



# TEMPLE WATER TECHNOLOGIES LTD.

From the source to the last flowing tap

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## Small Water Supply - Design Solutions





# WHO ARE WATER SUPPLIERS?

If you are not on Town Supply & it is not for your own domestic dwelling, then you are a water supplier & have a duty of care..



# DRINKING WATER CATEGORIES SMALL SUPPLY...

VERY SMALL  
COMMUNITY (VSC)  
UP TO 25 PEOPLE

NETWORKED SMALL  
SUPPLY  
26 - 100 PEOPLE  
WITH DISTRIBUTION

SELF-SUPPLIED  
BUILDINGS  
26 - 100 PEOPLE  
ACCEPTABLE SOLUTIONS  
UP TO 3 BUILDINGS





# SMALL SUPPLY

Ensuring everyone can access water that meets the NZ Drinking Water Standards (2022)





# HOW DO WE ENSURE WE MEET THE DESIGN CRITERIA?

Every step counts...

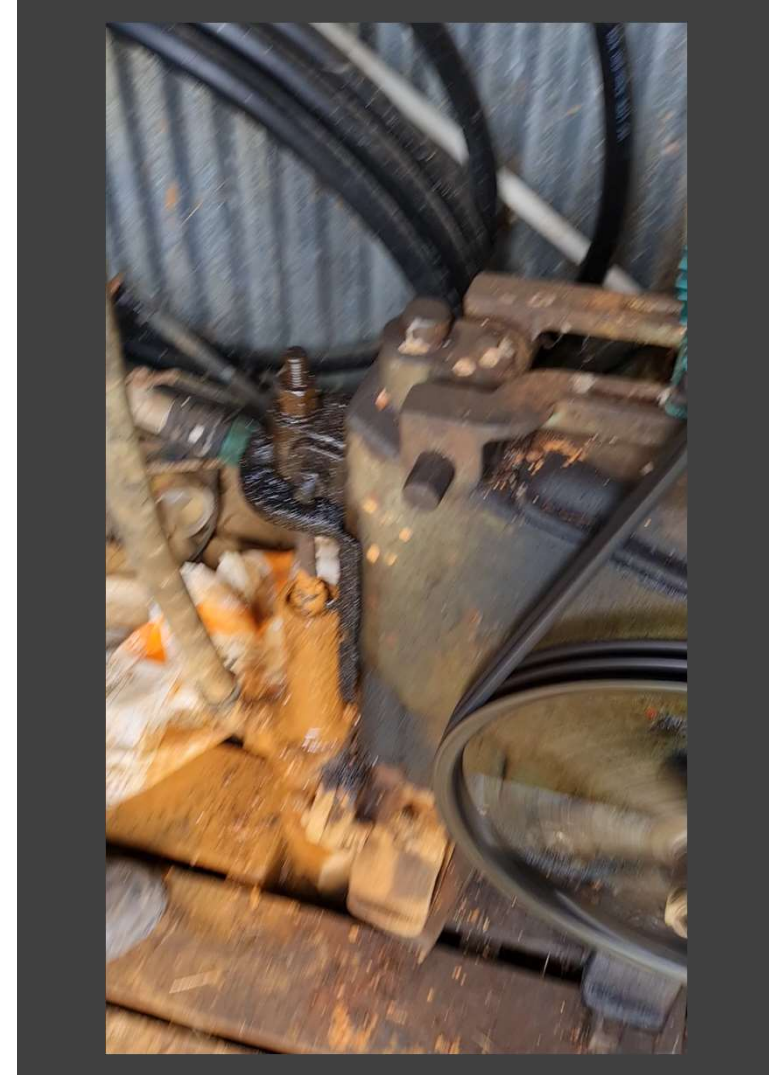




# STEP 1

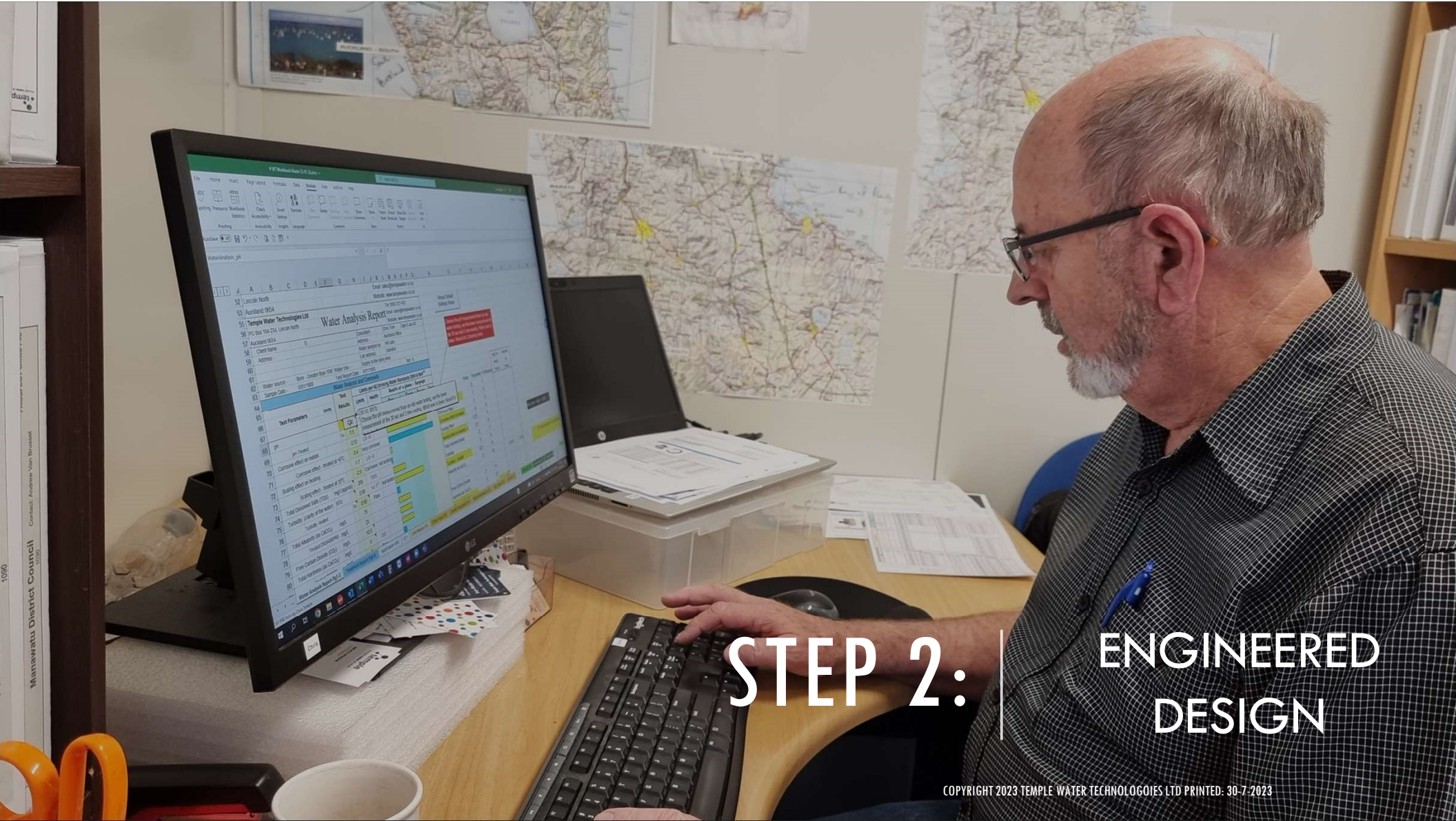
INVESTIGATE  
SITE AUDIT & LAB TESTING





**IDENTIFYING EVERY SINGLE CHALLENGE  
BEFORE TAKING A CALCULATED  
APPROACH...**





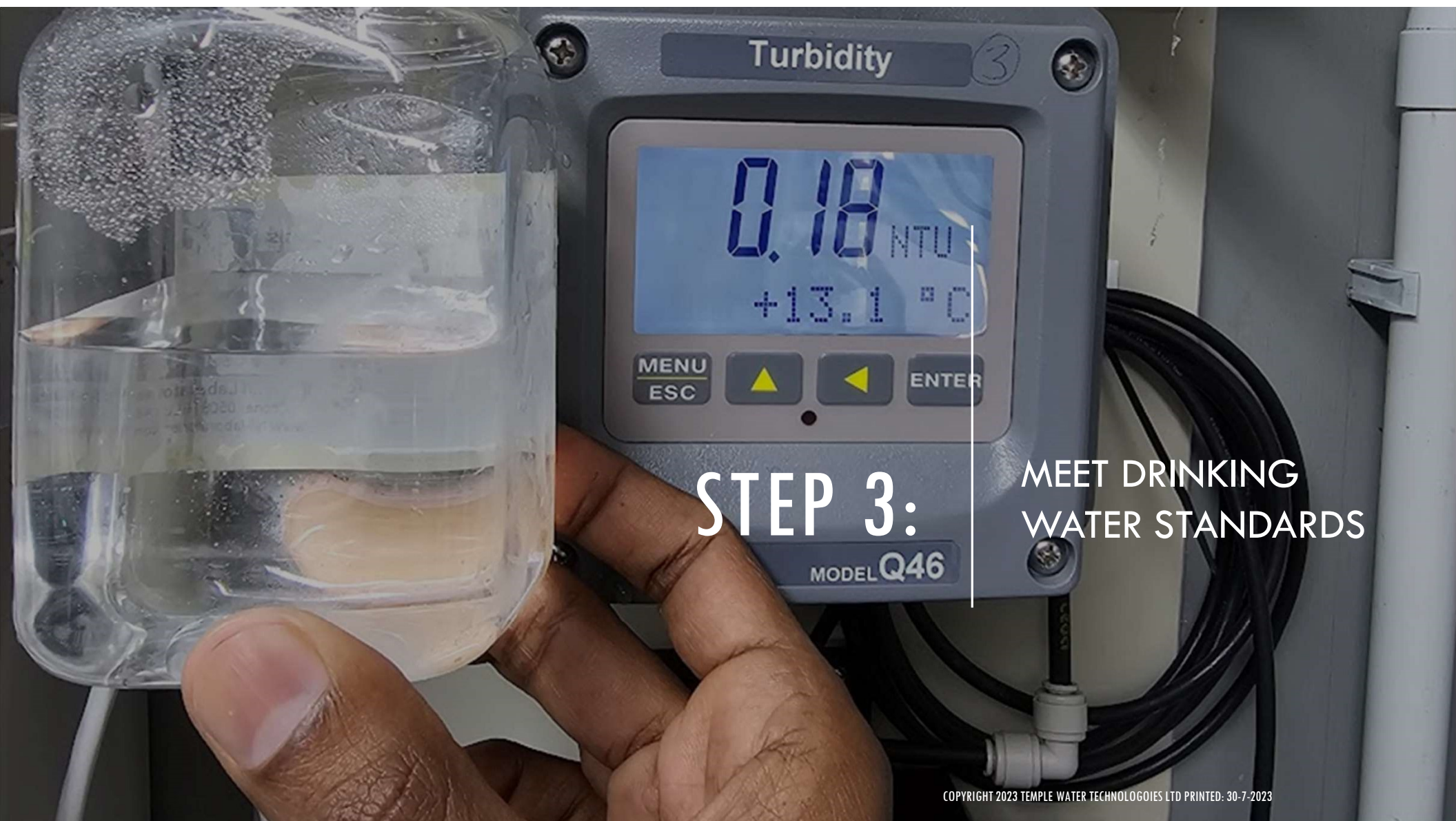
# STEP 2: | ENGINEERED DESIGN





# CHOOSING THE BEST TREATMENT SOLUTION FOR THE SPECIFIC WATER CHEMISTRY

Not all waters are the same...



# STEP 3:

MEET DRINKING  
WATER STANDARDS



A large green cylindrical water filtration tank is the central focus, situated in a utility room with wooden framing and corrugated metal walls. Two technicians are present: one on the left, wearing a grey hoodie and black track pants with white stripes, is adjusting a valve on the tank's piping; the other on the right, wearing a grey hoodie, a purple cap, and glasses, is talking on a mobile phone while holding a clipboard. The tank has a vertical label that reads 'IRON MANS SYSTEM'.

# STEP 4:

Ongoing monitoring  
& IANZ accredited  
testing



A lush green forest with a waterfall cascading over mossy rocks. The scene is vibrant with various shades of green, from deep forest greens to bright highlights on the moss and water. The waterfall is the central focus, with multiple streams of water falling over dark, wet rocks. The background is filled with dense foliage and trees, creating a sense of a wild, natural environment.

# TREATMENT SOLUTIONS FOR DIFFERENT SOURCES OF WATER

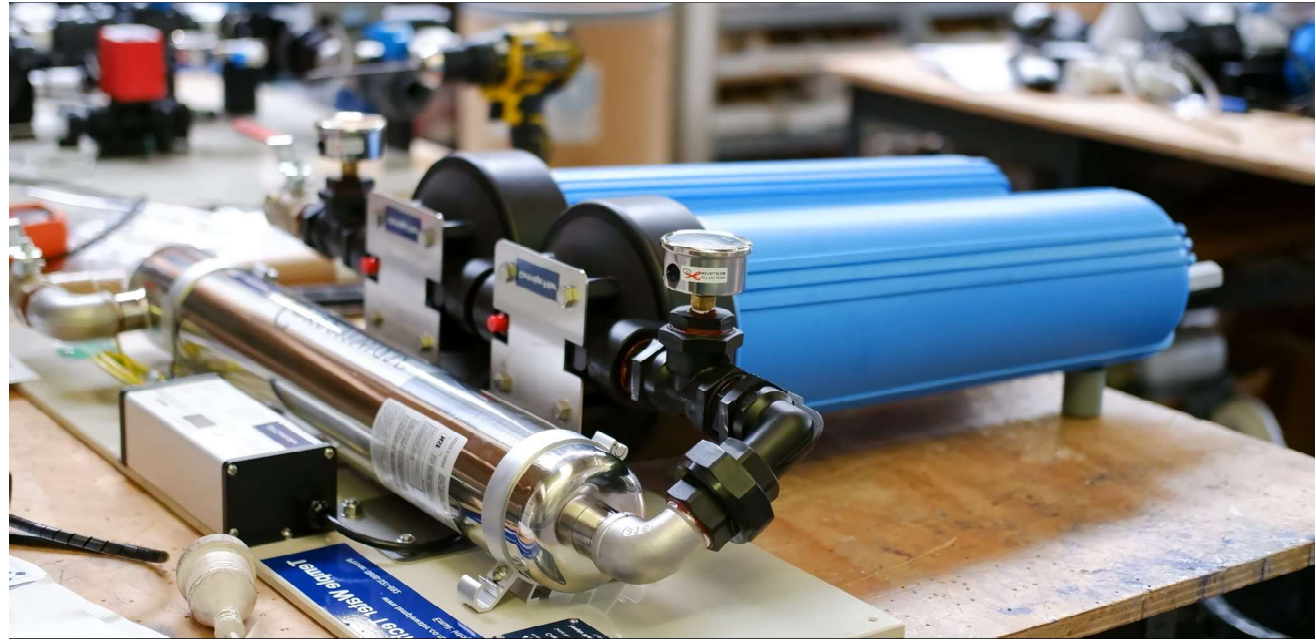
Every  
source is  
different...



# RAINWATER

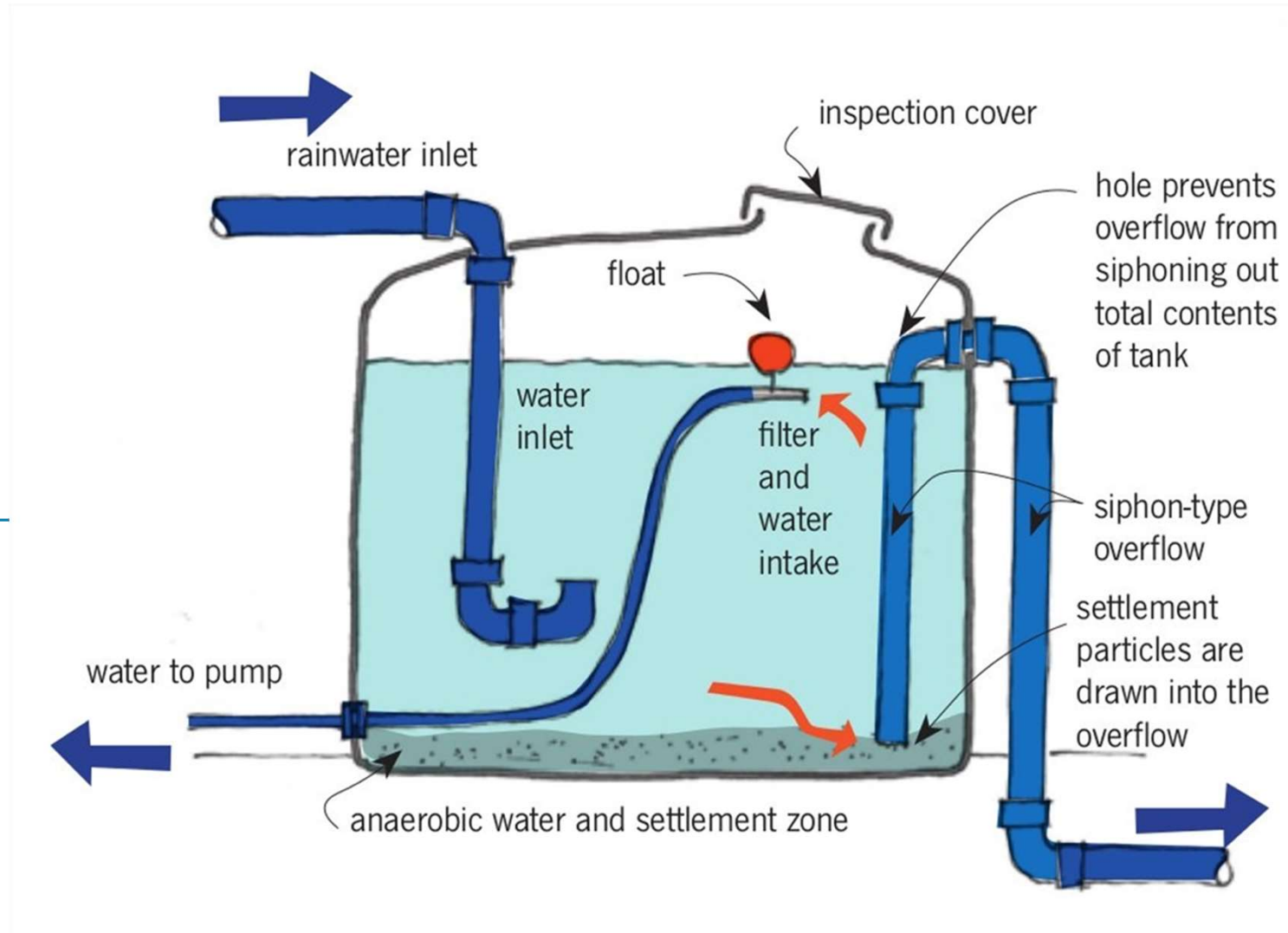
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Every rainwater supply  
should have cartridge  
filters & UV





# RAINWATER STORAGE ARRANGEMENT





# DOMESTIC UV VSC SUPPLY

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- Two stage cartridge filtration
- Pressure gauges for cartridge press. drop
- 40 mJ/cm<sup>2</sup> UV dose rate;
- 57 LPM at 30mJ specification down rated to 42 LPM to meet 40mJ/cm<sup>2</sup>
- Alarm on UV lamp failure
- Manual isolation valves



# VALIDATED UV NETWORK SUPPLIES & SELF SUPPLIED BUILDINGS

Two stage cartridge filtration  
40 mJ/cm<sup>2</sup>, NSF Validated flow  
UV monitor & alarm  
Flow control, auto shutdown  
Air release valve  
Manual isolation





Viqua Validated  
UV System



Luminor Validated  
UV System



## VALIDATED UV

Two stage cartridge filtration  
40 mJ/cm<sup>2</sup>, NSF Validated flow  
UV monitor & alarm  
Flow control, auto shutdown  
Air release valve  
Manual isolation

# CARTRIDGE PRE-FILTRATION...





# BORE WATER

Site Audit for:

- Flow and pressure testing
- Physical characteristic
- Chemical parameters
- Exiting infrastructure



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# Guideline Parameters for Drinking Water

Parameter	TWT Recommendation	NZDWS 2022	Health & Aesthetic Effects
pH	6.5 – 8.5	7.0 – 8.5	Corrosion and scaling
Hardness	< 50 mg/L < 1 mg/L depends on application	< 200 mg/L	Scaling
Iron – Rust	< 0.10 mg/L	< 0.3 mg/L (2022 increased 0.20 to 0.30 mg/L 2022)	Rust staining
Iron – Soluble	< 0.05 mg/L	< 0.3 mg/L	Rust staining
Manganese	< 0.04 mg/L	< 0.4 mg/L health, < 0.10 /mg/L taste < 0.04 mg/L for staining	Brown/Black manganese
Boron	<2.4 mg/L	< 2.4 mg/L (2022 increased 1.4 to 2.4 mg/L 2022)	Health, issues with plant toxicity
Nitrate	<11 mg/L as N, < 50 mg/L as NO <sub>3</sub>	<11 mg/L as N	Health
Arsenic	< 0.005 mg/L = 5 ppb	< 0.010 mg/L = 10 ppb	Health
Silica as SiO <sub>2</sub>	< 50 mg/L reactive silica < 15 mg/L depends on application		White scaling and staining
Hydrogen sulphide	< 0.010 /mg/L = 10 ppb	< 0.05 mg/L = 50 ppb	Smell and health at high level in the air
Less Common Parameters			
Copper	< 0.3 mg/L	1.5 mg/L	Taste & health, blue/green staining
Lead	< 0.005 mg/L	< 0.005 mg/l = 5 ppb	Health
Sodium	Depending on application	< 200 mg/L	Taste, issues with soil permeability
Zinc	< 0.5 mg/L	< 1.5 mg/L	Taste
Chloride	Depending on application	< 250 mg/L	Taste with sodium, corrosion on stainless, issues with poultry
Chromium, nickel	< 0.05 mg/L = 5 ppb	< 0.05 mg/L = 5 ppb	Health
Ammonia	< 0.5 mg/L as N	< 1.5 mg/L as N	Taste, pH, chlorine demand
Bromide	< 0.01 mg/L as Br = 10 ppb	< 0.01 mg/L	Health related to oxidation of Bromide to Bromate
Fluoride	< 1.5 mg/L	< 1.5 mg/L	Health
Aluminium	< 0.10 mg/L	< 0.10 mg/L	Taste
Colour	< 10 Hazen units TCU	< 10 TUC	Appearance, presence of organics
Total Organic Carbon (TOC)	< 10 mg/L TOC		Appearance, presence of organics, potential for bacterial growth
Tannin	< 1 mg/L		Appearance, presence of organics, potential for bacterial growth
Microbiological Parameters			
Heterotopic plate count	10,000 cfu		Indicator of general background bacteria
Total Coliforms	< 10 cfu/100ml	< 1 cfu/100ml	Health
E. coli	< 1 cfu/100ml	< 1 cfu/100ml	Health

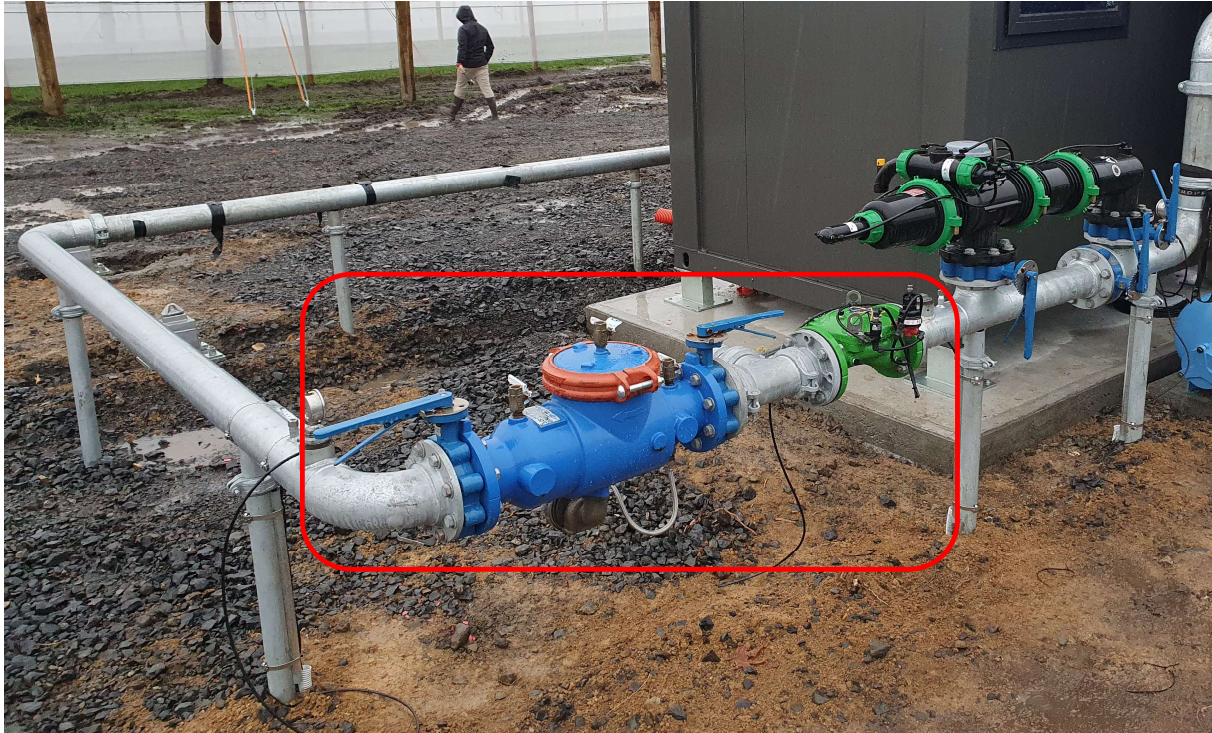




## SANITARY BORE HEAD

- Installed above ground & ensure no ponding during rainfall
- Annulus of casing is sealed
- Concrete apron 1m minimum & sloping
- All apertures are sealed & watertight
- All air vents must be screened, face downwards & are 0.5m above the ground
- Fenced to exclude farm animals 5m minimum
- Protect from unauthorised access/interference
- Inspected monthly for damage

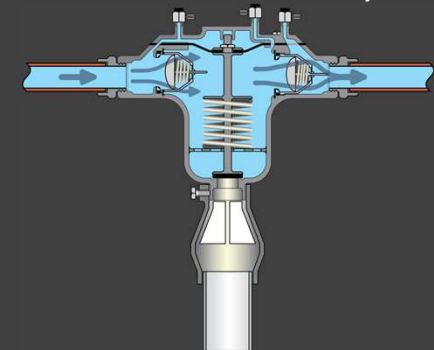




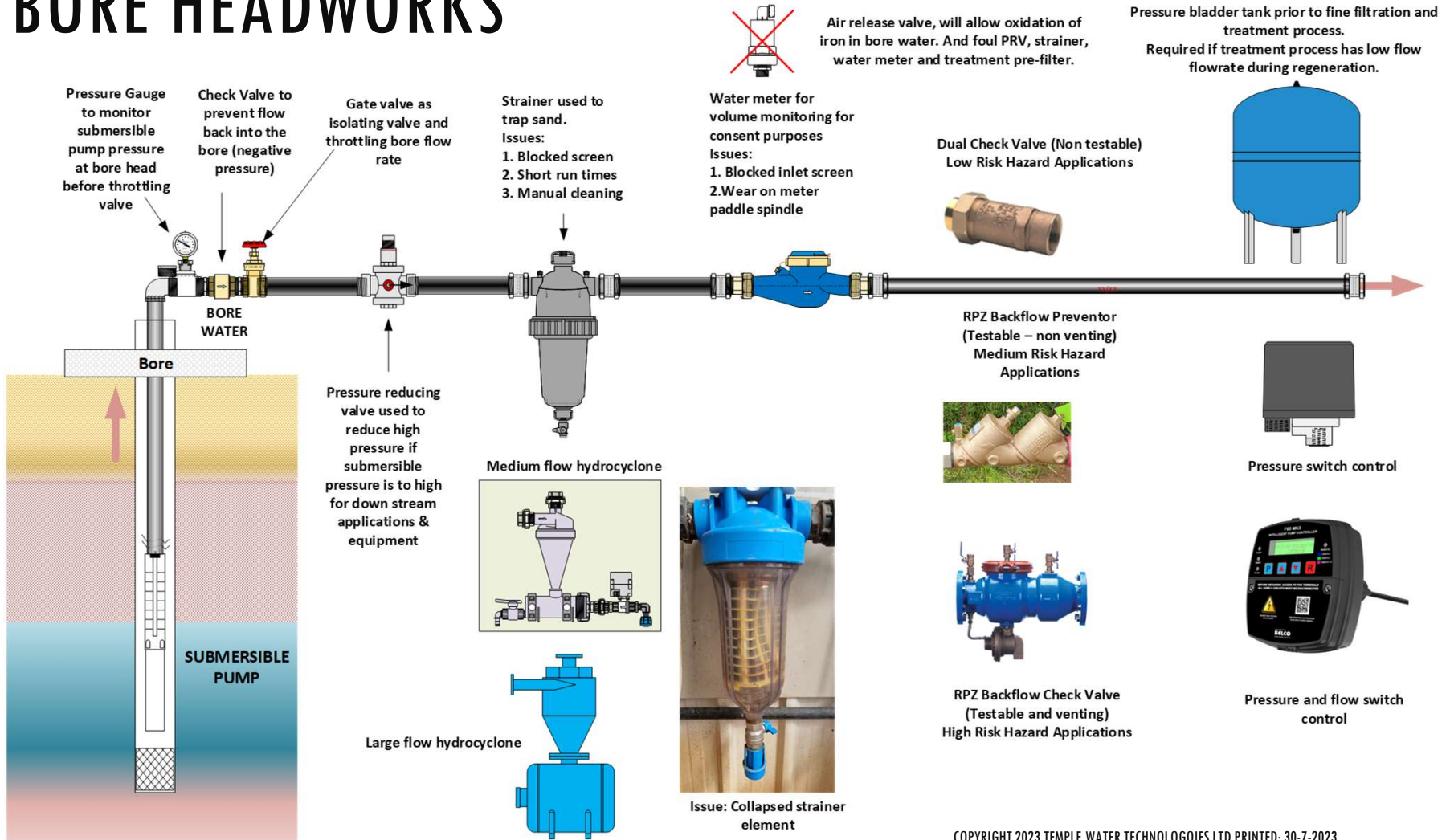
**BACKFLOW PREVENTION IS REQUIRED  
FOR A SANITARY BORE HEAD**



- 'A Mechanism that prevents backflow at the bore head'
  - low hazard = Dual check valve
  - high hazard = RPZ (reduced pressure zone device)
- Installation or certified by IQP



# BORE HEADWORKS



Air release valve, will allow oxidation of iron in bore water. And foul PRV, strainer, water meter and treatment pre-filter.

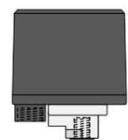
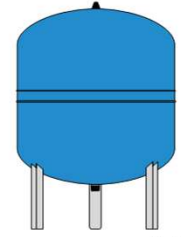
Dual Check Valve (Non testable)  
Low Risk Hazard Applications



RPZ Backflow Preventor (Testable – non venting)  
Medium Risk Hazard Applications



RPZ Backflow Check Valve (Testable and venting)  
High Risk Hazard Applications



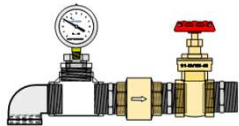
Pressure switch control



Pressure and flow switch control



1. No check valve used
2. Basic check valve subject to fouling by sand and fibers



3. Backflow preventor leaking due to sand



## CONSEQUENCES of IMPROPER BACKFLOW and CHECK VALVE APPLICATION



**1. Implosion Tank - Total Collapse**  
Negative Pressure caused by siphon. No Vacuum Breaker installed.



**2. Implosion Tank - Broken Fiber**  
Negative Pressure caused by siphon and Pressure Pump (RD) after filtration media tank. No Vacuum Breaker installed. Polyethylene inner shell damaged.



**3. Implosion Tank - Partial Collapse & Broken Fiber**  
Negative Pressure caused by siphon. No Vacuum Breaker installed. Polyethylene inner shell damaged and Fiber completely broken.



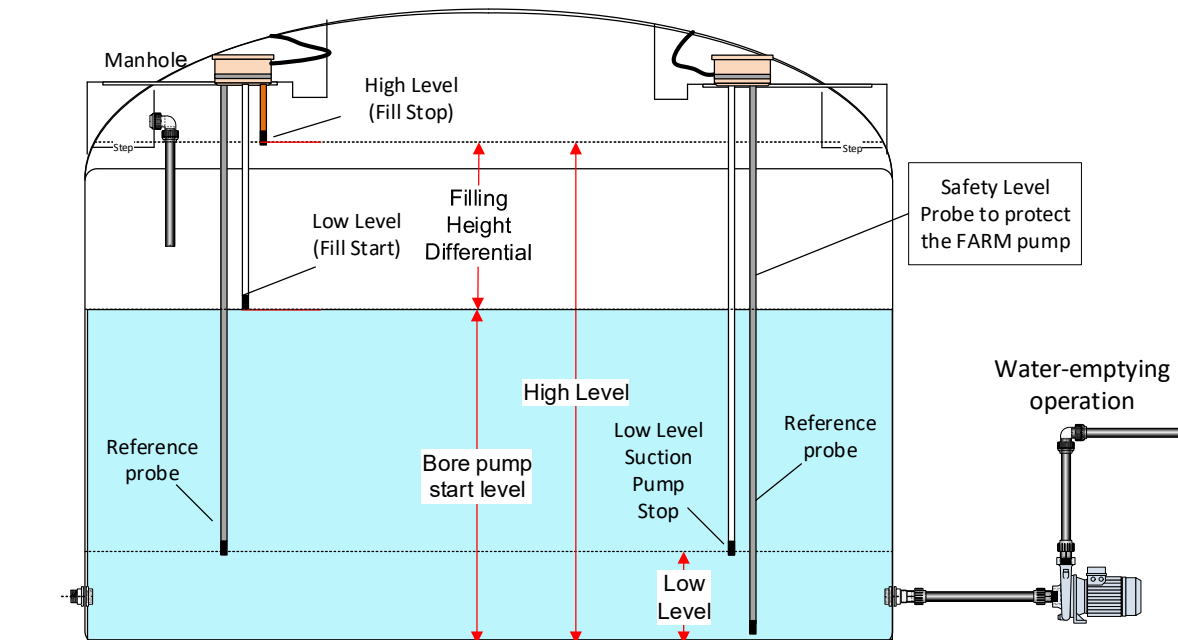
**4. Broken Fiber and Inner Polyethylene Shell**  
Negative Pressure caused by siphon and Pressure Pump (RD) after filtration media tank. No Vacuum Breaker installed.





# WATER STORAGE

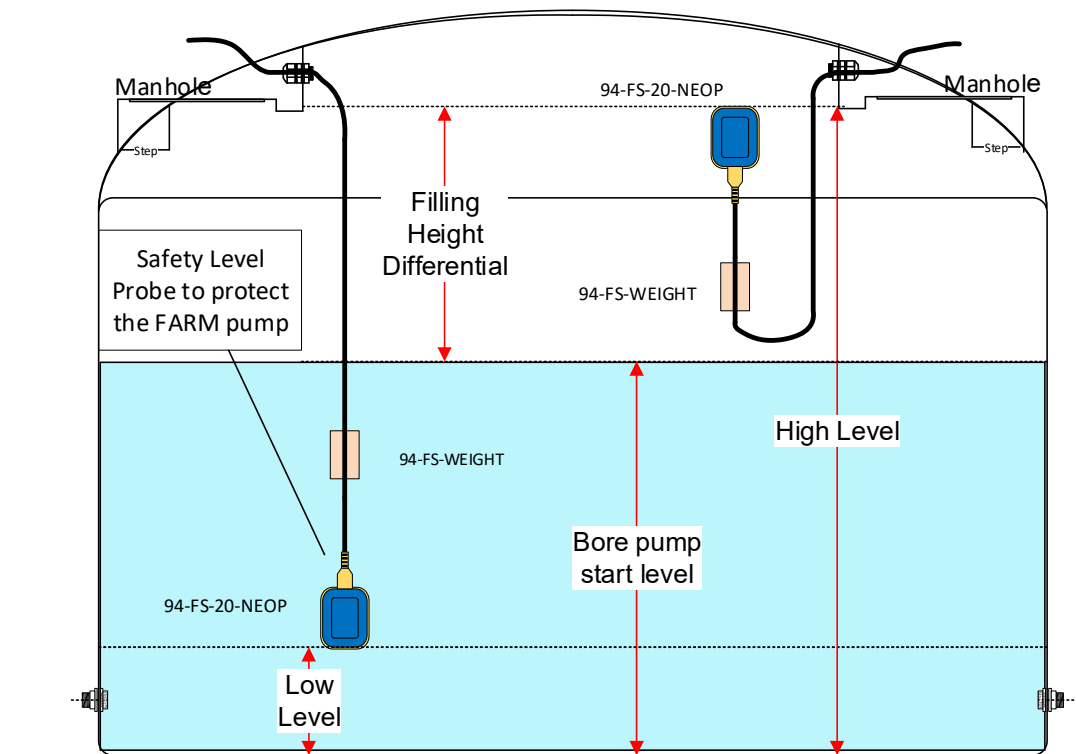
## LEVEL PROBES (ELECTRICAL LEVEL CONTROL) for PUMPING SYSTEM



1. Level probes – adjustable differential
2. Quick shut off and opening – no cycling of pump
3. Assume water is treated and not going to foul the level probes and cause a false level signal (fouled in slime or rust)
4. **Mount level probes near the manhole to manually adjust length or clean.**
5. **Install level probes electrical override to turn on pumps when required for servicing**

# WATER STORAGE

## FLOAT SWITCH (ELECTRICAL LEVEL CONTROL) for PUMPING SYSTEM



1. Float switch – adjustable differential
2. Quick shut off and opening – no cycling of pump
3. Fouling of float switch not an issue, compared to level probes being fouled by slime and rust
4. Mount float switch near the manhole to manually lift and override switch.
5. Install level probes electrical override to turn on pumps when required for servicing



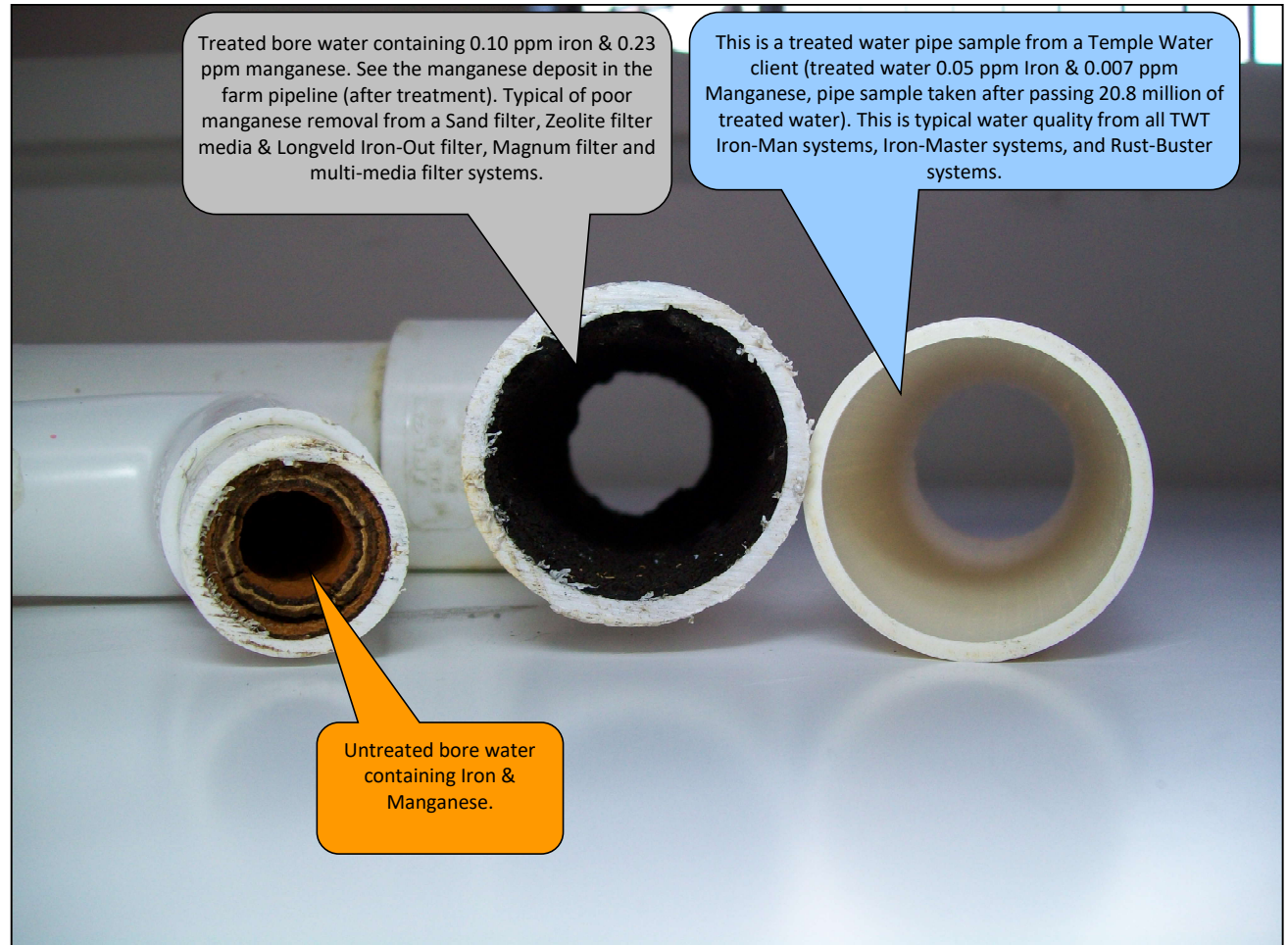


## IRON-MAN TREATMENT SYSTEMS

- Predominantly removes iron, manganese & hardness
- Can remove zinc, ammonium, lead, chromium & nickel
- Low maintenance & robust
- Designed to suit the specific application/water source

# CATION EXCHANGE TREATMENT SYSTEMS

The reason  
for IRON &  
MANGANESE  
removal



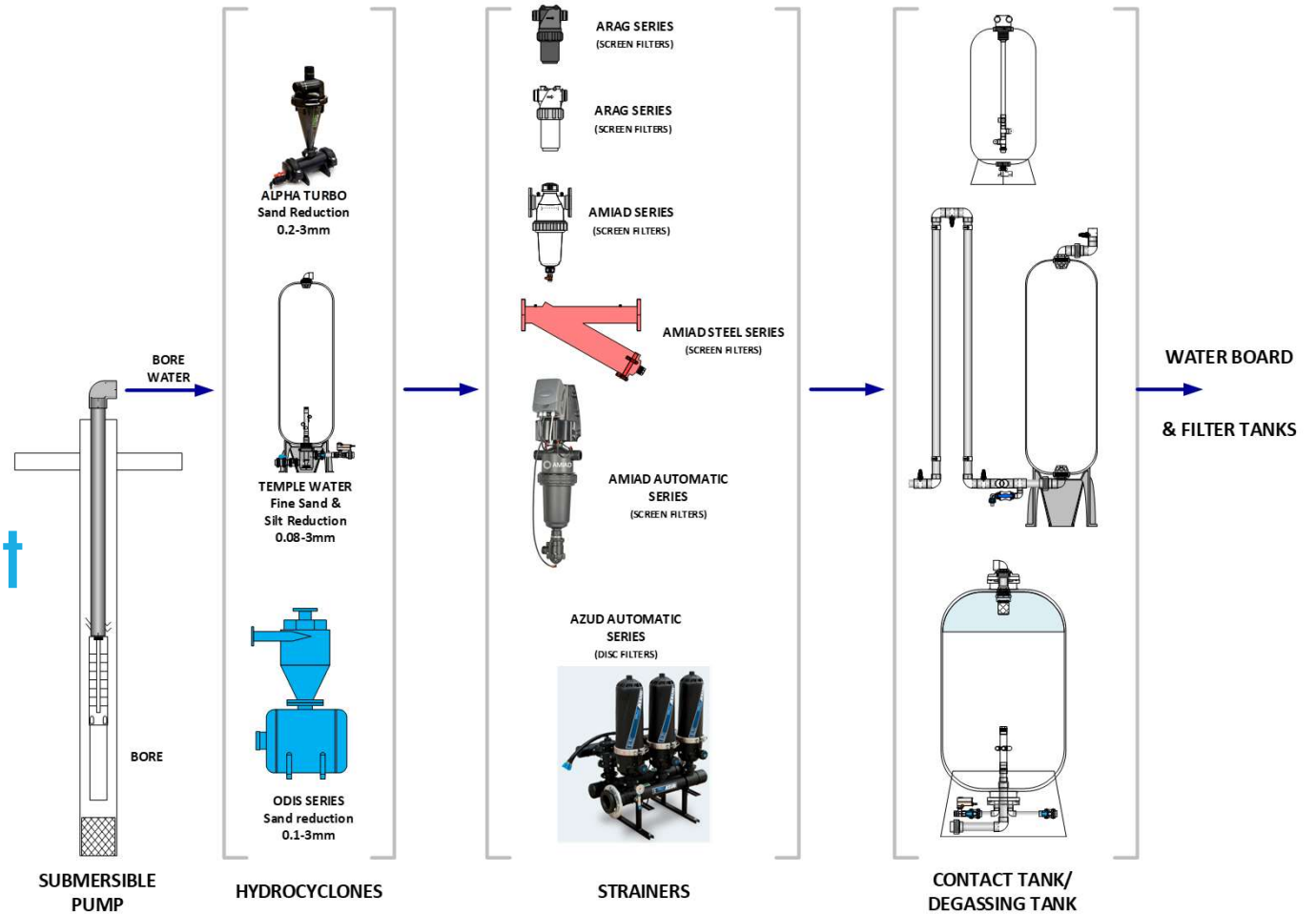




# IRON MASTER SYSTEMS

# CATALYTIC TREATMENT SYSTEMS

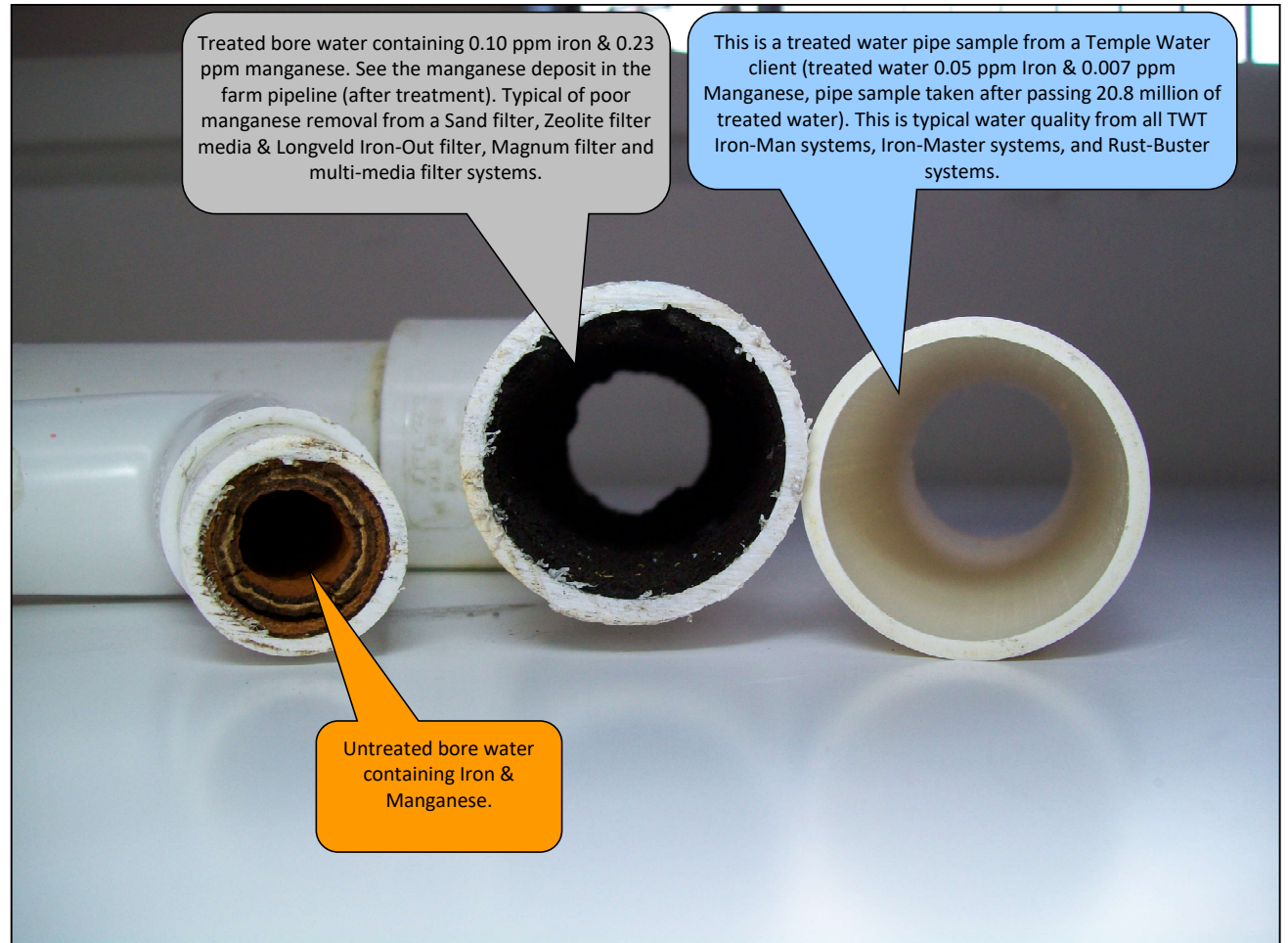
## Pre-Treatment Options





# CATALYTIC TREATMENT SYSTEMS

The reason  
for IRON &  
MANGANESE  
removal



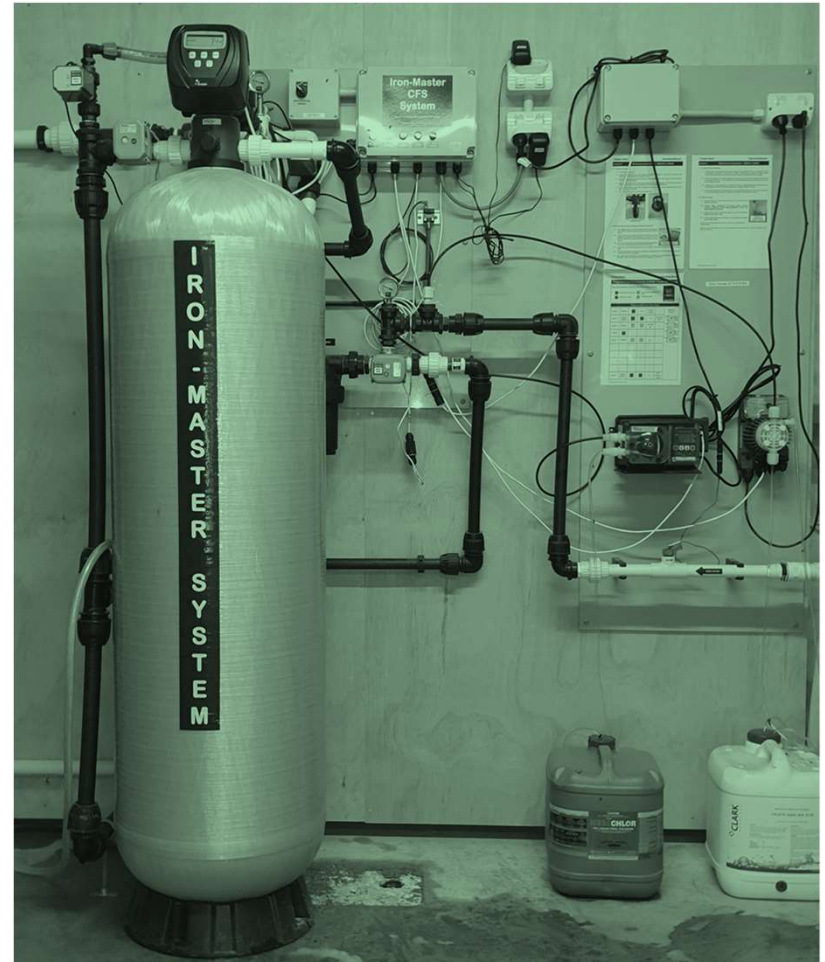
# IRON MASTER

**WF-WM-WQ-WR-WX Series Water Boards to suit applications**

**Low to medium Iron & Manganese**

**Lifestyle, Community Supply, Farming & Irrigation**

**Continuous Regeneration**



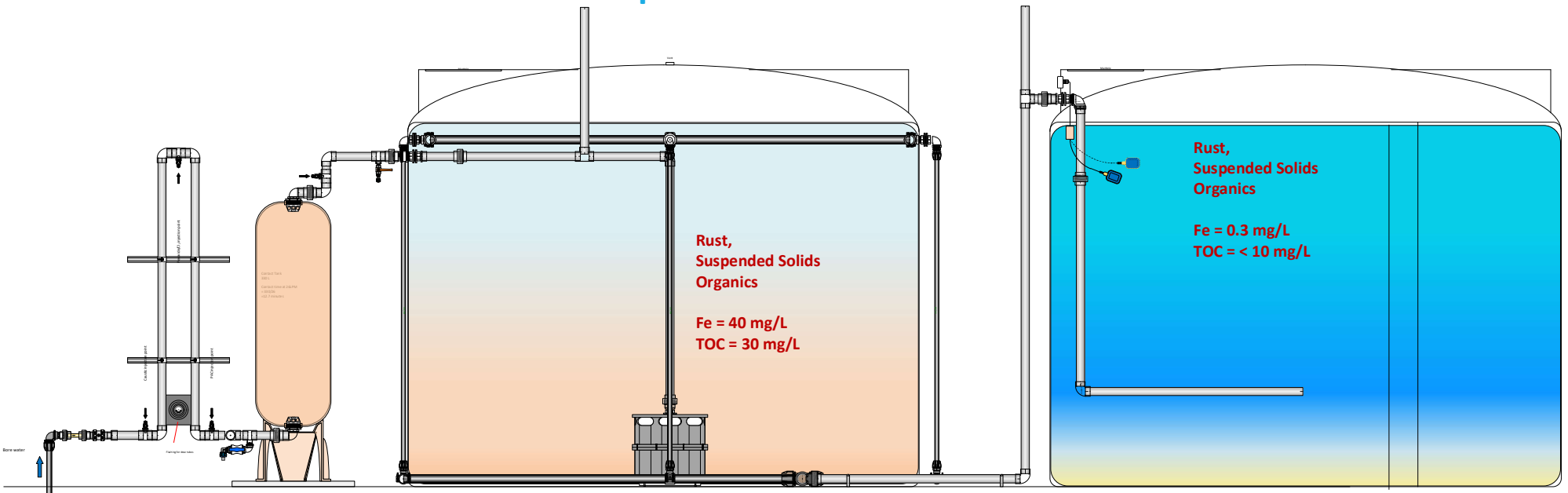


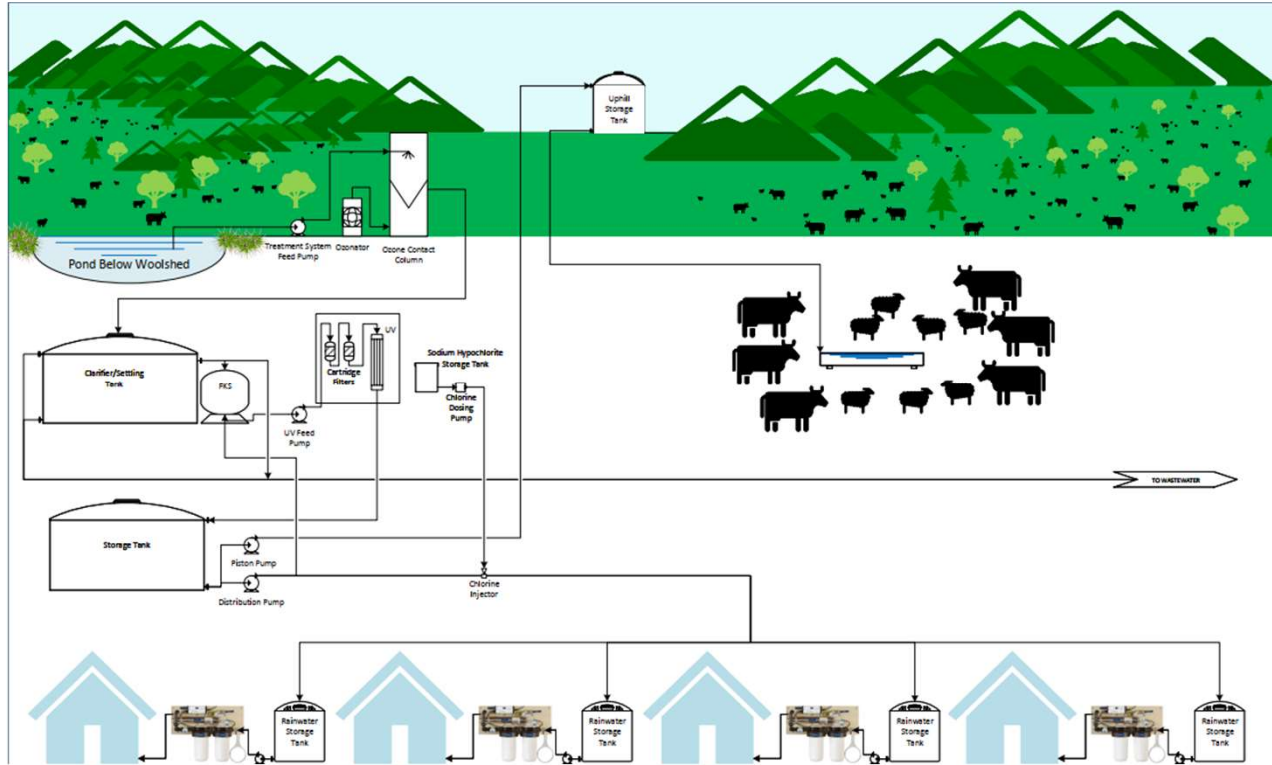
# RUST-BUSTER CLARIFYING SYSTEMS

No Filter

No backwash

Use where other treatment processes fail





# SURFACE WATER



# DAM WATER



# DAM WATER



**Algae, organics, rust, manganese through direct filtration with coag, catalytic filtration, colour reduction and disinfection.**





A. Iron 40mg/L plus Manganese 2 mg/L

B. Treated iron level 0.2 mg/L and  
Manganese 0.04 mg/L

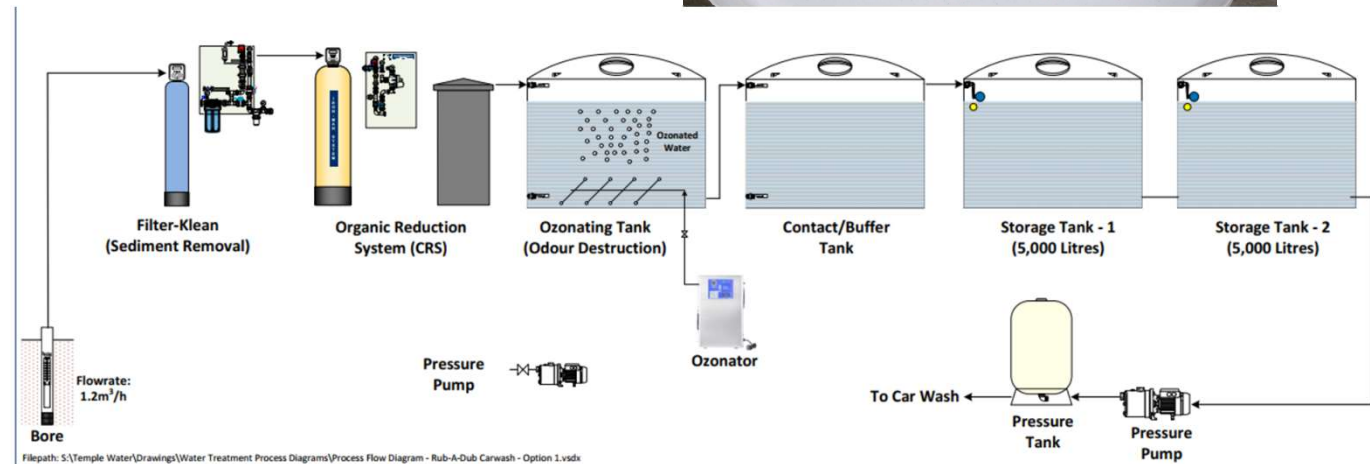
C. Colour 55 TCU

D. Colour < 5 TCU Turbidity 0.2 NTU

## COLOUR REMOVAL

# WE CAN REMOVE

Nitrates      Fluoride      CO<sub>2</sub>  
Methane      Chlorine      Organics





# WAITEMATA AQUIFER

Boron

Alkalinity

pH

Chloride

Sodium

Hydrogen Sulfide

Silica



# CENTRAL PLATEAU

## Arsenic



Lifestyle and Dairy Shed Application.

Colour & Arsenic reduction with pH correction



Under bench arsenic filter system.

Reduction 150 ppb reduced below 5 ppb.

Three plus years treatment.



# PACKAGED TREATMENT PLANT: LIFESTYLE SHED



# PACKAGED TREATMENT PLANT: CONTAINERISED







No Iron or Turbidity level has  
beaten us yet...





**DOES NOT MATTER WHAT THE WATER  
CONTAINS WE CAN ALWAYS FIND A SOLUTION  
TO TREAT IT**

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Ensuring drinking water from the source to the last flowing tap