

EHO's Water Treatment

Focus Areas

Mechanical

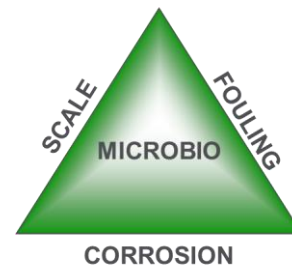
- Types of material in the systems
- Equipment on site
- Chemical dosing systems
- Dead legs
- Filtration systems
- Heat exchanger type – chillers, plate heat exchanges

Operational

- Hours of operation
- Number of days system operates
- Heat load
- All pumps and towers run or have standby systems

Chemical

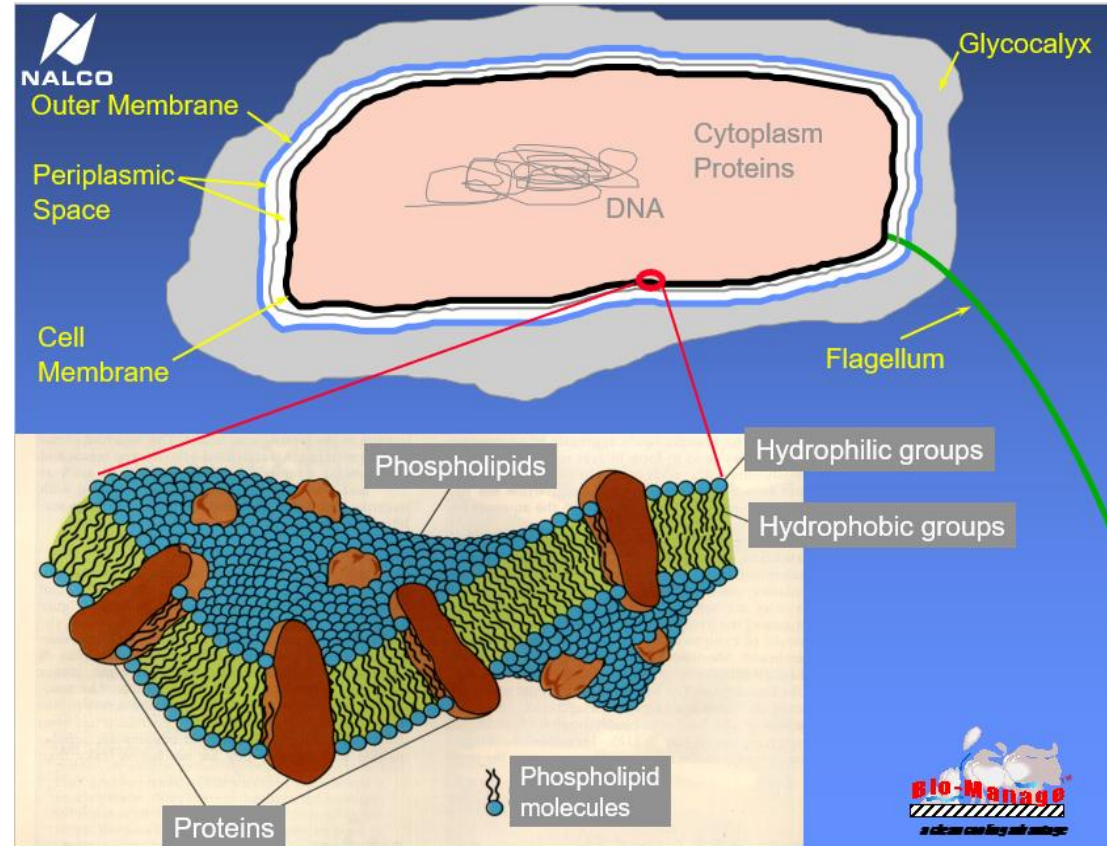
- Materials in system compatibility
- Hold time index – (contact time)
- Circulation rate
- Days and hours of operation
- In coming water quality
- Previous corrosion & bacteria issues



Biocides

Purpose

- 2 main types
 - Oxidising
 - Non-oxidising
- Oxidising
- Chlorine
- Chlorine Dioxide
- Bromine
- Bromine/chlorine combination
- Non-Oxidising
 - Isothiazolone
 - Glutaraldehyde
 - DBNPA



Biocides

Oxidising Biocides

Benefits

- Fast acting
- Bacteria tend not to build up immunity
- Low dosage rates

Disadvantages

- Restricted pH range 7.0 - 8.0
- Residuals Depletes quickly



Biocides (cont.)

Non-Oxidising

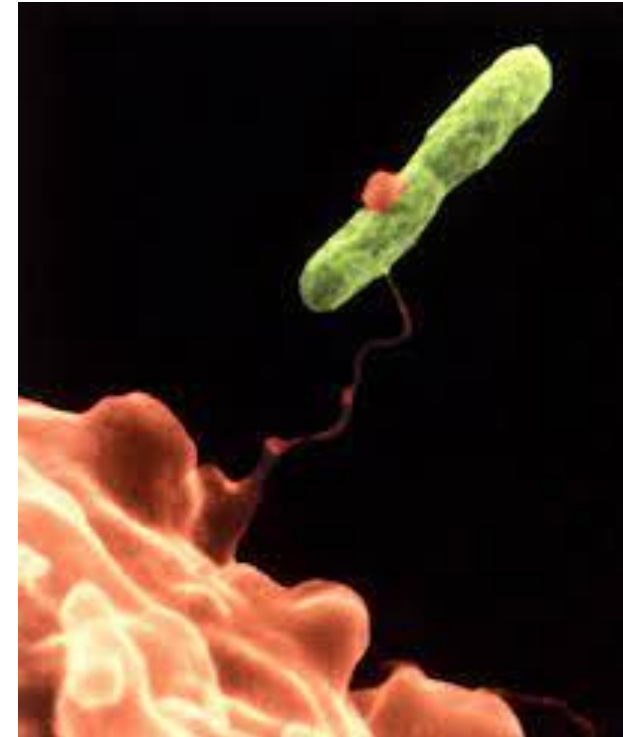
- Isothiazolone

Advantages

- Broad spectrum
- Higher pH range 6 – 9
- Dosage rates
 - Heavily fouled systems – 100ppm-300ppm
 - Maintenance dosage 50-100ppm

Disadvantage

- Long contact time (9-12 hours)
- Needs relatively high dosage



Biocides

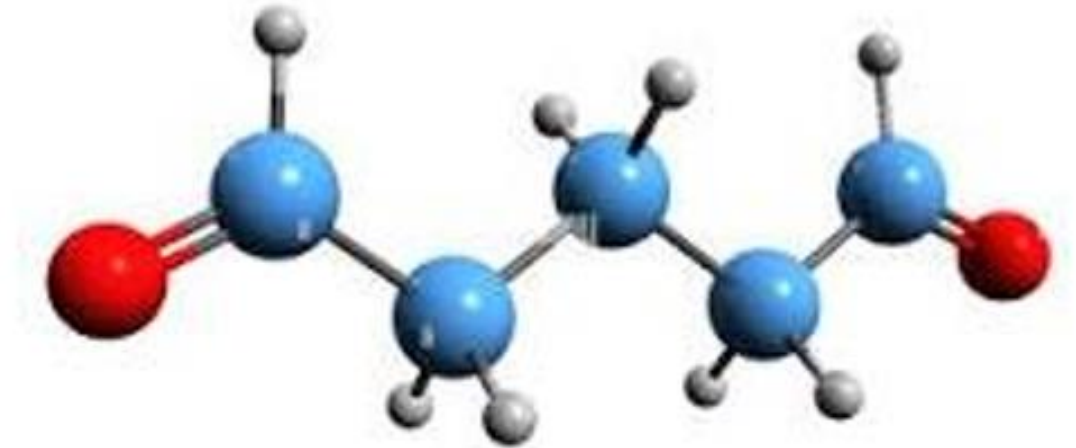
Glutaraldehyde

Advantages

- Broad spectrum
- pH range 6 - 9
- Slightly shorter contact time (3-8 hours)
- Dosage rates
 - Heavily fouled systems – 100ppm-300ppm
 - Maintenance dosage 50-100ppm

Disadvantages

- Has restraints on type of contaminants and other biocides



Biocides

DBNPA

Advantages

- Low dosage rate
- Fast contact acting

Disadvantages

- Tight pH range degrades quickly above pH 8.5
- Incompatible with oils



Maintenance

Monthly service –

- should include visual observations,
- Chemistry analysis
- Checks of dosing system operation
- Chemical stocks
- Visual condition of the cooling tower
- Flushing of drain
- Any change in system operation- standby system still runs at least once a week
- No leaks
- Sand filter – when was the last time sand was replaced and filter internal housing cleaned?

Towner Cleans

- Chlorine levels maintained during the disinfection period and pH readings recorded
- System has been physically cleaned
- Identify any corrosion or scale deposits
- Record information in a report

Maintenance

Bacterial Sampling

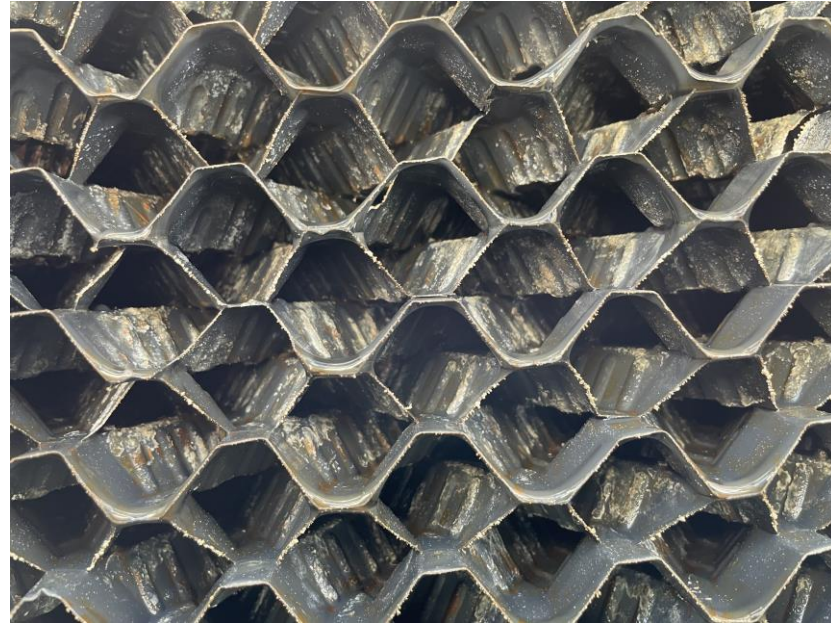
- Take sample from either a designated sample point or tower basin
- If from sample point flush sample point for minimum of 1 min.
- Make sure you are wearing the correct PPE Gloves etc.
- Dip the sample container 50mm below the surface of the water.
- Turn the bottle neck upwards and allow the bottle to fill,
- Moving the bottle slowly forward as it fills and cap straight away.



Record Keeping Requirements

- Maintain a log book which needs to contain:-
 - Service reports
 - Tower Clean reports
 - Legionella results
 - Corrective action reports
 - Disinfection and decontamination procedures
 - Shut down and start up procedures
 - System Pipe work Drawing with key components identified
 - Biocide dosage rates and residual target levels
 - Types of chemistry being used
 - Method of dosing chemicals and how often the biocide is being d
 - Maintenance schedule
 - Equipment manuals





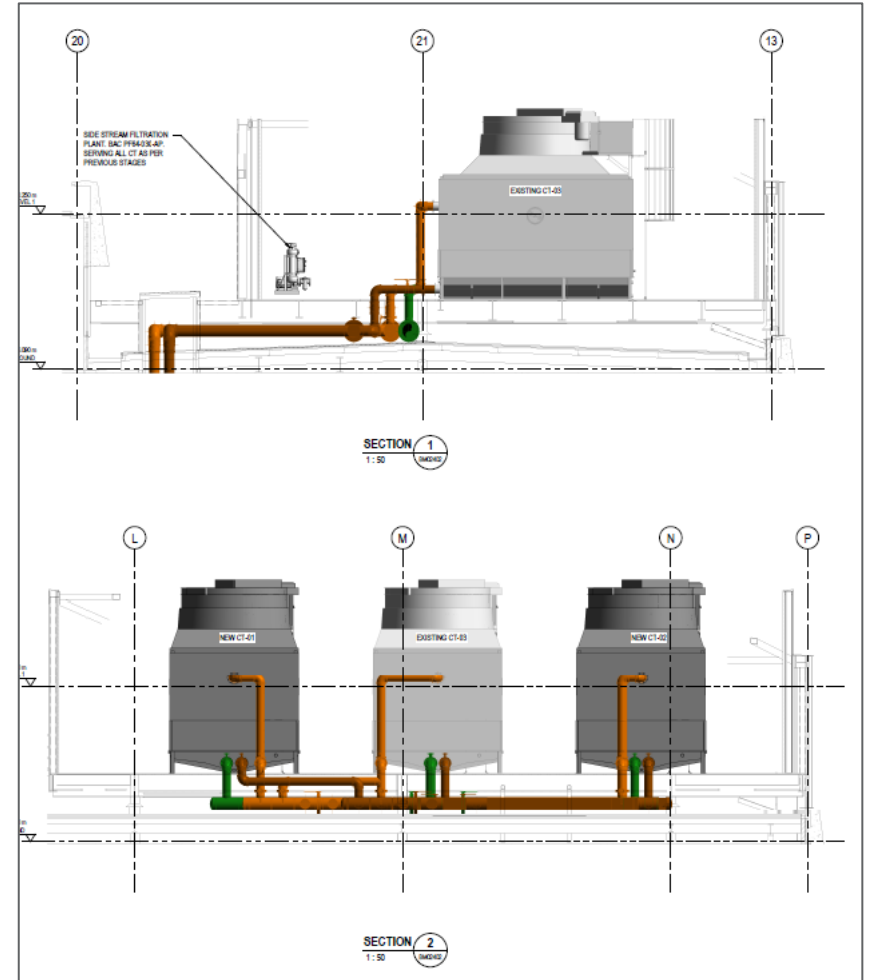
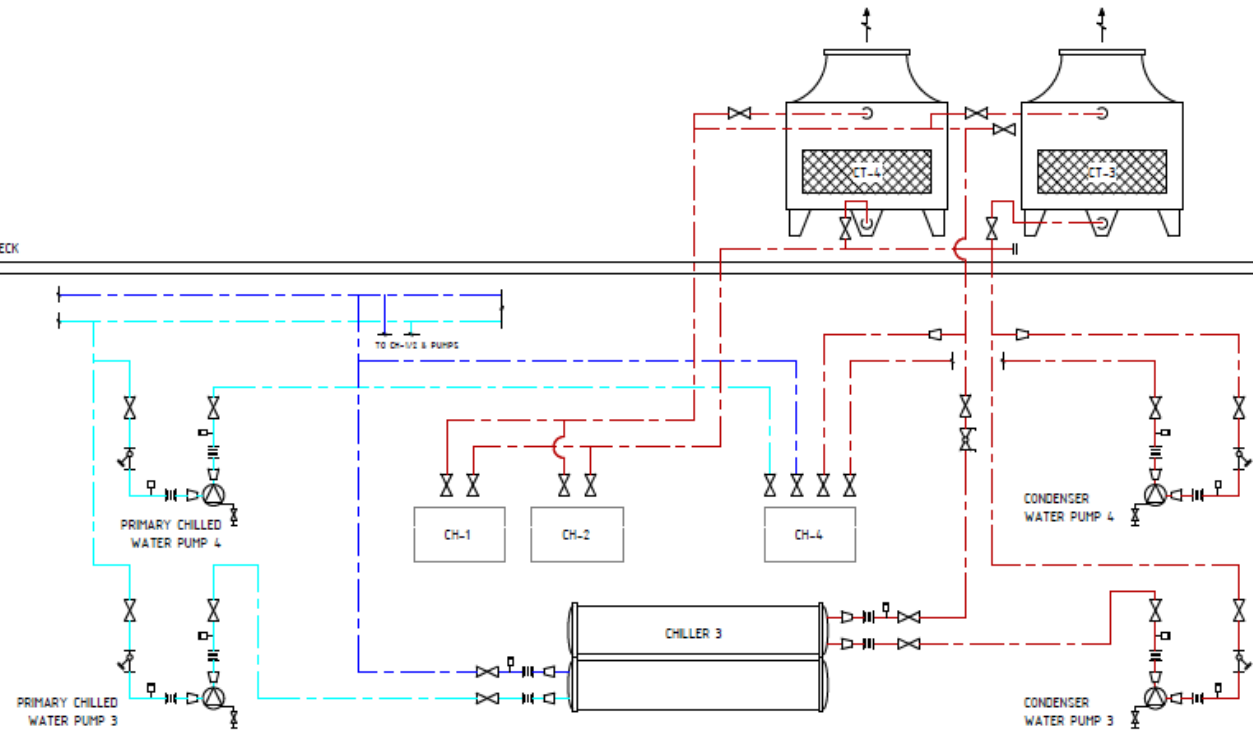






COOLING TOWER PLANT DECK

PLANTROOM



QUESTIONS

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