

15 August 2024

Round 3 Demand Assessment – Customer Information Pack



Water for Lockyer Valley and Somerset – Viability Assessment 2024

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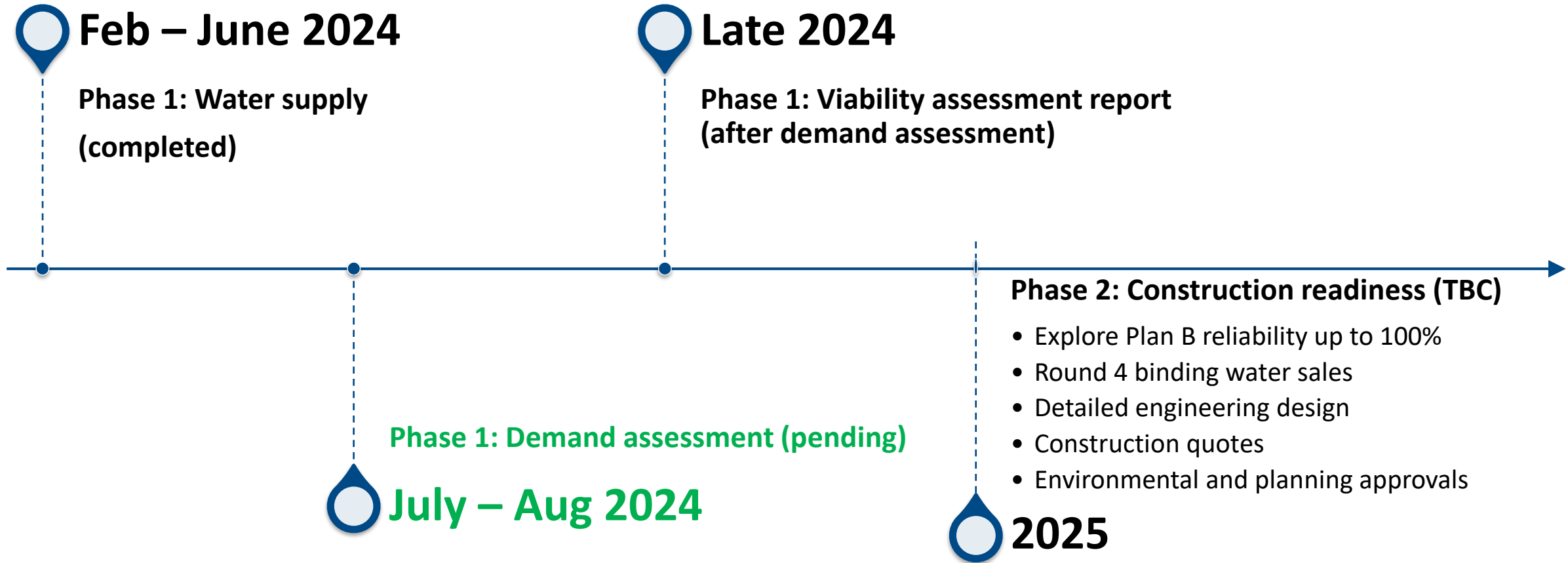
Encourage participation in Round 3 **non-binding** demand assessment



Water for Lockyer project update



Answer your questions



Other recycled water irrigation schemes

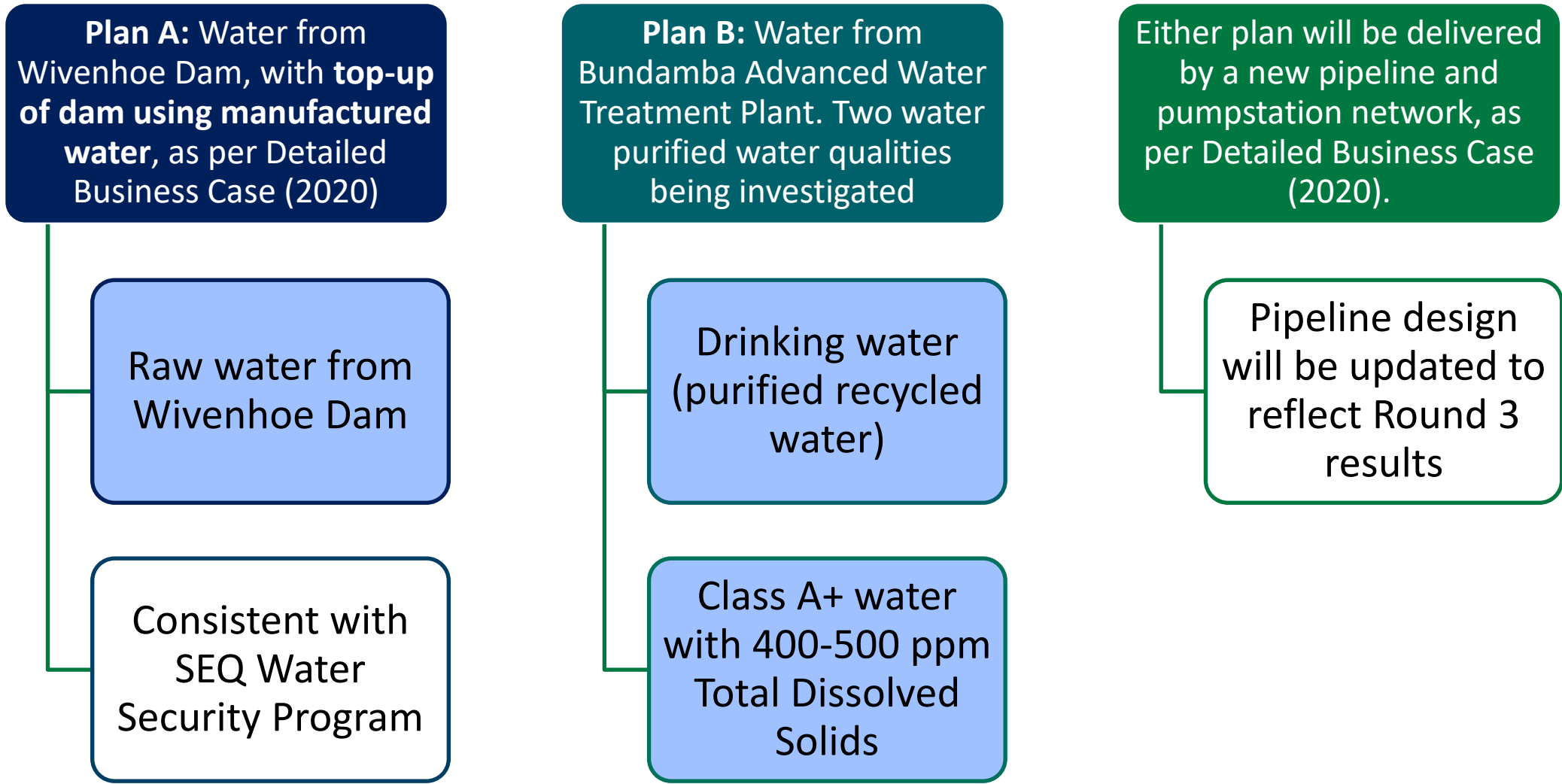


Scheme	Location	Volume	Water Quality	Annual charges (\$/ML)
Eastern Irrigation Scheme	Victoria	5 GL/a (delivered)	Class A+ TDS 430-500ppm	Unknown
Werribee Irrigation District	Victoria	10 GL/a	Class A+ TDS 1,000ppm	\$300-\$500
Wamuran Irrigation Scheme	Queensland	2.6 GL/a	Class A TDS 900ppm	Unknown
Virginia Pipeline Scheme	South Australia	20 GL/a	Class A+ TDS 600-1,200ppm	Unknown
Willunga Basin Water Network	South Australia	7 GL/a	Class B/C TDS 500–600ppm	\$1,200
Water for Lockyer (proposed)	Queensland	<34 GL/a	Class A+ (500ppm) or better	See below

Recycled water is in common use nationally for growing food in other Australian jurisdictions. For example, the range of Lockyer crops (mainly vegetables) are also grown in other recycled water schemes.

Total dissolved solids (TDS) is a measure of water salinity.

Two water supply options being considered





New irrigation scheme operates

20% of time in 2029 (before SEQ grid upgrades)
65% of time in 2035
0% of time from 2045 onwards (climate & population)



Average volume delivered during operation (i.e. average reliability)

40% in 2029 (start of scheme)
70% in 2035 (year 5-6 of operation)
0% from 2045 onwards (15 years)



Plan A scheme ends in 15-16 years (2029 to 2045) **under current policy**



New irrigation scheme may operate, because WCRWS is available:

97.5% of the time in 2029
98.5% of the time in 2035
95.5% of the time in 2045



Summary of reliability: Plan B water reliability 95% or better.



Phase 2 of investigation will explore options that may see Plan B reliability increase **up to 100%**. Will require policy change / with cost impacts.

Water class	Viable supply to Lockyer Valley and Somerset
Drinking water (recycled)	Yes – exceeds health requirements for all irrigation purposes - 150+ chemicals and microorganisms are regulated
A+	Yes – meets or exceeds health requirements for all irrigation purposes and potentially all non-horticultural uses
A	No – does not meet health requirements for most vegetables grown in Lockyer and Somerset (given predominance of spray irrigation)
B	No - does not meet health requirements for most vegetables grown in Lockyer and Somerset (given predominance of spray irrigation)
C	No - does not meet health requirements for most crops and likely may not be allowed for non-crop uses as well

Water salinity	Total Dissolved Solids (TDS ppm)	Reasoning
Extremely low	<250	<ul style="list-style-type: none"> • If Drinking water (purified recycled water)
Very low	300	<ul style="list-style-type: none"> • Lower than the lowest salinity threshold (Beans in clay – 384ppm), heavy clays (Cation Exchange Capacity >30) • Enables multiple applications without substantial accumulation • Requires significant Reverse Osmosis (RO) to achieve 300ppm
Low	400	<ul style="list-style-type: none"> • Higher than lower salinity threshold (beans) but suits all other crops • Fewer applications without mixing or rainfall • Requires partial RO to achieve 400ppm
Moderate	500	<ul style="list-style-type: none"> • National guideline for recycled water irrigation uses • Requires partial RO to achieve <500ppm
High	500+	<ul style="list-style-type: none"> • Too high for key Lockyer crops • No RO required

Rainfall >50mm/month might enable a neutral impact on soil in total
 – Gatton averages 63mm/month

Two water quality options – Phase 2 of viability assessment process will decide



1. DRINKING WATER STANDARD
(PRW)
TDS OF <250PPM



2. CLASS A+ STANDARD
TDS OF ~400PPM

Class A+ is less expensive to produce than drinking water

All crops can be grown with Class A+ (TDS 400 ppm)

Queensland Health does not have a legislated requirement for drinking water

Only a policy decision would result in drinking water

WCRWS drinking water (from Luggage Point AWTP or Gibson Island AWTP) used by industry up to ~6 GL pa by 2045

Bundamba AWTP is not being used. Not envisaged to be used by 2045. Phase 2 will consider options to improve reliability.

Tradeable

- Permanent trading is possible
- Temporary trading is possible
- Some limitations based on zones / pipeline capacity

Benefits

- Water moves to highest value use over time
- **You are responsible for your own legal and financial due diligence**
- Banks may lend against supply agreement (needs to be confirm with financial institutions).

Water supply agreement term (years) – What is your preference?

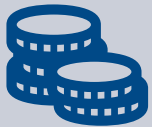


Initial contract term (years)	Description
20	<ul style="list-style-type: none">• Potentially a reasonable timeframe noting longer term investments have 25+ year life spans• Potentially reasonable for export contracts
30	<ul style="list-style-type: none">• Aligns with lifespan of most on-farm infrastructure• Exceeds likely requirements for export contracts
50	<ul style="list-style-type: none">• Exceeds life span of most on-farm investments and likely requirements for export contracts (no guarantee that this will be offered).

Only applies to Plan B under current policy settings



Round 3 demand assessment assumes the same contracted minimum pressure of 7 psi, at customer outlet valve, as in DBC



This design parameter minimises capital costs



Depending on outlet location and scheme, pressure will vary and may be as high as 60 psi (450 kPa)

Operates days per year:

- Plan A – Zero to 335 (11 months) per year
- Plan B – Up to 365 days per year (355 days is a reasonable target) (TBC)

All options 24 hours per day

Plan A: DBC flow rate designed to deliver 100% of volume in **270 days** – storage needed

Plan B: Recycled water delivery period not yet determined – also needs storage

Further investigations:

- Higher flow rates for Plan B (e.g., shorter minimum delivery period)
- Storage options (e.g., existing Lockyer dams, scheme ring tanks and on-farm storage)

Plan B: Possible increased flow rates?



How to deliver more value to customers.

Higher flow rates may increase capital costs.

Government may contribute to capex upfront (but NOT ongoing costs).

Higher flow rates reduce water storage needs and double-pumping.

Delivery period	Contract volume	Flow rate (ML/day)	Max. with rostering (ML/day)
270 days (DBC)	270 ML	1.0	2.0
210 days	270 ML	1.3	2.6
150 days	270 ML	1.8	3.6
90 days	270 ML	3.0	6.0

Water supply option	Indicative full cost of capital per ML (i.e. no government contribution)
Plan A: Wivenhoe Dam*	Up to \$25,000 per ML
Plan B: Bundamba AWTP*	Up to \$25,000 per ML

- Note 1: * Includes escalation beyond FY2024 but no financing costs (i.e capitalized interest during construction).
- Note 2: * Assumes 34GL demand for both supply options, noting that 34GL demand is very unlikely for Plan B.

Round 3 capital prices – Indicative customer capital contributions



Potential government & customer capital contribution scenarios	Government capital contribution (\$/ML)	Customer capital price (\$/ML)	Subject to change with Round 3 – Illustrative demand forecast (ML)	Subject to change with Round 3 – Illustrative customer contribution to capital costs
Scenario 1	Up to \$24,500/ML	\$500	20,000 - 30,000	Up to \$15 million
Scenario 2	Up to \$23,500/ML	\$1,500	16,000 - 20,000	Up to \$30 million
Scenario 3	Up to \$22,500/ML	\$2,500	0 - 16,000	Up to \$40 million

Annual charge scenarios – Fixed, variable and total annual charges



Annual charge scenario	Fixed (\$/ML)	Variable (\$/ML)	Total (\$/ML)
Very high	1,300	700	2,000
High	1,150	600	1,750
Medium	1,000	350	1,350
Low	700	150	850
Very Low	300	100	400

Annual charge scenarios cover Plan A and B likely cost range.

Annual charge scenarios – Indication of price linked to supply option



Annual charges	Fixed (\$/ML)	Variable (\$/ML)	Total (\$/ML)	Indicative water product	Illustrative solar &/or battery status
Very low	300	100	400	Plan A: Wivenhoe Dam	Pipeline solar only (DBC)
Low	700	150	850	Plan B: Class A+ Water (400-500ppm)	Pipeline & AWTP solar/battery + optimisation
Medium	1,000	350	1,350	Plan B: Class A+ Water (400ppm)	Pipeline solar. No AWTP solar/battery.
High	1,150	600	1,750	Plan B: Drinking water	Pipeline solar. No solar/battery for AWTP.
Very high	1,300	700	2,000	Plan B: Drinking water	Pipeline solar. No solar/battery for AWTP.

Price range tests demand sensitivity. Water products not seen as options – illustrative to provide indication of cost drivers.

Scenario 1: Capital price & annual charges for Round 3 form



Annual charge scenario	One-off upfront capital price (\$/ML)	Fixed annual charge (\$/ML)	Variable annual charge (\$/ML)	Total annual charge (\$/ML)
Very high	500	1,300	700	2,000
High	500	1,150	600	1,750
Medium	500	1,000	350	1,350
Low	500	700	150	850
Very Low	500	300	100	400

Scenario 2: Capital price & annual charges for Round 3 form



Annual charge scenario	One-off upfront capital price (\$/ML)	Fixed annual charge (\$/ML)	Variable annual charge (\$/ML)	Total annual charge (\$/ML)
Very high	1,500	1,300	700	2,000
High	1,500	1,150	600	1,750
Medium	1,500	1,000	350	1,350
Low	1,500	700	150	850
Very Low	1,500	300	100	400

Scenario 3: Capital price & annual charges for Round 3 form



Annual charge scenario	One-off upfront capital price (\$/ML)	Fixed annual charge (\$/ML)	Variable annual charge (\$/ML)	Total annual charge (\$/ML)
Very high	2,500	1,300	700	2,000
High	2,500	1,150	600	1,750
Medium	2,500	1,000	350	1,350
Low	2,500	700	150	850
Very Low	2,500	300	100	400

When would a customer pay the upfront capital contribution?



In previous schemes the one-off upfront capital contribution has been paid by customers in stages (see below).



2% upon signing a Round 4 Binding Water Sales demand form (contract). If Phase 2 proceeds, this may be in **2025** (subject to change).



8% upon government committing itself to a share of the capital funding. Timing unknown, but prior to start of construction, this may be **2026** (subject to change).



90% upon practical completion of construction (not long before you received water). Timing 2-3 years into construction, this may be **2029** (subject to change).

Today there is ample water, and new water may seem expensive, reducing your demand.

But drought will come again, and climate change / variability will make it worse.

New reliable water has proven nationally and abroad to:

- Deliver resilience
- Enable new commodity lines
- Offer expansion and export opportunities, with potentially higher margins.

The project will yield economic growth, with flow-on benefits to land and enterprise values, so ***put your best demand foot forward.***

Hardcopies of Round 3 demand form provided at meeting

All (300) email contacts will receive electronic copy in Word

Structure of form:

- Your contact details
- Water product information (reliability, capital prices and annual charges)
- Questions (e.g. demand, profit per ML, investment certainty)
- Send to angus.macdonald@kbr.com

Due date: 31 August 2024

Angus MacDonald Demand Lead

- Mob: 0488 444 973
- angus.macdonald@kbr.com
- Email your Round 3 form to Angus by **31 August 2024**

John Reeve Demand 2IC

- Mob: 0452 512 903

Other information – Water Quality

Recycled water class	Definition in Public Health Regulation 2018
Drinking water	Water meets the standards for quality of recycled water supplied to augment a supply of drinking water#: <ul style="list-style-type: none"> • Below prescribed values for 152 chemicals • <i>C. perfringens</i> - <1 colony-forming unit (pfu) / 100ml • <i>E.coli</i> - <1 cfu/100mL • F-specific RNA coliphages - <1 plaque-forming unit (pfu) /100mL • Somatic coliphages - <1 pfu /100mL • No detectable viral, bacterial or protozoan pathogens
A+	Water meets standards for: <ul style="list-style-type: none"> • <i>C. perfringens</i> - <1cfu/100ml • <i>E.coli</i> - <1 cfu/100mL • F-specific RNA coliphages - <1 pfu/100mL • Somatic coliphages - <1 pfu/100mL
A	Water meets standard for <ul style="list-style-type: none"> • <i>E.coli</i> - <10cfu/100mL
B	Water meets standard for: <ul style="list-style-type: none"> • <i>E.coli</i> - <100cfu/100mL
C	Water meets standard for: <ul style="list-style-type: none"> • <i>E.coli</i> - <1,000cfu/100mL

In addition, must not exceed values in Australian Drinking Water Guidelines

Water quality – Health – Class of recycled water by minimally processed crop



Crop type	Method of irrigation	Recycled water class
Root crops	Spray, drip, flood, furrow, subsurface	A
Crops grown on/ near ground and eaten with skin removed	Spray	B
	subsurface, drip, flood, furrow	C
Rockmelon	Spray, drip, flood, furrow, subsurface	A+
Crops grown on/ near ground and eaten without skin removed	spray, flood, furrow	A+
	drip	A
	subsurface	C
Crops grown away from ground and eaten with skin removed	spray	B
	drip, flood, furrow, subsurface	C
Crops grown away from ground and eaten without skin removed	spray	A+
	drip, flood, furrow, subsurface	B
	subsurface	C
Crops grown in hydroponic conditions	hydroponic	A+

Water quality: Total Dissolved Solids (TDS ppm) – Threshold to avoid yield reduction



Commodity	Sand	Loam	Clay (< = TDS ppm)
Beans	704	704	384
Onions	1,472	832	512
Lettuces	1,728	960	576
Potatoes	2,048	1,152	704
Cabbages	2,240	1,280	768
Tomatoes	2,240	1,344	768
Pumpkins	960	960	960
Rockmelon	2,944	1,664	960
Broccoli	3,136	1,792	1,024
Turf - Wintergreen couch	6,080	6,080	6,080
Turf - Zoysia	8,000	8,000	8,000

Equivalence – ppm = EC (dS/m) x 640 for EC < 5.0, ppm= EC (dS/m) x 800 for EC > 5.0

