

**Ref: VC/WS/ENV/CKJ/09-10/269**

Date: 12.08.2010

**Through: Regd. A/D**

To  
Member Secretary,  
Karnataka State Pollution Control Board,  
# 49, 4<sup>TH</sup> & 5<sup>TH</sup> floor,  
Parisara Bhavana,  
Church Street,  
BANGALORE – 560 001

Dear Sir,

Sub: - Environmental Statement for the Financial year 2009-2010  
Ref: - Notification No. G.S.R. 329(E) Dt. 13.03.1992 & G.S.R. 386(E) Dt.  
28.04.93 of MoEF, New Delhi.

With reference to the above, please find enclosed herewith the Environmental Statement for the financial year ending 31 March 2010.

Hope you will find the same in order.

Kindly acknowledge the receipt.

Thanking you,

Yours faithfully,

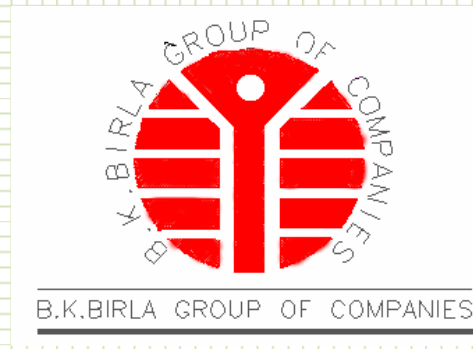
For Vasavadatta Cement,

For Kesoram Inds., Ltd.,

  
(C.K.Jain)

Joint President (Engg & Power Plant)

Cc: Environmental officer,  
Karnataka State Pollution Control Board (Regional office),  
1<sup>ST</sup> Floor, Gulbarga Development Authority Building,  
Near Sardar Vallabhabhai Patel Chowk,  
GULBARGA – 585 102



# REPORT

ON

# ENVIRONMENTAL STATEMENT

For the Year  
2009-10

OF

## VASAVADATTA CEMENT

PROP. : KESORAM INDUSTRIES LTD.

POST : SEDAM - 585222

DIST:- GULBARGA

KARNATAKA

## **INTRODUCTION**

Vasavadatta Cement is the 2nd green field project of Kesoram Industries, Located in the district of Gulbarga, 4 Kms., away from Sedam town. The Line-I Cement Plant was conceived in the year 1983-84 and commercial production was started in the year 1986. The Line-I plant is supplied by world known plant supplier M/S POLYSIUS, GERMANY and their counterparts M/s THYSSEN KRUPP INDUSTRIES INDIA LTD. Cement plants are based on dry process Pre-Calcliner technology and the major equipments of the plant include single stage Hazemag impact crusher for Limestone crushing, Stacker-Reclaimer for preblending/homogenisation/transport of crushed limestone, Polysius Vertical Roller Mill for Raw Meal grinding, Single Continuous Blending Silo for storing Raw meal, Rotary Kiln for Clinkerisation, Aumund's Deep Pan Conveyor for Clinker transport, closed circuit mill for cement grinding and two electronic packers for despatching Cement.

The Pollution Control measures include ESPs for Raw mill/Kiln, Cement mill and Grate Cooler; Bag dust collectors for lime stone crushing, Blending silo, Cement silo, Clinker stockpile, Raw mill hoppers, Cement mill hoppers, Coal mill, Coal weigh feeders, Fine coal bin, Packing plant. All this has made the plant environment friendly.

Line-II was put on stream in 1997. The main plant machinery is supplied by M/S POLYSIUS and their Indian counterparts M/s THYSSEN KRUPP INDUSTRIES INDIA LTD. It employs state-of-the-art technology. ESPs have been provided for Kiln/Raw mill, Cooler and Cement mill. At the other dust emission sources bag filters have been installed.

Line-III Cement plant was commissioned in the year 2006. Pyroprocessing equipment has been supplied by M/s FL Smidth, Denmark; Coal mill by M/s Gebr. Pfeiffer, Germany; Raw mill & Cement mills by M/s Polysius, Germany.

Line-IV Cement plant was commissioned in the year 2009. Pyroprocessing equipment has been supplied by M/s FL Smidth, Denmark; Coal mill by M/s Gebr. Pfeiffer, Germany; Raw mill & Cement mills by M/s Polysius, Germany.

After commissioning Unit-IV Cement Plant the capacity of Line-I, Line-II, Line-III & Line-IV together is 5.67 MTPA of clinker. Corresponding Cement production capacity is 8.565 MTPA.

## **HIGHLIGHTS OF UNIT-IV CEMENT PLANT**

1. Two support friction drive Kiln-eliminating the use of lubricants.
2. Raw mill does not need water spray, less hot air thus reducing energy & water consumption.
3. Bag house for Kiln/Raw mill instead of ESP eliminating uncontrolled emissions for short durations during ESP trippings. Bag house does not have gas conditioning tower in the circuit thus reducing the water requirement.
4. Return water is used in water spraying systems.
5. Selection of screw compressors with acoustic enclosure.
6. Clinker tank for storing clinker eliminates fugitive dust.
7. Cross flow cooler eliminates dust from cooler bottom hoppers.
8. Cooler fans selected with silencers.
9. Selection of machinery with less specific power consumption.
10. Selection of duo flux burner for handling alternate fuels.

Unit-IV Cement Plant Clinker production capacity is 1.75 MTPA and Cement production capacity is 2.625 MTPA. Unit-IV Cement Plant was commissioned in March 2009.

16.2 MW (peak capacity) Captive Thermal Power Plant (TPP-1) was commissioned in 1997. The Boiler was supplied by M/s CETHAR VESSELS LTD, TRICHY. Alternator was supplied by M/s TOYO DENKI SIEZO JAPAN. Water treatment plant was supplied by M/s ION EXCHANGE INDIA LTD. PUNE and cooling tower was supplied by M/s SHRIRAM TOWER TECH, CHENNAI.

9.5 MW Thermal Power Plant (TPP-2) was commissioned in June 2005. The Boiler was supplied by M/s CETHAR VESSELS LTD, TRICHY. Alternator was supplied by M/s BHEL, Hyderabad. Water treatment plant was supplied by M/s ION EXCHANGE INDIA LTD. and cooling tower was supplied by M/s Paharpur Cooling Tower, Kolkata.

18 MW Thermal Power Plant (TPP-3) was commissioned in February 2007. The Boiler was supplied by M/s CETHAR VESSELS LTD, TRICHY; CVPL,Trichy; Turbogenerator by M/s TDPS, Bangalore, Cooling tower by M/s Paharpur, Kolkata; ESP by M/s Thermax.

18 MW Thermal Power Plant (TPP-4) was commissioned in February 2009. The Boiler was supplied by M/s CETHAR VESSELS LTD, TRICHY; CVPL,Trichy; Turbogenerator by M/s TDPS, Bangalore, Cooling tower by M/s Paharpur, Kolkata; ESP by M/s Thermax. Air cooled condenser by GEA, Chennai.

## **HIGHLIGHTS OF UNIT-IV POWER PLANT-4**

1. Acoustic enclosure for TG set.
2. Screw compressors with acoustic enclosure.
3. Recycling of total effluent of power plant in cement plant.
4. Pneumatic handling of total ash.
5. Air Cooled condenser in addition to water cooled condenser to save water during shortage period.

18 MW Thermal Power Plant (TPP-4) was commissioned in February 2009.

**Consumption Of Raw Materials And Fuels For Cement Manufacture In Line-I, Line-II, Line-III  
& Line-IV (2009-2010)**

<b>S.NO.</b>	<b>DESCRIPTION</b>	<b>LINE-I, II, III &amp; IV CEMENT PLANTS IN MT</b>
1.	Limestone & Shale	4801490
2.	Additives	299224
3.	Gypsum	126023
4.	Coal	607378
5	Fly ash for manufacture of PPC	389316

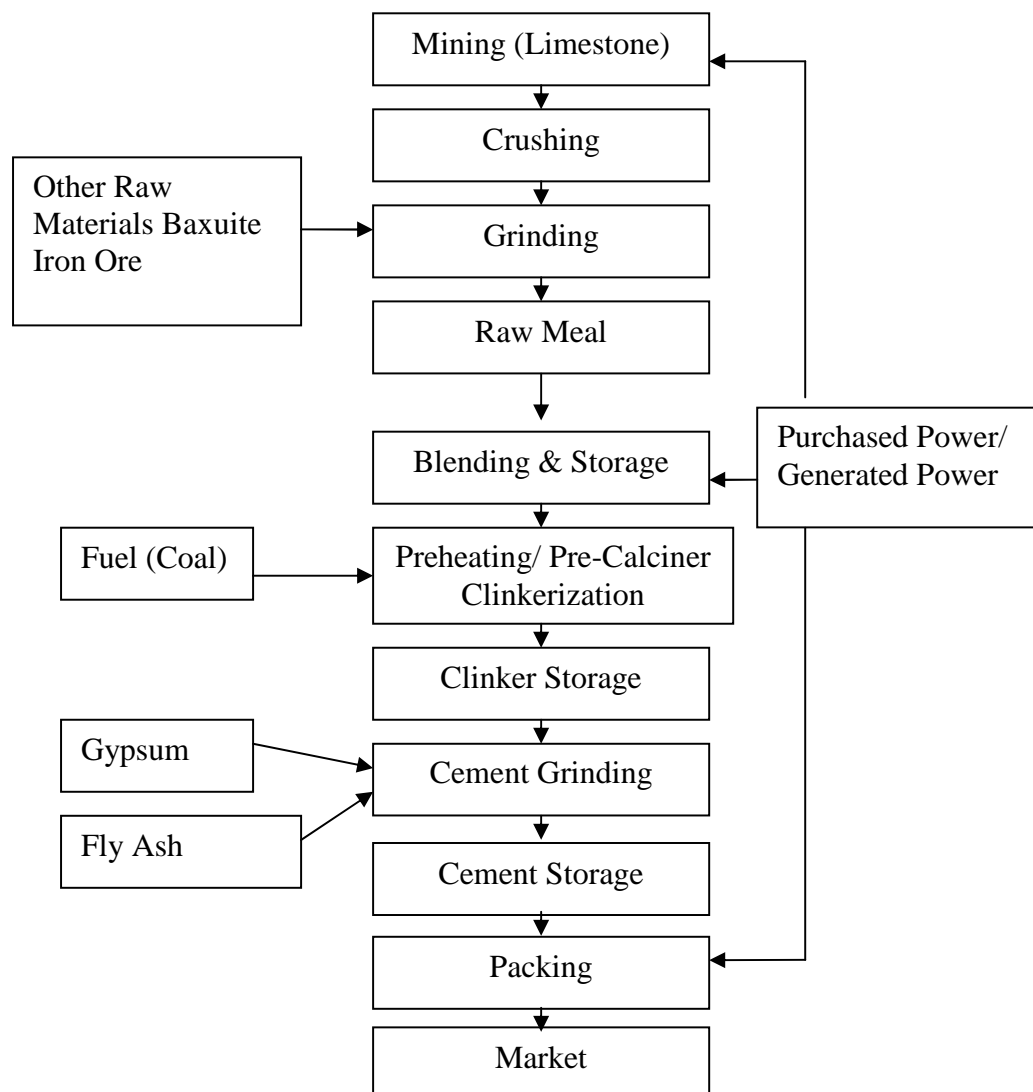
**CEMENT MANUFACTURING PROCESS**

The Process of manufacturing Cement involves basically the following sequential unit operation and processes.

- I) LIMESTONE MINING
- II) LIMESTONE CRUSHING
- III) STACKING AND RECLAIMING
- IV) RAW MATERIAL GRINDING
- V) STORAGE AND HOMOGENISATION OF RAW MEAL IN CONTINUOUS BLENDING SILO.
- VI) COAL UNLOADING, STACKING AND GRINDING
- VII) CLINKERISATION – (Kiln feed, preheating, kiln and cooler)
- VIII) CEMENT GRINDING, STORING
- IX) CEMENT PACKING & DESPATCHES

## CEMENT MANUFACTURING PROCESS

The production process for cement consists of drying, grinding and mixing limestone and additives like bauxite and iron ore into a powder known as “raw meal”. The raw meal fed in the form of a dry powder is then heated and burned in a pre-heater and kiln and then cooled in an air cooling system to form a semi-finished product, known as a clinker. Clinker (95%) is cooled by air and subsequently ground with gypsum (5%) to form Ordinary Portland Cement (“OPC”). Other forms of cement require increased blending with other raw materials. Blending of clinker with other materials helps impart key characteristics to cement, which eventually govern its end use.



**THE BASIC STEPS INVOLVED IN THE PRODUCTION PROCESS IS SET OUT  
BELOW:**

All VC Cement plants are dry process plants. Limestone is crushed to a uniform and usable size, blended with certain additives (such as iron ore and bauxite) and discharged on a vertical roller mill/roller press/ball mill, where the raw materials are ground to fine powder. An electrostatic precipitator/bag house dedusts the raw mill gases and collects the raw meal for a series of further stages of blending. The homogenized raw meal thus extracted is pumped to the top of a preheater by bucket elevator. In the preheaters the material is heated to 750°C. Subsequently, the raw meal undergoes a process of calcination in a precalcinator (in which the carbonates present are reduced to oxides) and is then fed to the kiln. The remaining calcination and clinkerization reactions are completed in the kiln where the temperature is raised to between 1,450°C and 1,500°C. The clinker formed is cooled and conveyed to the clinker storage area from where it is extracted and transported to the cement mills for producing cement. For producing OPC, clinker and gypsum are used and for producing Portland [Pozzolana] Cement ("PPC"), clinker, gypsum and fly ash are used.

**COAL ASH**

Coal ash is a solid waste generated from coal based Thermal power plant. As it is environmentally hazardous, the disposal of coal ash leads to various pollution problems, if it is not used for alternate beneficial use.

The coal ash from power plant is broken up in to two types.

1. Cinder ash (Coarse ash)
2. Fly ash (Ash collected from ESP)

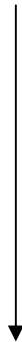
Both fine ash and coarse ash generated in power plant is pneumatically transported to cement plant through dense phase and used to manufacture cement.

We are also procuring the fly ash from Raichur Thermal Power Station and NTPC Ramagundam. It is being used in the production of Portland Pozzolana cement.

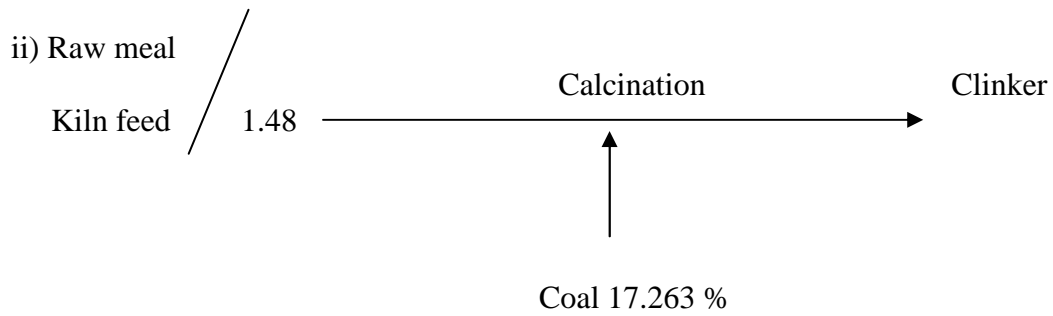
The utilisation coal ash helped in reduction of limestone (Natural mineral resource) consumption owing to partial substitution of clinker and conservation of thermal energy corresponding to clinker so substituted.

**MATERIAL BALANCE FOR 2009 – 2010 (Unit-I, II, III & IV)**

i) Limestone (94.80 %) + Additives ( 6.20 %)



Raw meal  
(100%)



iii) Clinker + Gypsum → Ordinary Portland Cement  
97.21 % 2.80 % 100%

iv) Clinker +Gypsum +Fly ash → Portland Pozzolana Cement  
75.0 % 3.00 % 22.00% 100%

Note: - Depending upon the quality of raw material and quality of coal, the above balance will go on changing.

## FORM – V

Environmental Statement for the financial year ending 31<sup>st</sup> March 2010

### PART – A

- i) Name and address of the owner/  
Occupier of the industry operation: Syt. DEEPAK TANDON  
Kesoram Industries Ltd.  
9/1 R.N. Mukherjee Road  
KOLKATA – 700 001
- ii) Industry Category  
Primary : (STC Code) ----  
Secondary : (STC Code) ----
- iii) Production capacity of units:  
Combined capacity of  
Line-I, II, III & IV Cement plants : 5.67 MTPY of clinker  
and Upgradation of Unit-II & Unit-III (effective from 22<sup>nd</sup> Jan 09)
- Combined capacity of Cement plant : 8.565 MTPY of cement  
Cement production of line-I, II, III & IV (effective from 22<sup>nd</sup> Jan 09)  
and Upgradation of Unit-II & Unit-III
- Thermal power plant (TPP# 1) : 15.7 MW (Peak 16.2 MW)  
(TPP#2) : 9.5 MW  
(TPP#3) : 18.0 MW  
(TPP#4) : 18.0 MW
- iv) Year of establishment:  
Line-I Cement plant : 1986  
Line-II Cement plant : 1997  
Line-III Cement plant : 2006  
Line-IV Cement plant : 2009 (March 09)  
Thermal power plant (TPP# 1) : 1997  
Thermal power plant (TPP# 2) : 2005  
Thermal power plant (TPP# 3) : 2007  
Thermal power plant (TPP# 4) : 2009 (Feb 09)  
Ball Mill : Jan 2002  
Fly ash silo : Jan 2002  
Mines Air Strip : Existing since 1986
- v) Date of last Environment statement submitted : 10.08.2009  
(for the year 2008-2009)

## PART B

### WATER AND RAW MATERIAL CONSUMPTION

#### 1. WATER CONSUMPTION

Being a complete dry process cement manufacturing plant does not require any process water. Water consumption in the plant for cooling, boiler feed, gardening etc is as follows.

S.NO.	Description	During current financial year 2008-2009	During current financial year 2009-2010
1.	Water consumption in cum. Per day	7505	8105
	a) Process/Cooling	5457	6151
	b) Domestic/Gardening	2048	1954

Note: VC is permitted to draw water for 238 days in a year from river Kagina. VC is permitted to draw water from Kagina River at the rate of 17 lakh gallons per day and 3182 m<sup>3</sup>/day from Kamalavathi Barrage.

Water consumption values are higher when comparing to last year because of unit-IV Cement plant & power plant-4.

#### 2. RAW MATERIAL CONSUMPTION

S.NO	Name of the Raw Material	Name of the Product	Consumption of Raw Material per unit of out put	
			During current financial year 2008-2009	During current financial year 2009-2010
			Line – I, Line-II & Line-III	Line – I, II, III & IV
a.	Lime stone & Shale	Tonne of cement	1.2104	1.2264
b.	Additives		0.07546	0.0809
c.	Gypsum		0.0321	0.02895
d.	Coal		0.1533	0.1525
e.	Ash		0.0991	0.08756

**PART C**

**POLLUTION DISCHARGED TO ENVIRONMENT/UNIT OF OUTPUT**

(Parameter as specified in the consent issued)

S.NO	Pollutants	Quantity of pollutants discharged (Mass/day))	Concentration of pollutants in discharge ( Mass/Volume)	Percentage of variation from prescribed standards with reasons
<b>WATER: -</b>				
a.	Outlet effluent of sewage treatment plant	436 KL/day		
	i) Suspended solids		18 *mg/lit	Within Standards
	ii) Bio chemical oxygen demand 5 days at 20 Deg. C		9 * mg/lit	Within Standards
<b>AMBIENT AIR:-</b>				
a.	Mine area (Plant premises)	Suspended Particulate Matter  And  RSPM	129 ∞g/m3 55 ∞g/m3	Within Standards
b.	Top of Guest house (Employees colony)		113 ∞g/m3 48 ∞g/m3	Within Standards
c.	Sedam town		93 ∞g/m3 39 ∞g/m3	Within Standards
d.	Top of Dairy farm (Employees Colony)		103 ∞g/m3 44 ∞g/m3	Within Standards
e.	Top of load centre-4 (Plant premises)		151 ∞g/m3 64 ∞g/m3	Within Standards
f.	Top of Lions Bhavan (Sedam town)		127 ∞g/m3 53 ∞g/m3	Within Standards

\* The value represents arithmetic average of 12 months for financial year 2009-2010.

## STACK GAS QUALITY FOR PARTICULATE MATTER

### LINE – I CEMENT PLANT

S.No	POLLUTANTS	QUANTITY OF POLLUTANTS DISCHARGED (m3/Hr)	CONCENTRATIONS OF POLLUTANTS IN DISCHARGE (Mass/Vol.) (mg/Nm3)	PERCENTAGE OF VARIATION FROM PRESCRIBED STANDARDS WITH REASONS
1.	Crusher	15403	48	Within Standards
2.	R.M. Hopper	7961	44	
3.	Blending silo venting	15387	51	
4.	Kiln feed equipment	3820	44	
5.	Fine coal silo	3918	45	
6.	Fine coal feeding equipment	3961	43	
7.	Clinker storage hall	13605	51	
8.	Cement mill hopper	9582	48	
9.	Cement silo	9655	46	
10.	Packing plant-I	18346	44	
11.	Packing plant-II	17721	43	
12.	Clinker cooler venting	255538	60	
13.	Coal mill	50229	54	
14.	Kiln/Raw mill	308626	67	
15.	Cement mill	41981	56	
16.	* D.G. Set-I	---	---	
17.	* D.G. Set-II	---	---	
18.	* D.G. Set-III	---	---	

The value represents arithmetic average of 12 months for financial year 2009-2010

- DG dismantled vide our letter No. VC:WS:ENV:CKJ:3804 dated 12.02.2009

## STACK GAS QUALITY FOR PARTICULATE MATTER

### LINE – II CEMENT PLANT AND POWER PLANT

S.NO.	POLLUTANTS	QUANTITY OF POLLUTANTS DISCHARGED (m <sup>3</sup> /Hr)	CONCENTRATIONS OF POLLUTANTS IN DISCHARGE (Mass/Vol.) (mg/Nm <sup>3</sup> )	PERCENTAGE OF VARIATION FROM PRESCRIBED STANDARDS WITH REASONS
19	Raw mill hopper and weigh feeders dedusting	17013	43	Within Standards
20	Raw mill silo	13097	51	
21	Kiln feed fluidor and weigh bin	9551	39	
22	Cement mill hopper	5481	39	
23	Polycom and bucket elevator	31031	48	
24	Static separator	7186	45	
25	Packer m/c –I	17195	45	
26	Packer m/c – II	17034	45	
27	Packer m/c – III	18572	44	
28	Packer m/c – IV	17217	44	
29	Cement silo – I	4586	44	
30	Cement silo – II	4304	44	
31	Cement silo – III	4253	45	
32	Raw mill/Kiln	597988	52	
33	Clinker cooler	414422	46	
34	Cement mill	71043	42	
35	Coal mill	97400	44	
<b>THERMAL POWER PLANT</b>				
36	Boiler 70 TPH	97864	41	Within Standards
37	Coal crusher	10350	42	
38	100 KVA D.G.Set	---	---	
39	Boiler 42 TPH	75044	47	

The value represents arithmetic average of 12 months for financial year 2009-2010.

## STACK GAS QUALITY FOR PARTICULATE MATTER

### LINE – III CEMENT PLANT AND POWER PLANT

S.NO.	POLLUTANTS	QUANTITY OF POLLUTANTS DISCHARGED (m3/Hr)	CONCENTRATIONS OF POLLUTANTS IN DISCHARGE (Mass/Vol.) (mg/Nm3)	PERCENTAGE OF VARIATION FROM PRESCRIBED STANDARDS WITH REASONS
40	Raw mill/Kiln	884051	39	Within Standards
41	Clinker cooler	529020	36	
42	Coal mill	143767	36	
43	Cement mill	74345	36	
44	Crusher (Located at Mines)	43426	43	
<b>THERMAL POWER PLANT</b>				
45	Boiler 80 TPH	132566	43	Within Standards
46	Kiln-I 125 KVA DG Set	---	---	
47	Kiln-II 125 KVA DG Set	---	---	
48	Kiln-III 380 KVA DG Set	---	---	
49	Boiler 42 TPH 250 KVA DG Set	---	---	

The value represents arithmetic average of 12 months for financial year 2009-2010.

## STACK GAS QUALITY FOR PARTICULATE MATTER

### LINE – IV CEMENT PLANT AND POWER PLANT

S.NO.	POLLUTANTS	QUANTITY OF POLLUTANTS DISCHARGED (m3/Hr)	CONCENTRATIONS OF POLLUTANTS IN DISCHARGE (Mass/Vol.) (mg/Nm3)	PERCENTAGE OF VARIATION FROM PRESCRIBED STANDARDS WITH REASONS
40	Raw mill/Kiln	883626	39	Within Standards
41	Clinker cooler	490031	36	
42	Coal mill	142401	35	
43	Cement mill	74467	37	
<b>THERMAL POWER PLANT</b>				
44	Boiler 80 TPH	131265	38	Within Standards
45	Kiln-I 125 KVA DG Set	---	---	
46	Kiln-II 125 KVA DG Set	---	---	
47	Kiln-III 380 KVA DG Set	---	---	
48	Boiler 42 TPH 250 KVA DG Set	---	---	

The value represents arithmetic average of 12 months for financial year 2009-2010.

TPP-4 was commissioned in 19<sup>th</sup> Feb 2009 and Unit – 4 Cement plant was commissioned in 12<sup>th</sup> Mar 2009.

## PART - D

### HAZARDOUS WASTE

(As specified under hazardous wastes/Management and handling Amendment Rules 2000)

Waste oil generated is being sold to authorised reprocessors; 327 barrels of waste oil were sold during the year 2009-2010.

116 numbers of used batteries (weighing approximately 5.80 MT) returned to dealers during the period 2009-2010.

## PART – E

### SOLID WASTES

S.No	Solid Waste	Total Quantity	
		During the current financial year 2008-2009	During the current financial year 2009-2010
1. (a)	From process (Fly ash from captive Thermal Power Plant)	# Nil from Cement plant. 1, 24,033 MT from Power plants.	# Nil from Cement plant. 1, 64,258 MT from Power plants.
1. (b)	Fly Ash from RTPS / NTPC Ramagundam	# 2,65,283 MT	# 2,04,069 MT
2.	From pollution control facility	Recycled in to main process in cement plant. Fly ash from power plants reutilised in cement plants.	Recycled in to main process in cement plant. Fly ash from power plants reutilised in cement plants.
3.	Quantity recycled or reutilised within the unit	22,812 MT/Day (In process, material recycled from Pollution control equipment like ESPs /Bag House /Bag filter).	24,947 MT/Day (In process, material recycled from Pollution control equipment like ESPs /Bag House /Bag filter).
	ii) Sold	-----	-----
	iii) Disposed	-----	-----

# Fly ash utilization improving continuously. This is observed from the consumption values of total ash generated at our power plant, RTPS& Ramagundam.

## PART – F

Pollution control equipments restrain the emissions and the entrapped solid wastes are recycled at appropriate stages in cement plant.

## **PART – G**

### **MODIFICATIONS FOR THE YEAR 2009-10 FOR ENERGY CONSERVATION AND BETTER ENVIRONMENT**

#### **MECHANICAL**

##### UNIT –III CEMENT MILL

- Elimination of Screw conveyor form HR-Separator to pipe conveyor.
- Modification of HR-separator cyclone to mill elevator O/L Air slide.

##### UNIT –IV CEMENT MILL

- Elimination of air slide blowers, air balance for material conveying through air slide carried out. in this way, eliminated three drives of 11 kw each taken out from the system.

##### UNIT-IV RAW MILL

- Modification of 4EA-21 Bag filter Discharge
- Modification of inlet plenum 4EA-21 Bag filter

#### **PROCESS & QUALITY CONTROL:**

- Unit 1 & 2 VRM'S hot air duct modified and production increased from 135 TPH to 145 TPH & from 210 TPH to 225 TPH respectively.
- Change in the interlock of Reverse air fan with the Bag house DP, Approximate saving of 8.8 lacs per annum
- Bypassed mass flow conveyor in cement mill-3 saving 24 Kw per hour power.
- Removed 40 ton's Grinding media from Cement Mill 3 & 4. Saving of 300 Kw per hour
- Reduced Effective area of Static aeration pad, of Raw Mill and Cement Mills by which out put increased by 5.0 tons per hour.

#### **INSTRUMENTATION:**

##### UNIT-I CEMENT PLANT

##### SECTION: KILN & COAL MILL - I

- Replacement of TA pyrometer duct thermocouple with new radiation pyrometer. Saved thermocouples consumption. The yearly savings comes to Rs 2,00,000/-

##### UNIT-III

##### SECTION-PACKING PLANT-3

- Developed software program to run the wagon loading bag diverter belt when the diverter was in close condition & particular belt was in running condition and power saving.

## **ELECTRICAL:**

### UNIT-1 KILN-RAWMILL-COAL MILL SECTIONS

- Replacement of LRS Rawmill-1 main drive with latest model (pioneer make), reducing breakdown, contact failure and cost of contacts.
- Replacement of LRS Coal mill-1 main drive with latest model (pioneer make), reducing breakdown, contact failure and cost of contacts.

### UNIT-2 & 3 CEMENT PLANTS

- Replacement of DOL starter with Delta/Star converter (additional) for Raw mill recirculation Bucket elevator, thus Starting current is reduced, bucket elevator operating below 50% load, automatically comes to start and load above 50% then changed to delta automatically finally Power saving up to 1.5kw /hour.

## **POWER PLANT:**

### **INSTRUMENTATION:**

- Installation of C2 system (PD pump) for unit 1 & 2 fly ash silo, The air consumption is low in the C2 system as compared to K Pump, hence there is energy saving through this System
- Installation of VFD for unit-2 condensate extraction pump-1, Its speed can be changed according to the level of the Unit-2 Hot well and saving energy.
- Logic is made for the auto operation (speed) of the feed water pump of unit 2, 3 & 4. It's speed can be varied in Auto as per Feed Water Pressure and Drum Pressure Difference, Saving energy of 35 KWh each in Unit-3& 4 and 15 KWh in Unit.

### **MECHANICAL:**

- Removal of loop at inlet piping for 2 no's of multigrade filters in softening plant, Now the water flow in the pipe is increased from 120 m<sup>3</sup> to 190 m<sup>3</sup> , hence MGF back wash improved and running hours of pump is reduced.
- Interconnection of discharge pipe of neutralization pit pumps of unit-1 & Unit-4, the flow is increased. Hence the running hours of the pump are reduced.
- Fitting of air regulator in service air line, Air pressure reduced from 5Kg/Cm<sup>2</sup> to 3.5Kg/Cm<sup>2</sup>. Hence there will be a power saving. The service air pressure can be maintained less than instrument due to which seal failure is avoided.

- Provided solenoid valve to both instrument compressors of unit-i, due to efficient operation of loading & unloading, saving of power, and for frequent replacement of auxiliary valve, reduced spare cost.
- Provided interlock to compressor for air dryer, Electricity saving for avoiding unnecessary of running of air dryer. And moisture less air is provided to Instrument.
- Commissioning of air cooled condenser (Unit-4) following benefits achieved. There is saving of 1500m<sup>3</sup> of water per day. Auxiliary consumption reduced by 1.5%.Hence saving of Rs.60lacs/annum achieved.
- Permission taken from kptcl to export power, Due to this provision the load factor on TG's increased. Whenever there is excess of power it is exported to grid. Last financial year 2009-2010 527 lacs units were exported with a saving of Rs.(3.75 – 2.75) 1 x 527 = Rs.527 lacs.
- Installation of c2 system (pd pump) for unit 1 & 2 fly ash silo, The air consumption is low in the C2 system as compared to K Pump so there is energy saving through this System.  
Saving :- Stopping of two compressors i.e 79KW & 49KW for 10hrs daily. 1450KWH /DAY X 350DAYS X Rs.2.75/KWH = Rs.14lacs/Annum
- Installation of VFD for Unit 2 Condensate Extraction Pump 01, its speed can be changed according to the level of the Unit 2 Hot well. So by this way energy is saved.  
Saving: - 12.5KWH X 24HRS X 350DAYS X Rs.2.75 = Rs.2.89lacs/annum.
- Logic is made for the auto operation (speed) of the feed water pump of unit 2, 3 & 4. Its speed can change automatically according to the Feed Water Pressure and Drum Pressure Difference. So by this it can run on lower speed and ultimately energy will be saved.  
Saving: - 60KWH X 24HRS X 350DAYS X Rs.2.75 = Rs.13.86lacs/annum.

### **MINES:**

- Water holding capacity of mines reservoir is enhanced to 30 lakhs Cu.m.
- Road in N-S direction across the mine pit to reduce lead from Pit-B to in pit crusher is completed.
- N<sub>2</sub> Tyre inflator is implemented for better Tyre life.
- Lubrication dispensing system is implemented to minimize spillages.
- Tractor with dozer blade is procured and in operation for lighter dozing in mines.
- Portable lighting tower is commissioned to improve illumination level in mines.

## **PART – H**

### **PROPOSED MODIFICATIONS FOR THE YEAR 2010-11 FOR ENERGY CONSERVATION AND BETTER ENVIRONMENT**

#### **MECHANICAL DEPARTMENT**

1. Cement mill fly ash unloading system Bag filter of 7,500 m<sup>3</sup>/hr to be replaced with bag filter of capacity 40,000 m<sup>3</sup>/hr
2. Cement mill-4 bag house discharge which is coming into mill outlet elevator, it is to be diverted directly to the cement silo through sepol cyclone air slides.
3. Packing plant -4 bulk loading system integral bag filter to be modified.
4. Cement mill-4 belt conveyor 4N11, additional venting line connecting to mill outlet bag house to be provided.
5. Installation of 18 bag filters for control of fugitive emission in cement plant and five Bag filters in power plant.
6. Installation of online SO<sub>x</sub> and NO<sub>x</sub> analyzers on all main stacks.
7. Purchase of two number of Road sweeping machines.
8. Installations of water spray system at all transfer points.

#### **MINES:**

1. Purchase of Dust suppression system by Techno Alpin – Italy for effective dust suppression while loading and transportation of limestone and shale.
2. Purchase of Bulk Mix & Delivery unit (truck Mounted) for Mixing and charging of AN and FO to achieve better explosive energy and less blasting fumes.
3. Installation of six tower lights around mines pit to improve illumination in mines.
4. Laying of high gradient shot length equipment shifting ramps for crawler mounted equipment to reduce shifting distance and time thereby saving in diesel.

#### **ELECTRICAL:**

1. Installation of additional capacitor banks near motor terminals in identified motors.
2. Implementation of load shedding scheme for unit-1 cement mill HT drives.
3. Introduction of additional GIP panel for U-3 BR2 synchronizing circuit.
4. Replacement of 110KV MOCB's with SF6 type breakers at substation switch yard.
5. Replacement of 110KV isolators with new type isolators at substation switch yard.
6. Introduction of Harmonic filters at 415V bus of unit-1 PCC & PP.
7. Installation of Neutral displacement relay at 110KV incomer to isolate TG sets with Grid and to avoid tripping of TG-2 during grid voltage unbalance.
8. Introduction of REM-543 relays in place of RACID relays in TG-1 outgoing power line breakers.
9. Replacement of old LT motors (Low efficiency) with energy efficient motors at Unit-1.

## **MISCELLANEOUS MATTERS**

1. Industry has been certified for standards ISO 9001: 2000, ISO 14001& IS 18001
2. Energy conservation measures are being taken.
3. On- site emergency and crises management schemes developed by industry.
4. Success in efforts of ensuring accident free working conditions for workers.
5. Building up-to-date library to facilitate the process of learning of environment protection measures.
6. Environment messages printed on company covers.
7. Implementation of TPM in the plant.
8. Regularity in filing of cess returns and payment of assessment demands, renewal of air, water, hazardous waste and bio- medical waste management consents for operation of plant.
9. Regular monitoring of stack gas quality, ambient air quality, solid waste management and submitting the report every month.
10. Regular monitoring of treated sewage quality and upkeep of sewage treatment plant.
11. Regularity in filing of hazardous waste management report.
12. Fugitive dust is being monitored regularly.
13. We have noise level meter and noise levels are being monitored regularly. Noise generating sources have been isolated by housing them in enclosures. Wherever entry is necessitated in such areas ear plugs/ear muffs are issued.
14. Helping the engineering and management students to carryout their project works.

## **AFFORESTATION**

In our plant, colony & mining area the conditions are not suitable for growing trees as rock sheet is just below 1 mt depth and especially in colony and mines it is just below 0.3 mt to 0.6 mt. Hence the roots of the plant cannot penetrate in to depth and cattle come for grazing due to which the whole area was looking like barren land except very few trees & shrubs here and there. In spite of the adverse conditions we have been able to develop plantation by constructing retaining walls and filling up the area with black cotton soil and installing tree guards. This has resulted in to a thick green belt in colony, mines and plant which has increased the aesthetic view of the area. The area greenery of our plant includes lawn, ornamental garden, mango orchard, teak wood farm, afforestation etc.

### **The following measures are being taken for development of thick green belt**

- We have a beautiful nursery where the saplings are being developed and distributed free of cost to our colony residents and farmers through GAK to enhance the greenery development and also we are purchasing plants from forest dept to develop afforestation.
- We are conducting annual garden competition among the colony residents and distributing the prizes. The competitions are conducted quarter wise to give awards to more nos. of people.
- We have developed a good checklist to audit the garden of the colony during competition and a committee is formed to award the winners.
- We are planting the trees as per five years plan. Our colony is so beautiful that the nearby peoples refer to it is a place of greenery and picnic spot.
- We have started plantation of mosquito repellent plants in colony.

Since 1983 till date we have planted over 4.34 lakhs saplings out of which over 2.49 lakhs plants are surviving.

The following species are being used for plantation

1. Neem
2. Tulsi
3. Marva
4. Lemon Grass
5. Lentana Hedge
6. Peltophoram
7. Pongamia
8. Cassia Sp.
9. Banyan
10. Pipal
11. D. Sisso
12. Teak

For year wise plantation refer annexure-I

### **ASSESSMENT/RECOMMENDATION**

The unit is operating with complete dry process of cement making and therefore water pollution is not significant. The emissions from stacks are within the limits and complying with the consent conditions.

**ANNEXURE – I**

**The Details Of Tree Plantation In Vasavadatta Cement Factory, Colony And Mines Area  
From 1983-84 To 2009-2010 And Percentage Of Survival**

<b>Year</b>	<b>Colony</b>	<b>Factory</b>	<b>Mines</b>	<b>Total</b>	<b>Survival % Age</b>	<b>Survivals</b>
1983-84	10000	8000	2000	20000	80	16000
1984-85	10000	7000	3000	20000	62	12400
1985-86	11000	3000	559	14559	60	8735
1986-87	13000	8500	3000	24500	55	13475
1987-88	14000	10000	3000	27000	60	16200
1988-89	13000	9000	3121	25121	60	15072
1989-90	12500	8500	4000	25000	55	13750
1990-91	9000	4000	3000	16000	65	10400
1991-92	11000	6000	4000	21000	48	10080
1992-93	11500	8000	2500	22000	47	10340
1993-94	13000	5000	4180	22180	83	18409
1994-95	10580	3500	1000	15080	80	12064
1995-96	9000	12764	5441	27206	80	21765
1996-97	9400	6400	9200	25000	52	13000
1997-98	2000	14996	8000	24996	50	12498
1998-99	4850	5700	4650	15200	50	7600
1999-00	1000	4000	5000	10000	30	3000
2000-01	1303	3891	4812	10006	35	3502
2001-02	2200	4500	3500	10200	50	5100
2002-03	2100	3500	4400	10000	30	3000
2003-04	2020	3010	5100	10130	52	5267
2004-05	1500	3500	1500	6500	60	3900
2005-06	1700	1500	4500	7700	30	2310
2006-07	4915	2800	2490	10295	50	5147
2007-08	2075	1650	3950	7675	45	3453
2008-09	2485	2950	1800	7235	43	3111
2009-10	2500	1000	5500	9000	--	--
<b>Total</b>	<b>187628</b>	<b>152661</b>	<b>103203</b>	<b>443583</b>	<b>54</b>	<b>2,49,578</b>