Mt. Zero Water Treatment Plant Bore Trial

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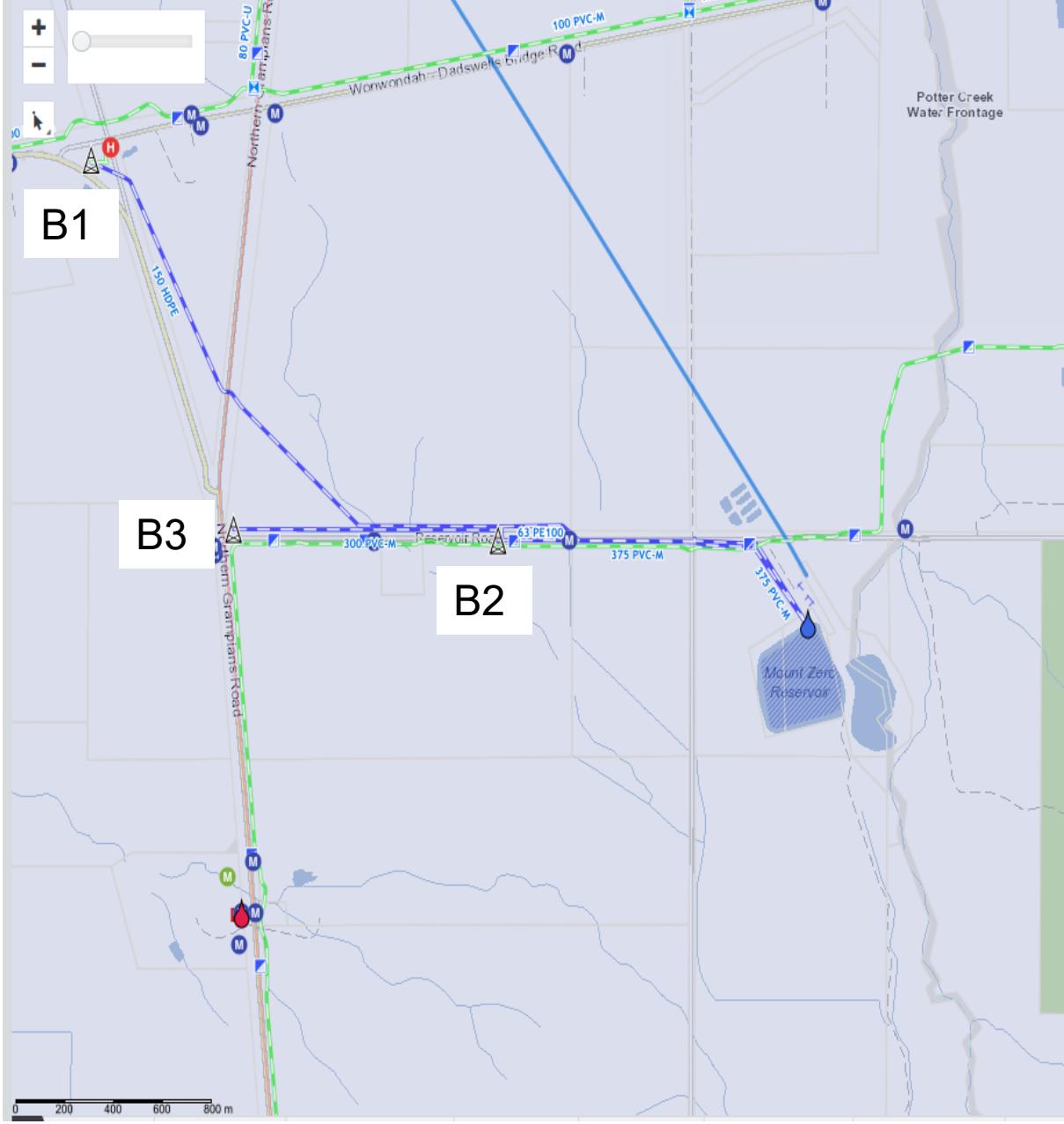
Background

- The water resource position of Lake Wartook is challenged under dry climate.
- GWMWater has licence to extract 1200 ML groundwater at Mt. Zero bores to supplement supply.
- The bores were last used in the Millenium drought.



Bore Water Quality and Risks

	Lake Wartook	Bore 1	Bore 2	Bore 3	Implications
Electrical conductivity (µS/cm)	110	1100	270	290	Bore 1 has a higher salt content. ADWG – 937.50 µS/cm
Bromide (mg/L)	0.06	1.0	0.24	0.27	Bromide can contribute to trihalomethane formation.
Sulphate (mg/L) Sulphide (mg/L) Iron (mg/L) Manganese (mg/L)	nd nd 0.520 0.007	21 1.0 2.2 0.12	2 <0.1 1.9 0.047	<1 <0.1 1.6 0.036	Sulphidic indicator compounds for taste and odour and skin irritations. Iron – taste should not exceed 0.3 mg/L. Aesthetic <0.1 mg/L; health <0.5 mg/L

With no controls:

- High risk of taste and odours/illness
- High risk of trihalomethane exceedance
- Low risk of high salinity

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Laboratory experiments 2008

- Previous lab experiments recommended:
- Aeration of bore water for hydrogen sulphide removal.
- Chlorination of bore water for iron removal.
- Better mixing in the reservoir.

Bore Water Trial

- Shandy water to reduce the risk of poor water quality (bores can do 5 ML/d).
- Incremental use of bore water & water quality testing program.
- Aeration important for removal of hydrogen sulphide.
- Use powdered activated carbon when bores in use.
- If iron remains a problem, can look to pre-chlorinate bores.

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Groundwater Quality – Why Sulphides

- Hydrogen sulphide is found in this ground water due:
  - Natural sulphur-bearing rocks in the geology +
  - Natural decay of organic matter in the aquifer +
  - Low oxygen levels +
  - High pressure (deep aquifer) traps the gas in the water.

- Pumped and released at surface level = pressure release:
  - Gas can now escape → Like opening a soft drink or beer.
  - Shake it up
    - Pressure wave = promotes gas bubble formation
    - High surface area = gas exit gate
  - No more gas = “flat”

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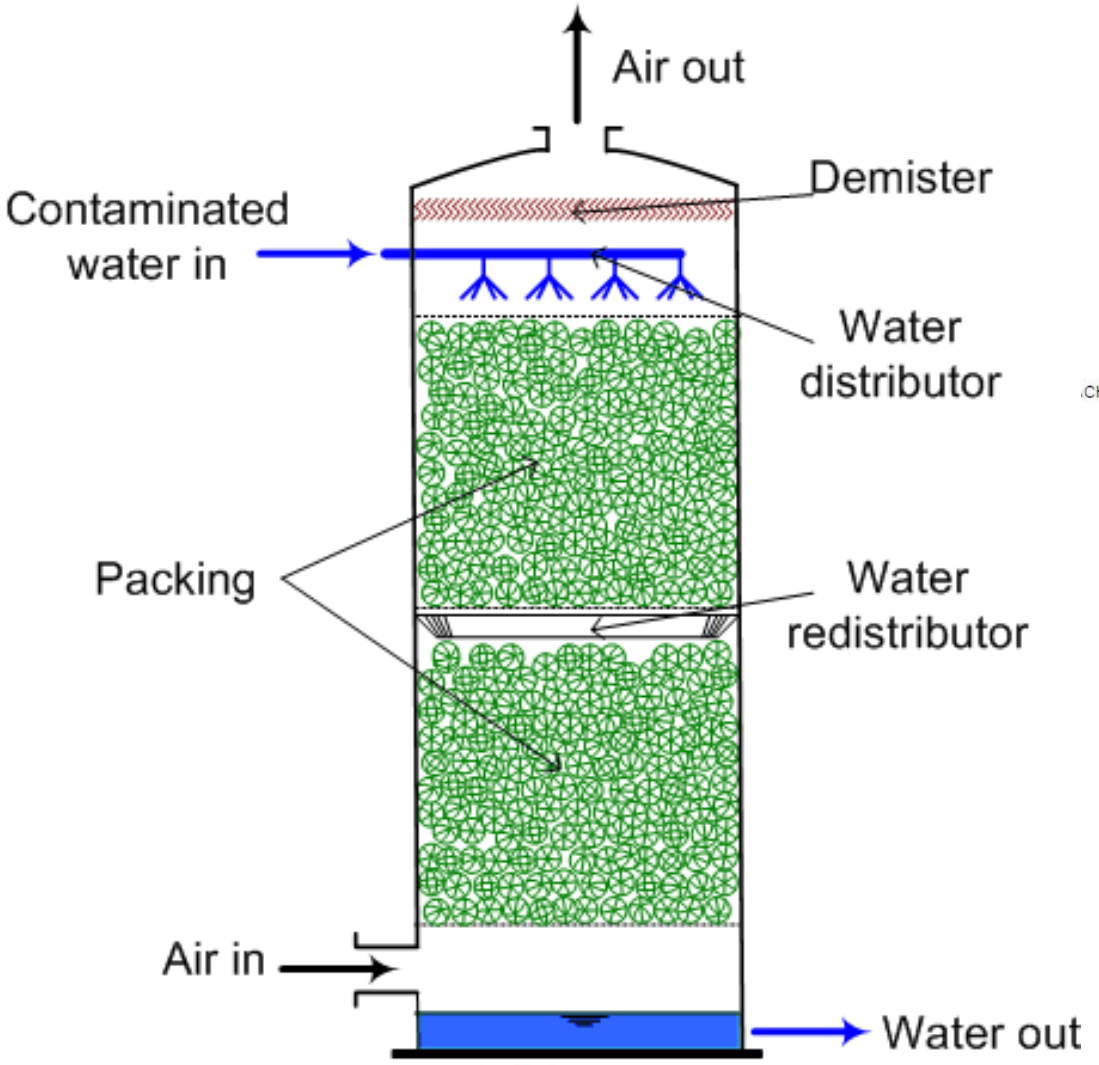
Bore Water Trial – Aeration Tower

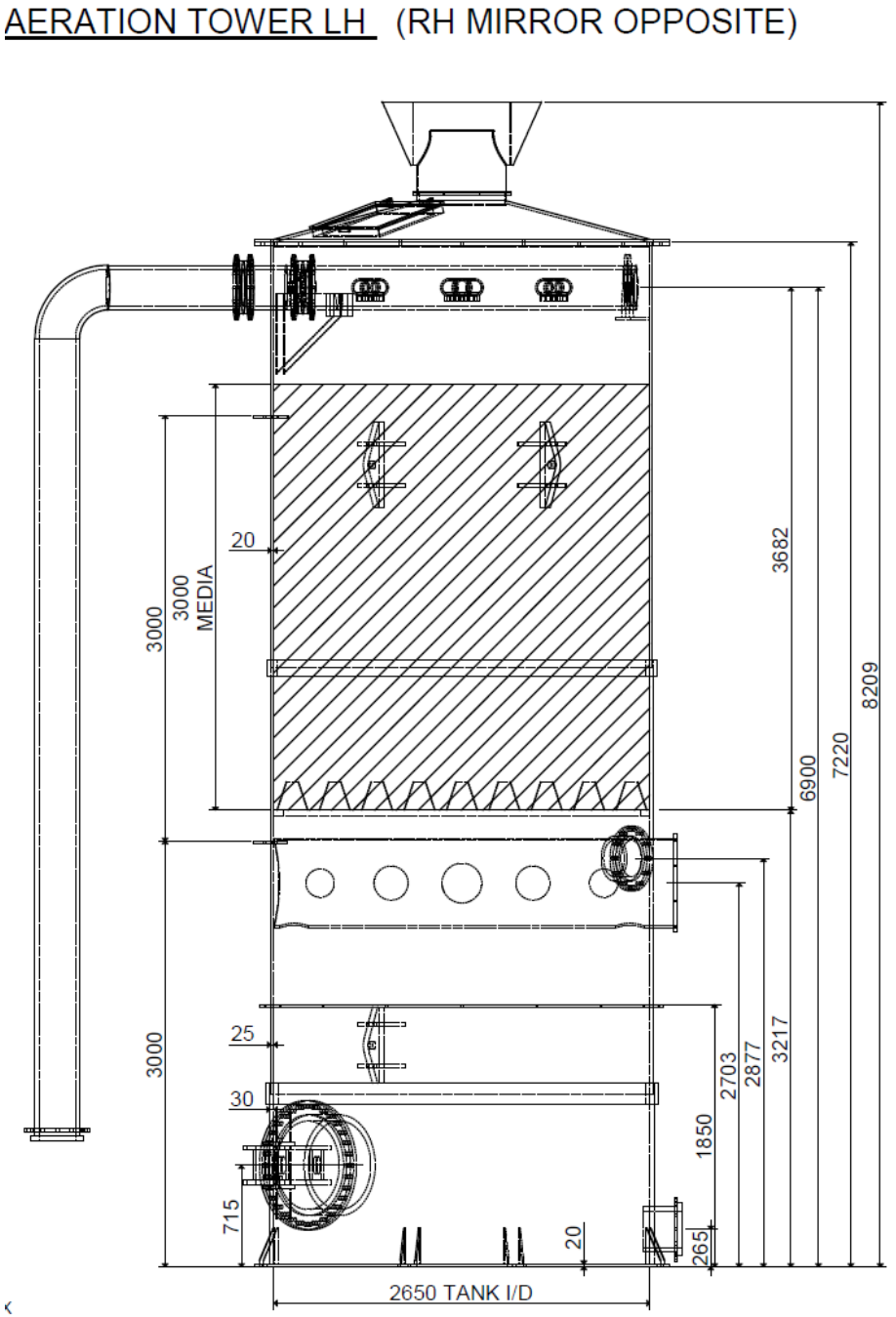


Cost and Timeframe

- Estimate:
  - Bore supply augmentation: $35K
  - Air Stripper System (8-12 weeks): $165K
  - Pump System $30K
  - Return Pipeline to WTP $45K
  - Return Pipeline to Raw Storage $35K

  - Total $310K

- Delivery timeframe: 12-16 weeks



Opportunities

- Bores provide a reliable quantity.
- Treatment and shandying the bore water will minimise the risks from bore water quality.
- Should GWMWater consider borefield expansion?
- Should GWMWater consider doing this trial/when?

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Challenges

- Any change in quality, customer complaints.
- Historical concern over use of bores from community.
- Water quality will meet the Australian Drinking Water Guideline standards.

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Questions

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