



# BIRLA CORPORATION LIMITED

**Rs.1500 Crore Plus**

**MULTI-PRODUCT, MULTI-INTEREST CONGLOMERATE**

JUTE

CEMENT

PVC FLOOR COVERING

AUTO-TRIM

CHANDERIA (RAJ.)

SATNA (M.P.)

DURGAPUR (W.B.)

RAEBARELI (U.P.)

**Captive power generation**

# Birla Corporation Limited

## Cement Division, Satna (MP)

ISO 9001

ISO 14001

- ➔ Production Capacity - 6300 TPD Clinker
- ➔ Captive Power Generation - 27 MW

| <b>Clinker (MT)</b> | <b>2005-06</b> | <b>2006-07</b> |
|---------------------|----------------|----------------|
| BVC Kiln            | 927064         | 895486         |
| SCW Kiln            | 1099800        | 1088080        |

| <b>Cement (MT)</b> | <b>2005-06</b> | <b>2006-07</b> |
|--------------------|----------------|----------------|
| BVC Kiln           | 853724         | 870945         |
| SCW Kiln           | 698950         | 711952         |

| <b>Power Generation<br/>KWH</b> | <b>2005-06</b> | <b>2006-07</b> |
|---------------------------------|----------------|----------------|
| Captive Power                   | 106531000      | 167723000      |



# List Of Awards – 2006-07

| S.N | AWARD   | AWARDED BY                      | YEAR    |
|-----|---|---------------------------------|---------|
| 1   | First Prize to SCW for Maximum reduction in KWH / Ton of Cement in MP                       | FLS Energy Award, Bhopal        | 2006-07 |
| 2   | Second Prize to BVC for Maximum reduction in KWH / ton of Cement in MP                      | FLS Energy Award, Bhopal        | 2006-07 |
| 3   | Second prize to SCW for Minimum Thermal Power Consumption K Col / Ton of Clinker in MP & CG | FLS Energy Award, Bhopal        | 2006-07 |
| 4   | Safety Excellence Award   | National Safety Council         | 2006-07 |
| 5   | Greentech Environment Excellence Award  | Greentech Foundation, New Delhi | 2006-07 |





## Community awareness on water saving

A movement is started to make awareness in men to know how the water is precious. In support of the above, we have circulated pamphlets in our industrial township and wrote some slogans on walls in area of mass density.

## जल ही जीवन है। पानी बचाएँ

प्रिय साथियों,

जैसा कि हम सब जानते हैं कि इस वर्ष सतना व उसके आसपास के क्षेत्रों में न के बराबर एवं बहुत कम बारिश हुई है, जिसकी वजह से सतना व उसके आसपास के क्षेत्रों में पानी की गंभीर समस्या हो गई है। बरसात होने में अभी लगभग 4/5 माह बाकी है। इस गंभीर जल समस्या की परिस्थितियों के लिए बचे हुए समय में हमें मिलजुलकर गंभीर जल समस्या का सामना करना है। पानी हमारे जीवन-यापन के लिए अति आवश्यक है एवं इसके साथ-साथ अपनी फैक्ट्री चलाने के लिए भी पानी की उतनी ही आवश्यकता रहती है। शासन द्वारा जो हमें पानी दिया जाता था उसे बंद कर दिया है एवं न के बराबर पानी दिया जा रहा है, जो कि हमारे जीवन यापन एवं फैक्ट्री उपयोग के लिए समुचित नहीं है।

साथियों! अतः अब वो समय आ गया है कि हम पानी की समस्या को गंभीरतापूर्वक समझें एवं आने वाले समय में पानी की कमी से होने वाले प्रभावों पर ध्यान दें एवं अभी से ही "पानी की बचत" एवं "पानी के सदुपयोग" पर विचार करें, जिसके लिए मिलजुलकर प्रयास कर और अभी से ही पानी की बचत एवं आवश्यकतानुसार उसका उपयोग करने की आदत को अपना परम कर्तव्य समझें।

### पानी की बचत एवं सदुपयोग - कुछ उपाय

- ◆ अपने घरों में पानी का उपयोग सोच-समझकर करें।
- ◆ रसोई एवं नहाने के नलों को उपयोग के बाद अच्छी तरह से बंद कर दें।
- ◆ पीने के पानी को केवल आवश्यकतानुसार स्टोरेज करें एवं इस स्टोर पानी को अगले दिन नहाने, बर्तन धोने एवं पौधों के जीवन के लिए प्रयोग करें।
- ◆ पानी से कार्य करते समय नल की धार को पूरा न खोले, आवश्यकतानुसार खोलकर ही कार्य करें।
- ◆ नहाते समय पानी बाल्टी में भरकर नहायें न कि सीधे नल के नीचे।
- ◆ घर या फैक्ट्री में कहीं भी पानी का लिकेज या टंकियों से ओवर फ्लो हो रहा हो तो तुरंत उसकी सूचना बिल्डिंग विभाग या पॉवर हाउस में दूरभाष क्र. 2444, 2303 एवं 2336, 2337 पर देवे और तुरंत मरम्मत करवाएं।
- ◆ दाँत एवं मुँह साफ करते समय नल चालू न रखें।
- ◆ घर में बच्चों एवं काम करने वाले नौकरों को पानी के सही उपयोग हेतु आवश्यक सलाह दें।
- ◆ घर के शौचालयों में जहाँ फ्लश करने की व्यवस्था है उन्हें लघु शंका (Urinal) में इस्तेमाल न करें। जग या लोटे से पानी डालें एवं हजारों लीटर पानी की बचत करें।

आईए, हम सब मिलजुलकर इस गंभीर जल समस्या का समाधान करें।

26 जनवरी 2007

पी.एस. मरवाह



# Daily Report Formats

27 MW THERMAL POWER PLANT  
DAILY REPRT  
WATER TRETMENT PLANT

DATE :

|                                  | Water Meter Reading | Flow<br>Inch of 'v' Notch | R/Hrs | Qty.<br>in KL |
|----------------------------------|---------------------|---------------------------|-------|---------------|
| <b>Raw Water receipt</b>         |                     |                           |       |               |
| 1- Quarry Line No. 2             |                     |                           |       |               |
| 2- Quarry Line No. 4             |                     |                           |       |               |
| 3- River Water                   |                     |                           |       |               |
| <b>Raw Water Consumption</b>     |                     |                           |       |               |
| SCR (A)                          |                     |                           |       |               |
| Recovery from (MGF+UF) (B)       |                     |                           |       |               |
| Net Consumption (A-B)            |                     |                           |       |               |
| <b>Treated Water consumption</b> |                     |                           |       |               |
| RO(Excluding MB )                |                     |                           |       |               |
| MB                               |                     |                           |       |               |
| Softener                         |                     |                           |       |               |
| TOTAL                            |                     |                           |       |               |
| <b>Water Rejection</b>           |                     |                           |       |               |
| Clarifier (a)                    |                     |                           |       |               |
| MGF (b)                          |                     |                           |       |               |
| Softener (c)                     |                     |                           |       |               |
| UF (d)                           |                     |                           |       |               |
| RO (e)                           |                     |                           |       |               |
| MB (f)                           |                     |                           |       |               |
| Water Recovery   27 MW (b+d)     |                     |                           |       |               |
| Reuse in main plant (a+e+f)      |                     |                           |       |               |
| Rejection to disposal ( ETP )    |                     |                           |       |               |
| <b>Water Balance</b>             |                     |                           |       |               |
| Raw Water Receipt                |                     |                           |       |               |
| Total water consumed             |                     |                           |       |               |
| Loss / Gain                      |                     |                           |       |               |
| <b>Water Tank level</b>          |                     |                           |       |               |
| RW Tank                          |                     |                           |       |               |
| CWST                             |                     |                           |       |               |
| Blended water storage tank       |                     |                           |       |               |
| DM storage tank                  |                     |                           |       |               |
| Cooling Tower Basin              |                     |                           |       |               |
| Deaerator tank                   |                     |                           |       |               |
| BVC Raw Water Tank-1             |                     |                           |       |               |
| BVC Raw Water Tank-2             |                     |                           |       |               |

SATNA CEMENT WORKS. SATNA  
POWER HOUSE

S 90660015

Summary of Water Receipt and Supply

Rainfall on Date:  
(all figures are in Lac gallons)

Rainfall upto Date:

Date :

| Water Receipt        | Source        | R.Hrs. | Qty. |
|----------------------|---------------|--------|------|
| Water Received       | PHED          |        |      |
|                      | "Quarry" No.1 |        |      |
|                      | "Quarry" No.2 |        |      |
|                      | "Quarry" No.3 |        |      |
|                      | "Quarry" No.4 |        |      |
|                      | Bore Wells    |        |      |
|                      | TOTAL         |        |      |
| Water Recovery       | From OXI Pond |        |      |
|                      | Others        |        |      |
|                      | TOTAL         |        |      |
| Total Water Received |               |        |      |

**Water Consumption**

|                                |                  | Should be     | Actual |
|--------------------------------|------------------|---------------|--------|
| Drinking Water                 | Colony           |               |        |
|                                | BVH              |               |        |
|                                | School & Temple  |               |        |
|                                | Dairy            |               |        |
|                                | Plant            |               |        |
|                                | TOTAL            |               |        |
| Power Generation (TPH)         | SCW TPH          |               |        |
|                                | BVC TPH          |               |        |
|                                | TOTAL            |               |        |
| Power Generation (DG Set)      | SCW DG           |               |        |
|                                | BVC DG           |               |        |
|                                | TOTAL            |               |        |
| (Industrial) For Plant Cooling | SCW Mill House   |               |        |
|                                | SCW Conv.        |               |        |
| 27 MW T.P.P.                   | BVC Plant        |               |        |
| Civil Const. SCW/BVC           | Steel Foundry    |               |        |
|                                | TOTAL            |               |        |
| <b>Total Water Consumption</b> |                  |               |        |
| Water Stock Yesterday          |                  | Running Stock |        |
| Water Stock Today              |                  | Running Stock |        |
| Stock in Slury tank - 1        |                  | Reserve Stock |        |
| Stock in Slury tank - 2        |                  | Reserve Stock |        |
|                                | <b>Yesterday</b> | <b>Today</b>  |        |
| Water Level A Quarry           |                  |               |        |
| Water Level C Quarry           |                  |               |        |



# **QUALITY CIRCLE MOVEMENT**

Quality circle movement started in our organization since 1996. there are 42 QC teams are in function from different sections. A team 'JEEVAN ' has been formed in the year 2003 – 04 to identify & solve the problem on water. A ten members team including leader is working under guidance of team facilitator . Focus of team is specially on the following.

1. Optimization in water consumption for industrial & domestic use.
2. Zero discharged concept.
3. Recycle & reuse of waste water.
4. Water conservation
5. Rain water harvesting
6. Improvement in water quality for specific use
7. Problem in water supply
8. Problems in water treatment

Team has identified 35 problems and out of that 32 problems has been solved till date. A monthly meeting being held chaired by our unit head for presentation on identified / solved problems.



## Reduction in Specific Water Consumption

| Year    | Clinker production M3/MT |           | Power Generation M3 / MWH |           |
|---------|--------------------------|-----------|---------------------------|-----------|
|         | Actual                   | Benchmark | Actual                    | Benchmark |
| 03 - 04 | 0.257                    | 0.24      | 5.76                      | 4.50      |
| 04 - 05 | 0.246                    | 0.24      | 5.22                      | 4.50      |
| 05 - 06 | 0.278                    | 0.24      | 5.27                      | 4.50      |
| 06 - 07 | 0.239                    | 0.24      | 5.02                      | 4.50      |

Current year Target is 4.50 M3 / MWH and 0.20 m3 / ton of clinker

Benchmarking as per CSEINDIA.ORG

| Year    | Drinking water consumption (Domestic) |               |                                       |
|---------|---------------------------------------|---------------|---------------------------------------|
|         | Consumption in M3 /day (Avg.)         | No of Persons | Per capita consumption (Litre/person) |
| 03 - 04 | 1167                                  | 11190         | 104.20                                |
| 04 - 05 | 1223                                  | 12060         | 107.40                                |
| 05 - 06 | 1221                                  | 12600         | 96.90                                 |
| 06 - 07 | 699                                   | 12350         | 56.60                                 |

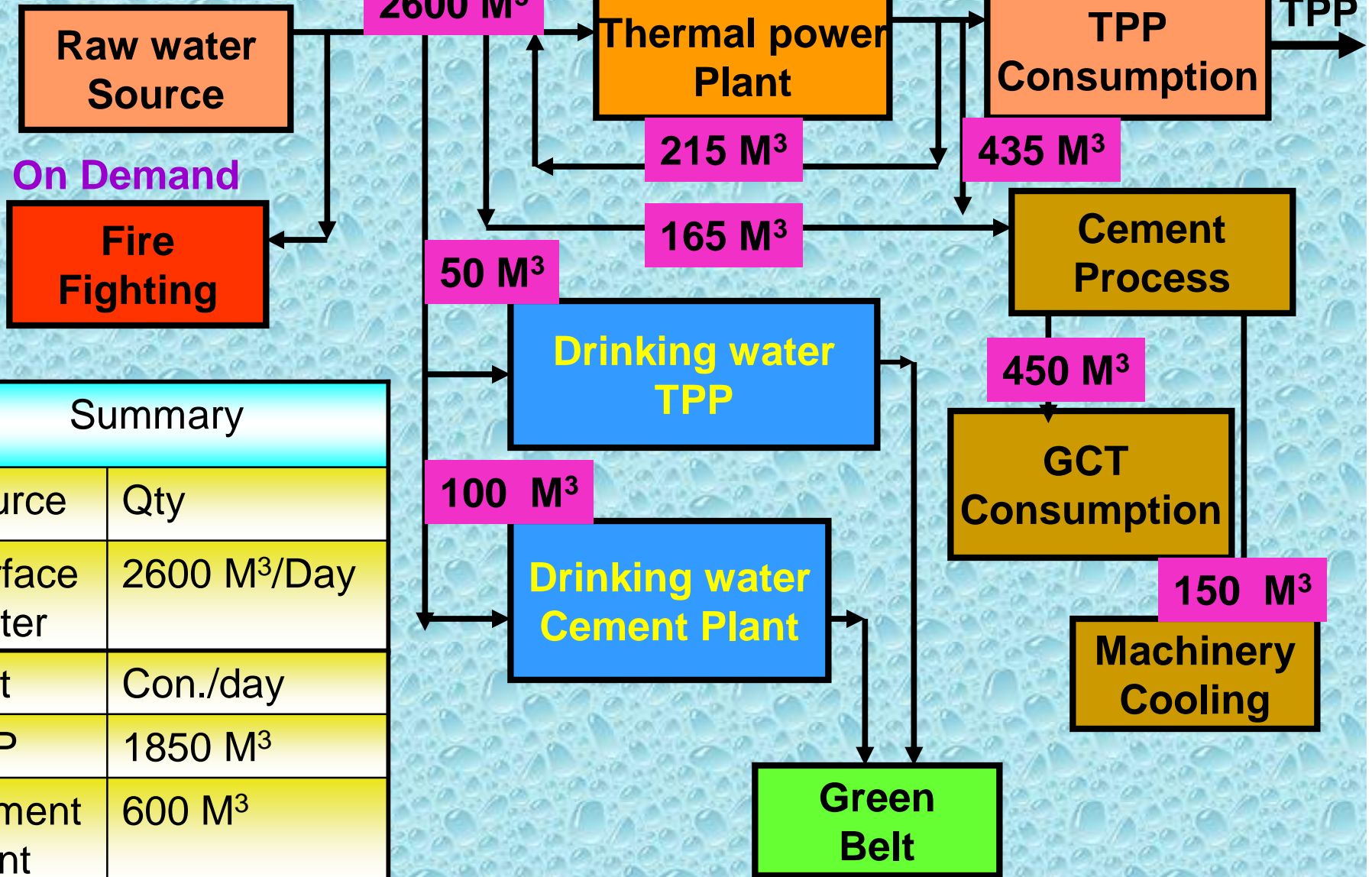


# An Approach To Zero Discharge

- ✓ **ZERO discharge condition achieved in 2003-04 in cement plant; only in rainy season water goes out to some extent**
- ✓ **Thermal power plant installed in 2005 posed a challenge**
- ✓ **Before commissioning modifications done to utilities the treated water discharge of cooling tower.**
- ✓ **Water used in industrial cooling thereby saving water.**
- **Detailed scheme as shown in next slide**



# Zero Discharge System



| Summary       |                           |
|---------------|---------------------------|
| Source        | Qty                       |
| Surface Water | 2600 M <sup>3</sup> /Day  |
| Unit          | Con./day                  |
| TPP           | 1850 M <sup>3</sup>       |
| Cement Plant  | 600 M <sup>3</sup>        |
| Drinking      | 150 M <sup>3</sup>        |
| <b>Total</b>  | <b>2600 M<sup>3</sup></b> |



# PROJECT NO.1: Surface run off RAIN WATERHARVESTING

## HISTORY

The Pond of size 200 x 100 x 5 M. deep. was made in the year 2005-06 near factory for storing water for thermal power plant by pumping water from mines area. It was planned to pump water from Mines Reservoir when water level increases above prescribed limit. But due to poor monsoon last year, we could not collect water in storage pond.

## ACTION PLAN

To harvest rain water from factory buildings and natural slope near POND.

Catchment area : Approx. 2 hectares

Distance form pond: Approx. 0.3 KMs

Rain water available (Litres) =  $A \times R \times C$

=  $10,000 \times 1,000 \times 0.9$

= 18000 M<sup>3</sup>/season.

**Where A = Area of catchment. , R = Average rainfall in season in meter. And C = Co efficient of run off.**



# **PROJECT NO.1: Surface run off RAIN WATERHARVESTING**



**Pucca Drain  
made using  
natural slope  
from factory  
collecting  
building top  
and road  
water**

**Clear rain  
water  
harvested  
this year**





## PROJECT NO.1: Surface run off RAIN WATERHARVESTING

**View of rain water conveying drain from collecting point end by natural Contouring of road / land**





## **PROJECT NO. 2 : Colony Domestic Waste Water Recovery**

### **HISTORY**

Earlier, sewage drains of residential block of labour colony was flowing towards mother drain. But due to soil erosion, slope of a part of this block turned towards adjacent township resulting in flow of sewage towards this town-ship. Drains were modified but passing of sewage could not be turned up due to large difference in level.

### **ACTION PLAN**

Made a water collecting pit using brick masonry and installed a pump for sewage transfer. Water is now coming in oxidation pond. The same is being recycled for gardening, plantation etc.



# PROJECT NO. 2 : Colony Domestic Waste Water Recovery



Water flowing  
into Sewage  
collection pit

Collected  
water being  
pumped to  
oxidation pond





## **PROJECT NO. 3 : Tanker Filling of waste treated water**

### **HISTORY**

Earlier water tankers were being filled with drinking water for supply in colony for road washing and precious water was being wasted for washing purposes. It was thought that treated waste water from factory cooling can be used for this purpose. Though the plant cooling water supply system is completely close circuit but water could be released due to

- Overflow of return water drain
- Leakage / seepage of return water drain.
- Waste water from drinking / sanitary use points inside plant.



## **PROJECT NO. 3 : Tanker Filling of waste treated water**

### **ACTION PLAN**

**Four nos. of waste water collecting and treatment points were made at following locations**

**Near DG Set.**

**Near Limestone stacker / reclaimers.**

**Near reclaimers transfer car**

**Near `A` frame clinker storage yard.**

**All above waste water collecting centers are well equipped having water transfer pumps at least one working + one standby.**





## PROJECT NO. 3 : Tanker Filling of waste treated water



**Tanker  
filling  
station  
near  
stacker /  
reclaimer**



## PROJECT NO. 3 : Tanker Filling of waste treated water





# **PROJECT NO. 4 : IT in optimising water harvesting**

## **HISTORY**

**In our mines, out of 270 hectares mined out area, only 100 hectares area was an effective catchments for collection of rain water. The rest of the area was isolated due to level variation / slope problem with the area of rain water collection.**

## **ACTION PLAN**

**To find out natural slopes in and around mined out area, picture from google was used for getting data of ground elevation. Thus, we could, without much effort note the natural slopes and necessary corrections in slope were done for maximum collection of rain water.**

**Even with scanty rains this year, we could collect more water than previous year.**





After checking elevation from Google earth, we found this point is at the lowest for diverting the rain water into non operational mine reservoir.

A deep canal made for getting water into mines and results were very fruitful.

**Inspite of less rainfall 35 lac gallons of additional water was stored in reservoir**



## **Future Plans**

### **Water Conservation**

- Feasibility is being conducted for conversion of water cooled condenser to Air cooled condenser.
- Up-gradation of sewage treatment plant to use treated water in industrial use. Our plan is to install the STP by before 31.3.08.
- Increment in catchments area of rain water harvesting at mined out pit water reservoir.
- Appointment of expert agency for scientific study of rain harvesting in our colony and near by areas.

### **Green Belt**

**More Tree Plantation near by the abandoned mines area**

### **Conservation of fossil fuel**

**We are planning to install waste heat recovery system where in hot waste gases from cooler section of cement plant shall be used to make steam for generation of 3.5 MW of Power.**