



OZONE APPLICATIONS

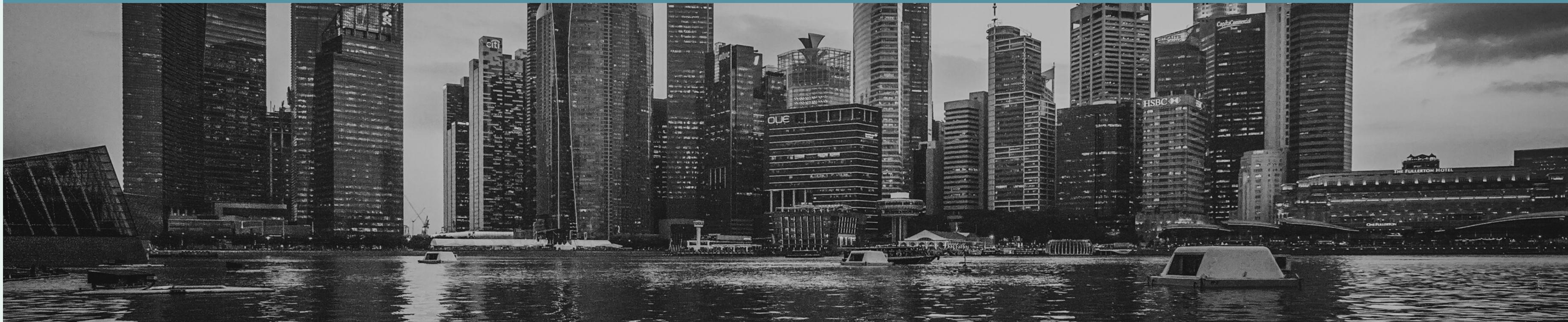
# COOLING TOWER OZONIZATION

Presented by Team Waterhouse

# BASICS OF OZONE

WHAT MAKES IT  
SPECIAL

- 5.5 times Stronger as an Oxidising agent than pure Oxygen
- 3157 times Stronger as a Disinfectant than Chlorine
- 50 times Stronger than PerAcetic Acid
- Does not leave any toxic residue
- Converts back into Oxygen after Sterilization
- Destroys Bacteria / Virus / Algae / Fungi / Mould
- Strongest De-odorizer, De-colourizer of water
- FDA USA recognizes Ozone treatment to be a Good Manufacturing Practice (GMP), since March 12 1975.



# Recommendations of Ozone in Cooling Towers

## US DEPT. OF ENERGY

- In Federal Technology Alert, released by US Government in December, 1995, ozone use was sincerely recommended for all cooling towers

## NASA

- NASA, USA has all the five cooling towers fully ozonated since 2003

## USA

- Estimated 1200 mega cooling towers in USA were ozonated till 2009

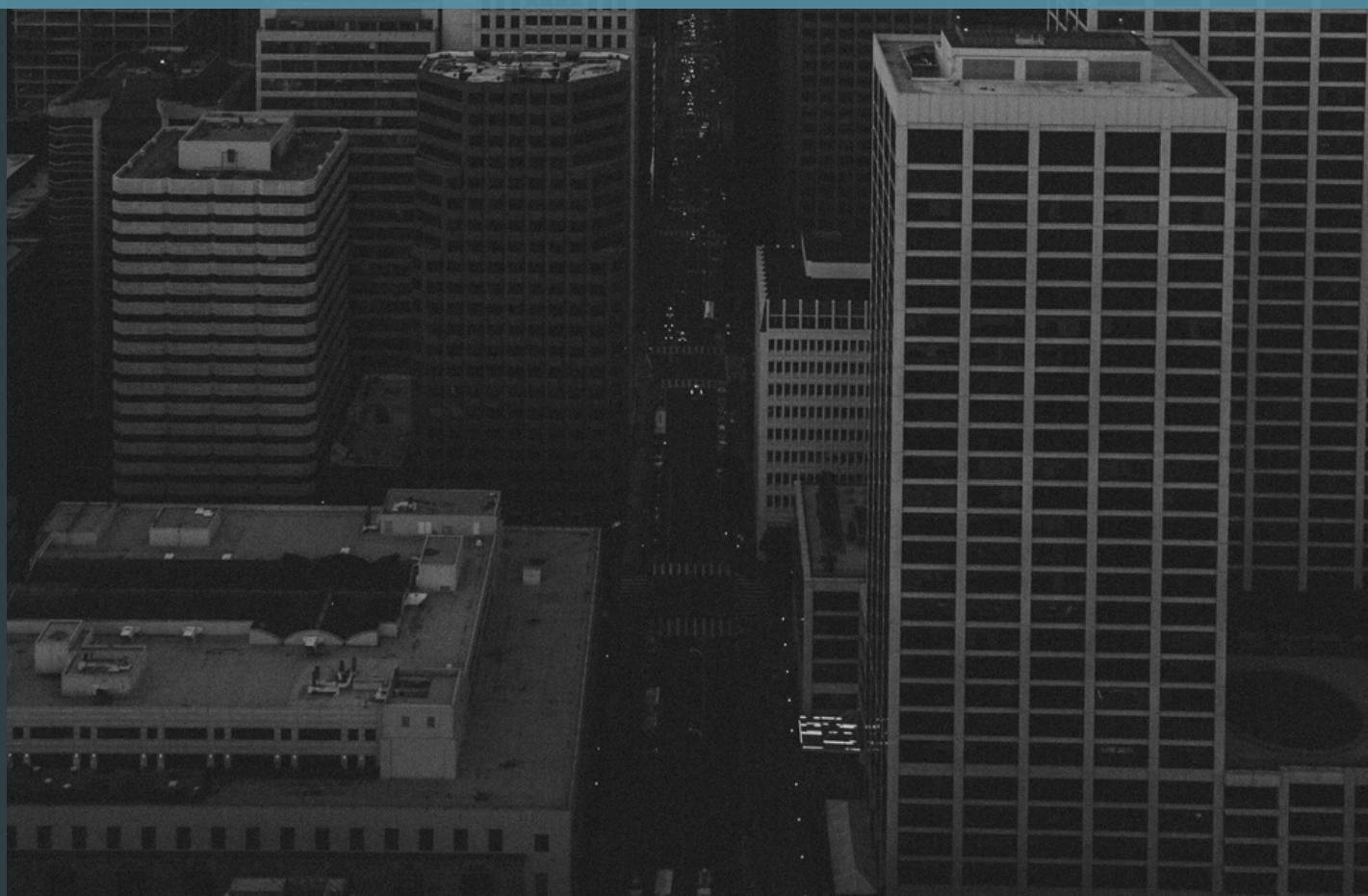
## HEALTHCARE

- Providence Hospitals, Oakland, California has been running Ozonated cooling towers since 1988

# CURRENT EXPENDITURES

YOU ARE SPENDING A LOT!

- The cost of the chemical treatment program is high.
- Chemical management is burdensome
- Handling of water treatment chemicals raises significant safety concerns
- Chemical water treatment is not completely effective or satisfactory
- Water and sewer charges are high or increasing or When local regulations require blowdown to be treated before discharge to surface waters.



# CONVENTIONAL METHOD CHALLENGES

- CHEMICAL HANDLING & RECURRING COST
- FORMATION OF BIO-FILM, INCREASED TDS : REDUCED HEAT EXCHANGE CAPACITY
- CORROSION OF COOLING TOWER WALLS
- INCREASED POWER CONSUMPTION & WATER USAGE TO MANAGE BLOW-DOWN
- INAPPROPRIATE DISINFECTION, ALLOWING BACTERIAL GROWTH LIKE LEGIONELLA & PROMOTE DISEASES
- TOXIC RESIDUE IN WATER
- CHEMICAL DEPOSIT IN WATER
- USAGE OF EXCESSIVE ACIDS DUE TO INCREASE OF PH LEVEL
- HIGH RUNNING COST OVERALL

# OZONE BENEFITS IN COOLING TOWERS

## HEAT EXCHANGE

Higher efficiency of heat exchange due to reduced biofilm formation.

## RUNNING COST

Low running cost, no man-power attendance/refill, one-time investment.

## SAFE & CHEMICAL-FREE

Natural element ozone is recommended, safe and reduces chemical usage/storage by more than 80%

## TOXICITY

No toxic residue. Ozone gets converted back to oxygen after sterilization.

## DISINFECTION

Destroys Legionella pneumophila, sulphate-reducing bacteria, Algae, Fungi, Mould, other Bacteria/Virus.

# BENEFITS demystified

## CORROSION

Prevention of microbially influenced corrosion.

Restricts the increase of pH, prevents MgSO<sub>4</sub> deposit

Prevents corrosion influenced by bacteria

Prevents acid build up and corrosion by killing sulfate reducing bacteria

## REDUCED BLOWDOWN

Reduced need for the conventional hassle of flushing out a portion of high mineral concentration cooling tower system water down the drain, while simultaneously replacing it with fresh water.

This saves you both power & water.

## SAVE THE ENVIRONMENT

Ozone being nature's own product, removes all microbial and biological load in the most environment friendly way. No headache of denaturing contaminants in blowdown water before disposing off in drains, to abide by pollution control board norms.

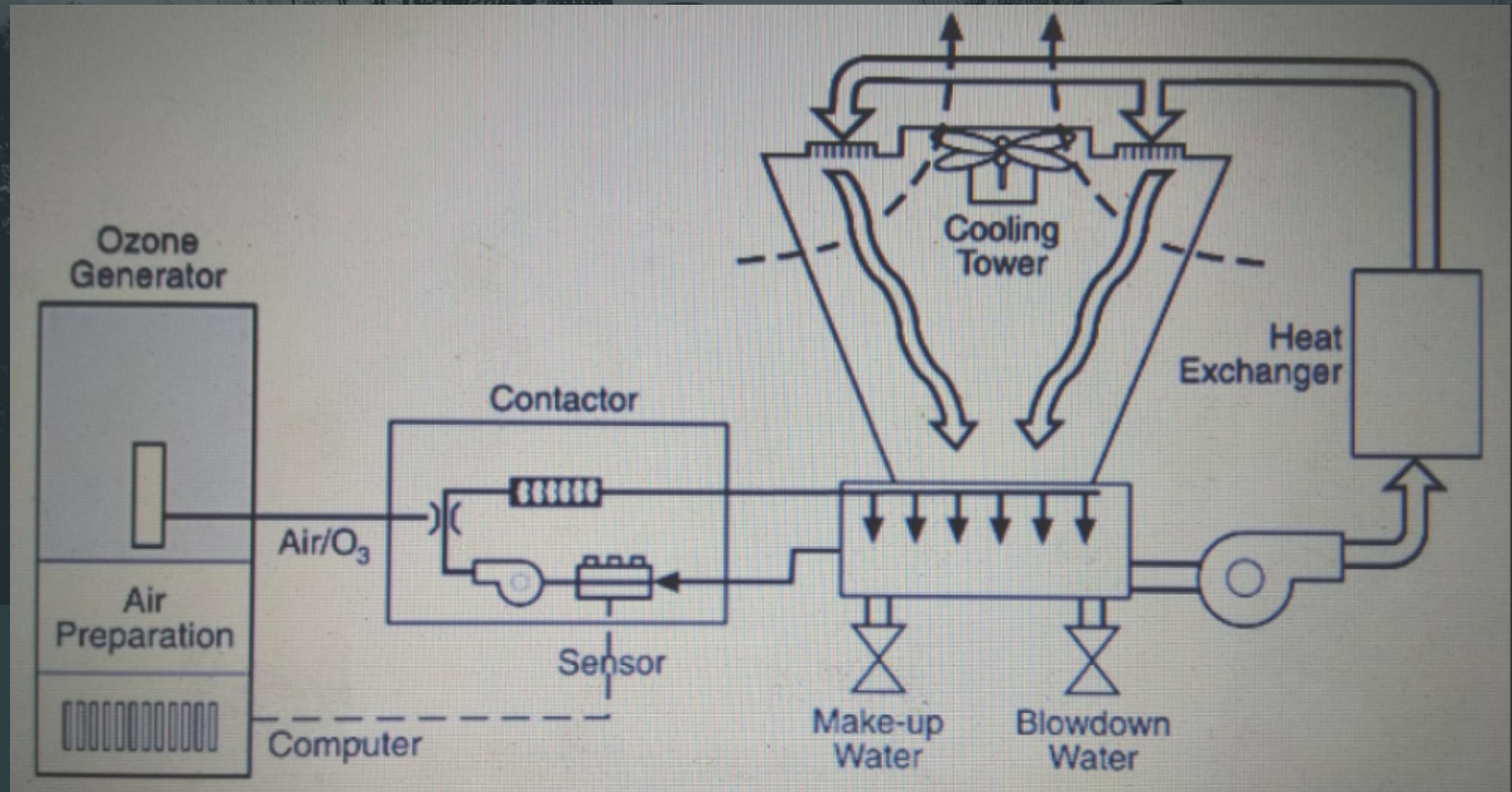
## HEAT EXCHANGE

Unlike Sodium Hypochlorite or Chlorine, Ozone does not increase the TDS level in water.

Ozone, 3157x stronger disinfectant than Chlorine, destructs the bio film, enabling increased heat exchange capacity and allowing usage of very less acid.

## POCKET SAVER

- One-time Investment
- Chemical cost negligence
- Power savings from highly reduced blowdown & increased heat exchange
- No maintenance cost / recurring cost, except nominal electricity
- Water usage reduction



## Recommended Procedure

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CAPITAL EXPENDITURE

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100% ROI

WITHIN A FEW MONTHS

MODERNIZE YOURSELF

Just Switching to Ozone may not  
be enough.  
Switch to Team Waterhouse.

# PRODUCTS

## DETOX-205

For Medium-scale Cooling Towers in HVAC /  
Power Plants.



## WITHERPRO7

For Large-scale Cooling Towers in HVAC /  
Power Plants

INDIA ADDRESS

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