









# National Award for Excellence in Water Management - 2008

# 16-17 Dec-2008

**Sterlite Industries (I) Limited, Tuticorin, Tamilnadu** 



#### **Global Presence – Vedanta Resources**





Sterlite Copper	Copper	400,000
Hindustan Zinc	Zinc	400,000
	Lead	85,000
BALCO	Aluminium	350,000
MALCO	Aluminium	40,000
IFL	Aluminium Foils	10,000
Vedanta Alumina	Alumina	1,400,000
	Aluminium	500,000
Sesa Goa	Iron Ore	15,000,000



# **Copper Operations**







# **Copper Smelting Process Flow**





ISA FURNACE



**ISA SMELT COMPLEX** 



**SHIP DISCHARGING** 



**RHF MATTE POURING** 



#### **CONVERTER SKIMMING**



**CONTINUOUS CAST COPPER COILS** 



**RHF SLAG GRANULATION** 



**ANODE CASTING** 



**CATHODES FOR DESPATCH** 



**ISA SMELT TAPPING** 



ANODE DESPATCH



**REFINERY CELL HOUSE** 



#### **Product and By-Products**



**25 TPD** 



Bismuth plant producing > 99.5% Bismuth bisulphate

Selenium plant producing 99.5% Selenium powder





- Our Tuticorin unit is certified for following requirements by M/s. DNV, Chennai
- ISO 9001 Quality systems Certification received in March 2000.
- System upgraded to ISO 9001-2000 Version
- ISO 14001 Environment Management Certification bagged in May 2001
- System upgraded to ISO 14001 2004 Version in Sept 2005
- OSHAS 18001 Occupational Health and Safety Assessment Series Certification accorded in July 2001
- System upgraded to OHSAS 18001 : 2007 version in May 2008.
- Unification of all the three systems done in 2003
- Recertification obtained for all systems in July 2004
- Scope of all systems extended to New Projects in Sept 2005.
- ISO 17025 Accreditation obtained for Electrical, Mechanical and Chemical analysis in Mar'07 from NABL.
- Revised Quality, Environmental, Occupational Health & Safety Policy in Apr'08.
- Recertification obtained for all the three systems in July 2007





- IMC RBNQ Certificate of Merit 2007
  India Manufacturing Excellence Award 2007 & 2008
- Sustainability Award 2007
- Golden Peacock Environment Management Award 2007
- CII National Award for Excellence in Energy Management 2007
- SIIL, Tuticorin was adjudged as "Excellent Energy efficiency unit". Notable fact is that Sterlite has received this award for the seventh consecutive time since 2001.
- CII National Award for Excellence in Water Management 2007
- CII HR Excellence Award
- Golden Peacock National Training Award 2007
- Indian National Suggestion Scheme Association (INSSAN) Awards 2007
- SIIL has also bagged Creative workplace by INSSAN 2007
- QualTech 2007
- SIIL bagged QualTech award 2007 for Innovation category in Sep'07.
- CII women Exemplar Award 2008
- Mrs. Dhanalakshmi, one of the women entrepreneurs from Sterlite's Self Help Group has won the "CII Women Exemplar Award 2008
- International Team Excellence Award 2008 from ASQ
- Three Indian teams qualified for making their improvement project team presentation at International Team Excellence Award competition and two from SIIL, Tuticorin.
- CII Exim award 2008
- IIM award 2008





#### Present Status of water management

- Zero discharge from the inception of the plant.
- Implementation of Air Coolers in Sulphuric Acid Plant to conserve 2500 m<sup>3</sup>/ day.
- Rain Water Catchment Pond to collect and reuse 54000 m<sup>3</sup> rain water in process.
- R.O. Plant with 300 m<sup>3</sup>/day capacity for utility waste water treatment.
- Continuous Specific Water reduction

## **Future perspective**

- To sustain zero discharge & to conserve the future environment,
- New RO plant of 1300 m3/day for ETP water is planned for raw water conservation in the plant
- Desalination plant of 5000 m3/day capacity is planned for alternative arrangement for Raw water sourcing other than river.









Rain water harvesting



The company's efforts towards protecting and conserving nature includes

- Community for the awareness on water conservation.
- Water day celebration with pledges and awareness programe for contract and company staffs.
- Circulated water conservation related article across the plant
- Development of a 25 meter green belt all around the factory premises.
- Afforesting the open lands in and around the plant in association with the Forest Department.
- An Environment Management Cell that reports to the Unit Head keeps a round-the-clock check on the working of all the initiatives implemented.





- Tuticorin's entire water requirement is met through the surface water source Papanasam Dam, located around 100 Km away from Tuticorin
- Further we have two, 27000 cubic meters capacity reservoirs to collect the run off from rain fall across the plant area and this water will be used for green belt development in the plant area.
- The total water holding capacity of the Papanasam Dam is 156 million cubic m3.
- Our withdrawal of water is less than 5% of the total water holding capacity of the dam, thus this source of water is not being significantly affected due to our operations



Water in take (m3)







Products	Specific water (m <sup>3</sup> /MT)	Average production per day (MT)	Total water requirement (m <sup>3</sup> /Day)
Copper Anode	2.42	1011	2308
Sulphuric acid	0.93	3268	3001
Phosphoric acid	4.33	502	1676
Copper Cathode	0.66	516	271
Copper Rod	0.24	239	57
Total	8.59	5536	7314







#### **Contents of Water Report**

- Water level in dams
- Water Receipts
- Water consumption areawise qty in m<sup>3</sup> and specific consumption
- Portable water consumption
- Water level in Reservoirs
- Blow down details



# Water saving Projects implemented



CLNA	Title of Water Saving project	Year of	Annual Water Savings		Invest. Made	Payback
SINO	implemented	Implementation	m <sup>3</sup>	Rs. Lakhs	Rs. Lakhs	(Months)
1	Primary Smelter- Waste Heat Recovery Boiler instead of Gas Cooler.	2005	99000	22.275	2200	98
2	Oxygen Plant Cooling Water <b>Blow down</b> Recycling.	2005	66000	14.85	03	0.2
3	Steam Turbine Generator Air Cooled Condenser	2005	49500	11.14	300	26.3
4	Secondary Smelter –Air cooled Condenser to reduce the gas volume.	2005	33000	7.425	40	5.38
5	Conversion of Gland Seal to Mechanical Seal.	2006	33000	7.425	20	2.69
6	Upgradation rain water collection system	2006	55000	12.37	100	Rain water harvesting
7	R.O. Plant -300 for Regenerated water from Water treatment plant	2008	109500	24.64	381	15
8	R.O. Plant -30 for ETP	2009	10500	2.36	10	50





Year Quantity (April-March) generated (m <sup>3</sup> )		Quantity recycled (m <sup>3</sup> )		Quantity discharged (m³)		Waste Water Discharge/Ton of Product
		(m³)	%	(m³)	%	
2004 – 05	576180	576180	100	0	0	0
2005 – 06	504240	504240	100	0	0	0
2006 – 07	720390	720390	100	0	0	0
2007 – 08	702625	702625	100	0	0	0





Year	Industrial			Colony water consumption		
	Consumption m <sup>3</sup>	Average employees per day	Per capita consumption per person/day	Consumption m <sup>3</sup>	No of persons	Per capita consumption/day
2004-05	124	1900	65	65	300	216
2005-06	110	1600	69	70	270	260
2006-07	170	2000	85	83	300	276
2007-08	222	3500	63	102	350	291





Vear	Annual Water	consumption (m <sup>3</sup> )	Source of	Production in tons or any other	Specific Water	
Teal	Industrial	Drinking / Domestic use	Water	unit of Production	(m <sup>3</sup> /MT)	
2004-05	1714227	45266		176872	9.9	
2005-06	2459219	40477	Industrial	273079	9.15	
2006-07	2552041	82311		313516	8.4	
2007-08	2623513	80857		323354	8.11	















#### Waste water discharge (m<sup>3</sup>/Ton)



- The entire process of smelting and acid production requires a huge quantity of water for various process purposes.
- The effluent out of these processes is treated in a full-fledged Effluent Treatment Plant and is being recycled and used in the plant and Sterlite is the first metallurgical plant to run on 'Zero discharge' basis from the inception of the plant.
- This achievement of ours has saved the precious natural resource (Water) which is a rare commodity in this part of the country.







**DM Plant** 



**RO Plant** 

- 300 m<sup>3</sup>/day RO plant for Utility regenerated waste water
- DM plant OBR increased from 250 m<sup>3</sup> to 450 m<sup>3</sup>
- DM plant waste water hooked up to the RO plant
- RO water outlet is taken as input to DM plant
- Gland packing was replaced by mechanical seals in DM plant
- In Phosphoric acid plant all seal water outlet of pumps has been diverted to cooling tower thereby reducing raw water input
- Elimination of steam requirement for 43% production thereby enhancing more return water consumption
- Cooling tower fluorine maintained below 0.2% to enhance more return water consumption





