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WATER TECHNOLOGIES

AFWA-Chlorination and safety
Overview

PRESENTED BY FABRICE PELLOTE

Overview Scope:

1. Why We Disinfect?
2. Chlorine gas and safety options
3. HTH
4. Electrochlorination
5. Chlorine monitoring and control
6. Ozone disinfection
7. UV disinfection
8. After sale service



1. Disinfection – Why?

Water borne disease has been a major global killer since time IN memorial

Mr Wallace and Tiernan in 1913 developed the first technique for disinfection through the use of chlorine gas

This development was voted by times magazine as the 7th most influential achievements of the 20th century

100 years later, access to bug free potable water remains a global challenge

In 2019 an estimated 3.4 million people died of PREVENTABLE water borne infection



1. First Attempt



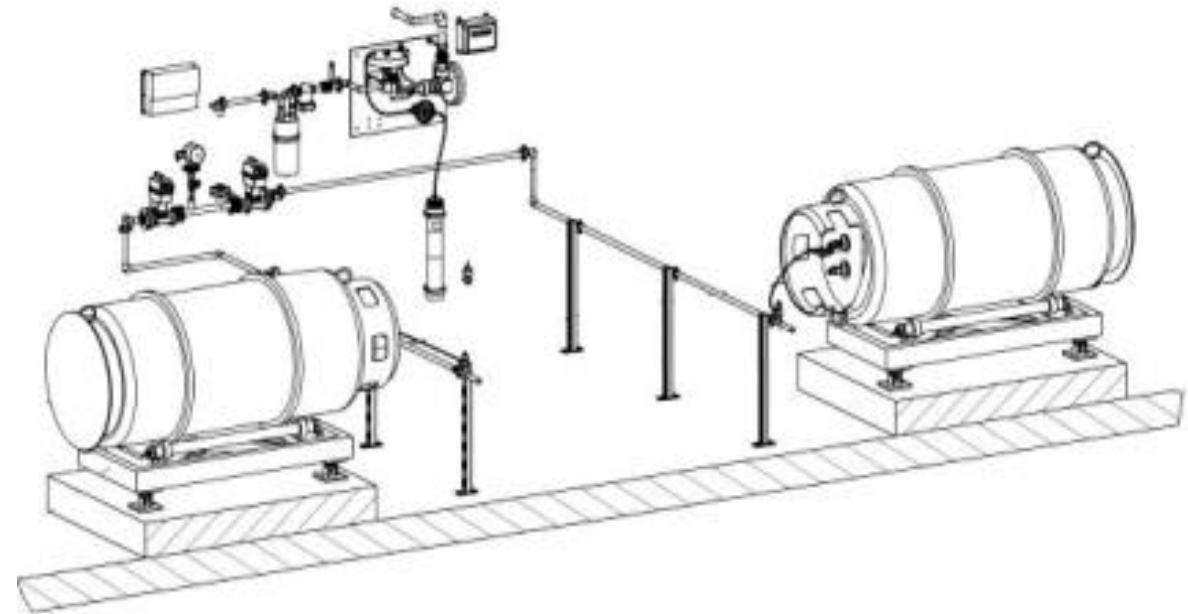
The W&T Chloro-boat was used for disinfecting large reservoirs or sterilizing large outdoor swimming areas.

2: Chlorine Gas

The direct injection of chlorine gas from 1 Ton chlorine drums into a potable water supply.

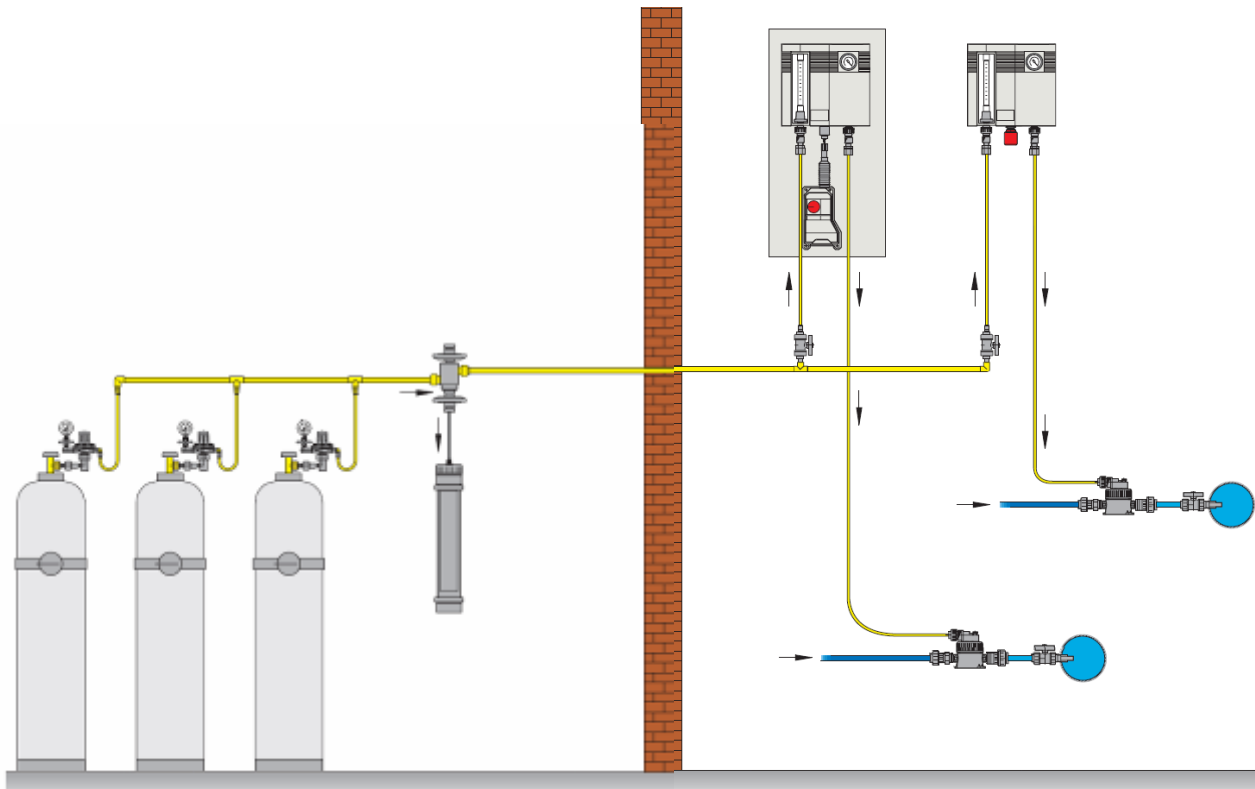
Advantages and disadvantages

- Stable and long lasting
- Most common method
- Cheap Capital
- Extremely Toxic
- Supply is difficult



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2: Chlorine gas small capacity



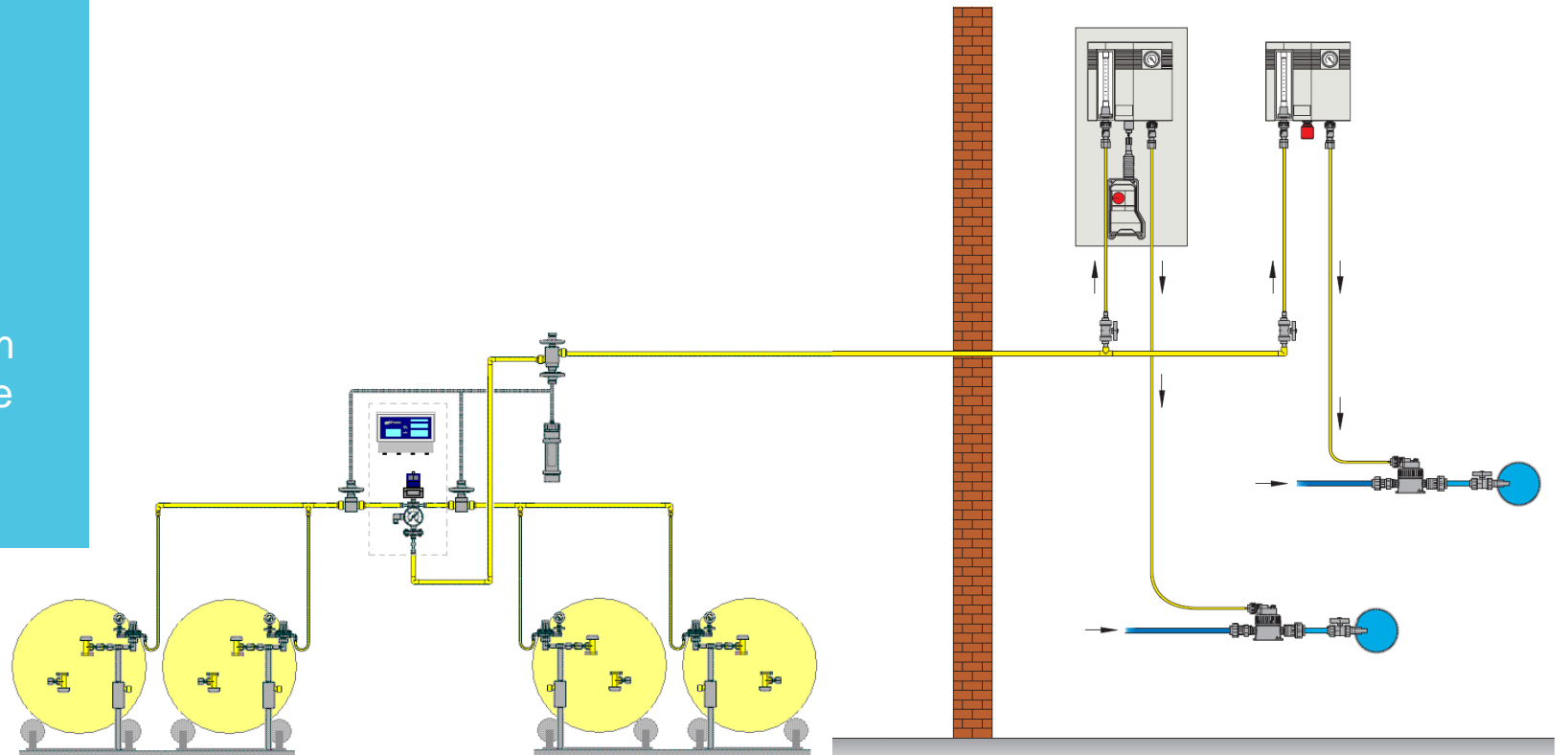
Core Components:

- Header
- Changeover
- Vacuum Regulators
- Chlorinators (Dosing control)
- Ejectors in Motive water stream (Creates the vacuum to pull the gas through)

2: Chlorine gas larger capacity

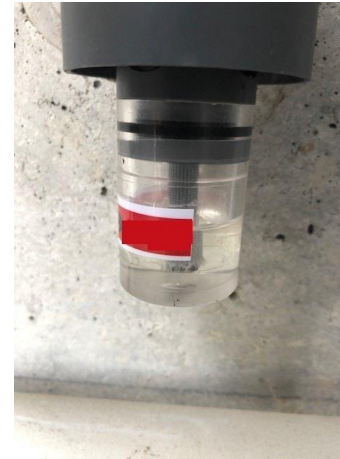
Core Components:

- Header
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2: Chlorine gas: safety options

- Gas Detection
- Automatic Closing Systems
- 1 Ton Chlorine scrubbers



3: Calcium Hypochlorite 65% HTH

Calcium hypochlorite is delivered in a stabilised powder form to site. This reduces the degradation of chlorine with time however the calcified chlorine is extremely expensive and difficult to dilute and dose.

Advantages and disadvantages

- Longer shelf life
- Can be explosive under certain conditions
- Produces sludge – breaks pumps, blocks lines
- Off Gases & THMs
- pH dependant
- High OPEX

→ RISK OF CHEMICAL SUPPLY
DISRUPTION



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4. OSEC – On Site Electrolytic Chlorination

OSEC technology uses electro chemistry to convert standard food grade salt into a hypochlorite solution which disinfects water sources.

Advantages and disadvantages

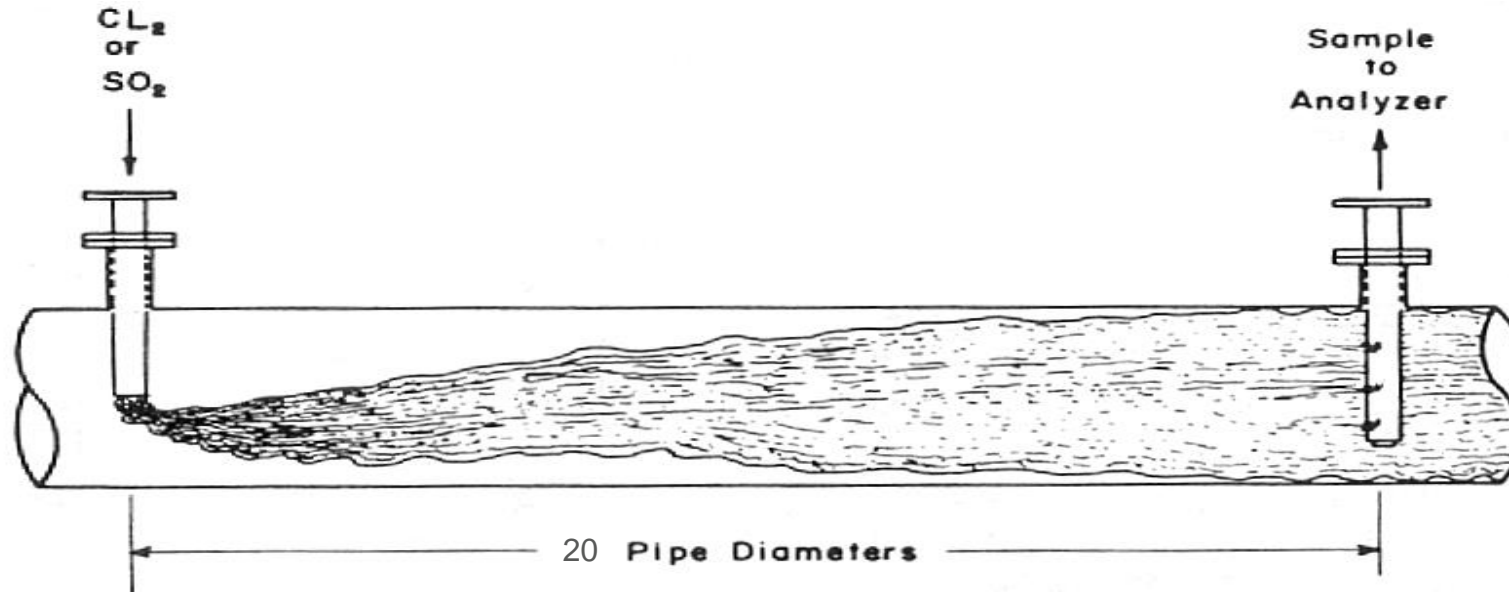
- No dangerous chemicals
- On Demand Generation removes Logistical challenges
- Initial CAPEX price is high – though ROI is relatively quick

→ NO RISK



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5: Measuring Residual - Chlorine Solution Mixing



In a straight run of pipe carrying water with reasonable turbulence, a chlorine solution will be fully mixed with 20 pipe Diameters without some form of mixing device before an accurate sample can be withdrawn

5: Analysers

W&T manufacture a variety of Analysers to both monitor and control your chlorine dose on site.

Advantages

- 24/7 monitoring
- Increased accuracy
- Decreased chemical costs
- Increased quality
- Reduction of labour costs



→ INCREASED WATER SAFETY

6. Ozone Disinfection

Ozone is an exciting technology which converts atmospheric air into tri-atomic oxygen, or ozone, which is a powerful 'chemical free' disinfectant

Advantages and disadvantages

- Requires only air and electricity
- Most powerful disinfectant
- Ozone gas requires careful management
- No long term residual



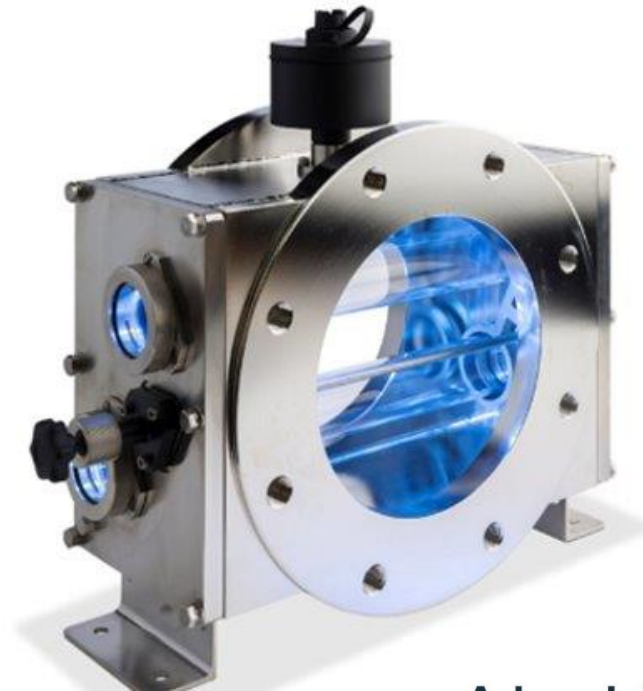
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7: Ultra Violet Disinfection

Ultraviolet disinfection is the only truly non-chemical means of disinfection. The UV system converts electric energy into low wave length light energy which alters the DNA of bacteria rendering them inert or 'unable to reproduce'

Advantages and disadvantages

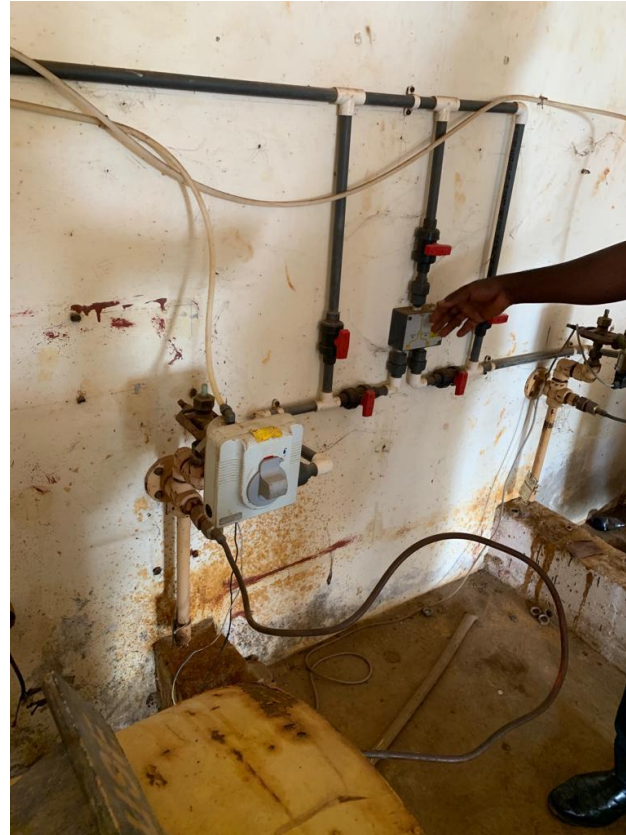
- Effective against Crypto & Giardia
- No CHEMICAL REQUIREMENT
- High Power Consumption
- No lasting residual in water
- Also ideal for waste water re-use



Atg UV Systems
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8: After sales support

- Local training, support
- Remote Troubleshooting
- ON site service
- Maintenance plan, list of components





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WATER TECHNOLOGIES

THANK YOU

EVOQUA WITH AFWA