



# Delegate Treated Water supply Presentation



# Delegate Water Quality

## 1. Water quality is variable depending on drought or floods

1. Stagnant water with sludge build up in droughts
2. High turbidity and contamination washed into river during high rain events

## 2. Intermittent discoloured water into network

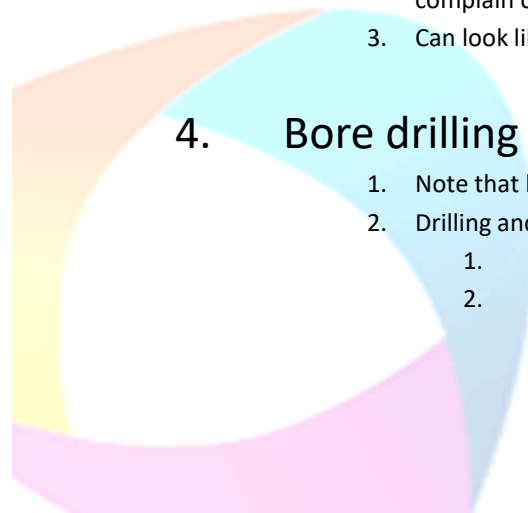
1. Settled turbidity in water network – when suspended (dirty water complaints)

## 3. Iron & manganese:

1. Water containing iron and manganese can stain clothes, discolour plumbing fixtures, and sometimes add a “rusty” taste and look to the water.
2. These materials form a coating on the inside of the water main and, when they break loose, a customer will sometimes complain of “dirty” water.
3. Can look like crystal clear water leaving plant but turn red/brown colour in network.

## 4. Bore drilling & feasibility tests

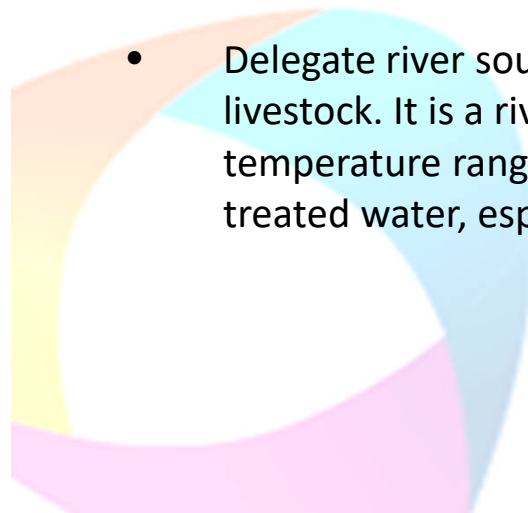
1. Note that bores were only ever a supplement to river supply
2. Drilling and feasibility/sustainability testing of bore holes
  1. No sustainability of supply
  2. Poor volume L/s





## Current Delegate water supply

- Many assets are 70 years old which is excessive for Mechanical/Electrical systems and majority of equipment not maintained properly for many years.
- Currently raw water is drawn into pump station by river intake, chlorinated and pumped to reservoir (No treatment) and no retention in current reservoir to only pump from pump station when turbidity low.
- Chlorinated water then gravitates from Reservoir into properties connected to water supply network.
- Delegate river source has high E.coli levels and is from an inhabited catchment with livestock. It is a river supply with variable turbidity and colour and a wide temperature range. It is a soft water source that needs alkali addition to stabilise the treated water, especially after chlorine gas is added.



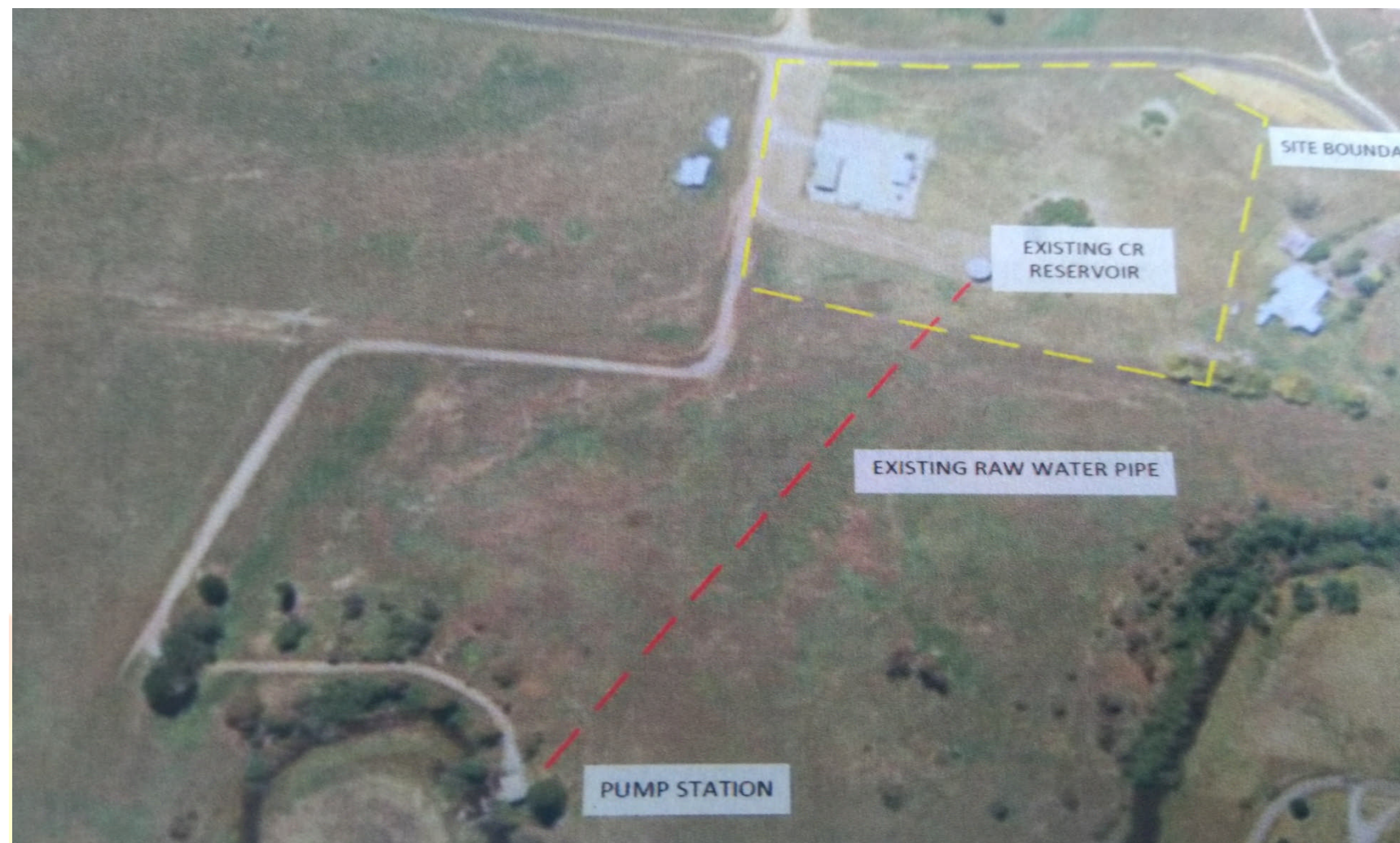


Current Delegate water supply

Water Quality Parameter	NSW Health Jan/Dec 2019 twelve results	SMRC 2017/20 daily results	ALS testing 19/5/2020 single result	95%ile for Delegate historical data for retic 2001-2019 (1)
pH	6.5 – 7.3	6.07 to 7.73	7.35	7.61
Alkalinity mg/L (as CaCO3)		8 to 75	26	
Hardness (mg/L as CaCO3)	10.4 – 26.1			26
TDS (mg/L)	7 – 220		57	60
Calcium (mg/L)	1.3 – 3.8			5.2
Copper (mg/L)				1.35
Turbidity (NTU)	0.6 – 9.7	3.5 to 20.7	5.4	20.5 (28.7)
True Colour (HU)	7 – 42		26	22 (32)
Apparent Colour (Hu)i		37 to 237		
Iron ( mg/L)	0.33 – 0.71		0.36	0.91 (1.03)
Manganese (mg/L)	0.009 – 0.042		0.012	0.028 ( 0.13)
herbicides	Not detected			
DOC (mg/L)			2	
TOC (mg/L)			2	
Total blue green algae			200 (Cyanophyta)	
Total Algae			1720	
Water Temperature( oC)		2 to 25		
Taste & Odour Geosmin MIB	No data		5 <1	



## Current Delegate water supply





Delegate Water Treatment, Reservoir and Pump Station : Corrowong Road DELEGATE



- Legend
- Water
  - Pump
  - Reservoir
  - Water Pipes
  - Lot
  - New Water Treatment Works
  - Easement for water pipe
  - Land acquisition



Imagery Department of Customer Service: Date 2011

0 50 100 150 200 m

06 November 2020

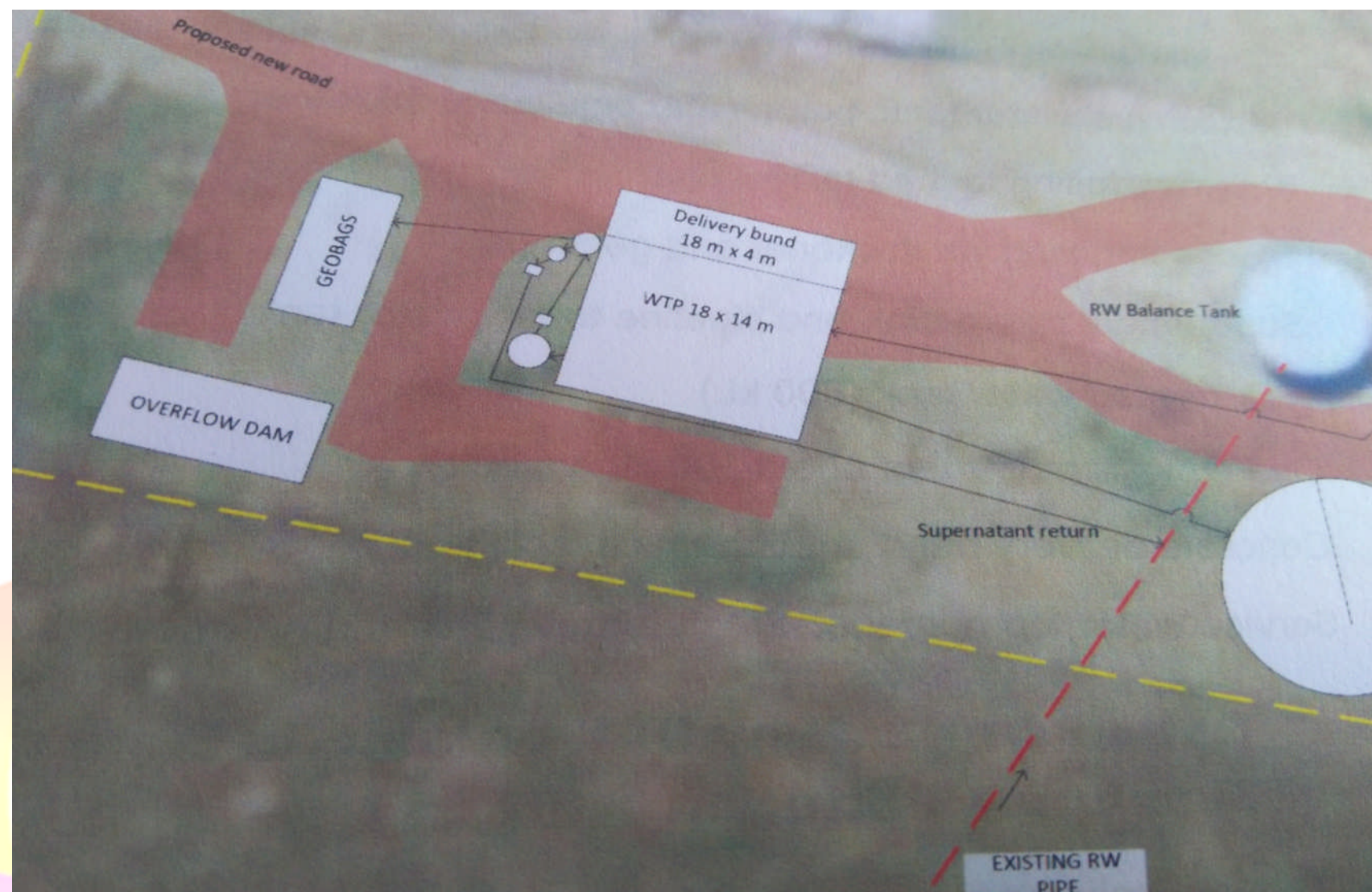


## Current Delegate River Intake





## Proposed new Water treatment plant layout





---

## Recommended Option

- Effective Treatment requires a 2- stage process of clarification (Lamella plate clarifier or Dissolved Air Floatation) then filtration (Gravity dual media filters or Microfiltration). UV then chlorine disinfection is needed to achieve Health Based Targets.
- The preferred 0.5ML/d capacity treatment process for the Delegate WTP is:
  - New raw water pumps
  - Repurpose the existing 283 kL reservoir tank as a raw water storage to balance out changes in raw water quality and provide some security of supply capability
  - UV disinfection then chlorination.
  - New 800 kL tank for treated water storage
  - Sludge treatment by sludge drying beds
- Allowance in floor area within the treatment plant building for future addition of PAC, potassium permanganate and ammonia dosing.
- The key benefit of this Microfiltration (MF) based system based option is the presence of a physical membrane. This is important for a river raw water supply system where raw water quality can change rapidly. In addition,
- Council has experience with MF technology at nearby Dalgety WTP. Also, usually a MF based process requires less operator attendance at site compared to gravity filters based process, as it is more an automatic process.
- The main benefit this type of clarification is, that it can handle higher solids loading due to high dose of coagulant for events of high turbidity plus colour.



# Projected Timeline





Thank you

