed in the respective processes.

#### **4.2 Noise Impacts**

The ambient noise level (day time and night time) will remain within the permissible limits after the proposed project activity at all locations. To reduce the impact of noise level, a three-tier greenbelt will be proposed around the plant boundary. The Noise mitigation measure should be adopted at project site to attenuate noise levels to safe limits

#### **Mitigation Measures**

1. Labor camp should be located away from the construction site.
2. Equipment should be standard and equipped with silencer. The equipment should be in good working conditions, properly lubricated and maintained to keep noise within permissible limits.
3. High noise zone should be marked and earplugs shall be provided to the workmen near high noise producing equipment. The workmen should be made aware of noise and vibration impacts on their health and mandatory use earplugs.
4. Proper shifting arrangement shall be made to prevent over exposure to noise and vibration.
5. Tall trees with heavy foliage shall be planted along the boundary of camp / project site / plantation area, which will act as a natural barrier to propagating noise.
6. Silent DG sets shall be used at construction camp / project site.
7. Provision of acoustic enclosures at all major noise generating equipment.
8. Speed limits shall be enforced on vehicle.
9. Use of PUC certified vehicle.
10. Use of horns / sirens shall be prohibited.
11. Use of loud speakers shall comply with the regulations set forth by CPCB.

Regular noise monitoring shall be carried at construction camp / project site to check compliance with prevailing rules.

#### **4.3 Impact on Water Environment**

The cement manufacturing process is not water intensive unit and manufacturing process does not require water and water being used in cooling towers and other utilities.

In conventional cement plant, water is used to meet the following basic consumptive requirements:

- I. Cooling water requirement.
- II. Process requirements.
- III. To meet miscellaneous requirements such as Firefighting, General services like floor washing and other services, Dust extraction and dust suppression in the RM yard, Potable use (for Power Station and township), Horticulture and afforestation.

### **Waste water generation & management plan**

The wastewater generation from the proposed plant will be 598 KLD. Industry is reusing the treated effluent in order to reduce the fresh water requirement. The industrial effluent will be treated in proposed treatment plant. The industry shall reuse the treated effluent in order to reduce the fresh water requirement.

### **Mitigating Measures**

- Water conservation plan will be carried out by recycling and reuse of treated domestic waste water in gardening, dust suppression which will reduce the fresh water demand.
- Closed circuit circulation system will be followed.
- Rain water harvesting shall be done to increase the water table of the area.
- All stock piles will be on pucca flooring to prevent for any ground water contamination.
- No effluent generation from process. Blow down from CPP will be neutralization and will used for ancillary purpose within the plant.
- Regular monitoring of water quantity will be done.
- Proper spill control measures for stored chemicals, raw material is / will be done.
- Provision of daily inspections on each site and provision of checking of general housekeeping on a daily or weekly basis.

### **4.4 Impact on Biological Environment**

There is no ecological sensitive area like national park, sanctuary, biosphere reserve, within 10 km radial distance from the project site. No forest land involved in the project activities. Thus, no significant impact envisaged on biological environment.

A greenbelt in an around 78.00 Ha (38.95%) area already planted which will be sustained local species with broad leaves and higher canopy. The ever green and native plants will be selected for the purposed of green belt.

### **4.5 Impact on Socio-economic environment**

#### **➤ Positive Impacts**

- During Construction phase, the expansion project will create numerous temporary jobs in construction, engineering, and support services, benefiting local workers.
- Post-Construction, long-term employment opportunities will increase in the cement plant operations, maintenance, and administration.
- Increased demand for local goods and services will stimulate the local economy, benefiting businesses in the vicinity.

- Local suppliers and contractors will benefit from increased business opportunities related to the plant's expansion.
- Higher tax revenues from increased economic activity can enhance local government resources, supporting public services and infrastructure development.
- Job creation and economic growth will lead to higher household incomes, improving the overall standard of living in the area.
- Potential investment in community facilities, such as schools, healthcare centers, and recreational areas, as part of corporate social responsibility (CSR) initiatives.
- The company may offer training programs to enhance the skills of the local workforce, increasing employability and career development opportunities.

➤ **Negative Impacts**

**Economic Drawbacks**

- Increased economic activity could lead to higher prices for goods and services, making it difficult for low-income households to afford basic necessities.

**Displacement of Local Businesses**

- Local small businesses might struggle to compete with larger suppliers and service providers associated with the cement plant.

**Social Drawbacks**

- Influx of workers and their families may strain local housing, leading to overcrowded living conditions and increased demand for housing.
- The influx of new populations can alter the social fabric of the local communities, potentially leading to social tensions.

**Health Impacts**

- Dust and emissions from the cement plant can degrade air quality, leading to respiratory problems such as asthma, bronchitis, and other chronic respiratory diseases.
- Potential contamination of local water sources from industrial runoff can lead to waterborne diseases and other health issues.
- Elevated noise levels from construction and plant operations can cause hearing loss, sleep disturbances, and increased stress levels.
- Long-term exposure to pollutants can increase the overall morbidity rates in the local population, impacting general health and wellbeing.

➤ **Mitigation Measures**

**Economic Mitigations**

- Implement subsidies for essential goods and services to help mitigate the impact of inflation on low-income households.
- Provide grants and training programs to help local businesses compete and thrive alongside larger suppliers.

### **Social Mitigations**

- Develop affordable housing projects to accommodate the influx of workers and their families.
- Invest in upgrading local infrastructure, including roads, water supply, and sanitation facilities, to support the growing population.
- Initiate community programs to foster social cohesion and address potential social tensions.

### **Health Mitigations**

- Air Quality Management by installing advanced pollution control technologies, such as electrostatic precipitators and bag filters, to minimize dust and emissions.
- Water Treatment Systems to ensure proper treatment of industrial wastewater to prevent contamination of local water sources.
- Conduct regular health check-up camps for local residents to monitor and address any emerging health issues.
- Enhance local healthcare facilities to provide better medical care and respond effectively to health emergencies.
- Install sound barriers and use noise-reducing machinery to minimize noise pollution from the plant.
- Implement strict operational timings to reduce noise pollution during night hours.

## **5.0 ANALYSIS OF ALTERNATIVES (SITE AND TECHNOLOGY)**

### **5.1 Site Selection**

Presently the integrated cement plant is in 200.26 Ha. land area. Out of this 17.68 Ha. land is for pipe conveyor belt from Limestone mine to Plant and 5.0 Ha. land identified for the proposed project. At present transportation of Limestone from captive mines is being done through covered Trucks. As construction work of closed pipe conveyor is not completed due to nearly 372 mtr piece of land is still to be acquired from SAIL + BSP. (Total length of closed pipe conveyor is 5.5 Km out of which 92% i.e 5.090 KM has been already completed). Lime stone will be transported by road till commissioning of closed pipe conveyor.

Hence site is already selected by project proponent and no alternative site is required. JKLCL has adequate land area for proposed expansion and hence expansion is proposed within existing land area. No additional land is required.

### **5.2 Selection of Alternative Technology**

Three technologies available for manufacture of cement are:

1. Dry process
2. Semi dry process
3. Wet process

All the three processes vary in the manufacturing process up to clinkerisation stage.

The existing plant is based on dry process technology which is single string - 5 stages preheater with inline calciner. The proposed plant will be based on dry manufacturing technology with single/double string – 5/6 stages pre-heater with inline/separate line pre-calciner.

## **6.0 ENVIRONMENTAL MONITORING PROGRAM**

An Environment Management Cell (EMC) is already functional at M/s. JK Lakshmi Cement Limited, Durg for its operational existing unit under the overall control of Board of Directors. G.M. (Head of Department) which will be directly reporting to board of Directors. The Environmental Manager having adequate qualification and experience in the field of environmental management.

Environment Management Department along with a well-equipped laboratory is already functional at M/s. JK Lakshmi Cement Limited, Durg for its operational existing unit. The department is having qualified Environmental Managers and experienced chemists/ staff for the environmental laboratory to cater the routine monitoring requirement and the same will be extended for the proposed expansion.

In addition to the above as the proposed project comes into operation, NABL/MoEFCC accredited lab (Third party) will engage to monitor all the environmental components as per CPCB/CECB norms.

## **7.0 ADDITIONAL STUDIES**

### **7.1 PUBLIC CONSULTATION**

The Draft EIA-EMP report for expansion activities of M/s. JK Lakshmi Cement Ltd. is prepared as per the TOR issued by EAC (Industry -1) and the report is submitted for public consultation process as per the provisions of EIA Notification 2006 and amendments thereof.

After completing the public consultation process, the points raised and commitment of project proponent during the public hearing will be incorporated in the final EIA-EMP report for final submission to Environmental Clearance.

### **7.2 RISK ASSESSMENT & DISASTER MANAGEMENT PLAN**

The assessment of risk in the proposed expansion project has been estimated for material handling, movement of Trucks/Tippers, Dust hazards, Hazards, shock hazards, etc. and corresponding mitigation measures are suggested in the EIA-EMP report.

Hazard analysis involves the identification and quantification of the various hazards (unsafe conditions) that exist in the project site. On the other hand, risk analysis deals with the identification and quantification of risks occurring due to the plant equipment and personnel exposed, due to accident resulting from the hazards in the plant. The occupational and safety hazards and preventive measures, process hazards and their preventive measures, and storage hazards and preventing measures are provided in details in Chapter 7 of the EIA report.

The main objective of the risk assessment study is to determine damage due to major hazards having damage potential to life and property and provide a scientific basis to assess safety level of the facility. The secondary objective is to identify major risk in manufacturing process, operation, occupation and provide control through assessment and also to prepare on-site, off site plans to control hazards.

## 8.0 PROJECT BENEFITS

### Proposed Social Welfare Arrangement

M/s. JK Lakshmi Cement Ltd. support social welfare activities under CSR obligation under companies act.

The Social welfare/CSR activities will aim at strengthening the bond between the project authorities and the local population in the vicinity of project area. The proposed expansion (additional) cost of the project is Rs. 1600 Crores. Rs. 500 lakhs will be spent towards the Improvement of Socio – economic Environment. M/s JKLCL as per CSR policy is being and will carry community welfare activities in the following areas:

- Community development
- Health & medical care
- Roads
- Education
- Drainage and sanitation
- Drinking water supply occasionally in the event of water scarcity through tankers, etc.

The project benefits also entail revenue earnings to national and state exchequer through Gross GST, road tax, income by registration of trucks & trailers, income tax, corporate tax, etc.

Fully compliance of Corporate Responsibility for Environmental Protection (CREP) for Cement industry.

Thus, result in –

- ✓ Periodic Monitoring Low emissions,
- ✓ Water conservation, recycle of treated wastewater,
- ✓ Solid waste management
- ✓ Thereby protection of environment and also result in low cost of production

## 9.0 ENVIRONMENTAL MANAGEMENT PLAN

An Environmental Management Plan comprising following set of mitigation, management, monitoring and institutional measures to be taken during implementation and operation of the project, to eliminate adverse environmental impacts or reduce them to acceptable levels.

- Overall conservation of environment.
- Minimization of natural resources and water.
- Ensure effective operation of all control measures.
- Monitoring of cumulative and longtime impacts.
- Ensure effective operation of all control measures.
- Control of waste generation and pollution.

The total project cost is of Rs. 3140 Crores (Existing Cost as on 2023-24 is of Rs. 1540 Crore and Proposed expansion cost is Rs. 1600 Crore). Thus, EMP cost towards Capital cost of EMP of Rs. 305 Crores (Existing EMP Cost Rs. 140 Cr. + Proposed EMP Cost Rs. 165 Cr.) is proposed and recurring cost will be Rs. 4.1 Crores/Annum.

## 10.0 CONCLUSION

The proposed expansion project of M/s. JK Lakshmi Cement Ltd. will be beneficial for the overall development of the nearby villages. Some environmental aspects like dust emission, noise, wastewater, traffic density, etc. will have to be controlled better than the permissible norms to avoid impacts on the surrounding environment. Necessary pollution control equipment like Bag House, Electrostatic Precipitator (ESP), water sprinklers, enclosures, etc. are integral part of the plant infrastructure.

JKLCL have obtained approval for railway siding adjoining the cement plant which is operational from Dt.1 April' 2024 onwards. Raw materials and dispatch of products will be carried out through this rail line. Thus due to implementation of this rail siding nearly 70 % of transportation by trucks of raw materials and products will be reduced. JKLCL is aiming for full operationalization of rail siding by Aug' 24 end. Thus the predicted pollutants will also be reduced proportionately. Additionally JKLCL team is also aiming for implementation of Closed Pipe Conveyor from mines to plant, thereby reducing the pollutants further.

Besides this, additional pollution control measures and environmental conservation measures will be adopted to control/minimize impacts on the environment and socio-economic environment of the area. Measures like development of green belt and plantation in nearby village and along transport road, adoption of rainwater harvesting/recharging in the plant and in nearby villages will be carried out. The proposed CSR/CER activities to be initiated by the industry will be helpful to improve the social, economic and infrastructure availability status of the nearby villages.

Thus, it can be concluded that with the judicious and proper implementation of the pollution control and mitigation measures, the proposed expansion project will not add adverse pollution levels to the environment, moreover, it will be beneficial to the society and will help to reduce the demand-supply gap of steel to some extent and will contribute to the economic development of the region and thereby the country.

## 11.0 DISCLOSURE OF CONSULTANTS

The Environmental studies for proposed expansion project of M/s. JK Lakshmi Cement Limited (JKLCL) have been carried out by M/s. Anacon Laboratories Pvt. Ltd., Nagpur (M/s. ALPL). Anacon established in 1993 as an analytical testing laboratory and now a leading Environmental Consultancy company backed by testing lab for environment and food in Central India region. M/s. ALPL is a group of experienced former Scientists from the Government Institutions and excellent young scientist of brilliant career with subject expertise. It is recognized by Ministry of Environment & Forests, New Delhi for carrying out environmental Studies & accredited by Quality Council of India (QCI) for conducting Environmental studies having Accreditation Certificate No.: **NABET/EIA/23-26/RA 0304\_Rev. 01** dtd. 13 March, 2024 valid till Sept 29, 2026.