

Enhancing our Drinking Water Resilience

The case for an alternate water source and the short-listed options.

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Purpose and Overview

- Purpose:

- Update Council on why an alternate water source is needed and the options being considered.

- Topics covered today:

- The **risk** of relying on a single water source
 - How Invercargill will **benefit** from greater resilience
 - The **requirements** of any new water source to be viable
 - The **options** explored and why some were ruled out.
 - The **preferred option**.
 - **The next steps**

Current Situation

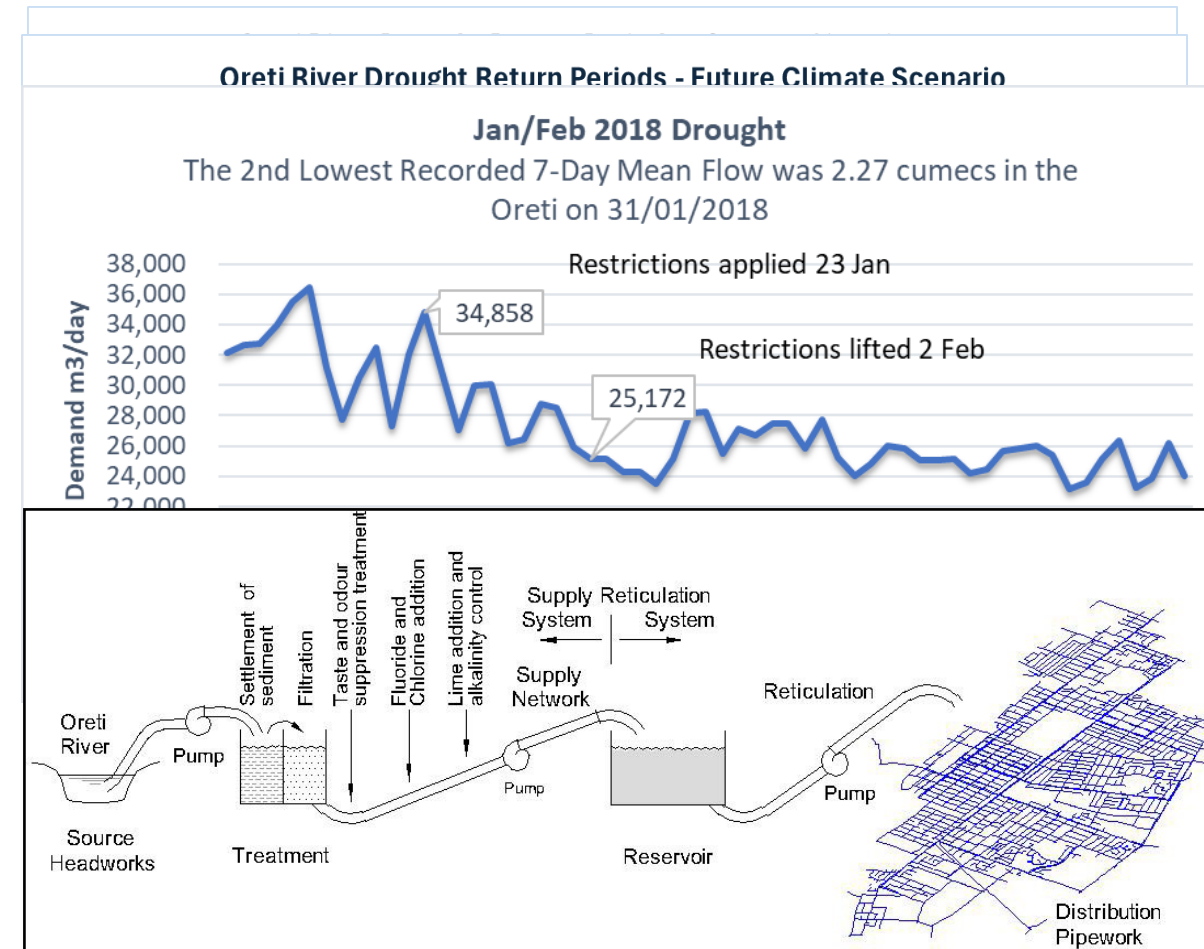
- **Customers:** Invercargill, Bluff and surrounds. Serving over 55,000 residents and numerous businesses.
- **Historical Context:** Initial water supply from Queens Park bores (1880s) replaced by Oreti River intake (1950s) due to quality and capacity issues.
- **Current Infrastructure:** Sole reliance on Oreti River and Bransholme Water Treatment Plant.
- **‘Top 3’ Water Infrastructure Risks** (From 2021 AMP):
 1. Single water source from Oreti River - Extreme criticality.
 2. Historic Water Tower - Seismic stability concerns.
 3. Backflow prevention and treatment plant - Major criticality.
- **Water Demand:** Steady demand over 20 years; peaks at 35,000 m³/day within consented limit of 45,000 m³/day.
- **Future Needs:** Economic growth constrained by limited water capacity, not domestic demand.

The risk of relying on a single water source

- Invercargill relies entirely on the Oreti River for drinking water.
 - There is no backup source → If the river is unavailable for a prolonged period (> 2 days) the city runs dry.
- Although it's a low likelihood the impact would be extreme:
 - No drinking water or flushing toilets for 55,000 people for a prolonged period
 - No firefighting across the entire city and Bluff
 - A complete economic shutdown
 - Would require tankered water en masse, and portable toilets until restored

Why now?

- **Drought and Climate Change Risk:**
 - A 1 in 25-year likelihood of low flow; last occurred in January 2018.
 - Climate change models show longer, drier periods are likely.
- **Regulatory Uncertainty – Future Extraction Limits**
 - Current consent (45,000 m³/day) expires in 2038—future limits may be stricter.
 - Trend: National water policies increasingly restrict river takes to protect ecosystems.
- **Seismic Risk – Single Point of Failure**
 - Past events show that infrastructure failures can take weeks to months to restore.



Why now?

- **The cost of doing nothing increases each year**
 - Reactive, emergency solutions are always more expensive than planned investment.
 - Example: Emergency water trucking during a crisis = \$\$\$ with no long-term benefit.
- **Economic & Community Growth Risk**
 - Water supply is a limiting factor for new industries and population growth.
 - Council will face harder decisions later if no action is taken now.



Raetihi Diesel Contamination

- Entire town lost its drinking water supply for 21 days.
- Residents forced to rely on emergency bottled water and tankers.
- Businesses shut down—restaurants, cafes, and schools unable to operate normally.
- Environmental damage required extensive remediation efforts.



A leaking diesel tank on Mt Ruapehu ski field, within the river catchment caused the contamination.

Why Invercargill's Risk is Greater

- Oreti River catchment is nearly 50x larger than Raetihi's and has industrial, agricultural, and urban runoff.
- Raetihi managed with water tankers and bottled water—Invercargill's scale > 50,000 residents makes this near impossible for more than a few days.
- City-wide evacuation is the more likely scenario, with water prioritised for hospitals and emergency services.



A leaking diesel tank on Mt Ruapehu ski field, within the river catchment caused the contamination.

How Invercargill will benefit from greater resilience

Community Benefits:

- **Public Health and Safety:** Reduced risks from water loss and contamination.
- **Community Confidence:** Reliable supply during disruptions, boosting community confidence.
- **Economic Stability:** Supports business operations and attracts new investments.

Long-Term Benefits:

- **Climate Change Responsiveness:** Our city is prepared for climatic changes over the very long term.
- **Better Freshwater Management:** Enhancing river health and flow, also improves future consenting chances.

The requirements of any new water source to be viable

Project Objective:

To enhance the resilience of ICC's potable water supply system as to withstand a prolonged loss of the existing Oreti River water source, before 2027.

Our alternate supply must supply the city for the next 100 years...

- **Daily Capacity:** Supply at least 80% (20ML/day) of daily demand continuously, ideally with full redundancy (backup), of treatment and storage.
- **Water Quality and Location:** Key factors include the quality of the water source and its proximity to users.

The requirements of any new water source to be viable

Project Objective:

To enhance the resilience of ICC's potable water supply system as to withstand a prolonged loss of the existing Oreti River water source, before 2027.

Our alternate supply must supply the city for the next 100 years...

- **Cost Considerations:** Ensure public value and affordability; limit rate increases to 25%-50% over current rates, with annual increases of 5%-10%, ideally phased over time.
- **Risk Considerations:** Must materially reduce the current risk profile. i.e. does not expose us to drought or contamination again. This rules out most other river sources.
- **Value for Money:** Water scarcity isn't widely perceived as a risk by the community, so we must demonstrate good value and robust reasoning.

What are Our Options?

The options explored and why some were ruled out.

Option 1: Augment Existing Source with storage solutions and flow regulation.

Option 2: New Surface Water Take from rivers or alpine lakes, or desalination.

Option 3: Develop New Groundwater Sources in Awarua Plains.

Option 4: Alternative Approaches like recycling and rainwater harvesting (ruled out).

The options explored and why some were ruled out.

Criteria for Shortlisting

Filter 1: Must deliver investment objectives “*enhancing resilience of ICC’s water supply before 2027.*”

Filter 2: Must meet or enable our minimum requirements, with varying degrees of service delivery.

Filter 3: Rank options that maximise benefit /minimise risk for the cost.

Of the options that remain.....

It is deliverable and is it affordable?

- Consenting, endorsement from Iwi partners
- Complexity and skills for delivery and maintenance.
- Affordability for ratepayers and Council funding capability.

The options explored and why some were ruled out.

Option 1: Augment Existing Source with storage solutions and flow regulation.

The options considered were:

Option 1A: - **Providing 7 to 30 days of backup** using large out of river storage reservoirs - Construct large storage reservoirs near the Oreti River and Bransholme treatment plant.

Option 1B: - **Regulate the Oreti River Flow during drought with a Storage Dam** Construct a dam across the Windley River, a tributary of the Oreti River. Stored water would be released into the Oreti River to regulate low flows.

Option 1C: - **Increase effective capacity by reducing water demand** – Implement universal water metering and volumetric charging to reduce water demand and thereby increasing the effective capacity of the existing source by 30%.

The options explored and why some were ruled out.

Option 1A: - Providing 7 to 30 days of backup using large out of river storage reservoirs.

Costs: 7 Days: \$12.2M-\$27.2M; 30 Days: \$52.8M-\$118.3M.

Advantages: 'Quick' resilience boost, staged for affordability.

Disadvantages: Cost-benefit, Land/consents needed, limited long-term protection. Still dependent on a single source...

Conclusion: Consider as a backup option for drought and contamination resilience.



Rangitata South Irrigation Scheme, built for \$115M in 2013, covers 300Ha and stores 16,500ML. Our proposed option is much smaller at 25Ha, storing 750ML.

The options explored and why some were ruled out.

Option 2: New Surface Water Take from rivers or alpine lakes, or desalination.

The options considered were:

Option 2A: - Reticulate water from large lakes (Wakatipu, Hauroko, Monowai).

Option 2B: - Extract from Mataura River, offering a different drought profile.

Option 2C: - Build storage dams on new river sources (Dunsdale, Otapari, Pourakino).

Option 2D: - Consider seawater desalination from Foveaux Strait.

The options explored and why some were ruled out.

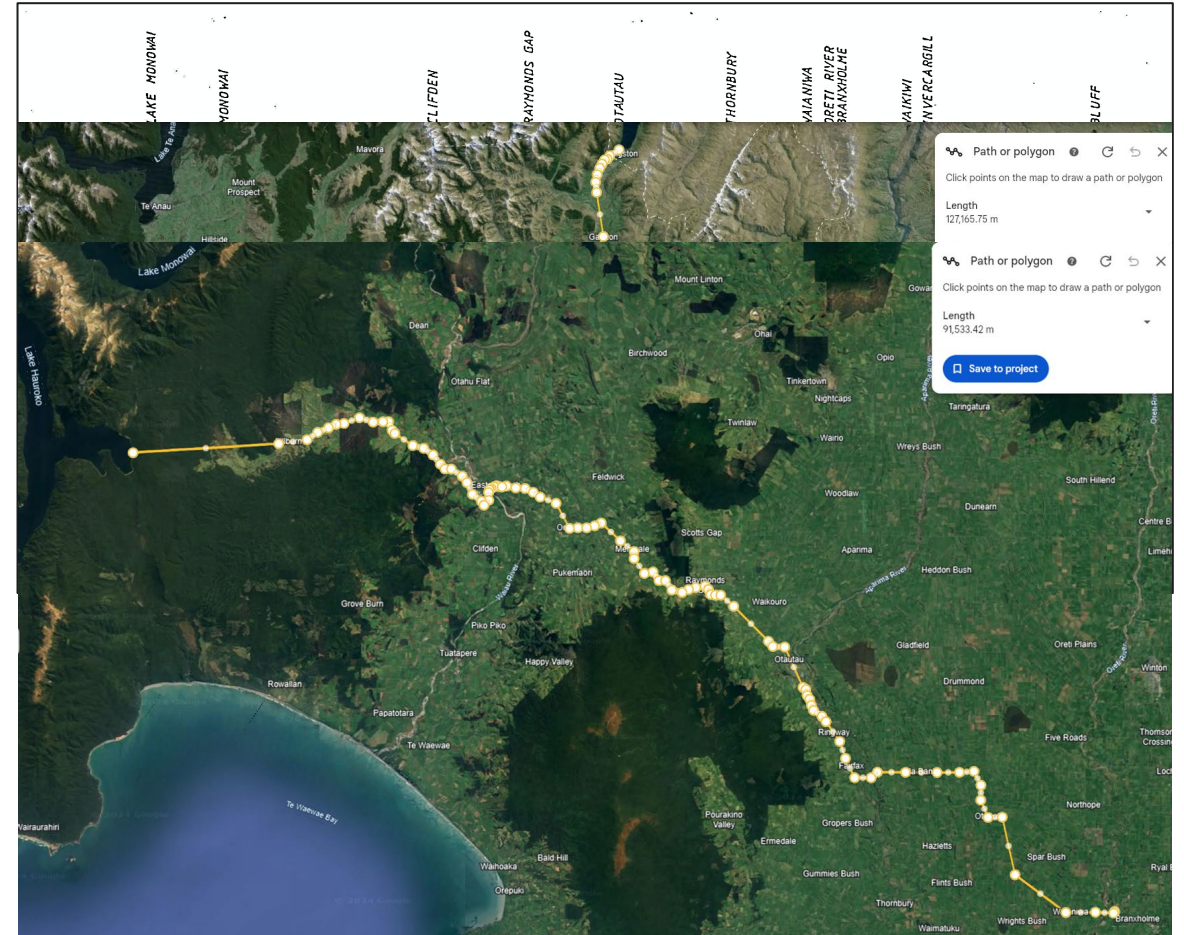
Option 2A: - Reticulate water from large lakes (Wakatipu, Hauroko, Monowai).

Costs:

2A: Lakes - \$213.2M to \$734.0M; Rates Increase: \$888 to \$3,024/year

2C: Dams - \$315.3M to \$1,493.5M; Rates Increase: \$1,262 to \$5,264/year

Ruled out – Too expensive and complex



The options explored and why some were ruled out.

Option 2B: - Extract from Mataura River, offering a different drought profile.

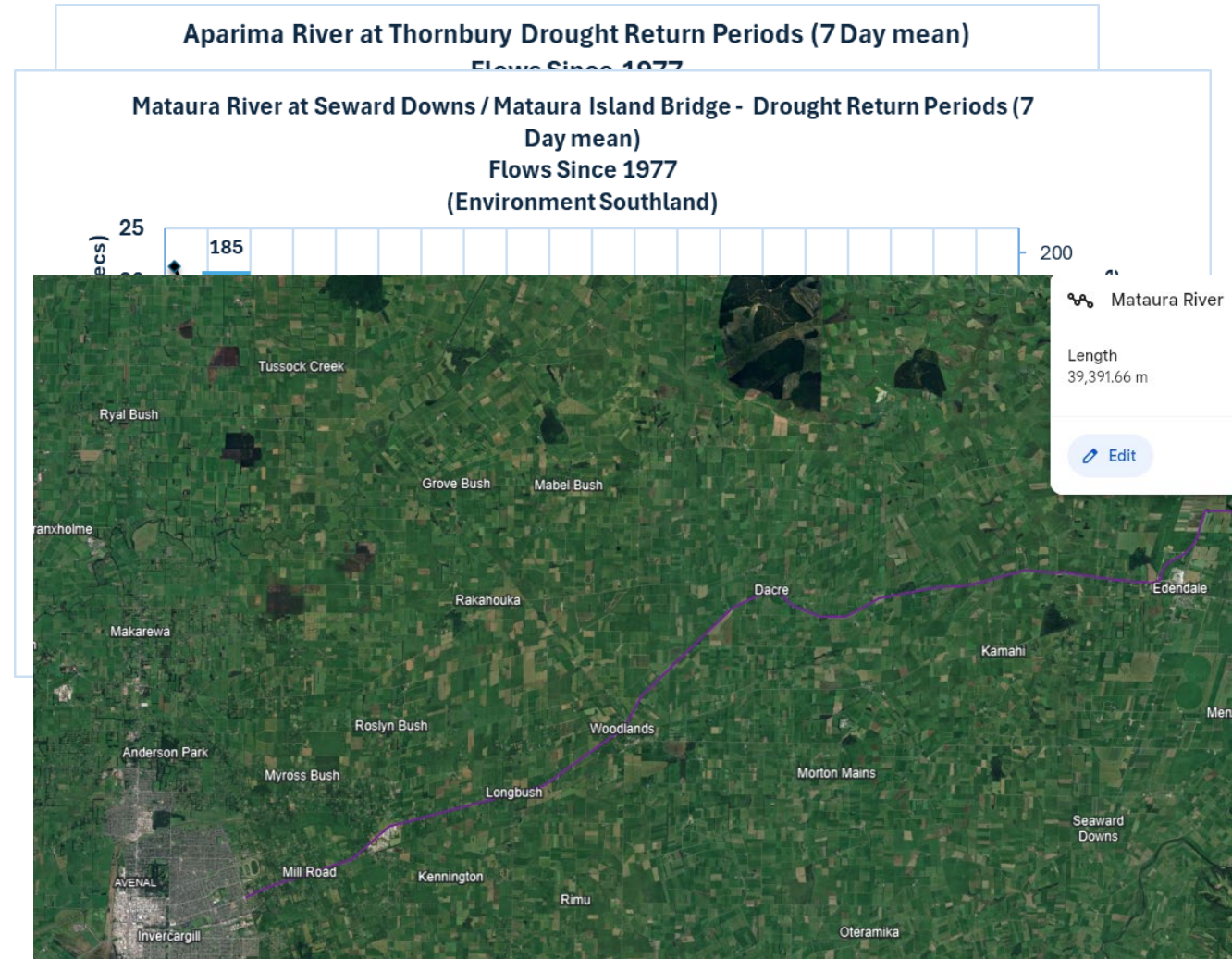
Costs:

2B: Mataura - \$119.2M to \$267.0M; Rates Increase: \$534 to \$1,068/year

Pros: Reduces single-source reliance, supports growth.

Cons: Challenges cultural values, Higher treatment costs, complex pipeline, significant funding needed, high contamination risk.

Conclusion: **Discounted** - Viable alternative but high consenting, contamination and cost risk.



The Preferred Option

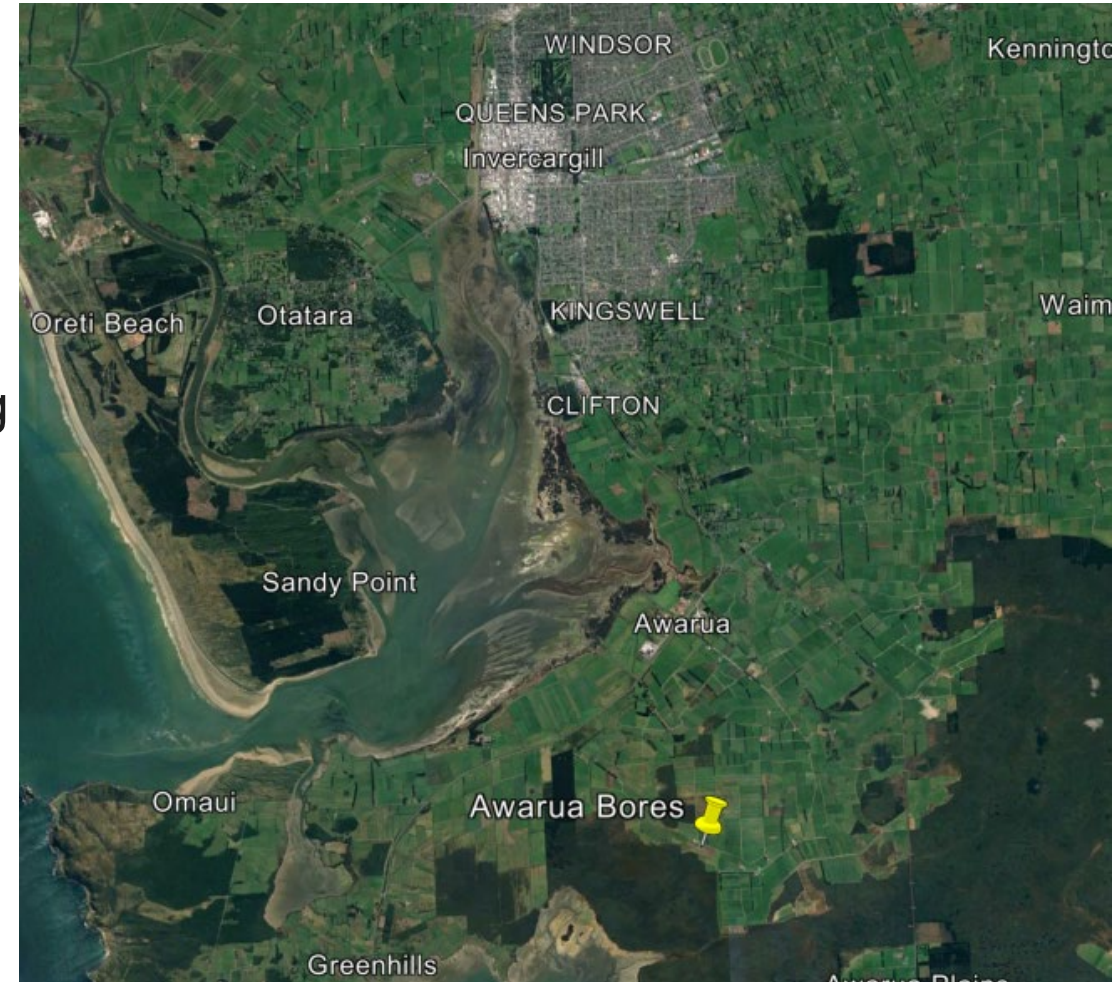
Option 3: Groundwater Source at Awarua Plains

Costs: c. \$53.3M (2024 LTP); Additional cost per rating unit: c. \$283. p.a.

Pros: Reduces single-source reliance, different risk profile, potentially supports growth.

Cons: Limited capacity (being tested now), pumping and pipeline, power dependent.

Conclusion: Preferred option, pending borefield viability



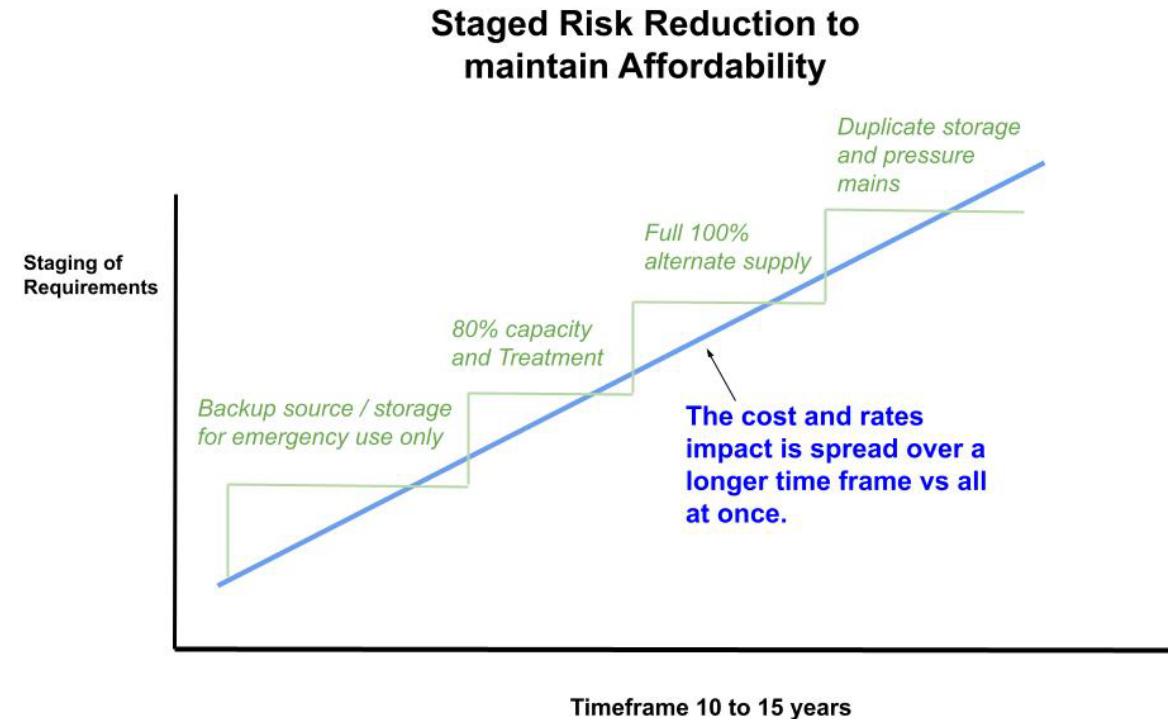
Reducing risk gradually with affordability

Water scarcity isn't widely perceived as a risk by the community. So, if proven viable, we can stage the development to maintain affordability, targeting risk reduction.

Years 1-5: Secure an emergency raw water source; still requires boiling, but health risks greatly reduced.

Years 5-10: Develop source to meet 80% demand; integrate with full treatment.

Years 10-15: Build dedicated pipeline to a new reservoir; providing full redundancy and boosted capacity for economic benefit.



Next Steps

If proven viable, then we can stage bore development to maintain affordability.

Validate Source Viability: Complete bore testing and hydrological modelling. Targeting June

Seek Consents: Develop consenting strategy. Commence July

Estimate Costs and Delivery: Prepare detailed estimates and delivery plan, that align with financial constraints.

Thank You

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