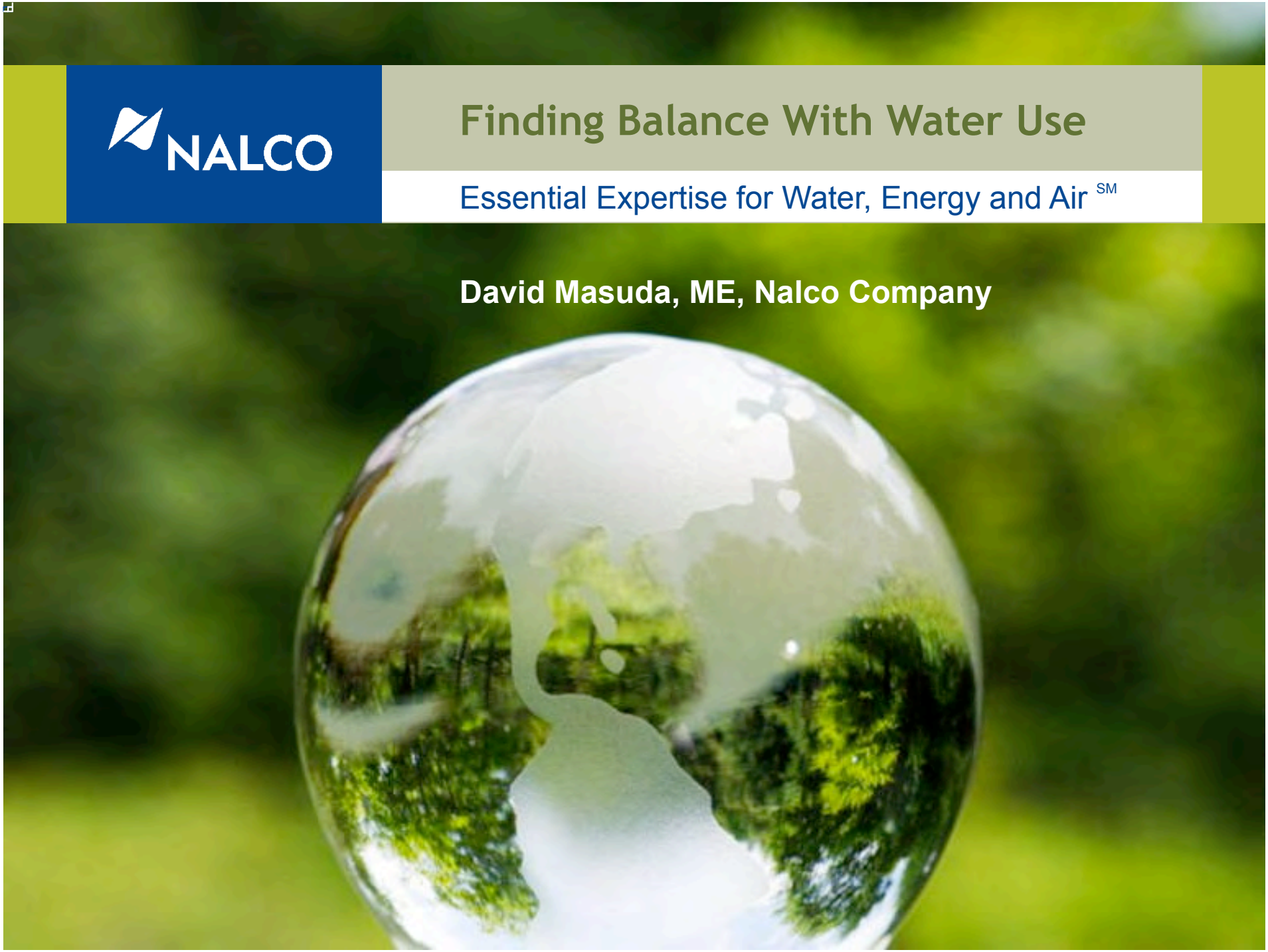
Finding Balance With Water Use

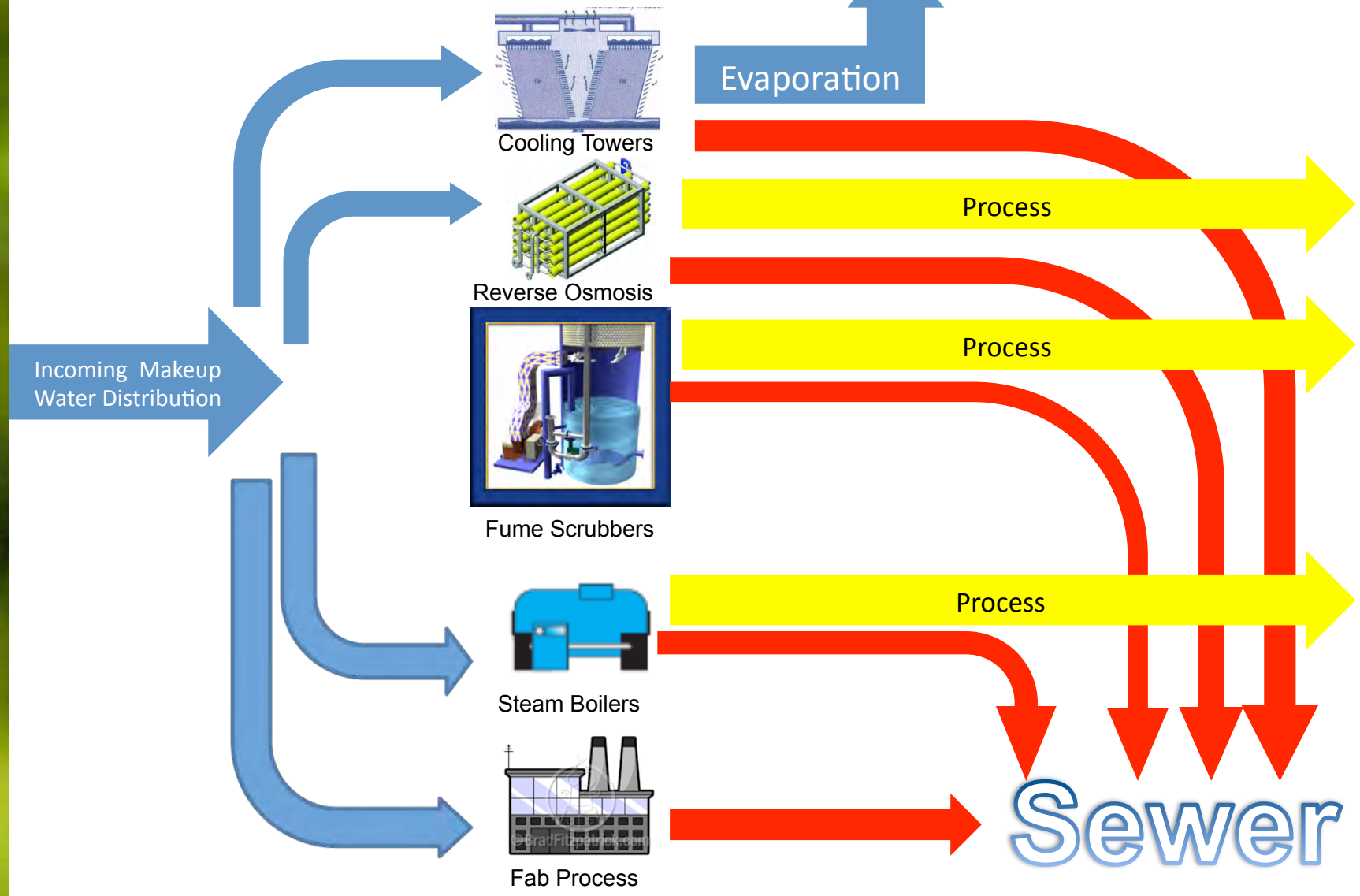
Essential Expertise for Water, Energy and Air SM

David Masuda, ME, Nalco Company

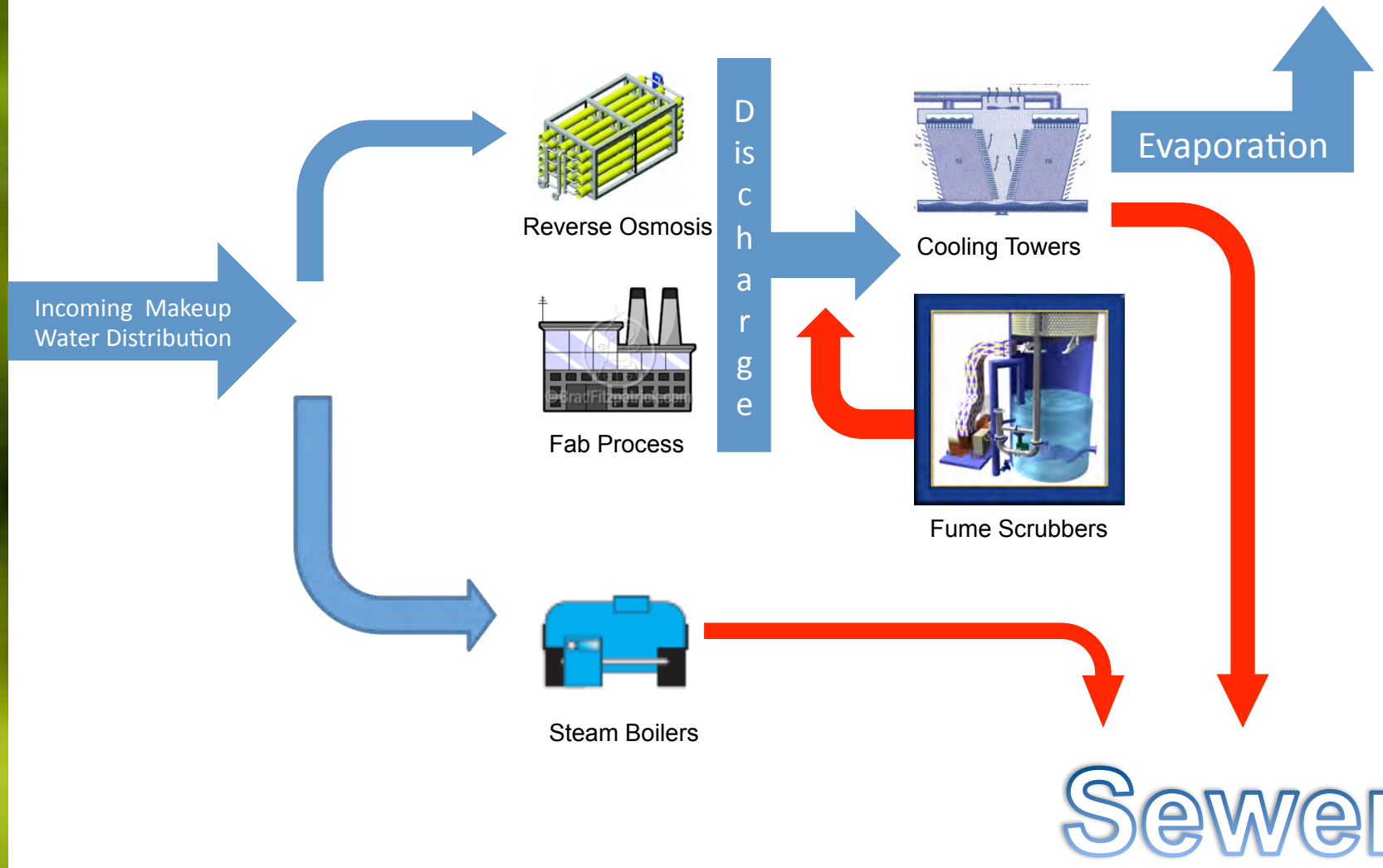



Depicts 23 million gallons of water, the amount wasted each year by a single factory with inefficient cooling systems. All over the world, companies are facing increasing strain on their water resources. IBM can help retailers create new business processes and strategies to reduce water usage and costs – in everything from manufacturing to food processing. Shrink your consumption at ibm.com/water

Water Distribution in A Manufacturing Fab

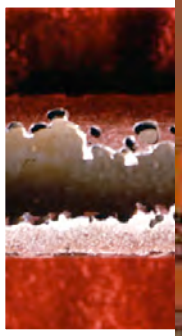


What If we Could Redistribute Streams?



What Happens if you just Reroute The Water?

Equipm

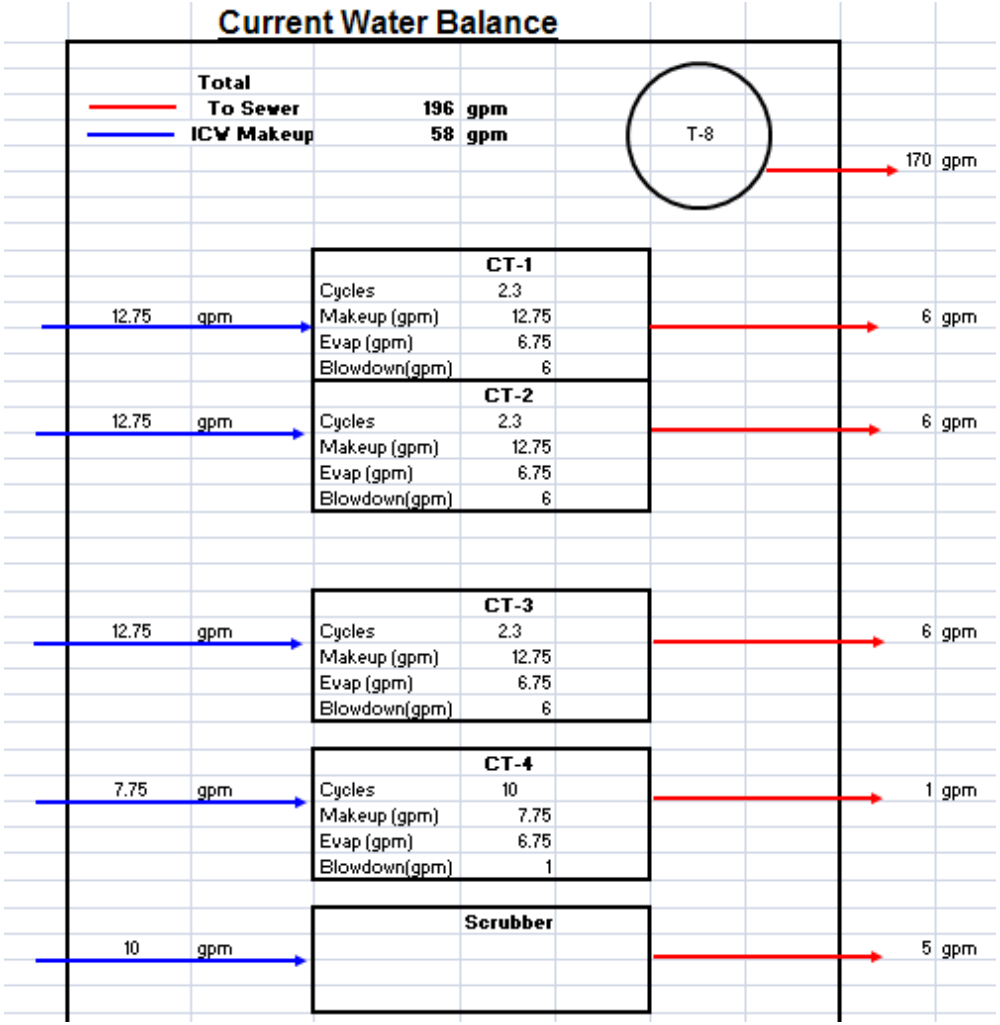


caling

Equipm

Plant Failure!!!!

How Do We Optimize Water Usage? 1. Get a Baseline



How Do We Optimize Water Usage? 2. Take Samples

NALCO

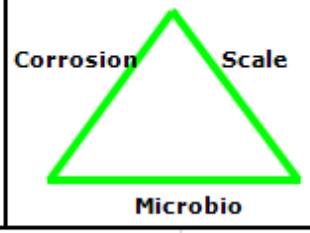
Nalco Analytical Resources
1601 West Diehl Road, Naperville, Illinois 60563-1198
Phone: (630) 305-2315, Fax: (630) 305-2948, Analytical.Lab.Naperville@Nalco.com

Yahoo!		**Sample Number:**	NW0816786
Santa Clara CA USA		**Date Sampled:**	10-Sep-2008
Sample Marked: Cooling Tower		**Date Received:**	11-Sep-2008
SAP SoldTo Number:		**Date Completed:**	17-Sep-2008

Water Analysis Report

Cations/Metals	Filtered	Total
Aluminum (Al)	<0.1	0.2 mg/L
Barium (Ba)	<0.05	<0.05 mg/L
Boron (B)	0.8	0.8 mg/L
Cadmium (Cd)	<0.05	<0.05 mg/L
Calcium (Ca)	11	12 mg/L
Chromium (Cr)	<0.05	<0.05 mg/L
Copper (Cu)	0.32	0.37 mg/L
Iron (Fe)	0.24	0.86 mg/L
Lead (Pb)	<0.1	<0.1 mg/L
Lithium (Li)	<0.05	<0.05 mg/L
Magnesium (Mg)	5.0	5.2 mg/L
Manganese (Mn)	<0.05	<0.05 mg/L
Molybdenum (Mo)	<0.1	<0.1 mg/L
Nickel (Ni)	<0.05	<0.05 mg/L
Phosphorus (P)	3.7	3.7 mg/L
Phosphorus (PO4)	11.0	11.0 mg/L
Potassium (K)	2.2	2.2 mg/L
Silica (SiO2)	160	170 mg/L
Sodium (Na)	900	900 mg/L
Strontium (Sr)	0.06	0.06 mg/L
Vanadium (V)	<0.05	<0.05 mg/L
Zinc (Zn)	0.72	0.91 mg/L
Calcium (CaCO3)	28	31 mg/L
Magnesium (CaCO3)	21.0	21.0 mg/L
Sodium (CaCO3)	2000	2000 mg/L
Calculated Hardness (CaCO3)	49	52 mg/L

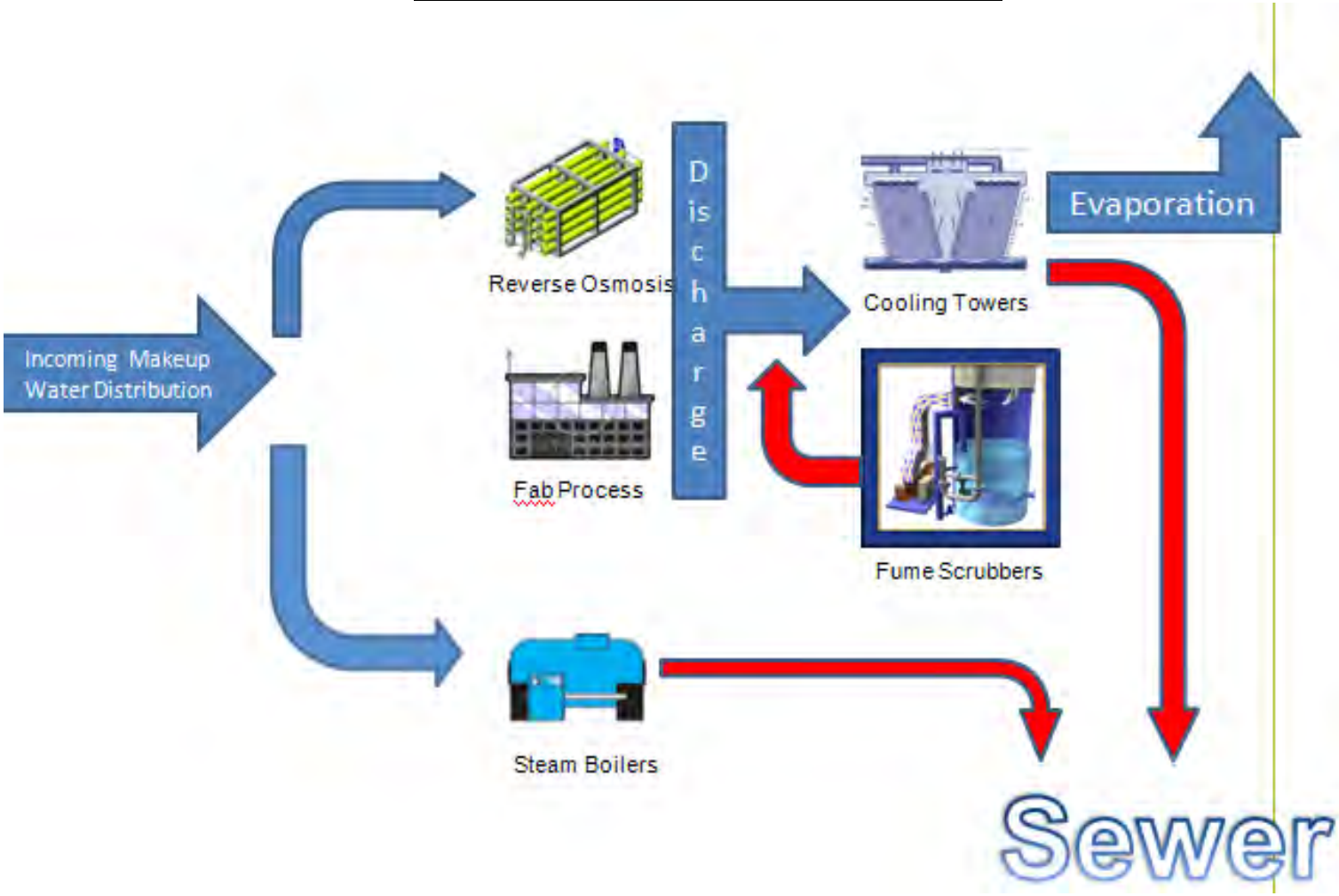
How Do We Optimize Water Usage?
3. Design a Reliable Water Treatment Program

Summary and Recommendations	Program Performance
This is the space where the Nalco Rep will write a summary of the program description and recommendations.	

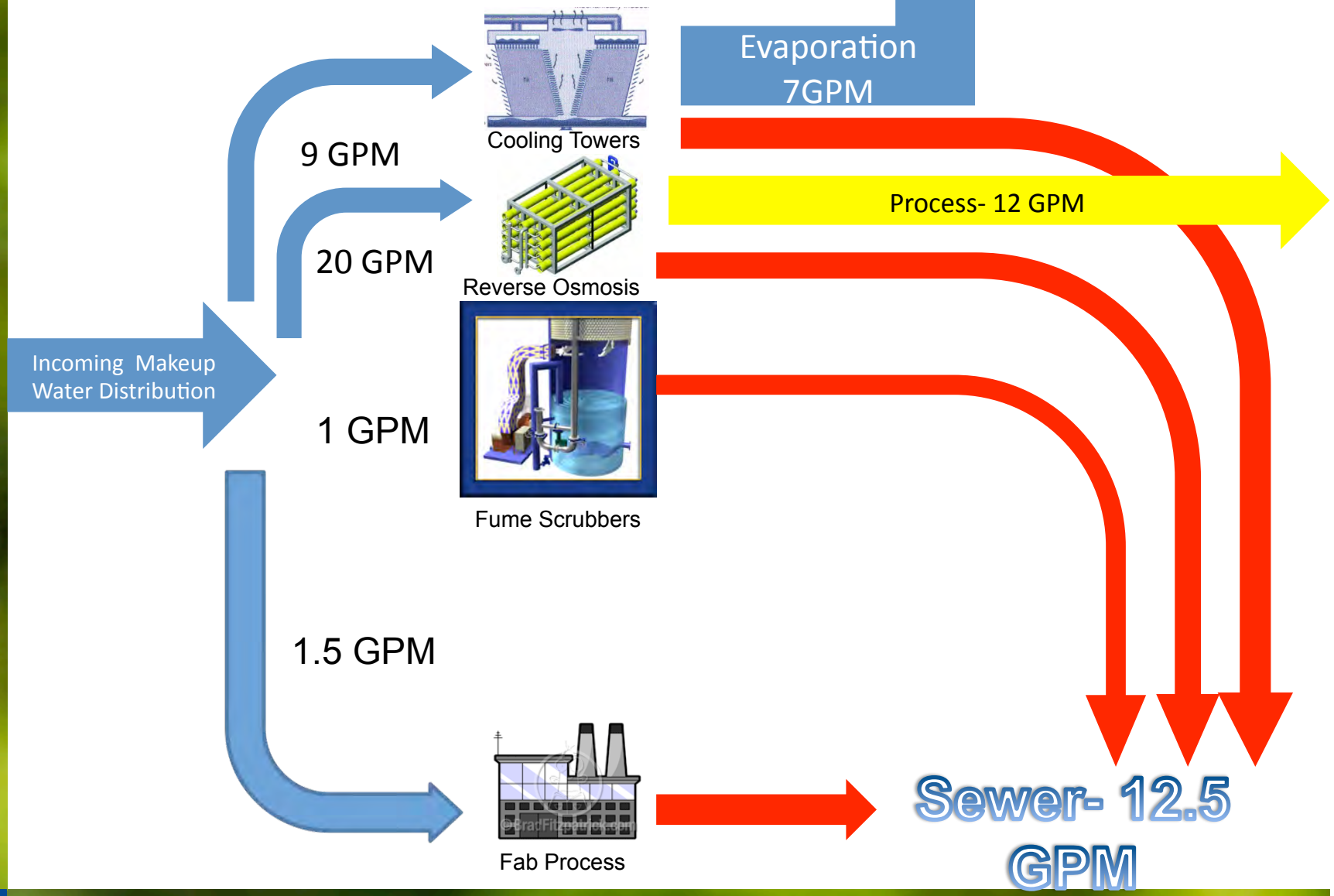
System Parameters	Value	Unit
Recirculating Rate	1,200	gal/min
Delta T	10	F
Volume	3,000	gal
Cycles	5.0	
Evaporation Rate	10	gal/min
Blowdown Rate	3	gal/min
Makeup Rate	13	gal/min
Holding Time Index	14	Hrs

Product Category or Control Parameter	Product Number or Control Parameter	Dosage or Control Set Point	Control Method	Product Description
Cycles of Concentration	5		Conductivity Set Point	na
pH			None	na
Multifunctional	3DT289	125 ppm	Tag Polymer	T#2, o-PO4, PSO, BZT, TT, THSP
Scale Inhibitor				
Copper Corrosion Inhibitor				
Mild Steel Corrosion Inhibitor				
Oxidizing Biocide	ST-20	0.165 ppm	3D Bio-Control	Aqueous, one drum, stabilized bromine biocide that is already active and ready to feed for control of microorganisms and slime.

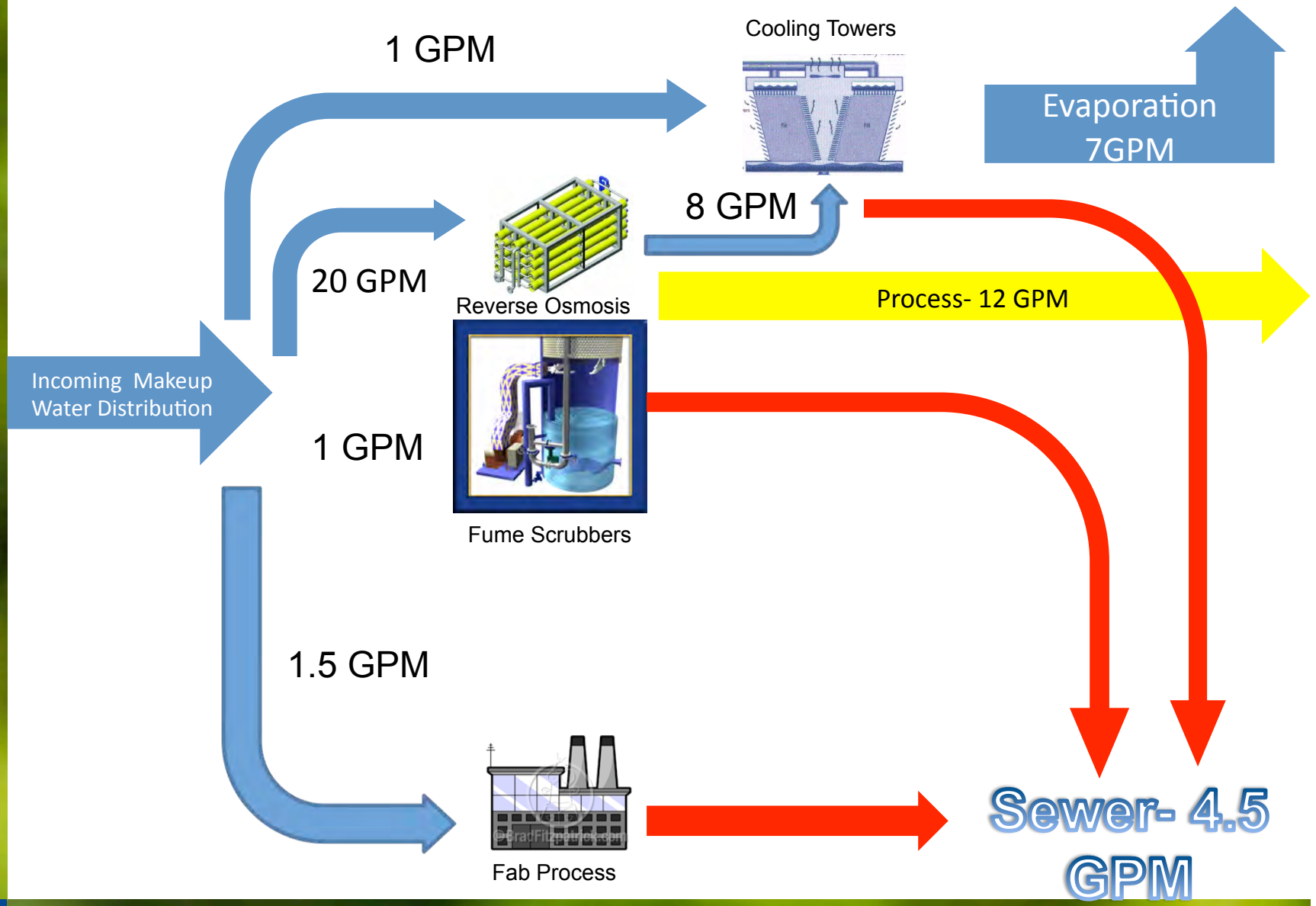
How Do We Optimize Water Usage?
4. Implement Program



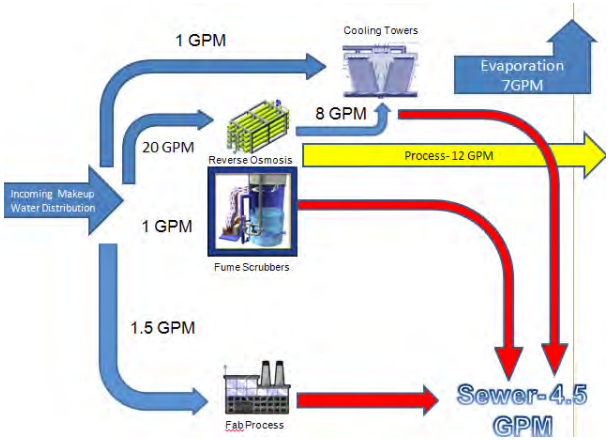
Quick Example: Supertex Inc.: San Jose, CA



Quick Example: Supertex Inc. After



Water and Cost Benefit



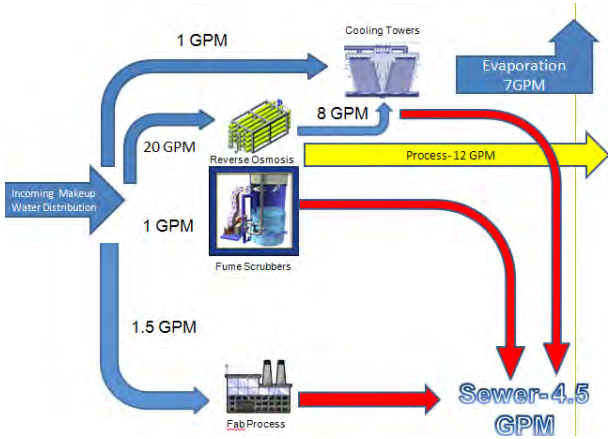
1. Reduced Makeup by 4.2 MM Gallons
2. Reduced Sewer by 4.2 MM Gallons
3. Reduced Water Cost by $27K Annually
4. Year To Date We have used 10.6 Million Gallons of RO Reject as Makeup to Cooling Tower

Project Cost: $16K

Increased Annual Chemical Cost: $3K

Lets Review: Steps To Optimizing Water Use

1. Get a Baseline. Meter Everything In & Out
2. Collect Samples: Determine Which Streams May be Rerouted, Reduced or Reused
3. Design the Infrastructure and Treatment Program to accommodate Optimizations
4. Implement A Reliable and Optimized Water Use Program



Thank You For Your Time

Questions?

Contact Information:
David Masuda
dmmasuda@nalco.com
(408) 858.6060