

## EXECUTIVE SUMMARY

### 1. **Proposed Project:**

Century Cement is situated at Baikunth, Tehsil- Tilda District Raipur (CG) in the State of Chattishgarh with licensed production capacity of 2.40 Million TPA (1.67 MTPA Clinker & 2.40 MTPA Cement).

It is proposed to increase the cement and clinker production capacity from 2.4 Million Tons Per Annum (MTPA) to 3.0 MTPA and 1.67 MTPA to 2.0 MTPA respectively by upgrading Kiln No.1 & Kiln No.2, optimization of existing cement mills and bottlenecks will be removed to reach maximum potential. The percentage increase in clinker production is estimated as 20% and in cement production , it is 25%.

The proposed modifications will be carried out within the existing plant; there will not be any additional land or site requirement. As well as existing infrastructure will be utilized for the proposed modifications.

The project cost of existing project is 255.57 crores which will be increased by Rs. 48.41 Crore

### 1. **Objective Of The Study:**

The Environmental Impact Assessment has been carried out to assess the existing base line environmental scenario of the area and probable impacts on various components of the proposed activities. Based on the activities of existing and proposed cement manufacturing unit, an environmental management plan has been suggested. The plan will identify and address the impacts and design mitigative measures to manage such impacts in a manner as to conserve environment and ecology of the area. The EMP has been prepared with a view to ultimately ensure that the adverse impacts can be minimized if these cannot be prevented altogether.

The main objectives of the study are listed as below:

- To anticipate & avoid, minimize or offset biophysical, social, and other relevant adverse effects of project
- To ensure environmental consideration are explicitly addressed and incorporated in to the development decisions making process
- To protect the productivity and capacity of natural system and ecological processes which maintain their functions.
- To establish the present environmental scenario
- To anticipate the impacts of proposed operations on the environment.
- To suggest preventive and mitigating measures to minimize adverse impacts and to maximize beneficial impacts.
- To prepare a detailed action plan for implementation of mitigating measures.

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- To suggest a monitoring program to evaluate the effectiveness of mitigating measures.
- To suggest the formation of a core group responsible for implementation of environmental control and protective measures and monitoring of such implementation.
- To suggest a feedback mechanism enabling to make mid course corrections.
- To prepare a capital cost estimate and annual recurring cost for Environmental Management Plan.

## 2. Environmental Setting:

The environmental setting of the proposed plant is given in **Table**.

S. No.	Particulars	Details
1.	Location	Baikunth, Tilda dist. Raipur
2.	Toposheet No.	64G/15
3.	Latitude Longitude	21°29'18.09"N to 21°30'11.70"N 81°46'43.33"E to 81°47'49.45"E
4.	General ground level	306-283m above MSL
5.	Nearest National/ State Highway	Simga- Tilda-Baloda Bazar Road – 2.75km – NE SH-9 – 11.50km
6.	Nearest Railway Station	Baikunth – Adjacent - W
7.	Nearest Airport	Swami Vivekanand Airport, Raipur – 34.50km
8.	Nearest Tourist Place	Bhoramdeo (Kawardha) & Sirpur (Masamund)
9.	Archaeological Important Place	None within 10km radius
10.	Ecological Sensitive Areas	None within 10km radius
11.	Reserved / Protected Forest within 10km radius	Bilari RF – 7.75km- NNW
12.	Nearest major city <50000 population	Tilda – 5.00km
13.	Nearest Town / City within 10km radius	Tilda – 5.00km
14.	Surrounding village within 1 km area of the project.	Kundru – 0.60km - S Baikunth- Adjacent
15.	Nearest village	Kundru (S) Bahesar (E) Tandwa (W) Baikunth- Adjacent
16.	Nearest River within 10km radius	No river in 10 KM radius
17.	Nearest Lake/ Ponds within 10km radius	Dhumma Nalla – 1.25km - SW Kirna Tank – 2.25km- S Kulhan Nalla – 9.50km- SW Kirna Canal – 2.25km- S Bhatapara Branch Canal –0.10km – E Jamuniya Nalla – 4.75km – E Deorani Jethani Nalla – 8.00km - WNW



18.	Nearest Hill Ranges within 10km radius	None within 10km radius
19.	Other industries within 10km radius	Shri Bajrang Power & Ispat Ltd. – 0.150km- SW Hitech Power & Steel Ltd. – 6.75km – NNW Kethan Sponge & Infrastructure – 9.25km – NNW Central Cement Industries – 8.25km – NNW GMR Chhatisgarh Power Project – 7.00km – SE No. of Rice mills
20.	Mines within 10km radius	Century Cement, Limestone mine No. of other mines
21.	Seismic Zone	Zone – II as per IS: 1893 (Part-I) : 2002

### 3. Details About The Project Site

Century Cement is situated at Baikunth, Tilda, Dist. Raipur in the State of Chhatisgarh. Century Cement Plant lies at Longitude: 21°29'18.09"N to 21°30'11.70"N and Latitude: 81°46'43.33"E to 81°47'49.45"E and is covered under Topo sheet No.64G/15.

Century Cement plant is located at 8 Km from Tilda. Subsequently, the place where the present plant and the colony came into existence was christened as "Baikunth". Baikunth is about 34 Km in east of Raipur on Mumbai – Nagpur – Howrah South East Central railway main line. By road connectivity it is around 25 from Simga towards Raipur – Bilaspur by NH130 and 26 KM from Kharora towards Raipur – Balodabazar. The entire land is in possession of Group and no additional land is required for the project.

### 4. Salient Features Of The Project

Particulate	Existing Details	Proposed Details
Capacity	1.67 MTPA Clinker 2.40 MTPA Cement	2.0 MTPA Clinker (20% increase) 3.0 MTPA Cement (25% increase)
Cost of Project	255.57 Crore	48.41 Crore
Type of Fuel	Coal & Pet Coke	Coal, Pet Coke & Non-Hazardous waste (AFR)
Source of Fuel	Linkage, Purchase & Imported	Linkage, Purchase & Imported
Water Requirement	3793 KLD	Additional around 100KL
Source of Raw water	Own water reservoir	Own water reservoir



Pollution control equipment	Electro Static Precipitator, Reverse Air Bag House, De dusting Bag filters, Low NO <sub>x</sub> duct arrangement etc. Sewage Treatment Plant.	Replacement of existing polymers bags of duct collectors with homo polymer bags..
Level of particulate Matter after APC	<25 mg/Nm <sup>3</sup>	< 25 mg/Nm <sup>3</sup>
Cost of Pollution Control Equipments	58.0 Crore	2.22 Crore
Recurring Cost on Pollution Control measures (2017-18)	2.77 crore	Approx 3 Crores
Total Employment generation	1500	Will increase by 15-20 nos.
Ash Generation	300 TPD Max	Ash content in Coal fed to TPP boiler increases.
Fly Ash Silo Capacity	2000 x 2 MT	No Change is proposed
Green Belt area	277.960 Ha (for Plant, Colony & Mines- @ 45%) 174.698 Ha (Plant & Colony- @ 62%)	Green belt shall be developed in surrounding areas/villages and open available space in plant and colony.

- The principal raw materials required for the production of clinker are Limestone and Laterite. Limestone is being sourced from Captive limestone mines of unit which are located adjacent to the plant. Coal and Pet Coke are being used as fuel.
- The proposed modifications will be carried out within the existing plant; no additional land is required. Existing infrastructure will be utilized for the proposed modifications.
- Present total power requirement for simultaneous running of complete plant is about 33.4 MW which is being met from CSEB, and captive Thermal Power Plants. There are two Thermal Power Plant with a capacity of 16 MW & 11.0 MW & solar power unit of 6X100 KWp & 1X102 KWp SPVPP. Total own power generation capacity is 27.7 MW and remaining power is fulfilled by CSEB. After enhancement of production capacity, incremental power will be met by through CSEB.
- Present water consumption is approximately 3793 m<sup>3</sup>/day for Cement Plant, TPP, Mines and Colony. The present requirement of water is sourced through reservoir developed in the captive mines and near to the plant also. The capacity of mine water reservoir is about 530 million gallon. The water body developed near to the plant over area of 10. 67 ha having volume of 200 million gallon.



- Water from reservoir is drawn and it is purified, chlorinated through filtration plant then pumped to 4.5 lac liter capacity over head water tank in the colony and two 2.5 lacs capacity overhead tanks inside the plant. Water from Overhead water tank is distributed to colony as well as plant through subsidiary water distribution lines. Wastewater generated from captive Thermal Power Plant is being treated and re-used in the Cement Plant. Present domestic wastewater generation from the Cement Plant, TPP & Colony is 348 KLD.
- There is no wild life sanctuary, national park, eco-sensitive area within the 10 km radius of the project site.
- Existing infrastructure includes railway siding, roads, storm water drains, adequate storage space for clinker and flyash and parking area, which have been developed over the years. All social infrastructure facilities such as education, health and others have also been developed in the area.
- The unit is already acquired land of 587.119 hact inclusive of mines, plant and colony, out of above the plant and colony is having total land of 275.273 hact. Green belt has been developed over 169.698 hact out of total land of cement plant & colony i.e. 275.273 hact, whereas greenbelt of 5,27,753 number have been developed over land of 269.96 hact of out of total land of 587.119 hact.
- Century Cement has well-defined CSR policy for carrying out social development and welfare measures in the surrounding villages. Under CSR activity Century Cement is executing community development projects, in the fields of health, education and environmental conservation.

## **5. Process Of Optimization For Increased Capacity**

### **1 Crushing of Limestone**

Crushing of limestone is done usually in Primary, Secondary & Tertiary crusher to reduce the size of ROM limestone from 1.0-1.2 m to less than 50 mm. feedable to Ball Mill.

### **2 Limestone Handling and Transportation to stockpile**

The capacity of the limestone handling and conveying system is as 800-850 TPH.

### **3 Pre-blending of Crushed Limestone**

Crushed limestone will be kept inside covered shed in such a way , low grade and high grade will be stacked differently. Up to all possible extend proportion of different grade will be either directly or through EOT crane fed to Raw Mills Hoppers. The storage capacity for limestone has been considered as 13 days.

### **4 Drying and Grinding of Raw Material**

In the dry process, the raw materials are dried and ground in Ball Mills (close circuit). Considering the lower specific energy consumption amongst available options. Hot air from before PH fan from Kiln 1 & 2 Calciner are being taken and fed to Separator & mill inlet.



## **5 Blending of raw meal and Storage of kiln feed**

Continuous flow homogenizing silo system has already provided to reduce the quality variation in the raw meal and the kiln feed. The capacity of the raw meal-blending silo & storage is 16,000 MT.

## **6 Pre-heater, Pre-Calculator**

In cyclone pre-heater system, an efficient heat transfer takes place to finally dispersed raw material particles when they come in contact with hot gases from kiln.

The pre-heater is multi stage cyclone system connected with gas ducts and meal chutes. The raw meal is fed into top stage gas duct and is carried by hot gas steam into cyclone. The material gets separated from gas in cyclones and then travels downwards and through meal chute is discharged into next lower stage gas duct. In this way, material comes into contact with high temperature gases and gets preheated and partially calcined and then enters the pre-calculator.

In the pre-calculator, further calcination takes place by firing pulverized coal/pet coke and then material is discharged to the kiln. The feed travels down as the kiln rotates. The chemical reaction completes when the material reaches the burning zone and cement clinker is formed.

## **7 Kiln and Kiln Burner**

The technical concept considers a rotary kiln with capacity of 3030 x 2 TPD. Kiln No.1 & 2 is in length of 64 Mts and dia 4.11 Mts. For monitoring the kiln shell temperature, shell scanner is installed. A modern multi channel with low primary air consumption is installed for fuel firing in the kilns.

## **8 Coal/Pet Coke Grinding**

Grinding of coal/pet coke is being done in Ball Mill & Hot air taken from Cooler is used for removal of moisture content during grinding for saving in energy and better drying capacity.

## **9 Cooling of Clinker**

The clinker is discharged from kiln at around 1000°C temperature and is cooled in a cooler. The cooled clinker is then transported to clinker storage silo by Deep Bucket Conveyor (DBC) / Belt Conveyor..

## **10 Clinker Storage and transportation**

The clinker is stored in covered shed. Clinker transported for grinding in cement mills for manufacturing of Cement through belt conveyor and Pan conveyor.

## **11 VRPM**

Before feeding the clinker into Cement mill, pre-ground in VRPM for fore energy saving & improve productivity of Cement Mill.

## **12 Cement Mill**

Clinker / pre-ground clinker, Gypsum, Pozzolana / Slag are inter ground in Cement Mill (Ball Mill) to produce the Cement. Cement transported to air tight concrete silo.

### 13 Packers

Cement is being packed in 50 kg of PP/HDPE bags through fully automatised Rotary Packers

#### **Specific Consideration For Upgradation In Pyro Process System**

SN	Section	Proposed Up gradation/Modification
1.	Mining of Limestone	No change is proposed as captive mines are having adequate capacity of 30 Lacs Tonne /years to supply the raw material to cement plant
2.	Crusher There are two Nos of crusher installed at the output rate of 500 TPH and 300 TPH	<ul style="list-style-type: none"> <li>• Crushing output of both the crusher is 631 TPH @ of 12 Hrs running. However the crushed limestone for additional quantity of clinker i.e. 1000 TPD(for both lines) is achieved by optimizing the crushing running hours.</li> <li>• Crusher feed size for both old and new crusher should be maintained maximum 800 mm with boulders less than 15 %.</li> <li>• Regular feed should be ensured to feed hoppers of both crushers.</li> <li>• Maximum utilization of the running hours should be ensured.</li> <li>• The old crusher can be operated at nearly 500 tph however the secondary crusher is getting jammed frequently at this feed rate. Replacing the blow bars frequently could minimize the jamming tendency.</li> <li>• The new primary crusher has designed capacity of 400 tph, whereas it is operating on an average output of less than 300 tph, as the re-circulating elevator and mechanical vibro feeder are getting overload at feed rate more than 300 tph. Hence it is necessary to increase the capacity of the re-circulating elevator and vibro feeder.</li> </ul>
3	Raw Mill The combined operating capacity of the existing raw mill is 340 TPH @ 27% residue on 90 $\mu$ .	<ul style="list-style-type: none"> <li>• The raw mill Modifications in the existing mill system are required to achieve the shortfall of raw meal for proposed increase in capacity.</li> <li>• Conversion of existing 4 Nos Raw mill into mono chamber along with cyclone modification &amp; installation of higher rating circulating fan. Replacement of existing polymers bags with homo polymer bags of dust collectors.</li> <li>• Optimization of grinding media load pattern also done. Bucket Elevator capacity also enhancement</li> <li>• The Existing LV classifier is vented through two numbers of new cyclones of <math>\text{Ø}2.3\text{M}</math> with increased</li> </ul>



		<p>height.</p> <ul style="list-style-type: none"> <li>• New Circulating fan is considered for cyclones to maintain the air flow required through dynamic classifier.</li> <li>• Requirement of circulating fan volume for LV classifier is 2,00,000 m<sup>3</sup>/hr.</li> <li>• 2 nos. bucket elevator for feeding the raw mill product to blending &amp; storage silo.</li> </ul> <p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• The Performance improvements expected with the above modification for raw mill grinding circuit is, Mill Capacity: 120 TPH. Product Fineness: 26.6 % R on 90 μ &amp; 9.2 % R on 212 μ</li> </ul>
4	Continuous blending silo	<ul style="list-style-type: none"> <li>• The Design capacity of the existing raw meal silo is 13500 MT where as the required capacity for one day operation for an output of 3030 tpd is 5000 MT for one kiln. Hence the existing storage silo is sufficient.</li> </ul>
5	Pre Heater, Kiln, Cooler The Pyro processing system in both lines consists of with 5 stage pre-heater with N-MFC Precalciner.	<p>The existing equipment is adequate to produce 3030 TPD (one kiln) except cooler which is under capacity.</p> <ul style="list-style-type: none"> <li>• Riser duct velocity, down comer duct velocity and cyclone loading to be optimized.</li> <li>• One kiln cooler modification and another line cooler modification is proposed</li> </ul>
6	Deep Pan Conveyor	<ul style="list-style-type: none"> <li>• The capacity of existing clinker transport system is not sufficient for operation at increased capacity. Hence it is proposed to install a DPC of sufficient capacity to meet the requirement.</li> </ul>
7	Burner The existing kiln burner is not sufficient for increased capacity	<ul style="list-style-type: none"> <li>• It has proposed that existing Burner will be replaced with Pillard Burner.</li> <li>• Based on available space, the modifications are proposed in the existing for achieving the maximum production capacity:</li> </ul>





8	Precalciner /Calciner	<ul style="list-style-type: none"> <li>• The NMFC is sufficient even for the increased clinker production with low degree of calcination.</li> <li>• To enhance the degree of calcination and also the clinker production of 3030 tpd(one Kiln) on sustained basis, coal firing system need to be improved.</li> <li>• The Low NOx duct also to be installed to reduce the NOx level further.</li> <li>• New kiln feed bucket elevator.</li> <li>• Upgradation of existing kiln feed bucket elevator.</li> <li>• Installation of additional bin of 70 t capacity each, 6 no's bucket elevator conveyor of varying length along with accessories.</li> <li>• Installation of new TAD duct.</li> <li>• Installation of Imported refractories in kiln .</li> </ul>
8	Tertiary Air Duct (TAD)	TAD is proposed to be replaced with duct of outer diameter of 2.010 m from existing 1.81 m to bring down the velocity and pressure drop.
9	Kiln Feed Bucket Elevator:	<p>The design capacity of the existing kiln feed elevator is 350 tph; the required capacity for 3030 TPD is 209 TPH for one kiln.</p> <p>No margin is available in kiln feed elevator capacity. Hence, a new bucket elevator of 300 TPH needs to be installed for each line to fulfill the requirement.</p> <p>The existing kiln feed bin is proposed to be dismantled from the top of the preheater tower and installed at a new location under raw meal silo bottom.</p> <p>For feeding the kiln feed separate bucket elevator of higher capacity installed.</p>
10	Preheater Fan: PH fan inlet draught, Gas flow and the Pressure has been worked out at the operating clinker production level of 2,530 TPD	For increased production it is studied that Pre Heater fan inlet draught for the clinker production at 3030 tpd is estimated as 625mmWC against the design value of 610 mmWC for K-string and 650mm WC against 663 mmWC for C-string. This will be optimized with process control.
11	Kiln The existing kiln has a potential to produce 3030 tpd clinker on sustained basis.	<p>The kiln will be operated at higher RPM. The proposal is for capacity utilization through up-gradation of pyro processing system at Kiln 1 and 2.</p> <p>The Pre-heater fans, Cyclones, RABH &amp; ESP are adequate to handle increased output rate.</p> <p>Cooler is the bottleneck, so upgradation of cooler is proposed by replacement of existing coolers of both the kilns with ( Kiln No 1 with IKN cooler&amp; Kiln No. 2 with FONS cooler). Clinker transport capacity will also be up graded by installation of Deep Bucket Pan Conveyor.</p>

		To mitigate the increased feed rate Surge Hopper Shifting from +81ML to GF with installation of separate higher rating elevator for each.
	<p><b>Kiln</b> The existing kiln has a potential to produce 3030 tpd clinker on sustained basis.</p>	<ul style="list-style-type: none"> <li>• Kiln has a dimension of 4.1 m diameter by 64 m length. The estimated kiln operating load has an adequate margin for operation upto 3030 tpd clinker production with optimization of kiln rpm. The Existing Kiln speed of 3.0 rpm is sufficient and needs process optimization to maintain the kiln filling, volumetric loading and retention time within acceptable range.</li> <li>• The Fuel firing ratio is suggested at 50% in kiln in lieu of existing 50% fuel firing in kiln. This is to make sure that the specific thermal loading is within acceptable range. The coal feeding system of calciner to be upgraded to meet the coal requirement.</li> <li>• Replacement of existing polymers bags with homo polymer bags of RABH. To meet the additional coal firing for the increased output Coal Feeding Pump will be upgraded.</li> </ul>
12	<p><b>Cooler:</b> The existing grate cooler is having a grate area of 36m<sup>2</sup>. The specific loading of the clinker cooler and specific cooling air for the present operating capacity are not as the specified industry norms</p>	<ul style="list-style-type: none"> <li>• To address the problem of higher cooler loading it is recommended to increase the cooler grate area to 55m<sup>2</sup>(kiln -2 ) &amp; 62.0m<sup>2</sup> ( for kiln-1</li> </ul>
13	<p><b>Cooler ESP &amp; Fan</b> Cooler ESP and ESP fan inlet draught, Gas flow and the Pressure has been worked out at the operating clinker production level and for increased clinker production.</p>	<ul style="list-style-type: none"> <li>• The estimated volumetric capacities &amp; static pressure of the Cooler ESP and ESP fan are within design range. Hence, existing cooler ESP and ESP fan are adequate to meet the requirement of 3030tpd clinker production on sustained basis for both lines.</li> <li>• Even after this considering the increased clinker production. The existing ESP fan also will be replaced with higher rating</li> <li>• Cooler grate area to be increased from 36 m<sup>2</sup> to 55m<sup>2</sup>(kiln-2)&amp; 62m<sup>2</sup> for (kiln-1)</li> <li>• The cooler specific cooling air should be increased to 2.2 from 1.8 Nm<sup>3</sup>/kg clinker.</li> </ul>
14	<p><b>Kiln BH &amp; BH Fan</b></p>	<ul style="list-style-type: none"> <li>• The estimated volumetric capacities &amp; static pressure of Kiln Bag house fan is adequate for increased clinker production</li> </ul>



15	<p>Coal Mill Presently 2 coal mills each in both the lines are operating at 8-12 tph in both kiln</p>	<ul style="list-style-type: none"> <li>The capacities of the existing coal mills are adequate for operation at 3030 tpd.</li> <li>It is proposed to install a suitable capacity booster fan in each line to meet the requirement of extra hot gas of 25,000 Nm<sup>3</sup> at an average mill inlet temperature of 250-300 DegC for each line (based on the moisture content of 13%-15% in raw coal feed during rainy season).</li> </ul>
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## 6. Raw Material Details & Storage Facility:

Raw Material Requirement				
Material	Sources	Transportation	Existing Requirement (LTPA) for 16.7 LTPA Clinker & 24.0 LTPA Cement	Proposed Requirement (LTPA) for 20.0 LTPA Clinker & 30.0 LTPA Cement
Limestone	Captive mines/purchase	Dumper	25.0	29.5
Iron ore	Purchased	Truck	0.02	0.03
Coal (Linkage/e-auction/Pet-imported/Pet-Indigenous/)	Linkage/e-auction/purchase	Wagon/trucks	3.1	3.1
AFR (Plastic Waste , RDF / FMCG / Food & Waste) & other Non-Hazardous (Non-toxic) waste	Purchase	Truck	Nil	0.2
Gypsum	Purchase	Truck / Wagon	1.2	1.2
Flyash	Purchase / Own TPP	Bulker/Dense Phase	5.9	8.6
Slag	Purchase	Truck / Wagon	1.8	1.3

## 7. Base Line Environment

### i. Ambient Air Quality Status

Station	PM-10		PM-2.5		SO <sub>2</sub>		NO <sub>x</sub>		CO PPM
	Avg.	98 <sup>th</sup>	Avg.	98 <sup>th</sup>	Avg.	98 <sup>th</sup>	Avg.	98 <sup>th</sup>	
Behind workshop	70.12	71.83	27.99	28.99	7.27	9.11	15.39	18.82	<1
132KV Substation	66.84	71.73	26.60	28.43	8.99	10.81	16.36	18.31	<1
Near Fabrication Yard	69.27	74.26	27.66	29.69	9.58	11.24	16.13	18.71	<1



Near Canteen	63.70	72.02	25.24	26.01	9.31	10.36	20.10	24.47	<1
Chataud	71.51	75.96	28.63	30.38	9.87	13.40	24.05	28.09	<1
Tilda	74.67	82.03	29.75	32.56	12.57	13.73	24.52	27.15	<1
Bhaisar	73.10	76.38	29.18	30.64	13.30	15.15	21.50	24.64	<1
Jalsa	61.95	64.47	24.98	26.25	12.08	13.23	22.49	27.13	<1
Ninwa	70.21	75.37	28.07	30.25	8.84	11.36	14.70	17.62	<1
Hathbandh	64.90	70.59	25.91	27.11	11.23	11.87	17.89	19.22	<1

## ii. Surface Water & Ground Water Quality

Surface Water Quality Monitoring Stations				
S. No.	Location	Location No.	Direction	Distance in km
1	Kirna Tank	SW-01	S	3.00
2	Jamuniya Nalla	SW-02	E	4.75
3	Dhumma Nalla	SW-03	SSW	2.25
4	Kulhan Nalla	SW-04	SW	9.25
5	Mine pit of 237ha	SW-05	N	-
6	Mine pit of 73ha	SW-06	NWN	-
7	Deorani Jethani Nalla	SW-07	NW	7.25
8	Local nalla near plant	SW-08	N	1.00
9	Local pond Bhaser Village	SW-09	NE	3.00
10	Local pond Kundru Village	SW-10	S	0.75

Surface Water Quality Results					
Sr. No	Test Parameters	Unit	Minimum	Maximum	Standard limit IS:2296
<b>Physical Parameter</b>					
1	Temperature	°C	19.20	21.50	#
2	Color	Hazen	Clear		#
3	Odour	-	UN		#
4	Taste	-	AG		#
<b>Chemical parameter</b>					
1	pH	-	7.06	8.34	6.5-8.5
2	Electrical Conductivity at 25°C	□mhos/cm	345.60	3884.00	#
3	Turbidity	NTU	0.80	15.10	#
4	Total Solid	mg/lit	190.00	3360.00	#
5	Total Dissolved Solid	mg/lit	168.00	3095.00	1500.00
6	Total Suspended Solid	mg/lit	5	265.00	#
7	Total Alkalinity	mg/lit	116.00	200.00	#
8	Total Hardness as CaCO <sub>3</sub>	mg/lit	114.00	1608.00	#
9	Ca Hardness as CaCO <sub>3</sub>	mg/lit	24.00	680.00	#
10	Mg Hardness as CaCO <sub>3</sub>	mg/lit	54.00	928.00	#
11	Calcium as Ca	mg/lit	9.62	272.54	#
12	Magnesium as Mg	mg/lit	13.12	225.50	#
13	Sulphates as SO <sub>4</sub>	mg/lit	20.84	171.49	400.00
14	Chlorides as Cl	mg/lit	5.00	203.93	600.00
15	Iron as Fe	mg/lit	<0.05		50.00



16	Nitrate as NO <sub>3</sub>	mg/lit	0.01	11.49	50.00
17	Nitrite as NO <sub>2</sub> -N	mg/lit	<0.01	0.53	#
18	Phosphate as PO <sub>4</sub>	mg/lit	<0.01		#
19	Fluoride as F	mg/lit	<0.10	0.15	1.50
20	Copper as Cu	mg/lit	<0.03		1.5
21	Chromium as Cr <sup>+6</sup>	mg/lit	<0.10		0.05
22	Manganese as Mn	mg/lit	<0.20		#
23	Zinc as Zn	mg/lit	<0.05		15.00
24	Total Chromium as Cr	mg/lit	<0.05		0.05
25	Cadmium as Cd	mg/lit	<0.05		0.01
26	Lead as Pb	mg/lit	<0.05		0.1
27	Mercury as Hg	mg/lit	<0.05		
28	Nickel as Ni	mg/lit	<0.05		#
29	Arsenic as As	mg/lit	<0.05		
30	Sodium as Na	mg/lit	7.34	173.48	#
31	Potassium as K	mg/lit	2.96	60.14	#
32	Boron as B	mg/lit	<0.10		
33	Selenium as Se	mg/lit	<0.05		0.05
34	Dissolve Oxygen	mg/lit	4.20	5.30	4.00
35	COD	mg/lit	<4.00	70.00	#
36	BOD	mg/lit	<2.00	7.00	3.00
37	Coliforms	MPN 100ml	per 22.00	94.00	5000.00

#### **Ground Water Quality Monitoring Locations**

Sr. No.	Location No.	Name of Station	Source of sample	Direction	Distance in km
1.	GW-01	Tilda	Hand pump	6.00	N
2.	GW-02	Chataud	Hand pump	6.25	E
3.	GW-03	Gaitara	Hand pump	7.50	SE
4	GW-04	Jalsa	Hand pump	2.75	S
5	GW-05	Ninwa	Hand pump	6.00	SW
6	GW-06	Hathbandh	Hand pump	2.75	W
7	GW-07	Tulsi	Hand pump	4.25	N
8	GW-08	Bahesar	Hand pump	2.50	NE
9	GW-09	Konari	Hand pump	4.00	E
10	GW-10	Jota	Hand pump	3.75	NW

#### **Ground Water Quality Results**

SN	Test Parameters	Unit	Minimum	Maximum	Desirable limits	Permissible limits
	<b>Physical Parameter</b>					
1	Temperature	°C	18.2	19.6		
2	Color	Hazen	Clear	Clear	5	25
3	Odour	-	UN	UN	UN	
4	Taste	-	Agreeable	Agreeable	Agreeable	
	<b>Chemical parameter</b>					
1	pH	-	6.37	8.28	6.5-8.5	6.5-8.5
2	Electrical Conductivity	□mhos	202.00	1277.00	-	-

	at 25°C	/cm				
3	Turbidity	NTU	0.40	11.50	5	10
4	Total Solid	mg/lit	98.00	696.00	-	-
5	Total Dissolved Solid	mg/lit	84.00	681.00	500	2000
6	Total Suspended Solid	mg/lit	8.00	70.00	-	-
7	Total Alkalinity	mg/lit	84.00	388.00	200	600
8	Total Hardness as CaCO <sub>3</sub>	mg/lit	76.00	452.00	300	600
9	Ca Hardness as CaCO <sub>3</sub>	mg/lit	56.00	272.00	-	-
10	Mg Hardness as CaCO <sub>3</sub>	mg/lit	20.00	180.00	-	-
11	Calcium as Ca	mg/lit	22.44	109.02	75	200
12	Magnesium as Mg	mg/lit	4.86	43.74	-	-
13	Sulphates as SO <sub>4</sub>	mg/lit	89.36	198.09	200	400
14	Chlorides as Cl	mg/lit	5.99	127.96	250	1000
15	Iron as Fe	mg/lit	<0.05		0.3	1.0
16	Nitrate as NO <sub>3</sub>	mg/lit	5.27	23.87	45	100
17	Nitrite as NO <sub>2</sub> -N	mg/lit	<0.01	3.57	-	-
18	Phosphate as P	mg/lit	<0.10	0.54	-	-
19	Fluoride as F	mg/lit	<0.10	1.00	1	1.5
20	Copper as Cu	mg/lit	<0.03		0.05	1.5
21	Chromium as Cr <sup>+6</sup>	mg/lit	<0.01		0.05	0.05
22	Manganese as Mn	mg/lit	<0.20		0.10	0.30
23	Zinc as Zn	mg/lit	<0.05		5	15
24	Total Chromium as Cr	mg/lit	<0.05		-	-
25	Cadmium as Cd	mg/lit	<0.05		0.01	0.01
26	Lead as Pb	mg/lit	<0.05		0.05	0.05
27	Mercury as Hg	mg/lit	<0.01		0.001	0.001
28	Nickel as Ni	mg/lit	<0.05		-	-
29	Arsenic as As	mg/lit	<0.05		0.05	0.05
30	Sodium as Na	mg/lit	5.79	160.36	-	-
31	Potassium as K	mg/lit	<1.00	24.74	-	-
32	Boron as B	mg/lit	<0.10		1	5
33	Selenium as Se	mg/lit	<0.05		0.01	0.01
34	COD	mg/lit	<4.00	20.00	-	-
35	BOD (3 day 27degree)	mg/lit	<2.00	3.00	-	-
36	Coliforms	MPN per 100ml	<2.00		Absent	10/100ml

## iii. AMBIENT NOISE LEVEL

## Ambient Noise Location

Sl. No.	Code	Stations	Distance	Direction	Zone
1.	N <sub>1</sub>	Tilda	6.00	N	Residential
2.	N <sub>2</sub>	Chataud	6.25	E	Residential
3	N <sub>3</sub>	Bhaisar	3.00	NE	Residential
4	N <sub>4</sub>	Jalsa	2.75	S	Residential
5	N <sub>5</sub>	Ninwa	6.00	SW	Residential
6	N <sub>6</sub>	Hathbandh	2.75	W	Residential
7	N <sub>7</sub>	Century Hospital	-	-	Silence



**Ambient Noise Level at Villages**

S. No.	Location Code	Leq day	Leq night
1.	Tilda	72.89	54.43
2.	Chataud	58.45	37.90
3.	Bhaisar	76.73	42.11
4.	Jalsa	56.08	35.52
5	Ninwa	57.33	35.09
6	Hathbandh	59.31	34.64
7	Century Hospital	54.39	33.35

Units are in dB(A).

**Noise level at sources**

S.N.	Location	Distance from	Maximum	Minimum
1.	Near Main gate		77.00	62.0
2.	Packing Plant		77.20	72.20
3.	CCR		54.20	52.20
4.	Raw Mills	0.0mt.	80.00	78.10
		5.0mt.	70.20	68.20
		10.0mt	64.10	62.30
5	Kiln feed	0.0mt.	80.00	79.30
		5.0mt.	71.20	68.30
		10.0mt	60.20	58.20
6.	Coal Mills	0.0mt.	81.00	79.20
		5.0mt.	76.20	74.20
		10.0mt	72.00	71.20
7	Compressor	0.0mt.	83.00	81.20
		5.0mt.	78.20	76.30
		10.0mt	74.20	70.20
8	Thermal Power (16 MW)	0.0mt.	86.00	84.20
		5.0mt.	80.20	78.20
		10.0mt	74.20	70.00
9	Thermal Power (11MW)	0.0mt.	85.00	83.80
		5.0mt.	80.30	79.10
		10.0mt	74.20	71.20
10	Behind workshop	-	78.00	44.20
11	132KV Substation	-	64.20	50.20
12	Near Fabrication Yard	-	78.90	42.00
13	Near Canteen	-	64.20	38.00



## 8. IDENTIFICATION OF IMPACTING ACTIVITIES

S No	Aspects/Activities	Impact without measures	Proposed Management/Mitigation Measures	Impact with EMP
1.	<p>Air Environment</p> <p><b>During construction</b> Dust emission due to the minor construction, movement of vehicles, concrete mixing machinery, emission from DG set</p> <p><b>During Operation</b> Emission from various stacks of kiln, cooler, cement mills, raw mills etc Emission from material handling / coal crushing/conveying and fly ash emission</p>	<p>Uncontrolled dust emission/source emission shall lead to change in air quality, visibility, deposition of dust over soil. Such emission will have secondary impact as :</p> <ul style="list-style-type: none"> <li>• Adverse impact over human health,</li> <li>• Adverse impact over crop production ,</li> <li>• Adverse impact over flora &amp; fauna</li> <li>• Adverse Impact over the climate</li> </ul> <p>The above secondary impact will have tertiary impact with respect to loss of economy and ill socio cultural environment</p>	<p><b>During construction</b></p> <ul style="list-style-type: none"> <li>• Provision of spraying water to reduce dust emission.</li> <li>• The amount of exposed ground and stockpiles will be minimized so that re-suspension due to wind and subsequent dust fall is prevented. Heights of stock piles should control dust fall in nearby areas.</li> <li>• Ensuring all vehicles, generators and compressors are well maintained and regularly serviced.</li> <li>• DG set will be kept as stand by.</li> </ul> <p><b>During Operation</b></p> <ul style="list-style-type: none"> <li>• Adequate height to various stacks and adequate control system have been provided with emission limit of 25 mg per normal cum.</li> <li>• Dust collectors shall be provided at various material transfer points</li> <li>• Dense phase conveying system for flyash has been provided.</li> </ul>	NA air
2	<p>Water Environment</p> <p><b>During construction</b> Requirement of 4-5m<sup>3</sup>/day of water during construction Accumulation of water in excavation  Release of waste water from</p>	<p>Uncontrolled withdrawal of water from water reservoir and release of un treated waste water will give primary adverse impact over</p> <ul style="list-style-type: none"> <li>• Change in ground water quality</li> <li>• Change in surface water quality</li> <li>• Decreased water level &amp; flow pattern</li> <li>• Disturbance to drainage pattern of the area</li> </ul>	<p><b>During construction</b></p> <ul style="list-style-type: none"> <li>• Local workers will be employed to avoid excess water consumption.</li> <li>• Waste water from domestic sanction has been taken to STP located within the premises.</li> <li>• Care will be taken to prevent water from entering excavations though GI</li> </ul>	NA water SB socioeconomic

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	<p>m<sup>3</sup>/day from domestic activities</p> <p><b>During Operation</b> Requirement of 3650 (+ 100 ) m<sup>3</sup>/day of water ( if proposed)</p> <p>Discharge of treated waste water from STP on land</p>	<ul style="list-style-type: none"> <li>Leaching of toxic substance</li> </ul> <p>These primary impact will lead to adverse impact on the agricultural production, water borne diseases to human beings and animals, loss of land scape, flora and fauna etc. which ultimately results in loss of aquatic life, negative impact on amenity &amp; recreation, hydraulics of water courses economy and ill socio cultural environment</p>	<p>sheets and other measures</p> <p><b>During Operation</b></p> <ul style="list-style-type: none"> <li>No discharge of water from outside of plant will take place</li> <li>The drain along the boundary wall (inside the premises) is proposed to prevent to meet any runoff from premises.</li> <li>Ground water table is anticipated to be rise by creation of water harvesting structure and water body</li> <li>Ground water recharge system have been developed which further help in recharging of ground water.</li> <li>Unit has also developed water reservoir in mines and near to the plant also. The capacity of mine water reservoir is about 530 million gallon. The water body developed near to the plant over area of 10. 67 ha having volume of 200 million gallon. Mine water pits and reservoir is located at adjacent distance of the plant and is capable of meeting about 237 days water requirements of the Cement Plant apart from the water reservoir developed within mine premises.</li> </ul>	
3	<p>Noise Environment</p> <p><b>During construction</b> Higher noise level during construction due to excavation,</p>	<p>Higher Noise may cause impacts as below :</p> <ul style="list-style-type: none"> <li>Change in ambient noise level</li> <li>Annoyance</li> <li>Interference with communication</li> </ul>	<ul style="list-style-type: none"> <li>Equipment like compressor shall be installed with acoustic enclosure</li> <li>The vehicles used will be with the standard limiting noise output.</li> <li>Online vibration monitoring of high</li> </ul>	NA noise



	<p>plying of vehicles, operations of construction machinery, operation of DG set etc.</p> <p><b>During Operation</b> Generation of noise due to operation of steam turbine, boiler, equipments, conveyer belt, etc.</p>	<ul style="list-style-type: none"> <li>• Health risk</li> <li>• Impact on work output and efficiency</li> <li>• Migration of birds, reptiles and population</li> <li>• Risk of accident with high vibration scenario</li> </ul>	<p>speed and vital equipments shall be planned</p> <ul style="list-style-type: none"> <li>• Noise shield shall be provided wherever required</li> <li>• Employees and others would be guided properly with sign board</li> <li>• Strict compliance of maintenance schedule have been done of all transportation and plant equipment</li> <li>• Regular monitoring of noise level will be carried out and corrective measures in concerned area have been adopted accordingly.</li> <li>• The adverse impact on occupationally exposed workers will not be envisaged, as noise protection devices have been provided</li> <li>• Rotation of workers working in high noise prone area</li> </ul>	
3	<p>Land Environment</p> <p><b>During construction</b></p> <ul style="list-style-type: none"> <li>• Leakage of oil from vehicles &amp; equipment.</li> <li>• Spillage of concrete mixture containing additives and plasticizers.</li> <li>• Contamination of land/soil</li> <li>• Spillage of construction material containing heavy metals, paints, coating, liners etc.</li> <li>• Storage and handling of</li> </ul>	<p>Soil contamination is envisaged through</p> <ul style="list-style-type: none"> <li>• Heavy metals and other pollutants</li> <li>• Change in Soil moisture, permeability</li> <li>• Leaching of toxic substance</li> <li>• Change in structure of Soil</li> </ul> <p>The above primary impact will result in less agricultural production, affected fodders for animals, health effect on human being and animals.</p> <p>Change in land use is not anticipated as expansion is proposed within the premises of existing unit.</p>	<ul style="list-style-type: none"> <li>• Spillage of oil from construction/operational vehicles and equipments is avoided. These should be inspected by supervisor for any leakage of oil.</li> <li>• The contamination of soil is avoided by soil conservation measures. Good plantation has been developed which help in soil conservation also.</li> <li>• Care has been taken to compact the soil after refilling so that, soil erosion and consequent soil import is avoided.</li> <li>• Cement powder, concrete retarding</li> </ul>	<p>NA land NA ground water</p>

	<p>concrete</p> <p><b>During Operation Phase</b> Contamination of soil due to spillage of oil from machinery Contamination of soil Release of waste water over the land</p>		<p>will be stored in areas away from storm water, grids, channels and watercourses or adequate measures will be taken to protect against pollution.</p> <ul style="list-style-type: none"> <li>• Storage of all potentially polluting substances will be located on impermeable surfaces with controlled drainage.</li> <li>• Storage areas is fenced off</li> <li>• No discharge of water will take place</li> <li>• The drain along the boundary wall (inside the premises) is m to prevent to meet any runoff from premises to nalla</li> </ul>	
6	<p>Solid &amp; Hazardous Waste Environment</p> <p><b>During construction</b></p> <ul style="list-style-type: none"> <li>• Generation &amp; disposal of waste like Cements bags, waste paper, unusable steel scrap and cardboard packing material and excavated earth and concrete debris</li> <li>• Waste oil from DG set</li> </ul> <p><b>During Operation Phase</b> Generation &amp; disposal Waste paper, broken bottles, Plastics, Bio-degradable – kitchen waste, Sludge, Inert –Waste Resin and carbon from ACF Discarded Drums Used Oil</p>	<p>Improper handling and disposal of solid and hazardous waste shall give impact over</p> <ul style="list-style-type: none"> <li>• Soil profile and characteristic of the area</li> <li>• Contamination of ground water and surface water courses of the area</li> </ul> <p>Contaminated soil and water will subsequently provide adverse impact over agricultural production and quality of crops, affected fodders for animals, health effect on human being and animals.</p>	<ul style="list-style-type: none"> <li>• Recyclables like Cements bags, waste paper, unusable steel scrap and cardboard packing material sold to vendors/recyclers</li> <li>• Inert material will be used as much as possible for the internal road construction and leftover is/will be sold to road contractor</li> <li>• Waste oil is/will be stored in HDPE drums and is/will be sold to authorized recyclers</li> <li>• Waste resin, carbon and discarded drums is/shall be disposed off at Common TSDF .</li> <li>• Waste oil is/will be sold to authorized recyclers</li> </ul>	0- land,



7	<p>Socio Economic environment</p> <p><b>During construction</b></p> <ul style="list-style-type: none"> <li>About 50-75 number of workers shall be deployed at site during construction</li> <li>Air, water, land, noise pollution through various construction activity</li> </ul> <p><b>During Operation</b></p> <ul style="list-style-type: none"> <li>Generation of direct and indirect employment</li> <li>Air, water, land, HSW, noise pollution through various operational activity</li> <li>Gross economic product</li> <li>Medical facilities</li> <li>Execution of CSR programme</li> </ul>	<p>Most of activities pertaining to socio economic aspects will have positive impacts. However uncontrolled discharge of air, water, solid &amp; hazardous waste will give impacts on social segment as tertiary impact. Following are the impacts envisaged :</p> <ul style="list-style-type: none"> <li>Net Income Output</li> <li>Change in Economic Base of the Region</li> <li>Development Of ancillary industries</li> <li>Employment Opportunity</li> <li>Demand For Communication Facilities</li> <li>Demand for infrastructural facilities in terms of water supply, sewerage &amp; waste management, educational, medical and recreational facilities,</li> </ul> <p>Uncontrolled discharge of air, water, solid &amp; hazardous waste will give impacts in terms of aesthetic risk, Effect on Human health, Effect on agriculture, &amp; fisheries, Effect on Building Materials Monuments</p>	<ul style="list-style-type: none"> <li>Proper implementation of EMP to prevent impact on social segment</li> <li>Direct &amp; indirect employment opportunity.</li> <li>Positive impacts since the employees are from different culture and religion.</li> <li>Positive impact due to change in zonal economy.</li> <li>Positive impact due to health care's facilities for workers &amp; villages.</li> <li>Better medical facilities through regular medical camps</li> <li>Execution of various need base programme under CSR, which ultimately resulted in development of area</li> </ul>	SB on socio economy
	<p>Biological Environment</p> <p><b>During construction</b></p> <ul style="list-style-type: none"> <li>Disturbance of flora and fauna due to illumination, &amp; unexpected fluctuations in lighting</li> <li>Disturbance of flora &amp; fauna due to noise generation from various machineries and transportation activities</li> </ul>	<p>Uncontrolled discharge of air emission , waste and treated water , will give impacts in terms of Aesthetic risk, Effect on Human/animal health, Effect on agriculture, &amp; fisheries.</p> <p>Uncontrolled dust emission/source emission shall lead to change in air quality, visibility, deposition of dust over soil. Such emission will have secondary impact as :</p> <ul style="list-style-type: none"> <li>Adverse impact over human health,</li> </ul>	<ul style="list-style-type: none"> <li>Thick Plantation of trees in and around premises. The unit is already acquired land of 587.119 hact inclusive of mines, plant and colony, out of above the plant and colony is having total land of 275.273 hact. Green belt has been developed over 174 hact out of total land of cement plant &amp; colony i.e. 275.273 hact, whereas greenbelt of 5,27,753</li> </ul>	NA on flora & Fauna

	<p><b>During Operation</b> Disturbance of flora &amp; fauna due to emission to ambient air because of burning of Fuel</p> <p>Disturbance of flora &amp; fauna due to noise generation from various machineries</p> <p>Disturbance of flora &amp; fauna due to release of waste water</p>	<ul style="list-style-type: none"> <li>• Adverse impact over crop production ,</li> <li>• Adverse impact over flora &amp; fauna</li> </ul> <p>Uncontrolled discharge of waste or treated water over the land or any surface water body will lead to adverse impact on the agricultural production, water borne diseases to human beings and animals, loss of land scape, flora and fauna etc. which ultimately results in loss of aquatic life.</p> <p>High noise level and significant illumination create disturbance the habitats of animals.</p>	<p>number have been developed over land of 269.96 hact of out of total land of 587.119 hact.. Good Greenbelt with 3,19,642 of plants has been developed within plant and colony whereas 5,27,753 plants have been developed at plant, colony and mines</p> <ul style="list-style-type: none"> <li>• As no wastewater/treated water from the proposed project is/will be discharged outside the premises, there is insignificant impact on the ecology of the study area.</li> <li>• The provision of adequate stack height with pollution control equipment at various point of siyrce emission, water spraying system and dust collector system at various material transfer points is/shall restrict the probable disturbance to the biological environment of the area.</li> </ul>	
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## 9. Environment Management Plan

The project will be implemented with environment friendly technology.

### a. Air Pollution Control

- All pollution control equipment is designed for less than 25mg/Nm<sup>3</sup> dust on dry basis,. Covered sheds/Silos have been provided for raw materials and finished products
- Stacks at various points with adequate height for wider dispersion of gaseous emissions have already been provided.
- In line with proposed up-gradation, the control equipments at Kilns, Cooler section, Cement mill and coal mill shall also be upgraded by providing additional compartment to ESP and additional module to Bag Filters to meet out the given norms.
- Storage of fly ash 2 nos concrete silo , capacity of each silo is 2000 MT and 2 nos of steel hoppers capacity of 300 MT. Flyash is being conveyed pneumatically.
- 360 x 30 mts & 228 x 25 mtrs covered shed adjacent to each other have been provided for the storage of materials i.e. Limestone, Iron Ore, Clinker, Gypsum, Pozzolana & Slag. Covered shed of the dimensions 250 x 22 mtrs & 75 x 15.5 mtrs have been provided for the storage of Coal.
- Water sprinkling system is provided at the limestone crushing system & conveying systems.
- Pucca road from Plant to Tilda Plant have been made to control the fugitive dust emission.
- Transportation of clinker to clinker silo is done through covered conveyor to prevent fugitive emission.
- Transportation of fly ash to silo is done pneumatically from tanker to avoid fugitive emission.
- Fly ash transportation has been transported by closed tankers.
- Covered unloading hoppers with atomized water spray system have been provided.
- Greenbelt has been developed 5 m all around the periphery of the plant to arrest the fugitive emissions. Total good Greenbelt with 3,19,642 of plants has been developed within plant and colony whereas 5,27,753 plants have been developed at plant, colony and mines.
- Online emission monitors have been provided for major stacks.
- Preventive maintenance of valves, flanges, joints, roof vents of storage vessels in practice. The fugitive dust emissions is controlled by installation of closed conveyor system along with suitable dust suppression measures:
- Dust collectors system has been provided at various material transfer points.
- Dust collected from air pollution control equipments is being totally recycled in the process.



- Roads and floors inside the plant are cleaned by vacuum sweeping machine.
- Low NOx burners are already provided for NOx control from Kilns stack.
- The guideline issued by CPCB on measures for controlling of source and fugitive emission in cement plant is being followed.
- The stack emission control system should be regularly monitored and maintained.
- Better process control shall also help to keep the emission within the limit
- Proper record of monitoring report of existing stacks, and ambient air shall be maintained.
- In order to control the fugitive dust emissions due to transportation activity, major roads within the plant area has been asphalted. The road nearby the fly ash silo shall also be asphalted..

To keep the PM emissions from stack below 30 mg/Nm<sup>3</sup>, all major sources of air pollution (i.e. kiln, cooler, cement mill etc.) have been provided with RABH / Bag filters / ESP.

<b>Details of Existing Air Pollution Control Equipments</b>				
<b>Emission Source</b>	<b>Existing APCE</b>	<b>Designed Emission level ( mg/nm<sup>3</sup>)</b>	<b>Stack Dia (mt)</b>	<b>Stack Height</b>
RM-1	Pulse Jet Dust collector	<25	0.98	35
RM-2	-do-	<25	0.85	35
RM-3	-do-	<25	0.97	35
RM-4	-do-	<25	1.00	35
Kiln No. 1	RABH	<25	2.60	40
Kiln No. 1 Precalculator	RABH	<25	2.00	45
Kiln No. 1 Clinker Cooler	ESP	<30	3.00	45
Kiln No. 2	RABH	<25	2.60	40
Kiln No. 2 Precalculator	RABH	<25	2.00	45
Kiln No. 2 Clinker Cooler	ESP	<25	3.00	45
Coal Mill-1	Pulse Jet Dust collector	<25	0.82	40
Coal Mil-2	-do-	<25	0.80	40
Coal Mill-3	-do-	<25	1.00	40
Coal Mill-4	-do-	<25	0.65	40
Cement Mill-1	-do-	<25	0.94	51
Cement Mill-2	-do-	<25	0.94	51
Cement Mill-3	-do-	<25	0.93	51
Cement Mill-4	-do-	<25	1.00	51
Cement Mill-5	-do-	<25	0.98	51
Thermal Power Plant (16 MW)	Hybrid Filter	<25	3.57	72.5
Thermal Power Plant	Hybrid Filter	<25	2.95	60

(11 MW)				
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<b>Technical Details of APC for Proposed Configuration</b>						
<b>SNo.</b>	<b>Description</b>	<b>Air pollution control Equipment</b>	<b>Air Consumption (Nm3/kg clinker)</b>	<b>Designed M3/Hr</b>	<b>Operating Air Flow, Nm3/Hr</b>	<b>Remarks</b>
1	Raw Mill No. 1	Pulse - Jet D.C	0.27	48000	34088	Increase production rate from 340 TPH to 404 TPH with upgradation , the Existing LV classifier is vented through two numbers of new cyclones of Ø2.3M with increased height. New Circulating fan is considered for cyclones to maintain the air flow required through dynamic classifier. Additional dust collectors(4 Nos-5000m3/hr each). After modification dust load same because improvement in cyclone efficiency.. D/c bags will be replaced with high efficiency homo polymer bags and other maintenance work in d/c will be done.
2	Raw Mill No. 2	Pulse - Jet D.C	0.25	48000	31563	
3	Raw Mill No. 3	Pulse - Jet D.C	0.27	48000	34088	
4	Raw Mill No. 4	Pulse - Jet D.C	0.25	48000	31563	
5	Kiln No. 1	RABH	1.07	250000	135000	Increase in production level from 105TPH to 126TPH , the flow rate increase , although the Total gas required Nm3/kg clinker reduced.
6	Kiln No. 1 Precalculator	RABH	0.87	194500	110000	
7	Kiln No. 1 Clinker Cooler	ESP	1.07	450000	135000	Cooler ESP and ESP fan inlet draught, Gas flow and the Pressure has been worked out at the operating clinker production level and for increased clinker production. The estimated volumetric capacities & static pressure of the Cooler ESP and ESP fan are within design range. Hence, existing cooler ESP and ESP fan are adequate to meet the



						requirement of 3030tpd clinker production on sustained basis for both lines. Even after above consideration, existing ESP fan also will be replaced with higher rating Fan.
8	Kiln No. 2	RABH	1.07	250000	135000	Increase in production level from 105TPH to 126TPH , the flow rate increase , although the Total gas required Nm3/kg of clinker will be reduced.
9	Kiln No. 2 Precalculator	RABH	0.87	194500	110000	
10	Kiln No. 2 Clinker Cooler	ESP	1.07	450000	135000	Cooler ESP and ESP fan inlet draught, Gas flow and the Pressure has been worked out at the operating clinker production level and for increased clinker production. The estimated volumetric capacities & static pressure of the Cooler ESP and ESP fan are within design range. Hence, existing cooler ESP and ESP fan are adequate to meet the requirement of 3030tpd clinker production on sustained basis for both lines. Even after above consideration , existing ESP fan also will be replaced with higher rating fan also for performance improvement of ESP internals (Panels upgradation, collecting, emitting electrode / plate , GD screen ,, HF Control, W/IGBT Board Sys, F/ESP, control cabinet etc)
11	Coal Mill No. 1	Pulse - Jet D.C		22000	Existing	There will be no change in coal mill. However for increased clinker production, mill hrs will be increased.
12	Coal Mill No. 2	Pulse - Jet D.C		22000	Existing	
13	Coal Mill No. 3	Pulse - Jet D.C		35840	Existing	
14	Coal Mill No. 4	Pulse - Jet D.C		30000	Existing	

15	Cement Mill No. 1	Pulse - Jet D.C		27500	Existing	Increased working day of cement mill from 330 to 345. Replacement of existing polymers bags with homo polymer bags of dust collectors also the diaphragm of solenoid has been planned for better efficiency .
16	Cement Mill No. 2	Pulse - Jet D.C		27500	Existing	
17	Cement Mill No. 3	Pulse - Jet D.C		35320	Existing	
18	Cement Mill No. 4	Pulse - Jet D.C		42000	Existing	
19	Cement Mill No. 5	Pulse - Jet D.C		42000	Existing	

**b. Noise Control**

Noise generating sources in a plant are identified as steam release valves, compressors, Various mills, turbine and DG set etc. No person is required to remain constantly at the above-mentioned units and will go occasionally to check the systems.

Noise attenuating devices like earplugs and earmuffs shall be provided to workers exposed to high noise levels. Noise barriers, silencer and enclosures shall be incorporated in the equipments, which emit high noise level. All basic equipments and various machineries should be kept well maintained. Green belts are good noise barriers and same will be developed around the plant. The sufficient green belt may be proposed to control noise levels.

Following are the measures proposed to control the higher noise level.

- Provision of acoustic enclosure for Turbine at TPP
- Provision of lining with sound absorbing materials for walls and ceilings of the concerned buildings.
- Provision of insulated enclosures at area close to the high noise sources.
- Provision of noise attenuating devices like ear plugs and ear muffs to the workers exposed to high noise level.
- Development and maintenance of sufficient green belt.
- Regular monitoring of noise level followed by corrective measures in concerned machinery.
- Maintenance of machinery & vehicles will be done in a sustainable manner to ensure best performance and less noise.
- Disallowing vehicles for parking at villages property and towards highway. Provision shall made for specified parking area for vehicle
- Continues exposure to workers in higher noise prone area shall be avoided. Workers will be subjected to regular medical examination for any symptoms of hearing loss.
- Provision of training to workers to generate awareness about effects of noise and importance of using PPEs.



### C. Water Management

Present water consumption is approximately 3793 m<sup>3</sup>/day for Cement Plant, TPP, Mines and Colony which is sourced from a reservoir developed in the captive mines/ plant.

The present requirement of water for the Cement Plant, Thermal Power Plant and colony is met from reservoir developed in the captive mines, where rainy season water are being collected for about 237 days water requirements of the Cement Plant.

The present requirement of water is sourced through reservoir developed in the captive mines and near to the plant also. The capacity of mine water reservoir is about 530 million gallon. The water body developed near to the plant over area of 10. 67 ha having volume of 200 million gallon. Mine water pits and reservoir is located at adjacent distance of the plant.

Water from reservoir is drawn and it is purified, chlorinated through filtration plant then pumped to 4.5 lac liter capacity overhead water tank in the colony and two 2.5 lacs capacity overhead tanks inside the plant. Water from Overhead water tank is distributed to colony as well as plant through subsidiary water distribution lines.

The waste water generated from cement plant and CPP is treated in the neutralization tank followed by treatment plant. The domestic waste water is provided treatment in 250 x 2 KLD & 60 KLD of STP .

#### Water Balance of Existing & Proposed Plant

Unit	Water consumption KLD		Waste water generation KLD	
	Existing	Proposed (additional)	Existing	Proposed (additional)
Cement Plant Process & Others	1800	100	42	2
Domestic (Colony & Others)	1500	-	283	-
Cooling Tower	220	-	10	-
DM Water	130	-	13	-
Sub Total	3650	100	348	2
Mines	143	-	-	-
<b>Grand Total</b>	<b>3793</b>	<b>-</b>	<b>348</b>	<b>2</b>

- Water conservation plan has been carried out by recycling and reuse of treated domestic waste water in gardening, dust suppression which will reduce the fresh water demand. Rainwater harvesting has been done to increase the water table of the area



Rain water harvesting system has been developed with in the plant and colony premises through roof water collection and water reservoir system . Total 6,58,779 m<sup>3</sup>/year runoff is being generated from the mine pit, plant and colony complex which can be considered for ground water recharge. The firm has constructed total eight (15) number rainwater harvesting structures four structures at surrounding of School building, near to the Club house & colony of the plant complex

- No effluent generation from process. Blow down from TPP is being neutralized and is/will used for various ancillary purposes within the plant .
- Proper spill control measures for stored chemicals, raw material is/ will be done.
- Regular monitoring of water is/will be done.
- Proper and covered storage area have been provided to avoid leakage and spillage.
- Daily inspections are carried out, on each site, and general housekeeping are often checked on a daily or weekly basis.
- Zero discharge condition is/will be maintained. PTZ camera with connectivity to server of MPPCB has been provided to monitor the condition.
- A drain along the boundary wall shall be made, which joins the settling tank to protect the flow of contaminant outside the premises if any.
- Oil spills and leaks from vehicle parking lots and washing area.

#### D. Solid & Hazardous Waste Management

##### Details of Solid & Hazardous Waste Generation/Management

<b>Details on Hazardous Waste Management</b>				
<b>Description</b>	<b>Unit</b>	<b>Existing Quantity</b>	<b>Proposed Quantity</b>	<b>Mode of Disposal</b>
Used Oil	KL	60	No Change	Disposed off to authorized recyclers
Spent ion exchange resin	MT	0.3	No Change	Disposal through authorized TSDF.
Lead Acid batteries	Kg	7410		Sold to registered cyclers
<b>Details on Solid Waste Management</b>				
Rubber Belt Scrap	MT	13		Sold to Buyer
Flyash	TPD	250 MT/day	50 MT/Day	Used for Manufacturing of PPC
Metal Scrap (Non Hazardous)	MT	955		Sold to Buyer
STP Sludge	Kg/Day	19 Kg/Day	No change	Used as Manure and

				used for Plantation
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### Use of High Calorific Hazardous Waste in Cement Plant

The co-processing of waste in cement industry is much beneficial option, whereby wastes are not only incinerated at a higher temperature of around 1400°C and longer residence time but its inorganic content gets fixed within the clinker apart from using the energy content of the wastes.

Apart from this, no residues are left, which in case of incineration still requires being land filled as incinerator ash. Further the acidic gases, if any generated during co-processing gets neutralized, since the raw material is alkaline in nature. Such phenomenon also reduces resource requirement such as coal and limestone.

Century cement has recently been granted permission on 31.10.2018 for incineration of following AFR Non Hazardous waste, qty mentioned below :-

Plastic Wastes	-	13 MT/Day
RDF	-	45 MT/Day
FMCG	-	05 MT/Day
Food Wastes	-	05 MT/Day

### E. Green Belt Development Plan

The unit is already acquired land of 587.119 hact inclusive of mines, plant and colony, out of above the plant and colony is having total land of 275.273 hact. Green belt has been developed over 174.698 hact out of total land of cement plant & colony i.e. 275.273 hact, whereas greenbelt of 5,43,870 number have been developed over land of 277.960 hact of out of total land of 587.119 hact.

Sr.No.	Species of Plant	Total planted as on 31.03.2018	Plantation done during the year to (01.04.2018 to 30.09.2018)	Total planted as on 31.12.2018
1	Neelgiri	23446		
2	Peltafarm	42298	2873	45171
3	Gulmohar	16622	906	17528
4	Sisu	54407	100	54507
5	Neem	21674	160	21834
6	Parkhiya	356		356
7	Karanj	61529	2898	64427
8	Siras	24025		24025
9	Bakayan	8288		8288
10	Sahtut	3188		3188
11	Moulshree	491		491

12	Khair	790		790
13	Khamar	8891		8891
14	Amaltas	5027	500	5527
15	Kalpataru	2200		2200
16	Peepal	1574	32	1606
17	Bargad	325		325
18	Fruit plants	27102	545	27647
19	Ponsitiya	345		345
20	Bougainvillea	3622		3622
21	Bel	102		102
22	Bamboo	11740		11740
23	Fragrant plants	5250		5250
24	Paras Peepal	2569		2569
25	Kapok	5797		5797
26	Bottlebrush	1133		1133
27	Badam	523		523
28	Kachnar	6819		6819
29	Subabul	8240		8240
30	Kessal Penia	2589		2589
31	Bahera	405		405
32	Bahumiya Purpuria	989		989
33	Kesia Samiya	61605	5960	67565
34	Pangra	4492	109	4601
35	Kadam	159		159
36	Coconut	57		57
37	Acacia	16955		16955
38	Raintree	1097		1097
39	Chhateem	2823		2823
40	Teak plant	7648	80	7728
41	Mangium	1200		1200
42	Jangal Jalebi	660		660
43	Ratanjot	13413		13413
44	Kaner	800	674	1474
45	Casiya Fistula	300		300
46	Others	59884	280	60164
47	Awala	2420		2420
48	Arjun	684	1000	1684
49	Village schools (Tandwa, Kundru, Jangira, Tulsi, Kirna, Konari)	1200		
	<b>TOTAL</b>	<b>527753</b>	<b>16117</b>	<b>543870</b>
	<b>Area covered (Hectare)</b>	<b>269.96</b>	<b>8.00</b>	<b>277.96</b>

**Proposed Action Plan for Greenbelt development/Plantation**

ES- 30

M/s Century Cement , Baikunth ,  
Tilda , Dist Raipur (CG)

M/s CES, Bhopal

Year	Plantation location	Total Nos. of Plant
Within 5 years	At nearby villages and common places .	75,000
	<b>Total</b>	<b>75,000</b>

## F. Health and Safety

Occupation safety and health is very closely related to productivity and good employer-employee relationship. Occupational health of workers may be affected by fugitive emission, dust and noise. Safety of employee during operation and maintenance of equipment and handling of materials are proposed to be taken care as per regulations. To avoid any adverse affects on the health of workers due to dust, heat, and noise sufficient measures shall be provided as per requirement .

Periodical medical check up is necessary. Provisions of pure and clean drinking water, safety provisions, training of all personnel to deal with accidents are required for an effective environmental management.

A dispensary has been established within the premises and services of the qualified Doctor shall be hired on regular basis. It is also to mention here that Century Cement is operating a good hospital also in the Baikunth area. Monitoring at work place will be done regularly. Each group of worker has been monitored at regular intervals. The analysis of the same need to be conducted by a specialist. However, to adhere to safety measures safety helmets, safety boots, safety goggles has been provided to the workers. Occupational health survey of the employees should be carried out at regular intervals.

The following measures is/will be taken to prevent occupational diseases and health hazards.

- Pre - employment and periodic medical examination of employees.
- Regular monitoring of working environment and implementation of safety and control measures.
- Use of protective equipment, clothing, helmets, gas mask, shoes, etc.
- Provision of rest shelters for workers/staff with amenities like drinking water, fans, toilets etc.
- Rotation of workers exposed to high noise area
- Dust suppression of road
- First-aid facilities in the plant area.
- Emergency Plan duly approved by the Director, Industrial Health and Safety shall be prepared and will be updated periodically.
- Compulsory use of PPE like dust mask, safety shoes, helmets during the working hours.
- Provision of Medical check up as per statutory provision



- Provision of Training programme on OHS aspect every year for the workers to educate them the importance of the impacts.
- Evaluation of health of workers need to be made through pre-designed format, for chest X-ray, Audiometry, Spirometry Vision testing (Far & Near vision, colour vision and any other ocular defect) ECG, during pre placement and periodical examinations.

#### **Plan and Fund allocation for Occupational and Safety Hazards**

Plan and fund allocation actually incurred to ensure the occupational health and safety of all contracts and subcontract workers is given in Table as below:

#### **Expenses incurred on OHS Aspects**

<b>Century Cement (Division Of Century Textiles And Industries Limited) Detail Of Staff Welfare Expenses (Amount In Rs.)</b>			
<b>Particulars</b>	<b>01.04.2015 to 31.03.2016</b>	<b>01.04.2016 to 31.03.2017</b>	<b>01.04.2017 to 31.03.2018</b>
<b>Staff &amp; Workers Welfare Expenses</b>			
	<b>63,50,290</b>	<b>79,0,7016</b>	<b>2,62,90,162</b>

#### **G. Socio Economic Welfare Activities**

##### **JAN SEVA TRUST**

*“Imbided with the philosophy & spirit of the great philanthropist Late GD Birlaji, Century Cement has always been at the forefront of social service and humanitarian causes.”* In order to promote social upliftment of neighboring villages, a Jan Seva Trust was registered under the M.P. Trust Act 1951, on 01<sup>st</sup> Dec 1990. The present range of activities of the Trust broadly covers the following Institutions / Schemes:-

- Vocational Training Centre (VTC)
- Rural Development
- Family Planning Scheme
- Health Care
- Education
- Social and Community Welfare Programmes
- Development of Sports and Cultural activities

The Trust acts as catalyst for Government sponsored Rural Development Programmes and, by means of careful identification and strong advocacy, we ensure that maximum Govt. assistance is received and utilised in our area of concern.





**Expenditure towards Corporate Social Responsibility during last five years are as under:-**

Year	Total Expenditure incurred, in Lac
2013-14	106.44
2014-15	160.53
2015-16	180.25
2016-17	139.77
2017-18	116.60

**Funds mobilization for the socio economic activity:**

Fund mobilization for the socio economic activity

Details of Activities		Amount		
		July'17 Dec'17	to Jan'18 June'18	to July 18 to Dec 18
1	Cleaning & Deepening work at Handi Talab, Amapara Raipur	600000/-		
2	Temple renovation work at Gram Panchayar Jalso - Nakti	100000/-		
3	CC Road construction at Gram Panchayat Bahesar			611000/-
4	Pond Pitching work at gram Panchayat Bahesar	538000/-		
5	CC Road construction at Gram Panchayat Kundru	300000/-		350000/-
6	CC Road At Line par ,Baikunth , Gram Panchayat Tandwa		600000/-	
7	Borewell Drilling at Railway Colony, Linepar, Baikunth, Gram Panchayat- Tandwa		132415/-	
8	Construction of Platform (Chabutara) at Gram Panchayat Kundru		100000/-	
9	Donaation of New Four Wheeler (Tata- Tiago) to Chhattisgarh Lok Sewa Samiti Raipur(CG)		453373/-	
10	Skill Development & Vocational Training programme for local communities	568173/-	568173/-	530863/-
11	Promotion Of Literacy & Education (Educational assistance /service for villagers)	145000/-	130000/-	124900/-
12	Support to social cultural, recreational activities	354011/-		53833/-
13	Livelihood & Social economic standard improvement support	45000/-	50500/-	
14	Drinking water supply	35000/-	52000/-	50660/-
15	Plantation	589610/-	417326/-	359936/-
16	Donation to Chhattisgarh Badminton Association, Raipur			500000/-

<b>TOTAL</b>	<b>32,74,794/-</b>	<b>25,03,787/-</b>	<b>2581192/-</b>
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उद्योगों की सामाजिक जिम्मेदारी (CSR) के तहत कार्य वर्ष 2017-18				
जिला – रायपुर, उद्योग – सेंचुरी सीमेंट, बैकुण्ठ				
क्र	इकाई का नाम	राशि रु.	वर्ष 2017-2018 (1 अप्रैल 2017 से 31 मार्च 2018) कुल व्यय राशि रु. 11660779	रिमाक
1	2	3	4	5
1	सेंचुरी सीमेंट बैकुण्ठ जिला-रायपुर	290011	<b>राष्ट्रीय त्यौहार/सामाजिक एवं धार्मिक कार्यक्रम :-</b>  सामाजिक एवं धार्मिक कार्यक्रमों के सफल आयोजन हेतु नगद राशि एवं जरूरी संसाधनों द्वारा ग्रामीणों को सहयोग किया गया। आस पास के गाँवों में जैसे टंडवा, बहेसर, कुन्दरू, बसंत पारा, दैहान पारा, जलसो, जोता, मढ़ी, किरना, खपरी, सिरवे, निनवा कोनारी, तुलसी आदि ग्राम लाभान्वित हुये। 15 अगस्त एवं 26 जनवरी में कार्यक्रम का आयोजन किया गया।	
2		2123335 210056 3075030	<b>स्वास्थ्य सुविधाएं :-</b> समय समय पर ग्रामीणों के लिए निःशुल्क स्वास्थ्य परीक्षण, परामर्श एवं दवाई वितरण ग्रामों में अन्य बीमारियों संबंधित शिविरो का अयोजन किया गया। जैसे पल्स पोलियो, प्रति मंगलवार टीकाकरण अन्य बीमारियों संबंधित सफल शिविरो का आयोजन किया गया है। जिसमें दंत चिकित्सा, होम्योपैथी सेवायें आदि प्रमुख है ग्राम कुन्दरू, सिरवे, कोनारी, टंडवा, बंसत पारा, तुलसी, दैहान पारा, रामनगर, जोता, नकटी खपरी, बहेसर, जोगी कुआँ, आदि गाँवों के ग्रामीण स्त्री पुरुष एवं बच्चे लाभान्वित हुये है। नर्सरी, हाई स्कूल एवं कालेज में अध्ययनरत सभी छात्र-छात्राओं का स्वास्थ्य परीक्षण किया गया। प्रति बुधवार आस पास के ग्रामों में निःशुल्क स्वास्थ्य शिविरो का आयोजन किया जा रहा है। जिसमें ग्रामीण अपने गाँव में ही शिविरो द्वारा लाभान्वित हो रहे है। राष्ट्रीय टीकाकरण हेतु सरकारी अस्पताल में वाहन उपलब्ध कराया गया। <b>दवाइयों पर अनुमानित खर्च</b> <b>स्वास्थ्य परीक्षण एवं शिविरो पर खर्च</b> <b>अस्पताल का अन्य प्रबंधकीय खर्च</b>	
3		1136347	<b>शिक्षा के क्षेत्र में कार्य -</b>  <b>व्यावसायिक प्रशिक्षण केंद्र</b> सेंचुरी सीमेंट सेवा ट्रस्ट द्वारा निःशुल्क व्यावसायिक प्रशिक्षण केंद्र का संचालन किया जाता है इसमें इलेक्ट्रिकल, डीजल मेकेनिक, वेल्डिंग, घरेलू विद्युत सामानों की मरम्मत कार्य, टेलरिंग आदि प्रशिक्षण दिया जाता है। आस पास के 20-30 कि.मी. के दायरे में तकरीबन 50 से ज्यादा गाँवों के बच्चों के लिए यह सुविधा निःशुल्क उपलब्ध है। प्रतिवर्ष 100 से 150 युवक-युवतियां लाभान्वित हो रहे है। यहां उन्हे युनिफार्म के साथ-साथ छात्रवृत्ति भी प्रदान किया जाता है। पिछले 26 वर्षों से निरंतर प्रशिक्षण चल रहा है। अभी तक कुल 2830 से अधिक ग्रामीण युवक युवतियां प्रशिक्षित हो चुके है। ट्रेड अनुसार इलेक्ट्रिकल 697, डीजल मेकेनिक 502, घरेलू विद्युत उपकरण की मरम्मत 119, कम्प्यूटर 754, स्पोकन इंग्लिश 196 फैशन टेक्नालाजी एण्ड डिजाईनिंग 451, महिलाओं को कम्प्यूटर प्रशिक्षण 111 छात्र-छात्राएं प्रशिक्षित हो चुके है।	



4		<b>275000</b>	<b>कम्प्यूटर की पाठशाला एवं स्पोकन इंग्लिश कोर्स</b> — आसपास के शासकीय ग्रामीण स्कूलों में जहां कम्प्यूटर शिक्षा उपलब्ध नहीं है ऐसी स्कूल के छात्र-छात्राओं के लिए कम्प्यूटर की पाठशाला शुरू किया गया है। जिसमें सैकड़ों छात्र-छात्रायें प्रशिक्षित हो रहे हैं। अभी तक 26वें बेच में 784 छात्र-छात्राओं को कम्प्यूटर प्रशिक्षण दिया जा चुका है। पाठशाला में ए.सी. कम्प्यूटर लैब एवं आने जाने हेतु कंपनी द्वारा निःशुल्क परिवहन व्यवस्था उपलब्ध कराई जा रही है। ग्रामीण स्कूलों के बच्चों में अंग्रेजी विषय के प्रति झिझक को दूर करने एवं विषय के प्रति रुचि जागरुक करने के उद्देश्य से निःशुल्क स्पोकन इंग्लिश कक्षा संचालित की जा रही है। जिसमें 6 गांवों के 226 बच्चों लाभान्वित हो चुके हैं।
5		<b>495000</b>	<b>पेयजल की व्यवस्था –</b> विभिन्न सामाजिक एवं धार्मिक कार्यक्रमों में पेयजल की उपलब्धता हेतु गांवों में टैंकरो द्वारा पानी प्रदाय किया गया एवं विभिन्न स्थानों पर प्याऊ लगाकर पीने का ठंडा पानी उपलब्ध कराया गया है। सुबह एवं शाम पाईप लाईन द्वारा ग्राम पंचायत बहेसर में 1 लाख लीटर पानी दिया जा रहा है। इससे ग्रामवासी संतुष्ट हैं। विभिन्न बड़े आयोजनों, शादी एवं अन्य कार्यक्रमों में पानी टैंकर द्वारा पेयजल आपूर्ति किये जा रहा है।
6		<b>1125000</b>	<b>वृक्षारोपण—</b> शासन द्वारा संचालित मुख्यमंत्री हरियर छत्तीसगढ़ योजना के अंतर्गत प्रतिवर्ष वृक्षारोपण का कार्य किया जा रहा है। लगभग 22 एकड़ से अधिक जमीन को समतलीकरण कर पौधरोपण की प्रक्रिया पूर्ण की जा चुकी है। पौधों की सिचाई हेतु स्थाई मोटर पंप की व्यवस्था, रोपित पौधों की उचित देख-भाल, खाद, मिट्टी हेतु व्यवस्था की गई है। वर्तमान में 95 प्रतिशत रोपित पौधे जीवित हैं और वृद्धि कर रहे हैं।
7		<b>5,00,00 0</b>	प्रबंधन द्वारा आस-पास के गांवों में पेयजल की उपलब्धता हेतु हैंडपंपों की सुविधा उपलब्ध करायी गयी है। जिसमें आवश्यकता अनुसार समय समय पर मरम्मत का कार्य किया जाता रहा है। आस पास के 10 से 15 गांवों में आवश्यकता अनुसार हैंडपंप सुधार कार्य किया जा रहा है। जिससे ग्रामीणों को लगातार जलापूर्ति हो रहा है। मरम्मत कार्य के अंतर्गत हैंडपंप के पार्ट्स सुधारने के साथ साथ आवश्यकतानुसार नये पार्ट्स लगाये जाते हैं। पानी निकासी हेतु सोखता गड्ढे का निर्माण, हैंडपंप के नीचे सीमेंट घेरे की भी मरम्मत की जाती है।
8		<b>300000</b>	गली कांक्रीटीकरण कार्य ग्राम पंचायत कुंदरु।
		<b>100000</b>	मुक्तिधाम के पास चबुतरा निर्माण कार्य ग्राम पंचायत कुंदरु।
10		<b>700000</b>	रेल्वे साईड के किनारे गलीकांक्रीटीकरण लाईनपार, बैकुण्ठ ग्राम पंचायत टंडवा
11		<b>538000</b>	तालाब पिचिंग कार्य ग्राम पंचायत बहेसर।
12		<b>100000</b>	गुरु घासीदास मंदिर निर्माण में सहयोग ग्राम पंचायत जलसो, नकटी।
13		<b>600000</b>	तालाब गहरीकरण एवं सौंदर्यीकरण, हांडी तालाब आमापारा रायपुर।
14		<b>7000</b>	रामायण महोत्सव सहयोग राशि ग्राम पंचायत बहेसर।
15		<b>4000</b>	कल्पना क्रिकेट क्लब सहयोग राशि ग्राम पंचायत बहेसर
16		<b>2000</b>	मंडई, मेला ग्राम पंचायत जलसो के आयोजन के लिये सहायता राशि।
17		<b>49000</b>	गणेशोत्सव, दूर्गा पूजा, घासीदास जयंती में सहयोग राशि।
18		<b>21000</b>	ब्रह्मकुमारी ईश्वरीय विश्वविद्यालय रायपुर को सहयोग राशि।
19		<b>7000</b>	खेल प्रोत्साहन हेतु सहयोग राशि ग्राम पंचायत खम्हरिया।
20		<b>3000</b>	गुरु घासीदास सतनाम महोत्सव में सहयोग ग्राम पंचायत बहेसर।

**Proposed Expenditure For CER Activities**

Total Cost of proposed Project : 48.41 Crores

CSR Budget @ 1 % : 48.41 Lacs @ 50 Lacs



This amount Rs 48.41 lacs per year will be spent over a period of 5 years ( @ Rs 9.682 lacs @ 10 Lacs per Year) after commercial production in addition to the existing activities being carried out.

<b>PROPOSED BUDGET FOR CER</b>				
<b>S. no</b>	<b>Need Identified For CSR Plan</b>	<b>Activities</b>	<b>Budgetary Provision (Rs. In lacs )</b>	<b>Budgetary Provision on yearly basis (Rs. In lacs )</b>
1	Skill Development Programmes for youths as per the requirement of the Unit	Facilitating self-employment skill generation vocational training programmes for creating better self employment ventures through inducing skill among the youths as per the requirements of the cement unit. A Apprentice type training in association with ITI.	15	3.0 5 person per year @ Rs 5000/- per month
2	Ensuring Safe drinking water and healthy Sanitation Practices	For ensuring this Awareness generation campaign, wall writing, village level theme camps. Construction of toilets to stop open defecation at Tilda, Bartori, Konari, Jalso, Sontara, Madhi, Tulsi Khamharia, Raikheda, Behesar, Tandwa, Kirna, Kundaru, Baikunth. Provision of supply of drinking water or payment of bills of water supply of villages.	10	Toilets at two villages every year with supporting like water tanks etc ( Rs 1.50) Drinking water facility in terms of bore well, water cooler, etc , for two villages every year ( Rs 0.50)
3	Rainwater harvesting in the villages	Rain water harvesting in the villages Tilda,Bartori, Konari,Jalso, Sontara,Madhi, Tulsi Khamharia, Raikheda, Behesar, Tandwa, Kirna, Kundaru, Baikunth	5	Provision of water harvesting structure in terms, roof water of community building, deepening of ponds , stop and check dams etc Rs 1.0 lacs per year )
5	Provision of solar lights in the villages	Solar light, at common property of surrounding villages at Tilda,Bartori, Konari,Jalso, Sontara,Madhi, Tulsi Khamharia, Raikheda, Behesar, Tandwa, Kirna, Kundaru, Baikunthetc enable to reduce the dependency on the Govt electric supply	7.5	Rs 1.5 lacs per year per villages
7	Infrastructure development at School	Infrastructure facilities at schools of nearby villages in terms of provision of computers, teachers, facility of safe drinking water, separate toilets for girls and boys etc.	7.5	Rs. 1.50 Lac per year
9	Need base assistance to villages/ individual basis	In consideration and with recommendation of gram panchayat	5	Rs 1 Lac per Year
<b>Total</b>			<b>50 Lacs</b>	<b>10 Lacs per year</b>

#### **E. ENVIRONMENTAL MONITORING PROGRAMME**

<b>Suggested Monitoring Programme</b>			
<b>Attributes</b>	<b>Sampling Network</b>	<b>Frequency</b>	<b>Measurement Method</b>
<b>A. Air Environment</b>			
<b>Meteorological</b>	Project impact area	Continuous Hourly	Mechanical/automatic



<ul style="list-style-type: none"> <li>• Wind speed</li> <li>• Wind direction</li> <li>• Dry bulb temperature</li> <li>• Wet bulb temperature</li> <li>• Relative humidity</li> <li>• Rainfall</li> </ul>			weather station
<b>Pollutants</b> PM <sub>-10</sub>	4 locations in the project impact area. Four stations along the boundary of unit and two station at villages – Behasar and At Village- Jalsa	Once in Month	As per IS : 5182 and Revised National Ambient Air Quality Standards (NAAQS) vide MoEF circular, dated 16.11.2009
PM <sub>-2.5</sub>	As Above		Gravimetric
SO <sub>2</sub>	As Above		EPA Modified West & Gaeke method
NO <sub>x</sub>	As Above		Arsenite modified Jacob & Hochheiser
CO	As Above		NDIR technique
Stack Emission from various major stack	-	<ul style="list-style-type: none"> <li>• Online monitoring system</li> <li>• Under direction of SPCB/CPCB</li> </ul>	<ul style="list-style-type: none"> <li>• As per CPCB Guide Line and Indian Standard 11255 (1985).</li> <li>• As Per IS-11255 part (2) 1985 (Absorbing Solution of H<sub>2</sub>O<sub>2</sub>, Iso-propanol Reagent)</li> <li>• As Per IS-11255 part (7) 2005 with NO<sub>x</sub> flask assembly</li> </ul>

Attributes	Sampling Network	Frequency	Measurement Method
<b>Water</b>			
<b>Parameters for water quality</b> <ul style="list-style-type: none"> <li>• pH, turbidity, magnesium hardness, total alkalinity, chloride, sulphate, nitrate, fluoride, sodium, potassium, total phosphorus, DO, BOD, COD, Phenol, Heavy metals, Total coli forms, faecal coli forms</li> </ul>	<ul style="list-style-type: none"> <li>• Set of grab samples during for ground and surface water for 5km distance (06 ground water sample at village- Kundru, Baikunth, Jalsa, Bahesar, Jota, Kirna )</li> <li>• 02 surface water sample at Kirna Tank and Dhumma Nalla</li> <li>• Two Sample of mine water reservoir, and Plant water Reservoir</li> <li>• Monthly sample of</li> </ul>	Pre and post-monsoon	Samples for water quality should be collected and analysed as per : <ol style="list-style-type: none"> <li>1. IS : 3025 methods for Methods of sampling and test (physical and chemical) for water and wastewater</li> <li>2. Standard methods for examination of water and wastewater analysis published by American Public Health Association.</li> </ol>

	Treated water from STP		
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Attributes	Sampling Network	Frequency	Measurement Method
<b>Noise</b>			
• Hourly equivalent noise levels	At premises of boundary (04 samples)	Quarterly	Instrument : Noise level meter IS:4954-1968 as adopted by CPCB
• Hourly equivalent noise levels	(1.5 meter from machinery) ( 04 samples)	Quarterly	Instrument : Noise level meter CPCB/OSHA
<b>Soil</b>			
• Soil	06 locations around the plant	Yearly	As CPCB protocol For parameters viz pH, conductivity, Organic matter, organic C, NPK, , WHC, moisture, particle size distribution, Fe, Cu, Zn,

Socio Economic Environment			
Attributes	Sampling	Frequency	Measurement Method
<b>Socio-economic</b>			
* Economic resource base * Health status * Cultural and aesthetic attributes * Education	Socio-economic survey is based on proportionate, stratified and random sampling method		Regular meeting with local gram Panchayat  Need base programme may be prepared with the help of Gram panchayat under CSR activity.
<b>Land Use</b>	Land Use Pattern	Once in three year	-

### Project Cost of Existing and Proposed Unit

SN	Particulars	Investment Existing (Up to 31.03.2018) in Crore	Investment Proposed (2018-19) Crore
1	Capital cost of Plant & Machinery, land & Building	255.57	48.41
2	Capital Cost incurred on environmental measures inclusive of APC, Online monitoring system, web camera , STP , RWH OHS Dust supression etc	58.0	2.22
3	Recurring cost on environmental measures inclusive of	2.77	3.00



monitoring of environmental parameters, green belt development, Maintenance of APC, Online monitoring system, web camera , STP , RWH OHS Dust suppression etc		
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#### F. COST OF MEASURES UNDER EMP

Sufficient fund allocation will be made towards environmental management and monitoring program. Following provisions are proposed to be taken for improving, control and monitoring of environment protection measures

<b>Total Cost (EMP + CSR+ Plantation + Monitoring ) for proposed project</b>			
<b>Sn</b>	<b>Particular</b>	<b>Amount (Rs in Lacs) Capital</b>	<b>Amount(Rs in Lacs) per annum – Recurring</b>
1	Plantation (Capital cost) outside plant	75.0	15.0
	<b>Sub Total</b>	<b>75.0</b>	<b>15.0</b>
4	CSR cost	50	10
	<b>Sub Total</b>	<b>50</b>	<b>10</b>
5	Occupational health and safety exp.	200	25 ( avg)
	<b>Sub Total</b>	<b>200</b>	<b>25 ( avg)</b>
6	Environmental Monitoring cost	58	90.04
	<b>Sub Total</b>	<b>58</b>	<b>90.04</b>
	<b>Grand Total</b>	<b>383</b>	<b>140.04</b>

## 27 CONCLUSIONS

It can be seen from the foregoing chapters that air emission due to proposed activity of capacity utilization and optimization will not be increased significantly . The TPM emission from the boiler stack will be below the 25 mg/nm<sup>3</sup>. Adequate stack height and control measures have been provided.

Zero discharge effluent treatment system have been provided. No significant impacts is envisaged on other environmental aspects such as meteorology, topography and geology, mineral resources, archaeology, cultural, religious and land use.

As discussed, it is safe to say that the proposed expansion project will not be likely to cause any significant impact on the ecology of the area, as adequate

preventive measures will be adopted to contain various pollutants within the permissible limits. Green belt development around the area would also be taken up as an effective pollution mitigative technique, as well as to control the pollutants released from the premises of Century cement.

