

## EXECUTIVE SUMMARY

OF

**“Expansion of Integrated Cement (Clinker: 8.1 MTPA to 16.1 MTPA, Cement: 6.5 MTPA to 16.5 MTPA, WHRS: 43 MW to 85 MW & CPP: 63 MW to 123 MW) by Installation of Line- IV & Line-V ”**

AT

**Village: Rawan, Tehsil: Baloda Bazar, District: Baloda Bazar- Bhatapara, Chhattisgarh**

**Total Existing Area (Line I + Line II + Line III): 238.97 ha**

**Proposed Area (Line IV + Line V): nil**

**Total Area after proposed expansion (Line I + Line II + Line III + Line IV + Line V): 238.97 ha**

**Total Existing Capacity (Line I + Line II + Line III): Clinker 8.1 MTPA, Cement: 6.5 MTPA, WHRS: 43 MW & CPP: 63 MW**

**Total Proposed Capacity (Line IV + Line V): Clinker 8 MTPA, Cement: 10 MTPA, WHRS: 42 MW & CPP: 60 MW**

**Total Capacity after proposed expansion (Line I + Line II + Line III + Line IV + Line V): Clinker 16.1 MTPA, Cement: 16.5 MTPA, WHRS: 85 MW & CPP: 123 MW  
Schedule – 3(b) Category ‘A’**

**Total Existing Cost (Line I + Line II + Line III): Rs. 4536.79 Cr.**

**Total Proposed Cost (Line IV + Line V): Rs. 5890 Cr.**

**Total Cost after proposed expansion (Line I + Line II + Line III + Line IV + Line V): Rs. 10,426.79 Cr.**

**Reference: TOR issued vide identification no. TO24A1101CG5595808N, File No. IA-J-11011/355/2005-IA-II(IND-I) dated 29/05/2024**

### PROJECT PROPONENT

**M/s Ambuja Cements Limited (Unit: Bhatapara)**

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### ENVIRONMENTAL CONSULTANT

**M/s Perfect Enviro Solutions Pvt. Ltd.**

**(NABET Registered vide list of accredited consultants organizations/ (NABET/EIA/2225/RA 0284 (Rev 01))**

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# 1. Executive Summary

## 1.1. Introduction

M/s Ambuja Cements Ltd. (Unit: Bhatapara) is proposing an Expansion of Integrated Cement Plant i.e. (Clinker: 8.1 MTPA to 16.1 MTPA, Cement 6.5 MTPA to 16.5 MTPA, Waste Heat Recovery System (WHRS): 43 MW to 85 MW and Captive Power Plant (CPP): 63 MW to 123 MW) at Village: Rawan, Tehsil: Bhatapara, District: Baloda Bazar, Chhattisgarh.

Since the unit is for Expansion of Integrated Cement Plant i.e. (Clinker: 8.1 MTPA to 16.1 MTPA, Cement 6.5 MTPA to 16.5 MTPA, Waste Heat Recovery System (WHRS): 43 MW to 85 MW and Captive Power Plant (CPP): 63 MW to 123 MW) the project falls under Category “A” Major Activity ‘3(b)’ Cement Plants. Also as CPP is involved hence, the project falls under minor activity ‘1(d)’ Thermal Power plant as per EIA Notification dated 14th September, 2006 and its amended thereof. It has been made mandatory to obtain environmental clearance for all Cement Plants and the project lies under Item 3(b), Category A as per EIA Notification 2006 and its subsequent amendments. the project falls under Category “A” (As per EIA Notification dated 14th Sept., 2006 and as amended from time to time).

Terms of Reference (TOR) for the proposed project has been granted by the Ministry of Environment, Forest and Climate Change (MoEF&CC) vide identification no. TO24A1101CG5595808N, File No. IA-J-11011/355/2005-IA-II(IND-I) dated 29th May 2024.

### 1.1.1. About the Project

The proposed project is an “Expansion of Integrated Cement (Clinker: 8.1 MTPA to 16.1 MTPA, Cement: 6.5 MTPA to 16.5 MTPA, WHRS: 43 MW to 85 MW & CPP: 63 MW to 123 MW) by Installation of Line- IV & Line-V”, hence it falls under Category “A”, Major Activity ‘3(b)’ Cement Plants. Also as CPP is involved hence, the project falls under minor activity ‘1(d)’ Thermal Power plant, over a total area of 238.97 ha.

For the existing unit, Line-I has been in operation for production of clinker & Cement since 1985 based on CTO granted vide letter no 1865/MPPNM/BPL for capacity 0.9 MTPA and it was further expanded to 1.2 MTPA capacity vide letter no. 21726/TS/EZ/Raipur/MPPCB/95 & 21728/TS/EZ/Raipur/MPPCB/95 valid from 01.08.1988. CPP of 15 MW was in operation since 2005 as per the CTO granted vide letter no. 1791/TS/CECB/2005. Afterwards renewal of CTOs were taken regularly.

1st EC was granted vide letter no. J-11011/289/2005 -IA - II(I) dated 06.01.2006 for expansion of the unit for line-I cement from 1.2 MTPA to 1.8 MTPA (Clinker line-I -1.7

Expansion of Integrated Cement (Clinker: 8.1 MTPA to 16.1 MTPA, Cement: 6.5 MTPA to 16.5 MTPA, WHRS: 43 MW to 85 MW & CPP: 63 MW to 123 MW) by Installation of Line- IV & Line-V at Village: Rawan, Tehsil: Balodabazar, District: Balodabazar-Bhatapara, State: Chhattisgarh by M/s Ambuja Cements Limited (Unit: Bhatapara)

MTPA). Further, 2nd EC was taken for expansion of the unit by installation of new Clinker production unit (line-II) of 2.72 MTPA along with CPP of 33 MW & 15 MW in 2007 vide J-11011/355/2005-IA- II(I) (Cement line-I capacity remains the same). Further, 3rd EC was taken for expansion of the unit for cement capacity from 1.8 MTPA to 2.4 MTPA (Line-I) in 2008 vide J-11011/539/2008 -IA - II(I). Afterwards CTOs were taken regularly.

Further, 4th EC was granted for installation of Line II of cement of 1.1 MTPA (resulting in the total capacity of cement expanded from 2.4 MTPA to 3.5 MTPA) vide letter no. J-11011/72/2009 - IA- II (I) dated 15.05.2009. Further amendment in EC was taken for explanation of stage wise expansion done till date for cement production vide letter no. J-1101/72/2009-IA-II(I) dated 13.05.2011. Afterwards CTOs were taken regularly.

Further, 5th EC was granted for expansion of the unit by optimization in Line II of existing clinker capacity of 2.72 to 3.1 MTPA (resulting in the total capacity of clinker expanded from 4.42 MTPA to 4.8 MTPA), vide letter no. J-11011/355/2005 - IA- II (I) dated 25.01.2016. Afterwards CTOs were taken regularly.

Further, 6th EC was granted for expansion of the unit by installation of line-III and capacity expanded for clinker 4.8 MTPA to 8.1 MTPA, cement 3.5 MTPA to 6.5 MTPA, WHRS 18 MW to 43 MW vide letter no. J-11011/355/2005-IA.II (I) dated 31.10.2022. CTE for Line III has been obtained vide letter no. 02/TS/CECB/2023 dated 03.04.2023 valid till 31.03.2028 and the same is under construction.

Since inception of the unit, the production has been done well within the capacity granted as per CTE/CTO/EC and no violation has occurred. The unit is currently operating as per valid Combined CTO (Renewal) granted by Chhattisgarh Pollution Control Board having Clinker- (Line-I and Line-II)- 4.8 MTPA (Line I – 1.7 MTPA and Line II – 3.1 MTPA), Cement 3.5 MTPA ((Line I – 2.4 MTPA and Line II – 1.1 MTPA), WHR Based Power Plant- 18 MW, Maximum Petcoke Quantity / Year- 1,94,766 MT, CPP- 15 MW and 33 MW (Total 48 MW), CPP Based on Biomass (Agro residues – Rice Husk) and Coal- 15 MW, Power Generation By D.G. Set- 4 MW vide letter no. 91/TS/CECB/2024 dated 02.04.24 valid till 31.01.25..

Now, further expansion of the unit by addition of line IV & V is proposed for which TOR has been granted and EIA is being submitted.

### **1.1.2. Location & Accessibility**

The proposed project is located at Village: Rawan, Tehsil: Balodabazar, District: Balodabazar-Bhatapara, State: Chhattisgarh. The minimum elevation of the project site is 255 m AMSL whereas the maximum elevation is 260 m AMSL of the project site.

The site is well connected to SH 10 which is adjacent to the project site in NE direction from the project site. Nearest Railway Station is Bhatapara Railway Station which is at 14.16 Km, WNW of the project site and nearest Airport is Swami Vivekananda Airport, Raipur which is at 63.78 Km SSW of the project site.

## 1.2. Project Description

S.No.	Particulars	Existing-As per EC for exp. granted dated 31.10.2022			Proposed	Total
		Line-I + Line-II	Line-III	Total (Line I + Line II + Line III) - A	Line IV + Line V- B	Line I + Line II + Line III + Line IV + Line V-C= A+B
1	<b>General Information</b>					
1a.	S.No. in the Schedule & Project Sector	3(b), Cement Plant				
1b.	Category of the Project	A				
1c.	Specific/General Condition applicable	No				
1d.	Proposed Site/Land Details	Plot Area- 238.97 ha				
1e.	Details if project falls under the purview of a)FCA, 1980, b) WPA,1972 c) CRZ,2011	No				
1f.	CPA/SPA/ESA/ESZ, if any	No				
1g.	Interlinked Project, if any, with Status	No				
1h.	No. of shift	3				
1i.	No. of working days in a year	330				
1j.	Cost of the Project	2536.79	2,000	4536.79	5,890	10,426.79
1k.	EMP cost in Cr	68.72	172	240.72	580	820.72
1l.	Total manpower	1,474 (417 permanent, 1057 contractual)			400 (100 permanent, 300 contractual)	1,874 (517 permanent, 1357 contractual)
1m.	GreenBelt Area	83.1 ha (34.8 % of the project area)			0	83.1 ha (34.8 % of the project area)
2	<b>Production Details</b>					
2a.	Clinker Plant, MTPA	4.8	3.3	8.1	8 (Line IV- 4, Line V- 4)	16.1
2b.	Cement Plant, MTPA [OPC, PPC, PSC & Composite Cement]	3.5	3	6.5	10 (Line IV- 5, Line V- 5)	16.5
2c.	Waste Heat Recovery Boiler, MW	18.0	25	43	42 (Line IV-21, Line V- 21)	85
2d.	Captive Power Plant, MW	63.0	0	63	60 (Line IV- 30, Line V- 30)	123

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3						
Power requirement, Source & fuel						
3a.	Power Load ( MW)	60	43	103	102	205
3b.	Power Source	Chhattisgarh State Electricity Board (CSEB), WHRS, CPP				
3c.	Capacity of D.G. Sets	4 MW	Nil	4 MW	3.7 MW	7.7
3d.	Fuel Type & Quantity for DG Sets in kVA	400l/hr	Nil	400l/hr	370 U/hr	770l/hr
3e.	Capacity of WHRB	18	25	43	42 (Line IV-21, Line V- 21)	85
3f.	Capacity of CPP	63 (2 x 15 & 1 x 33)	0.0	63 (2 x 15 & 1 x 33)	60 (Line IV- 30, Line V- 30)	123
3g.	Total Fuel for CPP & Plant- Coal/Petcoke/ Biomass with 20% blending (Agro residues - Rice Husk)	0.596 MTPA	0.432 MTPA	1.028 MTPA	1.0126 MTPA	1.699 MTPA
4						
Air Emission Management						
4a.	Stack height for utility stacks	Stack height of 25 m from ground level for DG set 4MW	-	Stack height of 25 m from ground level for DG set 4MW	Stack height of 30 m from ground level each for DG set of 2 x 1100 kVA & 4.5 m above roof level each for 3 x 500 kVA	Stack height of 25 m from ground level for DG set 4MW, 30 m from ground level each for DG set of 2 x 1100 kVA & 4.5 m above roof level each for 3 x 500 kVA
4b.	Number of stacks & APCS for process stacks	2 no. of RABH & bag house (Raw Mill and Kiln 1 & 2 ), 2 no. of Bag House (Coal mill 1 & 2), 3 no. of ESP (Clinker cooler 1 & 2), 3 no. of Hybrid Bag House & Bag House (Cement mill 1,2 &3), 18 no. of ESP & Bag Filter for each (CPP)	1 no. of RABH & bag house (Raw mill and Kiln 3), 1 no. of Bag House(coal/Pet coke Mill 3), 1 no. of ESP (Clinker Cooler 3), 3 no. of Hybrid Bag House & Bag House (Cement mill 4,5,6)	3 no. of RABH & bag house (Raw Mill and Kiln 1, 2 & 3 ), 3 no. of Bag House (Coal mill 1, 2,3), 4 no. of ESP (Clinker cooler 1, 2, 3), 6 no. of Hybrid Bag House & Bag House (Cement mill 1,2 , 3,4,5,6), 18 no. of ESP & Bag Filter for each (CPP)	2 no. RABH & bag house (Raw Mill and Kiln 4,5), 2 no. of Bag House for each (Coal Mill 4,5), 2 no. ESP (Clinker cooler 4,5), 4 no. of Hybrid Bag House & Bag House (Cement Mill 7, 8,9,10), ESP & Bag Filter (CPP)	5 no. of RABH & bag house (Raw Mill and Kiln 1, 2, 3,4,5 ), 5 no. of Bag House (Coal mill 1, 2,3,4,5), 6 no. of ESP (Clinker cooler 1, 2, 3,4,5), 10 no. of Hybrid Bag House & Bag House (Cement mill 1,2 , 3,4,5,6,7,8,9,10), 18 no. of ESP & Bag Filter for each (CPP)

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<b>5 Water Requirement &amp; Waste Water Generation</b>				
5a.	Total Water Requirement in KLD	<b>7,544</b>	<b>3,800</b>	<b>11,344</b>
5b.	Fresh Water Requirement & Source in KLD	<b>6852</b>	<b>3602</b>	<b>10454</b>
5c.	Source of fresh water	Groundwater for domestic activities & mine pits for industrial activities (NOC from CGWA has been granted from CGWA vide letter no. 21-4(117)/NCCR/CGWA/2011-762 dated 05.09.2019 and was valid till 25.07.2024 and renewal of the same has been applied vide letter no. 21-4/17/CT/MIN/2011 dated 24/07/2024)		
5d.	Treated Water Requirement & Source in KLD	From ETP cum RO- 435 From STP- 257	From ETP cum RO- 130 From STP- 68	From ETP cum RO- 565 From STP- 325
5e.	Waste water generation in KLD	<b>728</b>	<b>209</b>	<b>937</b>
5f.	STP capacity	<b>2 x 25 KLD and 1 x 500 KLD based on FAB technology</b>		
5g.	Waste Water Discharge in KLD	0		
<b>6 Waste Generation</b>				

6a.	Hazardous waste, Used oil	<ul style="list-style-type: none"> <li>• <b>Used or Spent Oil-</b> 15.00 KLPA-will be sold to CPCB registered Recycler</li> <li>• <b>Contaminated processing. cotton rags or other cleaning materials-</b>0.20 MTPA-used in Kiln as co- Contaminated processing</li> <li>• <b>Empty barrels/containers/liners contaminated with hazardous chemicals /wastes-</b> 100.00 no./annum- sold to CPCB registered recycler</li> <li>• <b>Lead acid battery plates and other lead scrap/ashes/residues not covered under Batteries (Management and Handling) Rules, 2001-</b> 0.02 MTPA- sold to CPCB registered recycler</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Used or Spent Oil-</b> 10.00 KLPA-will be sold to CPCB registered Recycler</li> <li>• <b>Contaminated processing. cotton rags or other cleaning materials-</b>0.100 MTPA-used in Kiln as co- Contaminated processing</li> <li>• <b>Empty barrels/containers/liners contaminated with hazardous chemicals /wastes-</b> 70.00 no./annum- sold to CPCB registered recycler</li> <li>• <b>Lead acid battery plates and other lead scrap/ashes/residues not covered under Batteries (Management and Handling) Rules, 2001-</b> 0.01 MTPA- sold to CPCB registered recycler</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Used or Spent Oil-</b> 25.00 KLPA-will be sold to CPCB registered Recycler</li> <li>• <b>Contaminated processing. cotton rags or other cleaning materials-</b>0.30 MTPA-used in Kiln as co- Contaminated processing</li> <li>• <b>Empty barrels/containers/liners contaminated with hazardous chemicals /wastes-</b> 170.00 no./annum- sold to CPCB registered recycler</li> <li>• <b>Lead acid battery plates and other lead scrap/ashes/residues not covered under Batteries (Management and Handling) Rules, 2001-</b> 0.03 MTPA- sold to CPCB registered recycler</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Used or Spent Oil-</b> 20.00 KLPA-will be sold to CPCB registered Recycler</li> <li>• <b>Contaminated processing. cotton rags or other cleaning materials-</b>0.27 MTPA-used in Kiln as co- Contaminated processing</li> <li>• <b>Empty barrels/containers/liners contaminated with hazardous chemicals /wastes-</b> 180.00 no./annum- sold to CPCB registered recycler</li> <li>• <b>Lead acid battery plates and other lead scrap/ashes/residues not covered under Batteries (Management and Handling) Rules, 2001-</b> 0.027 MTPA- sold to CPCB registered recycler</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Used or Spent Oil-</b> 45.00 KLPA-will be sold to CPCB registered Recycler</li> <li>• <b>Contaminated processing. cotton rags or other cleaning materials-</b>0.57 MTPA-used in Kiln as co- Contaminated processing</li> <li>• <b>Empty barrels/containers/liners contaminated with hazardous chemicals /wastes-</b> 350.00 no./annum- sold to CPCB registered recycler</li> <li>• <b>Lead acid battery plates and other lead scrap/ashes/residues not covered under Batteries (Management and Handling) Rules, 2001-</b> 0.06 MTPA- sold to CPCB registered recycler</li> </ul>
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6b.	Solid Waste	<ul style="list-style-type: none"> <li>● <b>Biodegradable-</b> 76.44 kg/day- will be utilised as manure for greenbelt development</li> <li>● <b>Non-Biodegradable-</b> 114.66 kg/day- sold to registered recycler or burnt in Kiln after obtaining necessary permission</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Biodegradable-</b> 12 kg/day- will be utilised as manure for greenbelt development</li> <li>● <b>Non-Biodegradable-</b> 18 kg/day- sold to registered recycler or burnt in Kiln after obtaining necessary permission</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Biodegradable-</b> 88.44 kg/day- will be utilised as manure for greenbelt development</li> <li>● <b>Non-Biodegradable-</b> 132.66 kg/day- sold to registered recycler or burnt in Kiln after obtaining necessary permission</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Biodegradable-</b> 36 kg/day- will be utilised as manure for greenbelt development</li> <li>● <b>Non-Biodegradable-</b> 24 kg/day- sold to registered recycler or burnt in Kiln after obtaining necessary permission</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Biodegradable-</b> 124.44 kg/day- will be utilised as manure for greenbelt development</li> <li>● <b>Non-Biodegradable-</b> 156.66 kg/day- sold to registered recycler or burnt in Kiln after obtaining necessary permission</li> </ul>
6c.	Non- Hazardous Waste	<ul style="list-style-type: none"> <li>● <b>Dust from Bag Filter-</b> 450 TPD- recycled into the process</li> <li>● <b>Fly ash-</b> 450- TPD- used in manufacturing of PPC grade cement</li> <li>● <b>STP Sludge-</b> 20 kg/day- used as manure for greenbelt development/ plantation</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Dust from Bag Filter-</b> 400 TPD- recycled into the process</li> <li>● <b>Fly ash-</b> 0- TPD- used in manufacturing of PPC grade cement</li> <li>● <b>STP Sludge-</b> 2 kg/day- used as manure for greenbelt development/ plantation</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Dust from Bag Filter-</b> 850 TPD- recycled into the process</li> <li>● <b>Fly ash-</b> 450- TPD- used in manufacturing of PPC grade cement</li> <li>● <b>STP Sludge-</b> 22 kg/day- used as manure for greenbelt development/ plantation</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Dust from Bag Filter-</b> 1059.3 TPD- recycled into the process</li> <li>● <b>Fly ash-</b> 473 - TPD- used in manufacturing of PPC grade cement</li> <li>● <b>STP Sludge-</b> 22 kg/day- used as manure for greenbelt development/ plantation</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Dust from Bag Filter-</b> 1909.3 TPD- recycled into the process</li> <li>● <b>Fly ash-</b> 923- TPD- used in manufacturing of PPC grade cement</li> <li>● <b>STP Sludge-</b> 52 kg/day- used as manure for greenbelt development/ plantation</li> </ul>

## Resource Requirements

- **Land:** The existing integrated unit including Line I + Line II is established on a land area measuring 238.97 ha. At present construction of Line III is under process which is being done on the same plot area with slight modifications in ground coverage and open area. For the proposed expansion for addition of Line IV + Line V, there will not be any addition of area.

Land is in possession of M/s Ambuja Cement Limited (Adani Cement limited).

The existing integrated unit including Line I + Line II is established on a land area measuring 238.97 ha out of which Ground coverage including clinker plant, cement plant, WHRB & CPP is 24.92 ha, Green Area is 83.1 ha, Open area including storage area, road and parking area and Railway siding area is 130.95 ha.

For the proposed expansion for addition of Line IV + Line V, there will not be any addition of area. Demolition of few existing structures & clearance of few bushes may be done if required.

- **Water Requirement:**  
**During construction Phase**

**In the existing unit,** construction of Line III is ongoing for which 110 KLD of water is being utilized. Out of which 90 KLD water is being required by 2000 no. of laborers and workers which will be sourced through Groundwater/mine pits and the rest 20 KLD required for construction purposes is treated water which is being provided by existing STP.

**For the construction of proposed expansion,** 210 KLD of water will be required. Out of which 190 KLD water will be required by 4200 no. of labourers and workers which will be sourced through Groundwater/mine pits (NOC from CGWA has been granted from CGWA vide letter no. 21-4(117)/NCCR/CGWA/2011-762 dated 05.09.2019 and was valid till 25.07.2024 and renewal of the same has been applied vide letter no. 21-4/17/CT/MIN/2011 dated 24/07/2024). 20 KLD will be required for construction purposes. Treated water obtained from existing STP will be used for construction purposes.

**Source of Freshwater during Operation:** Groundwater will be sourced for domestic activities & mine pits water for industrial activities. NOC from CGWA has been granted from CGWA vide letter no. 21-4(117)/NCCR/CGWA/2011-762 dated 05.09.2019 and was valid till 25.07.2024 and renewal of the same has been applied vide letter no. 21-4/17/CT/MIN/2011 dated 24/07/2024.

**During the Operation Phase-**

**Existing (Line I + Line II + Line III)-**

Expansion of Integrated Cement (Clinker: 8.1 MTPA to 16.1 MTPA, Cement: 6.5 MTPA to 16.5 MTPA, WHRS: 43 MW to 85 MW & CPP: 63 MW to 123 MW) by Installation of Line- IV & Line-V at Village: Rawan, Tehsil: Balodabazar, District: Balodabazar-Bhatapara, State: Chhattisgarh by M/s Ambuja Cements Limited (Unit: Bhatapara)

Total water requirement for the unit is 7544 KLD out of which, fresh water of 6852 KLD will be sourced from Groundwater for domestic activities (310 KLD) & mine pits (6542 KLD) for industrial activities and rest 435 KLD is treated water from ETP cum RO and 257 KLD is treated water from STP.

7544 KLD consists of water required for cement plant makeup (2560 KLD), WHRS Makeup (454 KLD), Domestic (310 KLD), Gardening (40 KLD) & CPP (4180 KLD).

The domestic wastewater generated of 270 KLD is treated in STP of combined capacity 550 KLD and treated water (325 KLD) will be used in gardening (70 KLD) and the remaining 217 KLD is used in CPP. The wastewater generated from other activities like WHR, Cement plant makeup and CPP of 458 KLD is treated in ETP cum RO of 360 KLD and treated water generated of 435 KLD is reused in CPP.

**Proposed expansion (Line IV + Line V)-** Total water requirement for the unit will be 3800 KLD out of which, fresh water of 3602 KLD will be sourced from Groundwater for domestic activities (80 KLD) & mine pits (3522 KLD) for industrial activities and rest 130 KLD is treated water from ETP cum RO and 68 KLD will be treated water from STP.

3800 KLD consists of water required for cement plant makeup (2470 KLD), WHRS Makeup (420 KLD), Domestic (80 KLD), Gardening (30 KLD) & CPP (800 KLD).

The domestic wastewater generated of 72 KLD will be treated in existing STP of combined capacity 550 KLD and treated water (68 KLD) will be used in gardening (30 KLD) and the remaining 38 KLD will be used in CPP. The wastewater generated from other activities like WHR, Cement plant makeup and CPP of 137 KLD will be treated in ETP cum RO of 360 KLD and treated water generated of 130 KLD will be reused in CPP.

**Total after expansion (Line I + Line II + Line III + Line IV + Line V)-** Total water requirement for the unit will be 11344 KLD out of which, fresh water of 10454 KLD will be sourced from Groundwater for domestic activities (390 KLD) & mine pits (10064 KLD) for industrial activities and rest 565 KLD is treated water from ETP cum RO and 325 KLD is treated water from STP.

11344 KLD consists of water required for cement plant makeup (5030 KLD), WHRS Makeup (874 KLD), Domestic (390 KLD), Gardening (70 KLD) & CPP (4980 KLD).

The domestic wastewater generated of 342 KLD will be treated in existing STP of combined capacity 550 KLD and treated water (325 KLD) will be used in gardening (70 KLD) and the remaining 255 KLD will be used in CPP. The wastewater generated from other activities like WHR, Cement plant makeup and CPP of 595 KLD will be treated in ETP cum RO of 2 x 360 KLD and treated water generated of 565 KLD will be reused in CPP.

Expansion of Integrated Cement (Clinker: 8.1 MTPA to 16.1 MTPA, Cement: 6.5 MTPA to 16.5 MTPA, WHRS: 43 MW to 85 MW & CPP: 63 MW to 123 MW) by Installation of Line- IV & Line-V at Village: Rawan, Tehsil: Balodabazar, District: Balodabazar-Bhatapara, State: Chhattisgarh by M/s Ambuja Cements Limited (Unit: Bhatapara)

- **Power Requirement:** Total Existing Power load (Line I + Line II + Line III) is 103 MW (CPP- 63 MW, WHRS- 1 x 18 MW & 1 x 25 MW), Proposed (Line IV + Line V) will be 102 MW (CPP- 2 x 30 MW and WHRS-2 x 21 MW - WHRS) and after proposed expansion (Line I + Line II + Line III + Line IV + Line V) will be 205 MW (CPP- 123 MW, WHRS- 85 MW).  
Total DG sets in existing plant (Line I + Line II + Line III) is 1 x 4 MW, Proposed (Line IV + Line V) will be 2 x 1,100 kVA, 3 x 500 kVA (1.5 MW), therefore after proposed expansion (Line I + Line II + Line III + Line IV + Line V) total 7.7 MW of power will be fulfilled by DG set.
- **Fuel:** Total fuel required in the existing unit for DG sets (Line I + Line II + Line III) is 400 lit/day of High Speed Diesel, and for proposed expansion (Line IV + Line V) 370 l/hr of HDD will be used for the proposed DG Sets.  
Total **Fuel for CPP & Plant (Coal/Petcoke/ Biomass with 20% blending (Agro residues - Rice Husk))**required in the existing unit (Line I + Line II + Line III) is 1.028 MTPA and for proposed expansion (Line IV + Line V), 1.0126 MTPA will be used for the proposed CPPs and plant machineries.
- **Manpower:** Total employment during construction of Line III is 2000 no. which shall increase to 4200 during construction for proposed Line IV & V . During the Operation phase, in the Existing (Line I + Line II + Line III) is 1474 Nos. and Proposed for Line IV + Line V will be 400 Nos. In addition to that there will be indirect employment opportunities & business opportunities such as in transportation, workshop, packing, repair & maintenance, supply of machineries etc. The project will be beneficial in the government's target of increasing the production capacity.
- **Operational Activities:** Operational activities involved in the unit are for clinker production includes transportation of excavated limestone from mine site, raw mix preparation & homogenization (which includes raw mill feed, raw mill grinding process), Clinkerization and cement production which includes raw meal transport to Kiln feed, Kiln feed, pre-heating & calciner, Kiln, cooler and extra clinker transport and dispatch. For cement production includes Clinker handling, Fly ash handling, Slag, Gypsum storage & handling, Cement Production, Cement Packing and Dispatch, WHRS & CPP operation
- **Pollution Sources:** Main Pollution sources from the project will be air & noise emission, wastewater generation and Solid & Hazardous waste.

**Total quantity of wastewater generation Existing (Line I + Line II + Line III)-** The domestic wastewater generated of 270 KLD is treated in STP of combined capacity 550 KLD and treated water (325 KLD) will be used in gardening (70 KLD) and the remaining 217 KLD is used in CPP. The wastewater generated from other activities like WHR,

Expansion of Integrated Cement (Clinker: 8.1 MTPA to 16.1 MTPA, Cement: 6.5 MTPA to 16.5 MTPA, WHRS: 43 MW to 85 MW & CPP: 63 MW to 123 MW) by Installation of Line- IV & Line-V at Village: Rawan, Tehsil: Balodabazar, District: Balodabazar-Bhatapara, State: Chhattisgarh by M/s Ambuja Cements Limited (Unit: Bhatapara)

Cement plant makeup and CPP of 458 KLD is treated in ETP cum RO of 360 KLD and treated water generated of 435 KLD is reused in CPP.

**Proposed expansion (Line IV + Line V)-** The domestic wastewater generated of 72 KLD will be treated in existing STP of combined capacity 550 KLD and treated water (68 KLD) will be used in gardening (30 KLD) and the remaining 38 KLD will be used in CPP. The wastewater generated from other activities like WHR, Cement plant makeup and CPP of 137 KLD will be treated in ETP cum RO of 360 KLD and treated water generated of 130 KLD will be reused in CPP.

**Total after expansion (Line I + Line II + Line III + Line IV + Line V)-** The domestic wastewater generated of 342 KLD will be treated in existing STP of combined capacity 550 KLD and treated water (325 KLD) will be used in gardening (70 KLD) and the remaining 255 KLD will be used in CPP. The wastewater generated from other activities like WHR, Cement plant makeup and CPP of 595 KLD will be treated in ETP cum RO of 2 x 360 KLD and treated water generated of 565 KLD will be reused in CPP.

**Air Emissions** are from the process machinery Raw Mill and Kiln, Coal mill, Clinker cooler, Cement mill, and of CPP for which adequate APCS like RABH & bag house, ESPs, Hybrid Bag House , ESP & bag filter respectively along with adequate stack height with APCS are provided & maintained. Also, emissions are from Vehicles & DG sets (emergency use only) for which adequate control measures are adopted. The same will be followed after proposed expansion.

**Noise generation** from the existing unit is through operation of process machinery, transportation, DG sets (emergency use only), CPP, WHRS etc. Adequate engineering controls are taken to minimize the noise level during construction and operations. The same will be followed after proposed expansion.

**Manufacturing Process:**

Expansion of Integrated Cement (Clinker: 8.1 MTPA to 16.1 MTPA, Cement: 6.5 MTPA to 16.5 MTPA, WHRS: 43 MW to 85 MW & CPP: 63 MW to 123 MW) by Installation of Line- IV & Line-V at Village: Rawan, Tehsil: Balodabazar, District: Balodabazar-Bhatapara, State: Chhattisgarh by M/s Ambuja Cements Limited (Unit: Bhatapara)

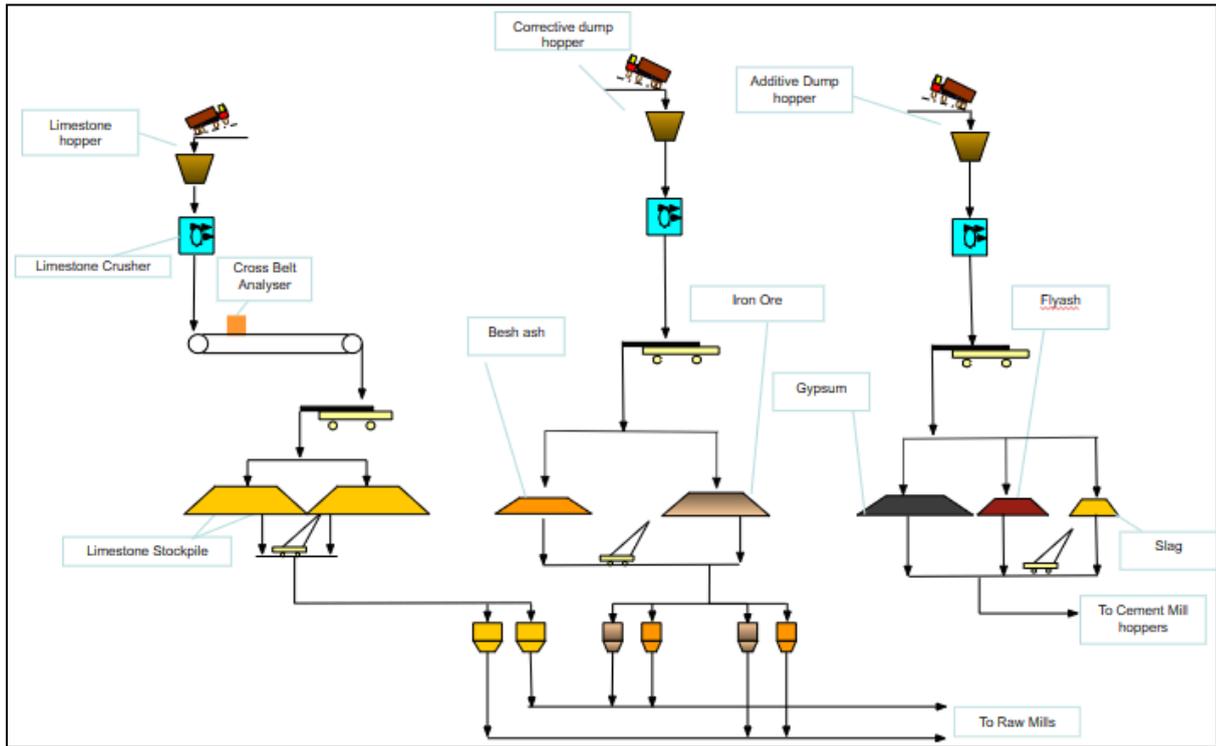


Figure 1. Process flow Diagram showing flow of material from hopper to mills

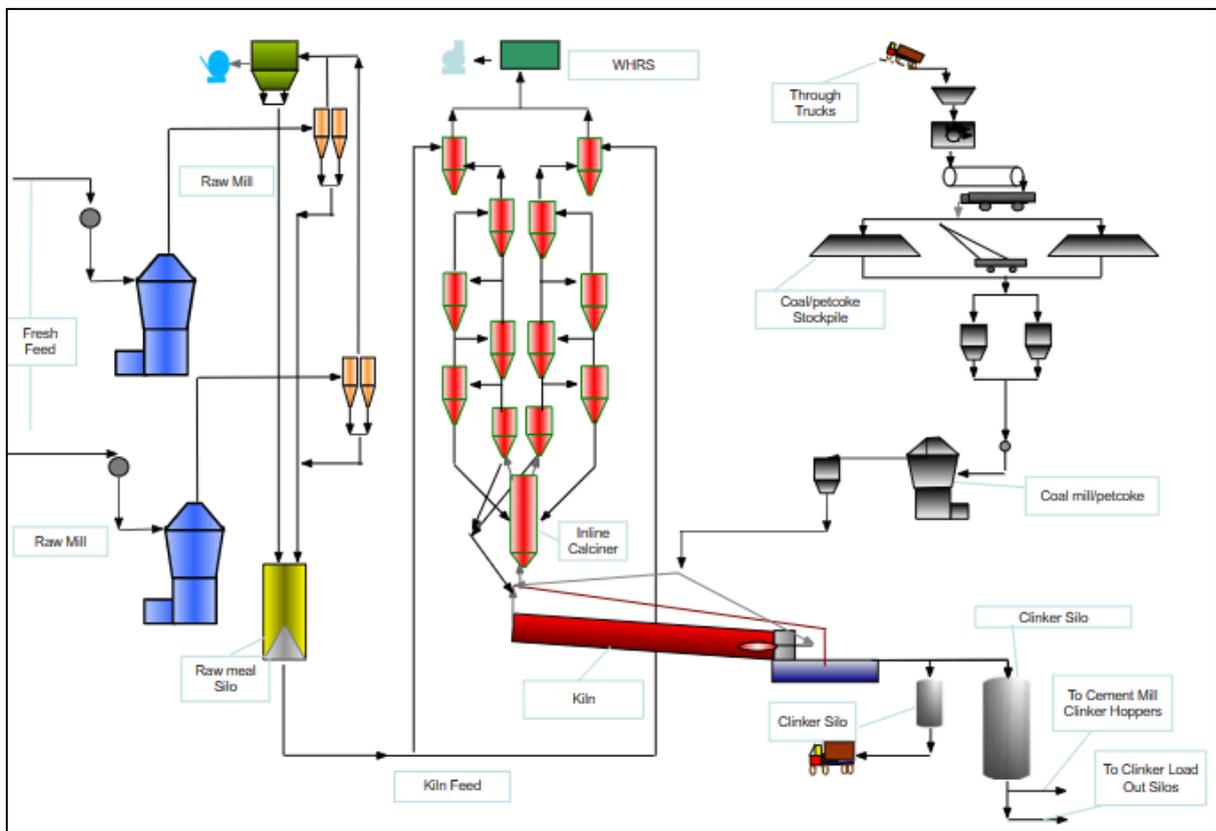


Figure 2. Process flow diagram for Clinker Manufacturing

Expansion of Integrated Cement (Clinker: 8.1 MTPA to 16.1 MTPA, Cement: 6.5 MTPA to 16.5 MTPA, WHRS: 43 MW to 85 MW & CPP: 63 MW to 123 MW) by Installation of Line- IV & Line-V at Village: Rawan, Tehsil: Balodabazar, District: Balodabazar-Bhatapara, State: Chhattisgarh by M/s Ambuja Cements Limited (Unit: Bhatapara)

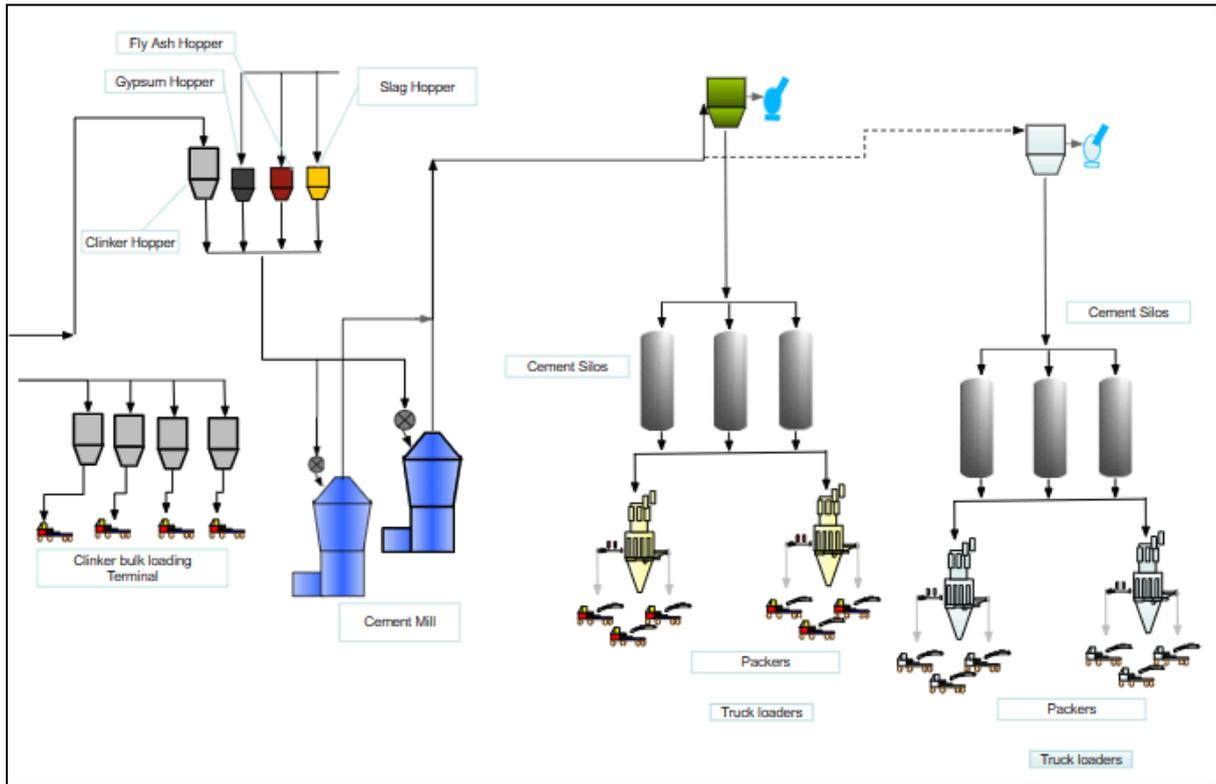
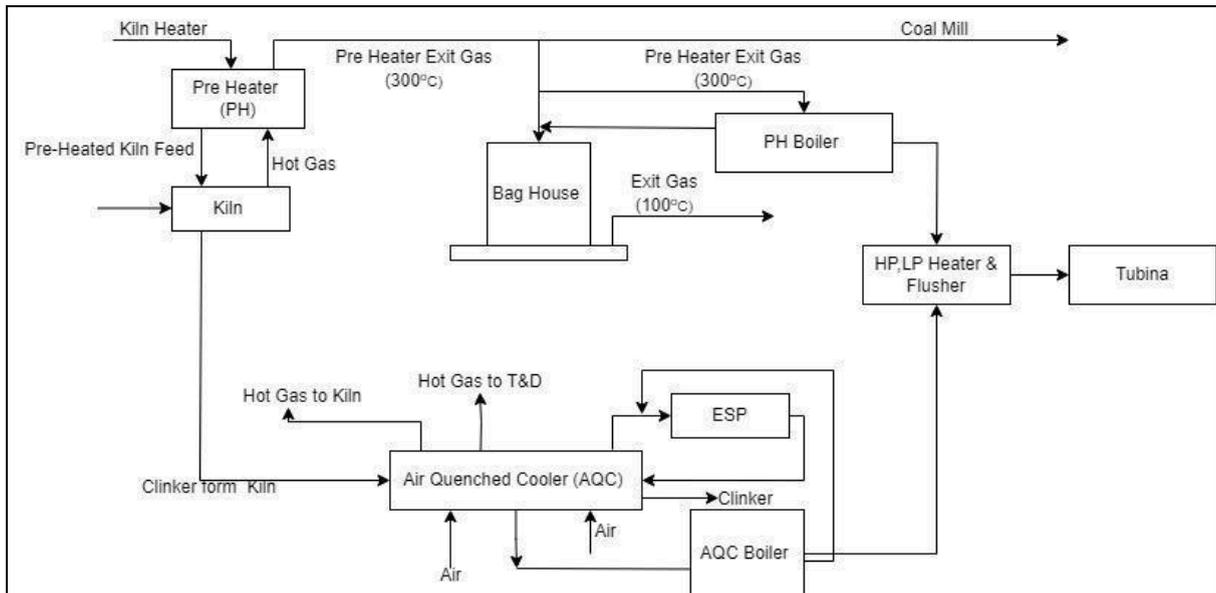
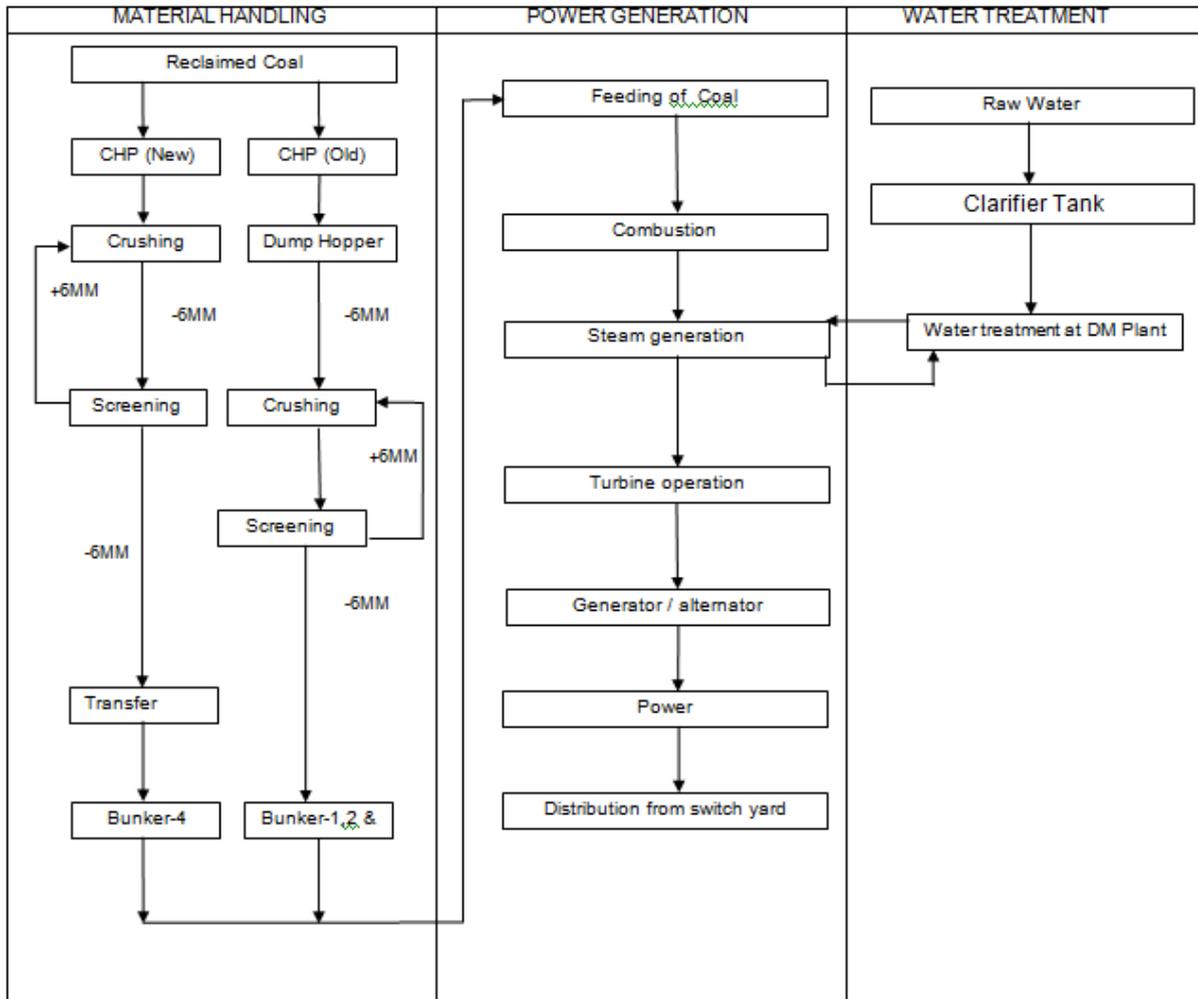


Figure 3. Process flow diagram for Cement Manufacturing



Block Flow Diagram (BFD) for WHRS in existing & proposed

Expansion of Integrated Cement (Clinker: 8.1 MTPA to 16.1 MTPA, Cement: 6.5 MTPA to 16.5 MTPA, WHRS: 43 MW to 85 MW & CPP: 63 MW to 123 MW) by Installation of Line- IV & Line-V at Village: Rawan, Tehsil: Balodabazar, District: Balodabazar-Bhatapara, State: Chhattisgarh by M/s Ambuja Cements Limited (Unit: Bhatapara)



Block Flow Diagram (BFD) for CPP

### 1.3. Description of Environment

The baseline data is generated through field study within the impact zone (Core Zone and Buffer Zone i.e. 10 Km from Project Boundary) for various components of the environment viz. Air, Noise, Water, Soil, Land, Traffic, Ecology and Socioeconomic. The baseline environmental quality has been assessed for Winter Season (December 2023- February 2024) (by NABL accredited laboratory Perfect Researchers Pvt Ltd, New Delhi) in a study area of 10 Km radius from the project site. The baseline data obtained is summarized below:

- **Land Use:**

**Core Zone:** The proposed project is located at Village: Rawan, Tehsil: Bhatapara, District: Baloda Bazar, Chhattisgarh. The existing integrated unit including Line I + Line II is established on a land area measuring 238.97 ha ut of which Ground coverage including clinker plant, cement plant, WHRB & CPP is 24.92 ha, Green

Area is 83.1 ha, Open area including storage area, road and parking area and Railway siding area is 130.95 ha. At present construction of Line III is under process which is being done on the same plot area with slight modifications in ground coverage and open area.

For the proposed expansion for addition of Line IV + Line V, there will not be any addition of area. Demolition of minor few existing structures may be done if required. The land use of the area is industrial land.

**Buffer Zone:** Out of total 10 km radius study area i.e. 38901.21 Ha, agriculture land is about 23159.9 hectares (59.53%), built up area is about 775.82 hectares (1.99%), waste/barren land is about 8437.75 hectares (21.69%), Water bodies area is about 1280.59 hectares (3.29%), scrub land is about 3360.28 hectares (8.63%), Forest land is about 849.06 hectares (2.18%), Mining Area is about 693 hectares (1.78%), Solar Plant land is about 64.64 hectares (0.16%) of the total 10 km radius study area.

- **Natural Hazard:** The area under study falls in Zone-II, as per IS 1893 (Part-I): 2002.
- **Geology:**

Topographically the proposed site area is almost flat as well as an undulating topography. The minimum elevation is 255 meters AMSL in the western of the site whereas the maximum elevation's contour passes near the southeast and eastern boundary of the site is 260 m AMSL. The buffer area has almost flat and undulating topography. As per the topo map the maximum elevation is 280 m AMSL in the south-southwest. In contrast, the minimum elevation is 237 m AMSL in the north close to the Jamuniya Nadi.

The study area is underlined by two distinct geological formations ranging in age from Achaean to Proterozoic. The Chhattisgarh supergroups of rocks occupy major parts of the area comprising shale, limestone, and sandstone. Granites and phyllites intruded by quartz veins form the basement of the basin. The rocks of the Chhattisgarh Supergroup are unconformably overlying the basement crystalline. They are represented by the sandstone, limestone, and shale sequence occupying the entire district except the southeastern part of the district.

- **Hydrology:**

The project site is drained by first to third-order ephemeral drains. The slope of the area is towards the north of the site. The Mahanadi Canal runs along the boundary of the site, approximately 9.61 meters south, southeast, and east of the site.

The buffer zone area drained by Jamuniya Nadi, Chitawar Nala, Baniari Nala, Burgahan Minor, Keviari Minor, and Baloda Branch(Mahanadi Canal), Risda Canal. The buffer zone comprises various water bodies such as Nadi, Minor, Canals Pond, etc. The major Nadi of the area is Jamuniya Nadi which flows from west to northeast at about 5.91 km NNW of the site. The area has parallel and dendritic drainage patterns having first to fifth-order streams. The general slope of the area is towards the northeast of the site.

There is a water divide between Orcha Nala and Jamuniya Nadi. In the southeast parts of the divide, water flows into Orchha Nala, while in the north and northeast parts, water flows into Jamuniya Nadi. The Mahanadi Canal runs between Orchha Nala and Jamuniya Nadi, It serves as an important waterway for irrigation in the area.

- **Ambient Air Quality:**

**Core zone:** The mean value of PM<sub>10</sub> at core zone locations ranges from (60.64-63.13 µg/m<sup>3</sup>) & PM<sub>2.5</sub> ranges from (24.78-25.88 µg/m<sup>3</sup>), SO<sub>2</sub> ranges from (5.73-5.98 µg/m<sup>3</sup>), NO<sub>2</sub> ranges from (13.59-14.18 µg/m<sup>3</sup>) & CO(0.29-0.30mg/m<sup>3</sup>), are within the limits of National Ambient Air Quality Standards (NAAQS). As per the Air Quality Index by CPCB, the air quality of the core zone is found to be Satisfactory during the sampling period - December 2022- February 2023.

**Buffer zone:** The mean value of PM<sub>10</sub> ranges from (66.65-85.32 µg/m<sup>3</sup>), PM<sub>2.5</sub> ranges from (26.99-35.80µg/m<sup>3</sup>), SO<sub>2</sub> ranges from (6.22-8.16 µg/m<sup>3</sup>), NO<sub>2</sub> ranges from (14.77-19.41 µg/m<sup>3</sup>) & CO ranges from (0.31-0.41 mg/m<sup>3</sup>) which are within the limits of National Ambient Air Quality Standards (NAAQS). As per the Air Quality Index by CPCB the air quality of the buffer zone is found to be Satisfactory during the period - December 2022- February 2023.

- **Ambient Noise levels:**

**Core Zone(Industrial area): N1, N2:**The ambient noise level during day time at the proposed project site varies from 61.7 dB (A) to 61.9 dB (A) which are within the day time standard limit of industrial area ~ 75 dB (A). During night the noise level at the project site ranges from 57.5 dB (A) to 57.8 dB (A) which are also within the night time standard limit of industrial area ~ 70 dB (A).

**Buffer Zone:** The ambient noise level during day time at the residential area varies from 54.6 dB (A) to 58.7 dB (A) which is slightly higher than the daytime noise standard limit of the Residential Area of ~ 55 dB (A) due to vehicular activities in the area. During night the noise level ranged from 46.3 dB(A) to 47.2 dB(A) which is slightly higher than the night-time noise standard limit of ~ 45 dB (A). In Commercial area the ambient noise level during night time varies from 60.8 dB (A) to 67.7 dB (A) which is slightly higher than the daytime noise standard limit of the commercial area of ~ 65 dB (A) and during night time it

varies from 56.5 dB (A) to 60.9 dB (A) which is slightly higher than the night-time noise standard limit of commercial area~ 55 dB (A) due to high vehicular movement.

- **Soil Quality:**

**Core Zone (S1):** The samples collected from the onsite - S1 shows that the soil moisture content in the core zone is 1.6% pH is 7.5. Amount of primary nutrients like Organic matter is 0.99%, the available nitrogen is 116.0 mg/kg is low, available Potassium is 23.9 mg/kg is very low while the available Phosphorus is 12.4 is medium in range. Therefore, the Primary nutrient profile shows that soil is low fertile in the core zone due to low concentration of available nitrogen & potassium.

**Buffer Zone (S2- S8):** The samples collected from the site S2- S8 shows that the soil moisture content in the buffer zone is between 1.4-3.2%, pH is 7.00-7.44. Amount of primary nutrients like Organic matter is 0.61-1.30%, the available nitrogen 86-122 mg/kg is low, available Potassium 25.6-39.9 mg/kg is low while the available Phosphorus 10.6-13.9 mg/kg is in medium range. Therefore, the Primary nutrient profile shows that soil is low fertile in the buffer zone due to the availability of extremely low amounts of nitrogen, potassium & phosphorus.

- **Surface Water Quality:**

The results of water quality of surface water for locations i.e SW1 (Onsite pond), SW2 (Rawan village pond), SW3 (Ambuja Mining Pond), SW4 (Arjuni pond), SW5 (Kukurdihi Talav) & SW9 (Jamunia Nadi Downstream) shows that these are meeting the criteria class "D" i.e. Propagation of Wildlife and Fisheries as per CPCB surface water quality- Designated Best Use Water Quality Criteria defined by CPCB while surface water for locations SW6 (Chhuiha Dam), SW7 (Banjari Nala) & SW8 (Jamunia Nadi Upstream) shows that these are meeting the criteria class "B" i.e. Outdoor Bathing (Organised) as per CPCB surface water quality- Designated Best Use Water Quality Criteria defined by CPCB

- **Ground Water Quality:**

**Core Zone:**

The **Total Dissolved Solids (TDS)** of the sampling locations is 558 mg/l. **Total Hardness** of the sampling locations is 432 mg/l, **Magnesium content** in the sampling location is 50.54 mg/l, **Alkalinity** of the sampling locations is 415.73 mg/l, **Calcium** Concentration of the sampling locations is 90 mg/l, **Chloride** Concentration of all the sampling locations is 140 mg/l. All values were found to be higher than the prescribed drinking water standards except for chloride which was within the prescribed drinking water standards.

### **Buffer Zone**

The **Total Dissolved Solids (TDS)** of the sampling locations was found to range from 453 mg/l to 986 mg/l. **Total Hardness** of the sampling locations was found to range from 336 mg/l to 700 mg/l, **Magnesium content** in the sampling location was found to range from 38.88 mg/l to 87.48 mg/l, **Alkalinity** of the sampling locations was found to range from 268.73 mg/l to 671.29 mg/l, **Calcium** Concentration of the sampling locations was found to range from 67 mg/l to 144 mg/l, **Chloride** Concentration of all the sampling locations was found to range from 97 mg/l to 260 mg/l.

- **Biological Environment:**

**Flora:** In the core zone, as it is a brownfield project, plantation has been already done at site. Trees present at site are Ashok tree, Amaltas, Arjuna, Karanj, Neem, Sisoo, Teak etc. In the buffer zone, trees present are Wood Apple, Saffron Teak, Silk trees, Monkey fruit, Ceylon Oak, Silk Cotton Tree, Banyan tree, weeping fig etc.

**Fauna:** In the core zone, fauna primarily consisted of birds like crows, sparrows, and red-vented bulbuls, alongside common animals such as squirrels, mongooses, and garden lizards, with occasional sightings of butterflies. In the buffer zone, during primary survey, the presence domestic cows (*Bos taurus*), common dogs (*Canis lupus familiaris*), common cats (*Felis catus*), Indian palm squirrel (*Funambulus palmarum*), and common birds as crow, common myna, sparrow were noted. Additionally, local communities reported sightings of Indian grey mongoose (*Herpestes edwardsii*), and, Wild Boar (*Sus scrofa*) in the buffer zone.

Earlier conservation plan was approved by PCCF & chief wildlife warden vide letter no. order. No./ WL/Management-572/123 dated 04.07.2022 which was prepared for Schedule I species Indian Rock Python (*Python molurus*) & Monitor Lizard (*Varanus bengalensis*). Now, as per The Indian Wildlife (Protection) Act, 2023, 11 schedules I species have been identified in the buffer zone namely *Canis aureus* (Golden Jackal), *Felis chaus* (Jungle cat), *Hyaena hyaena* (Striped Hyena), *Hystrix indica* (Indian Porcupine), *Urva edwardsii* (Indian Grey Mongoose), *Circus melanoleucos* (Pied Harrier), *Pavo cristatus* (Indian Peafowl), *Naja naja* (Indian Cobra), *Ptyas mucosa* (Rat Snake), *Python molurus* (Indian Python), *Varanus bengalensis* (Bengal Monitor Lizard). Revised Conservation plan has been prepared & will be submitted for the Schedule I species found in the buffer zone.

- **Socioeconomic Environment:** According to the secondary data the study area consists of 36326 no. of households and 181975 no. of population. Survey data was collected from 9 villages for Primary study namely Bhadrपाली village, Khairtal, Arjuni Village, Rawna, Pausari, Bharseli Malgajari, Chhuiha Malgajari and Turma .

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The total population of the above-mentioned villages in the Primary study area is 23372 having 4246 households. The main source of income in the surveyed area is agriculture & Agriculture Labour. People mainly depend on Agriculture, Labors, private services, Govt. job, business and self employed for a source of livelihood. The main crop in the surveyed area is Paddy (61%) followed by Wheat(25%), Pulses 14 %) is also grown in all the villages. There is the availability of banks, ATMs, Post Office, Public transportation in the villages. Drinking water is primarily sourced from Hand Pump, Tube Wells, & Tank/ Pond / Lake/ River. Medical facilities include Asha workers in most of the villages. Most of the villages have Anganwadi and Govt. primary school, Govt. Middle School in the study area and has a 100% electricity facility for domestic use.

- **Traffic Studies**

The carrying capacity of the SH-10 is much higher than the proposed traffic volume. The traffic (to & fro) from the Proposed Integrated Cement Plant will increase.

The volume/capacity ratio is likely to change from 0.17 to 0.41 with LOS "A" to "C" only.

## **1.4. Additional Studies**

The project is situated in the Seismic zone-II area and is a Low risk zone. Proper measures will be taken during the construction to avoid damage and loss. A detailed fire safety and management plan as well as on-site and off-site management plan have been developed for the site.

### **Some General safety measures**

- Occupational health surveillance programmes are being done six monthly & recorded.
- Well-equipped Occupational Health Centre with adequate paramedical staff has been provided. Routine and special investigation related to occupational health is being done.
- Health surveillance and maintenance of health record are being done
- Formulation of OHS implementation team/ cell. Implementation of OHSAS 18001 for Occupational Health and Safety Management System
- Health check-up camps are being organised on a regular basis at company's dispensary/nearby locations for nearby people.
- Proper medical facility arrangements are provided in case of any accident.
- Label Precautions and First Aid facilities are provided.
- Emergency plan is prepared and mock drills of the on-site emergency are conducted.

Expansion of Integrated Cement (Clinker: 8.1 MTPA to 16.1 MTPA, Cement: 6.5 MTPA to 16.5 MTPA, WHRS: 43 MW to 85 MW & CPP: 63 MW to 123 MW) by Installation of Line- IV & Line-V at Village: Rawan, Tehsil: Balodabazar, District: Balodabazar-Bhatapara, State: Chhattisgarh by M/s Ambuja Cements Limited (Unit: Bhatapara)

- Employers and employees are aware of the hazardous properties of materials in their workplaces, and the degree of hazard each poses.
- Inspection of the industrial activity is being done at least once in a year and an annual status report on the compliance with the rules are submitted.
- An Environment, Health and Safety (EHS) Manager is available, which handles all the safety issues related to man, machine & materials.
- Exterior refuge or safe areas including parking lots, open fields or streets which are located away from the site of the emergency and which provide sufficient space to accommodate the employees.
- Coal storage mitigation – Proper ventilation is provided around the coal storage shed.
- Specific written instructions are obtained before any welding, burning, grinding or other flame heat producing work commences in coal processing areas.

Same shall be followed after expansion.

## 1.5. Project Benefits

The unit will generate direct & indirect employment and benefits with respect to availability of social, physical infrastructure and other benefits, such as,

- The project will cater to the increasing demand of cement in the country as well as increase export capacity of the country. The project will meet the demand & supply gap.
- The industry has spent Rs 15.9 crores & will spend Rs 20.57 crores as Social welfare activities in the area including activities for rural development and livelihood development.
- Total employment during construction of Line III is 2000 no. which shall increase to 4200 during construction for proposed Line IV & V . During the Operation phase, in the Existing (Line I + Line II + Line III) is 1474 Nos. and Proposed for Line IV + Line V will be 400 Nos. In addition to that there will be indirect employment opportunities & business opportunities such as in transportation, workshop, packing, repair & maintenance, supply of machineries etc. The project will be beneficial in the government's target of increasing the production capacity.
- The industries will require raw materials, skilled and unskilled labourers. It will be available from the local area. Unit will employ a minimum of 80% people of Chhattisgarh in the Managerial cadre and minimum 90% people of Chhattisgarh in Non Managerial Cadre. Due to increasing industrial activities, it will boost the commercial and economic status of the locality, to some positive extent.

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- M/S Ambuja Cements Ltd. (Unit: Bhatapara) will improve their efficiencies and use technological advances to reduce their impact on the environment. The industry also aims to use dust collected in bag filters and fly ash generated to be 100% reused in the plant process.
- Fly ash which is the waste generated from coal based thermal power plants & CPP is stored and is used in manufacturing of PPC grade cement and sludge produced is used as manure for greenbelt development / plantation.
- The project will utilise slag which is a waste from steel plants and thus can be regarded as an environmentally friendly project. The same shall be continued after proposed expansion. Further the company is willing to go for other environment friendly measures if any are recommended to it.

## 1.6. Environment Management Plan

### Air Quality Management Plan

#### For Construction Phase

- Water sprinkling is being done to reduce the dust generation.
- Flexible dust suppression systems (water spray) is being done as per the requirement at the construction site.
- No excavation of soil is being carried out without adequate dust mitigation measures in place.
- No loose soil or sand or Construction Waste or any other construction material that causes dust is being left uncovered.
- Construction Waste processing and disposal sites are being identified and required dust mitigation measures be notified at the site.
- To minimize the occupational health hazard, proper masks are being provided to the workers who are engaged in dust generation activity.
- Only covered vehicles carrying construction material and machinery and waste are permitted.

The same will be followed for construction of proposed Line IV + Line V.

#### For Operation Phase

- **Only covered vehicles** carrying construction material and machinery and waste are permitted.
- **High efficiency Pollution control equipment** have been installed in the unit so that there is no adverse impact on the sensitive areas due to air pollution.
- **Online Continuous stack monitoring system (OCSMS)**- Online Continuous stack monitoring system (OCSMS) has been provided & monitoring data is transmitted

regularly to Chattisgarh PCB & CPCB servers.

- **Low NOx burners** are installed to reduce NOx.
- **Interlocking system has been provided.** Whenever pollution control equipment fails, the process system gets tripped and stops the operation.
- **Fly ash (used as raw material) transportation** is done by Bulklers/ closed tankers.
- Water tankers are deployed for water sprinkling at coal & limestone storage yards.
- Greenbelt plantation has been provided along the plant boundary to confine & control the fugitive emission.
- Transfer point locations are fully enclosed for the project and spillage of cement is being removed regularly.
- The air emissions are controlled by proper mitigating measures such as regular dust suppression by sprinkling of water which helps in reducing the effect. In addition, periodical monitoring will be done and results will be analyzed. In case any change shows adverse effects, it will be attended to for improvements.
- Adequate APCS and stack height are provided to all the process machineries, process to reduce PM emissions to less than 30 mg/Nm<sup>3</sup> as per the revised standards of MoEFCC/CPCB norms. Also, adequate stack height is provided to the utilities.
- All the personnel working in dust/noise prone areas are provided with appropriate personal protective equipment (PPE) such as helmets, safety shoes, safety goggles, industrial grade gloves, safety harnesses, nose masks.
- Green belt/ greenery is developed along most of the periphery of the project area as well as along roads. Green area in the plot will be 34.73%, i.e. 83.1 ha of total plant area has been maintained as green belt / plantation area.
- Vehicles with valid Pollution Under Control (PUC) certificates are used for transportation.
- Fully covered conveyors for the transportation of materials are provided to minimize dust generation.
- Asphaltting/Concreting of roads have been conducted within the plant to reduce dust emissions from unpaved surfaces & Road/vacuum sweeping machines have been deployed for cleaning dust from the internal road.
- Clinker produced is used as raw material for cement and is produced in house so that they are transported to cement plant via. inhouse Covered conveyor belt. Also, Limestone is being transported from captive mines to the Cement Plant through belt conveyors & road. With the use of conveyor belt, the number of trips by road (trucks) has reduced and the consumption of fuel that is required for the movement of vehicles has also been reduced and thereby reducing the air pollution load.

The same shall be followed after proposed expansion.

## Noise Level Management Plan

### **For Construction Phase**

- There will be some noise generation due to movement of vehicles carrying materials and it can be managed by properly regulating the movement of vehicular traffic so that the ambient air quality with respect to noise is not adversely affected.
- Machines and equipment are properly greased, lubricated and regularly maintained and shall be provided with vibration isolators and noise damping, construction is done during the day time only, proper barricading of the project site is done and maintained during the construction.
- Appropriate PPE like ear plugs and muffs are provided to the workers at the project site. Also, acoustic flooring using tiles is done in the admin building so that it acts as a noise absorber.
- Proper barricading are done around the project site which helps in controlling noise emission to & from the site to some extent.

The same shall be followed during construction for proposed expansion.

### **For Operation Phase**

To reduce Ambient Noise level the following measures will be adopted:-

- Noise attenuating devices like earplugs and earmuffs have been provided to the workers exposed to high noise levels.
- Sufficient green belt has been developed around the cement plant.
- Regular monitoring of noise level is carried out and corrective measures in concerned machinery are adopted accordingly.
- About 34.7 % of land has been earmarked for the green belt and plantations.
- Noise generating machinery has been kept in the covered sheds.
- All the latest machines are purchased for the plant and due care is given to generation of noise by the equipment.
- Improved mufflers & silencers are provided in the machinery generating high noise.
- Maintenance of vehicles and machinery has been done & it is ensured that machineries have adequate vibration isolators and dampers.
- The installation of DG sets are bought acoustically enclosed.
- Properly insulated enclosures have been provided to equipment generating excessive noise.
- Isolation of continuously vibrating structures/ machines by proper and secured mountings.
- Installation of compressors and turbines in closed buildings.

Expansion of Integrated Cement (Clinker: 8.1 MTPA to 16.1 MTPA, Cement: 6.5 MTPA to 16.5 MTPA, WHRS: 43 MW to 85 MW & CPP: 63 MW to 123 MW) by Installation of Line- IV & Line-V at Village: Rawan, Tehsil: Balodabazar, District: Balodabazar-Bhatapara, State: Chhattisgarh by M/s Ambuja Cements Limited (Unit: Bhatapara)

- Proper maintenance, oiling and greasing of machines at regular intervals has been done to reduce generation of noise.
- Acoustic enclosures are provided at various locations like compressor houses, Process fans to bring down noise levels within the desired level

The same shall be followed after proposed expansion.

## **Solid & Hazardous Waste Management plan**

### **During Construction Phase:**

In the existing unit for construction of Line III, 2000 no. of labourers have been hired, 300 kg/day solid waste is generated from labourers. Out of which, 120 kg/day biodegradable waste is composted & 180 kg/day recyclable waste (Plastic, paper, wood, glass etc) is sent to approved recyclers.

For the construction of proposed expansion, 630 kg/day solid waste will be generated from labourers. Out of which, 252 kg/day biodegradable waste will be composted & 378 kg/day recyclable waste (Plastic, paper, wood, glass etc) will be sent to approved recyclers.

### **During Operation Phase:**

- Dust collected from various air pollution control equipment is recycled back to the process.
- Domestic solid waste generated from the plant is stored in separate bins. Biodegradable waste in the existing unit of 88.44 kg/day is utilised as manure for greenbelt/development while non-biodegradable waste of 132.66 kg/day is used in kiln as co-processing. After the proposed expansion, the value will increase to 124.44 kg/day and 156.66 kg/day resp. which will be handled in same manner as existing.
- Sludge generated from STP in the existing unit of 22 kg/day is used as manure in greenbelt development, the value will increase to 52 kg/day after proposed expansion which will be handled in the same manner as existing.
- Fly ash as generated from CPP in the existing unit of 450 TPD is utilized in manufacturing of PPC, which will be increased to 923 TPD after proposed expansion and will be handled in the same manner as existing.
- Dust generated from Bag filters in the existing unit of 850 TPD is utilized completely in the process, the value will increase to 1909.3 TPD after proposed expansion and will be handled in the same manner as existing.
- Used Oil in the existing unit is 10 KLPA and after expansion it will be 20 KLPA which is sold to CPCB registered recycler, the same will be followed after expansion.

Expansion of Integrated Cement (Clinker: 8.1 MTPA to 16.1 MTPA, Cement: 6.5 MTPA to 16.5 MTPA, WHRS: 43 MW to 85 MW & CPP: 63 MW to 123 MW) by Installation of Line- IV & Line-V at Village: Rawan, Tehsil: Balodabazar, District: Balodabazar-Bhatapara, State: Chhattisgarh by M/s Ambuja Cements Limited (Unit: Bhatapara)

- Contaminated processing cotton rags or other cleaning materials generated in the existing unit of 0.30 MTPA and after expansion it will 0.57 MTPA and is used in Kiln as co-Contaminated processing the same will be followed after expansion.
- Empty barrels/containers/liners contaminated with hazardous chemicals /wastes is 170 no./annum and after expansion it will be 350 no./annum which is sold to CPCB registered recycler and same will be followed after expansion.
- Lead acid battery plates and other lead scrap/ashes/residues not covered under Batteries (Management and Handling) Rules, 2001 generated in the existing unit is of quantity 0.03 MTPA and after expansion it will be 0.06 MTPA and are sold to CPCB registered recycler, and same will be followed after proposed expansion.
- Other solid waste like battery waste, E-waste and biomedical waste are sold to authorized vendors and the same will be followed after proposed expansion.

## Wastewater & Effluent Management Plan

### During construction Phase

- **In the existing unit**, construction of Line II is ongoing for which 110 KLD of water is being utilized. Out of which 90 KLD water is being required by 2000 no. of laborers and workers which will be sourced through Groundwater/mine pits and the rest 20 KLD required for construction purposes is treated water which is being provided by existing STP.
- **For the construction of proposed expansion**, 210 KLD of water will be required. Out of which 190 KLD water will be required by 4200 no. of laborers and workers which will be sourced through Groundwater/mine pits 20 KLD will be required for construction purposes. Treated water obtained from existing STP will be used for construction purposes.
- **Source of Freshwater during Operation:** Groundwater for domestic activities & mine pits for industrial activities.
- During the construction period, runoff from the construction site will not be allowed to stand (water logging) or enter the roadside or nearby drain.
- The runoff due to rain water from the site will be collected and reused.

### During the Operation Phase-

**After expansion (Line I + Line II + Line III + Line IV + Line V)-** Total water requirement for the unit will be 11344 KLD out of which, fresh water of 10454 KLD will be sourced from Groundwater for domestic activities (390 KLD) & mine pits (10064 KLD) for industrial activities and rest 565 KLD is treated water from ETP cum RO and 325 KLD is treated water from STP.

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11,344 KLD consists of water required for cement plant makeup (5030 KLD), WHRS Makeup (874 KLD), Domestic (390 KLD), Gardening (70 KLD) & CPP (4980 KLD).

The domestic wastewater generated of 342 KLD will be treated in existing STP of combined capacity 550 KLD and treated water (325 KLD) will be used in gardening (70 KLD) and the remaining 255 KLD will be used in CPP. The wastewater generated from other activities like WHR, Cement plant makeup and CPP of 595 KLD will be treated in ETP cum RO of 2 x 360 KLD and treated water generated of 565 KLD will be reused in CPP.

For storm water management, there is a garland drainage system along with the catch pit and for the further expansion of the existing garland system, design and engineering study has been carried out by NIT Rourkela which will be completed by the end of december 2024.

### **Biological Environment Management Plan**

- Total green area in the existing unit is 34.7% of the total plot area i.e. 83.032 ha.
- Total no. of trees required at the rate of 2,500 trees per hectare will be 207580 no. 246642 no. Of trees are already planted at the site and the same will be followed after proposed expansion.
- Green belt development along with the plant boundary is done which will attenuate noise level, arrest dust and improve the surrounding environment.
- Local species have been planted as per CPCB guidelines & as recommended by DFO.

The same will be followed after proposed expansion.

### **Socio Economic Environment management plan**

- The expansion of the industry will require raw materials, skilled and unskilled laborers. It will be available from the local area. Due to increasing industrial activities, it will boost the commercial and economical status of the locality, to a positive extent.
- Total employment during construction of Line III is 2000 no. which shall increase to 4200 during construction for proposed Line IV & V . During the Operation phase, in the Existing (Line I + Line II + Line III) is 1474 Nos. and Proposed for Line IV + Line V will be 400 Nos. In addition to that there will be indirect employment opportunities & business opportunities such as in transportation, workshop, packing, repair & maintenance, supply of machineries etc.
- Unit will employ a minimum of 80% people of Chhattisgarh in the Managerial cadre and minimum 90% people of Chhattisgarh in Non Managerial Cadre. Due to

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increasing industrial activities, it will boost the commercial and economic status of the locality, to some positive extent.

- Overall the regional economy will elevate with avenues for various ancillary industries and increased business opportunities. Government will be able to generate increased revenue by way of various taxes and levies.

## 1.11. Cost & EMP Implementation Budget

The total cost of the **Existing unit (Line I + Line II + Line III)** is Rs. 4536.79 Crores & proposed capital cost for (Line IV & Line V) is 5890 crores and **after total expansion (Line I + Line II + Line III + Line IV + Line V)** will be Rs. 10,426.79 Crores.

The existing capital cost for the EMP Budget is Rs 227.3 crores & Proposed (Line IV + Line V) is Rs 447.57 crores and existing recurring cost is Rs 8.75 Crores/Year & proposed recurring cost will be Rs 6.95 crores/annum.

S.No.	COST Summary	Proposed Cost for Total (Rs. in Crores)	% of the project Cost
1	Project Cost	5890	100
2	Capital cost for Environment Management Plan	447.57	7.60
3	Recurring cost for Environment Management Plan	6.95	0.117
4	Wildlife Conservation Plan	1.10	0.018
5	Social activities (included in EMP capital)	20.57	0.349
6	Occupational Health and Safety	4.89	0.083