Growing Pains: The Western Water Story

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The Western Water Service Area

Less than twenty years ago Western Water supplied a number of outer suburban and small towns through a combination of conventional surface and groundwater sources.

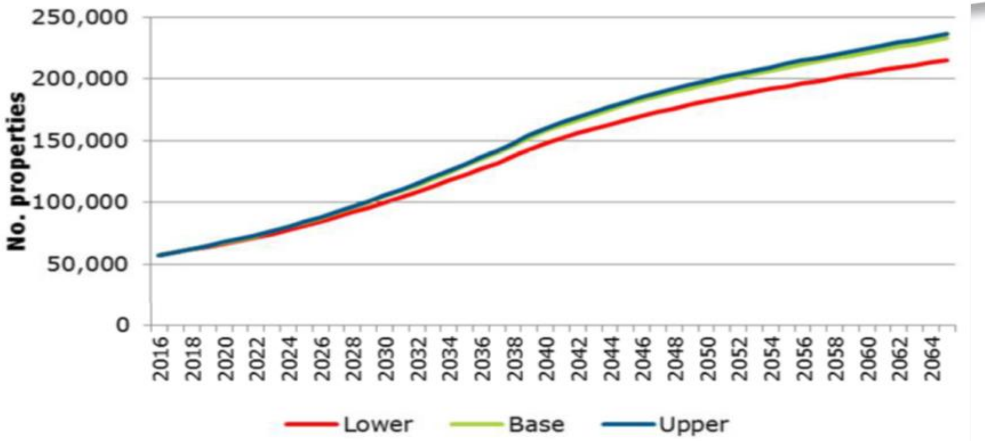
One of the fastest growing regions in Australia

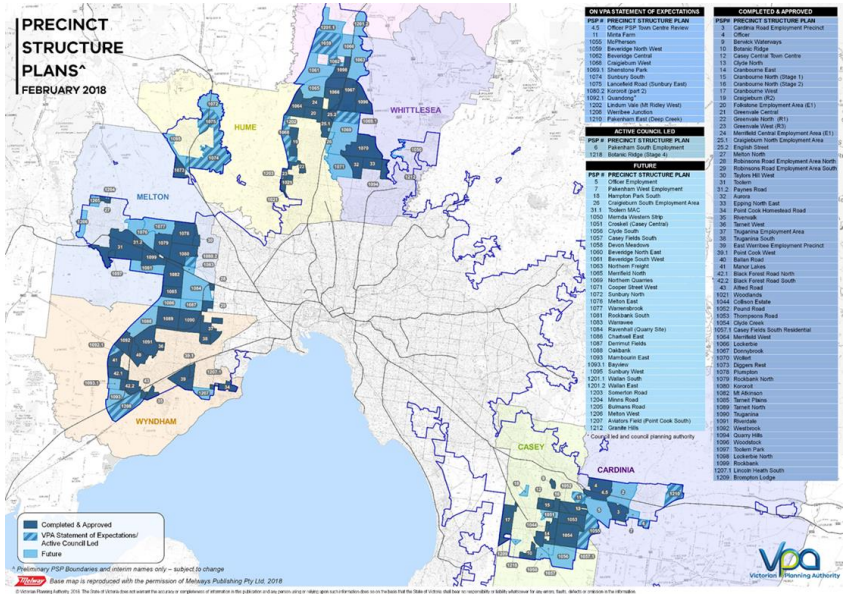
Today Western Water provides water, recycled water and sewerage services to:

- Approx. 66,000 properties
- a population of 153,358
- an area of 3,000 km^2

Over the next twenty years the population set to treble.

(Victoria in the Future, 2016)



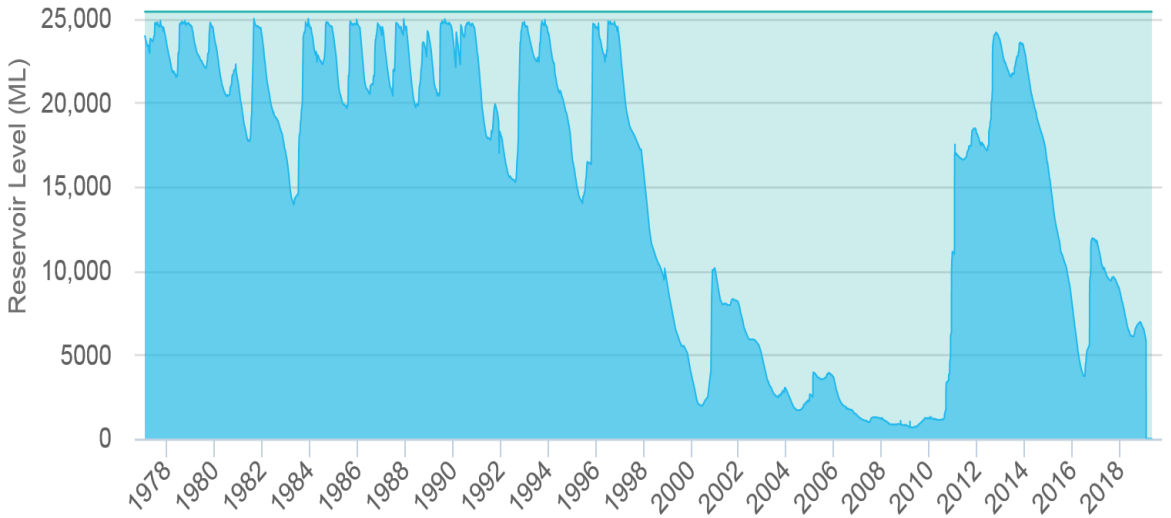


A changing landscape

In 2018 Western Water granted connection compliance certificates at a rate of **1,000 per month**

Impact of the Millennium Drought

Rosslynne Reservoir



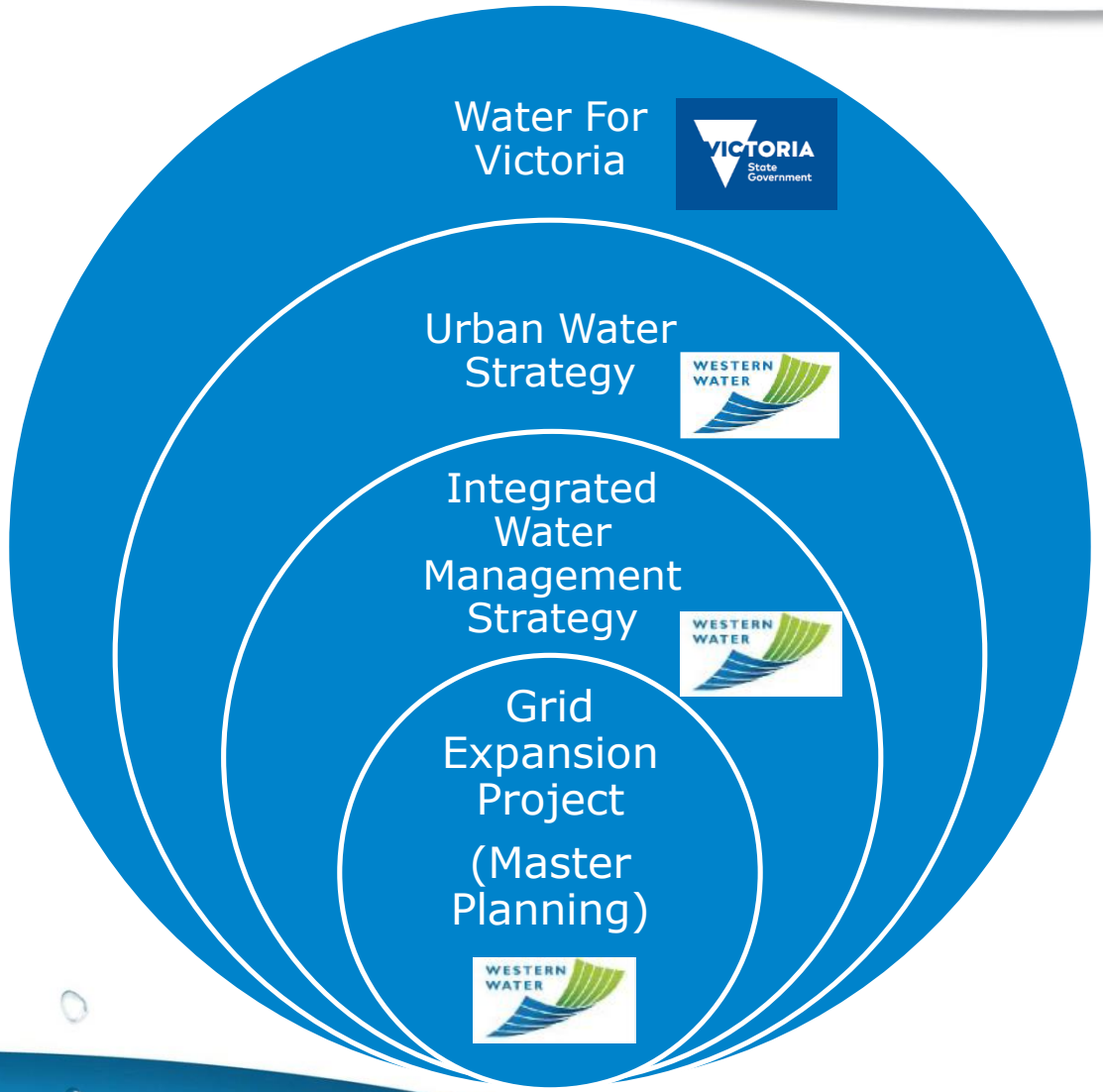
The millennium drought placed a significant strain on supplies, requiring:

- bulk supply from Melbourne Water,
- development of recycled water plants and a non-potable transfer network,
- investment in a more inter-connected potable water transfer network.

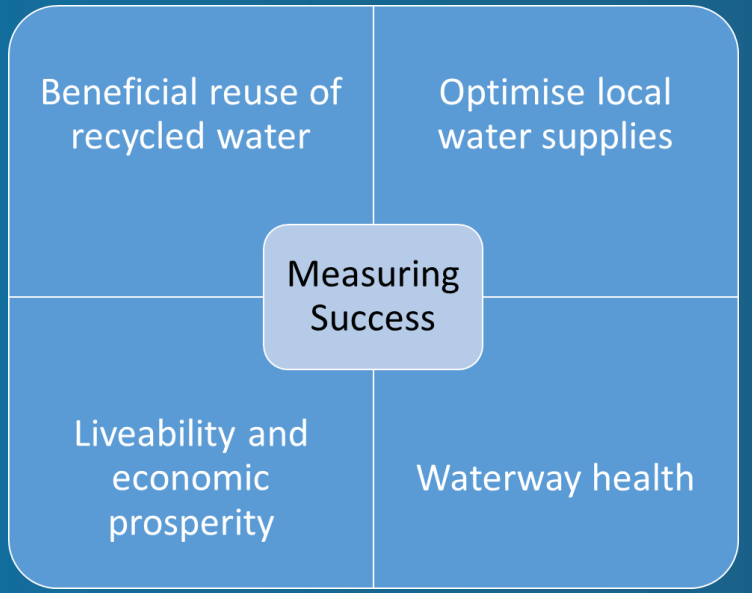
Future Impact of Climate Change

Predicted Climate Change Impacts	Potential Climate Change Risks
Reduced winter stream flows	Insufficient water supply and reduced quality
Increasing average and minimum temperatures	A major bushfire in critical water supply catchments
More frequent and intense droughts	Frequent and extended disruption to electricity and telemetry systems
Increased risk of bushfires	Decreased waterway and aquatic ecosystem health
More frequent and intense heatwaves	Impacts on the safety and wellbeing of staff
More intense rain events	Increased asset deterioration

An Integrated Response - Connectivity



Integrated Water Management

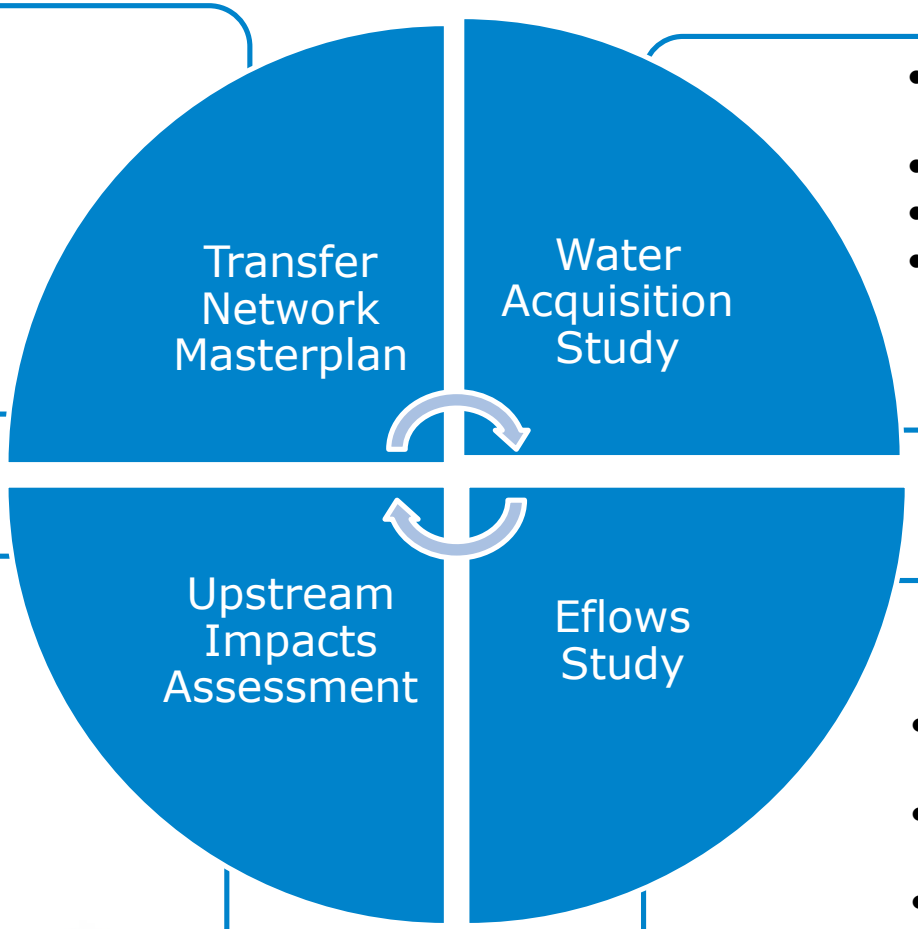


"Water is fundamental to our communities. We will manage water to support a healthy environment, a prosperous economy and thriving communities, now and into the future."

Water for Victoria

Water Grid Expansion Project

- Master Planning District wide and sub-regional
- Interconnected & resilient bulk transfer network
- Integrated water management
- Adaptive Planning

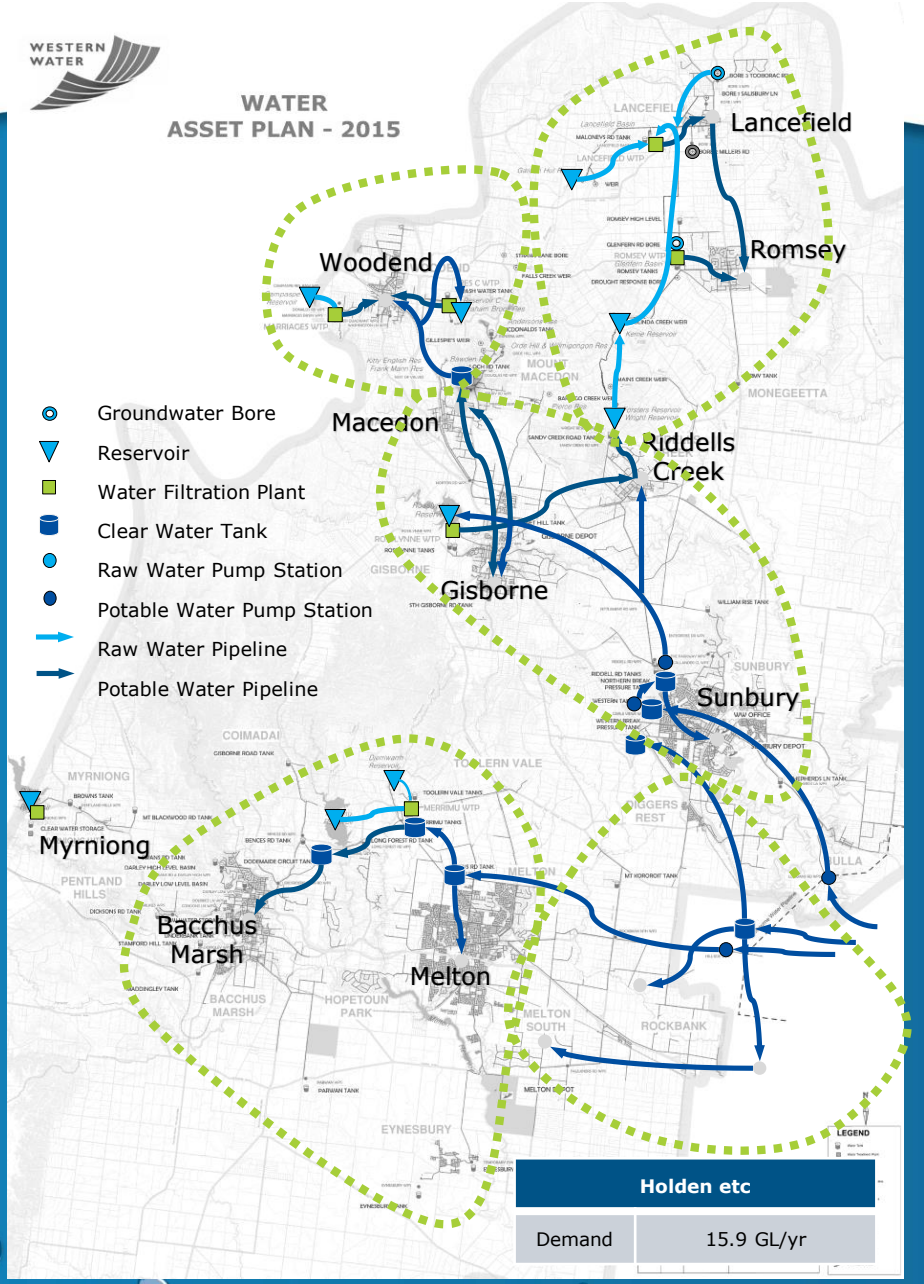


- Water from inside or outside the region
- Recycled water
- Stormwater harvesting
- Consider total cost

- Impacts on other users
- Basis for negotiations

- Return flows to the environment
- Regulate flows improve waterway health
- improve waterway health
- Assess benefits vrs costs

Supply/Demand Balancing



Woodend		
Demand	1.0 GL/yr	
Local Resource	0.8 GL/yr	(0.2 GL/yr)
Supply Limits	0.8 GL/yr	(0.2 GL/yr)

Lancefield & Romsey		
Demand	1.1 GL/yr	
Local Resource	1.1 GL/yr	(0 GL/yr)
Supply Limits	0.7 GL/yr	(0.4 GL/yr)

Rosslynne		
Demand	12.4 GL/yr	
Local Resource	2.9 GL/yr	(9.5 GL/yr)
Supply Limits	11.3 GL/yr	(1.1 GL/yr)

Merrimu		
Demand	18.9 GL/yr	
Local Resource	5.1 GL/yr	(13.8 GL/yr)
Supply Limits	16.2 GL/yr	(2.7 GL/yr)

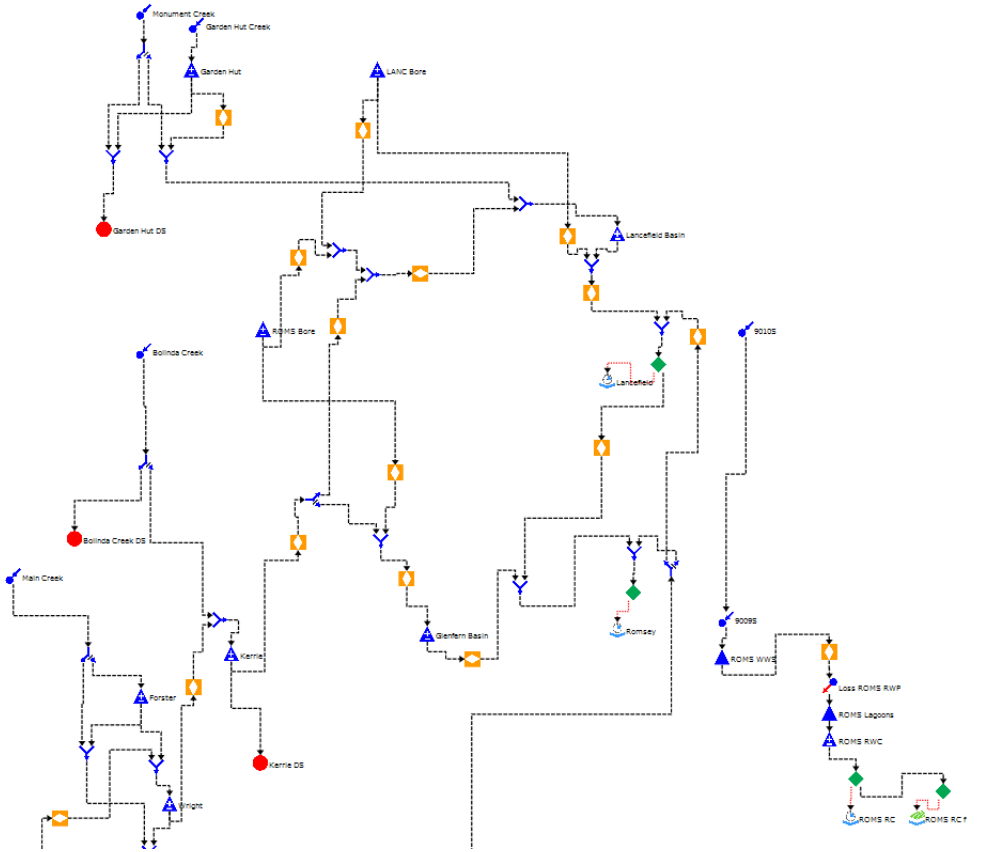
TOTAL (excl. Holden)		
Demand	33.4 GL/yr	
Local Resource	9.9 GL/yr	(23.5 GL/yr)
Supply Limits	29 GL/yr	(4.4 GL/yr)

Holden etc	
Demand	15.9 GL/yr

Existing Asset Capacity & 2067 Demand

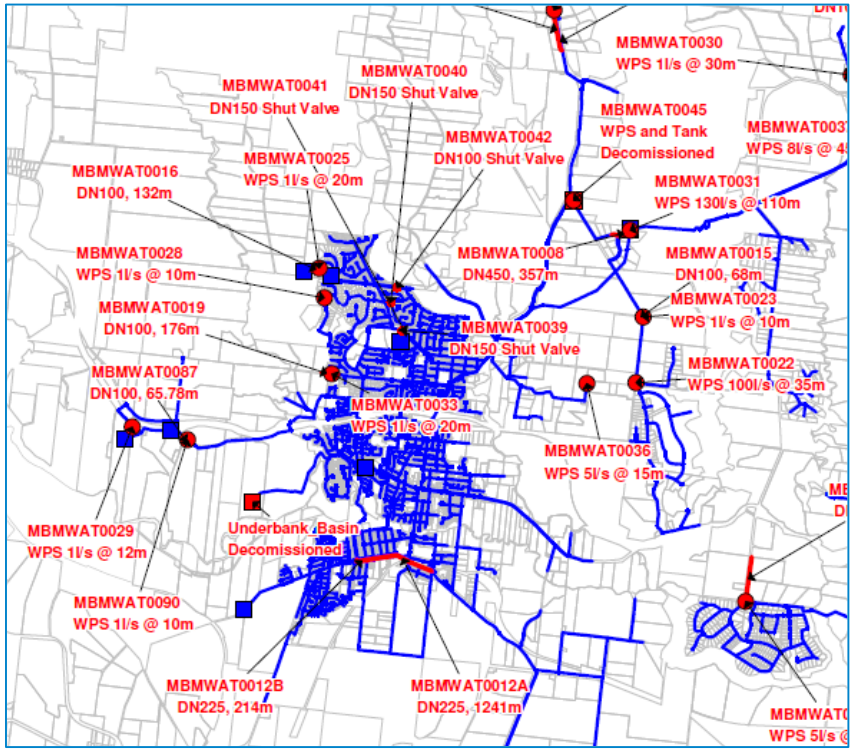
SOURCE Mass Balance Modelling

- Review supply vrs demand balance across a range of scenarios
- Considers a variety of water sources – local and imported
- Up to 50 year runs with different climate cycles
- Determine bulk transfer requirements

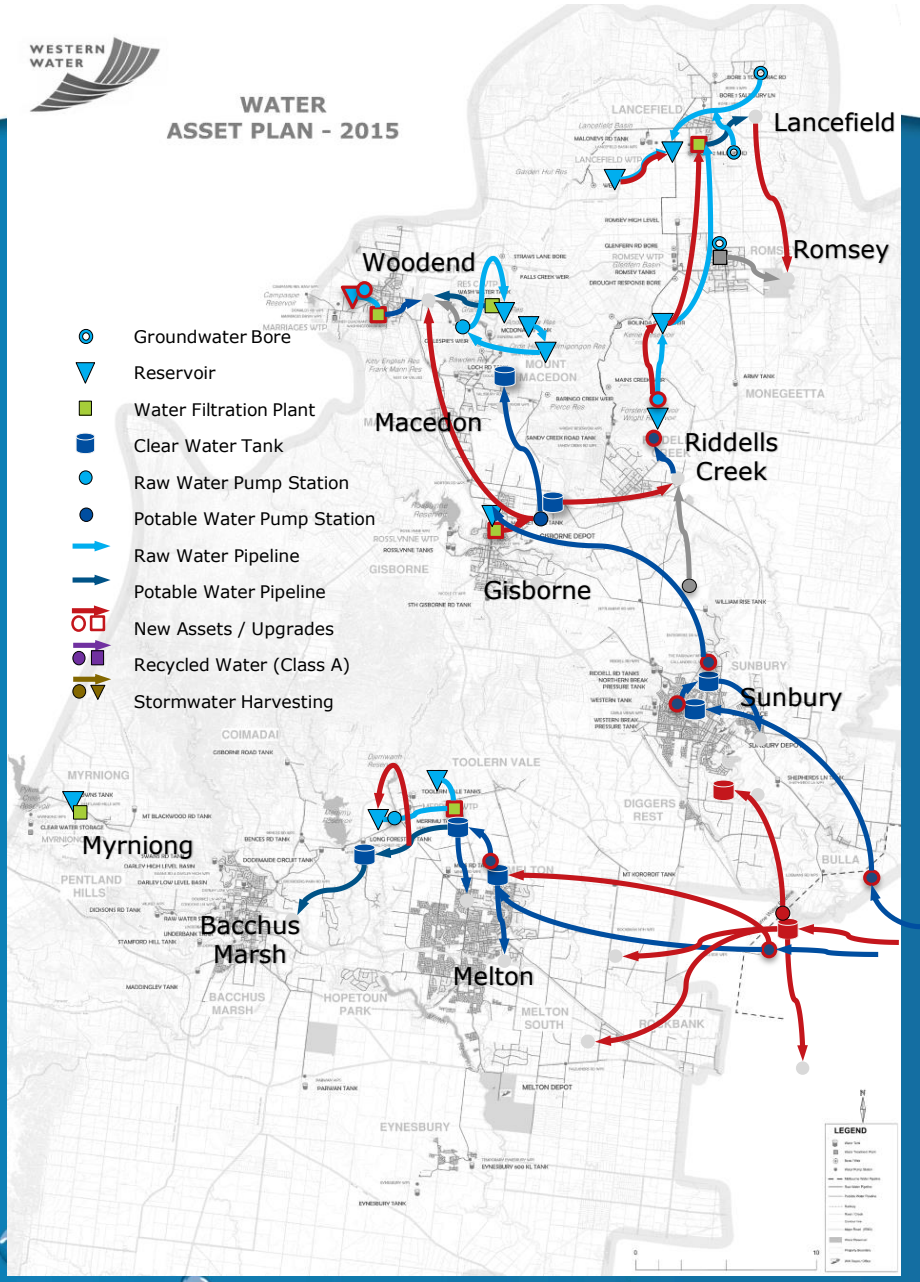


InfoWorks WS Pro modelling

- Determine system upgrades – trunk system and localised upgrades
- 24hrs-7 days runs
- Consider operational requirements
- Bulk transfers and meeting local demands
- Establish supply and pressure zones
- Staging for investment



Option Development



Lancefield Romsey

- Centralised Lancefield WFP
- Transfer system upgrade

Woodend

- Campaspe upgrade
- Macedon-Woodend transfer upgrade

Rosslynne

- Transfer to Rosslynne via Loemans WPS
- Rosslynne WFP -> Gisborne, Macedon & Riddells Creek
- Loemans WPS -> Sunbury

Merrimu

- Transfer to Merrimu via Hillside WPS
- Merrimu WFP -> Bacchus Marsh
- Hillside WPS -> Melton
- Holden Tank -> Melton growth areas

Optioneering and Optimisation Process

First Assessment Filter

- Identify long-list of sub-regional options
- Develop MCA criteria, sub-criteria & weighting
- Eliminate non-feasible sub-regional options; Trivial Options are "parked"
- Generate system wide options
- Populate MCA

Second Assessment Filter

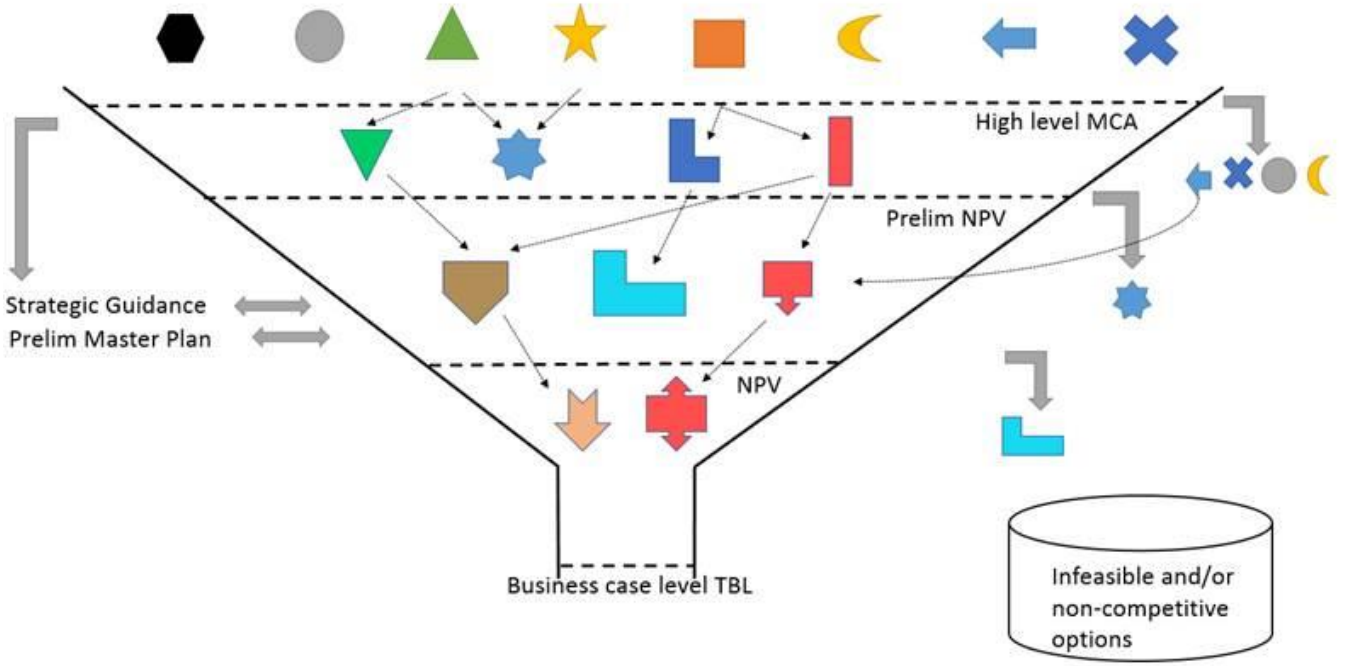
- Shortlist Options
- Develop shortlisted options

Third Assessment Filter

- Test sensitivity of options
- Recombine Trivial Options
- Cost/benefit and detail shortlist

Fourth Assessment Filter

- Preferred Option

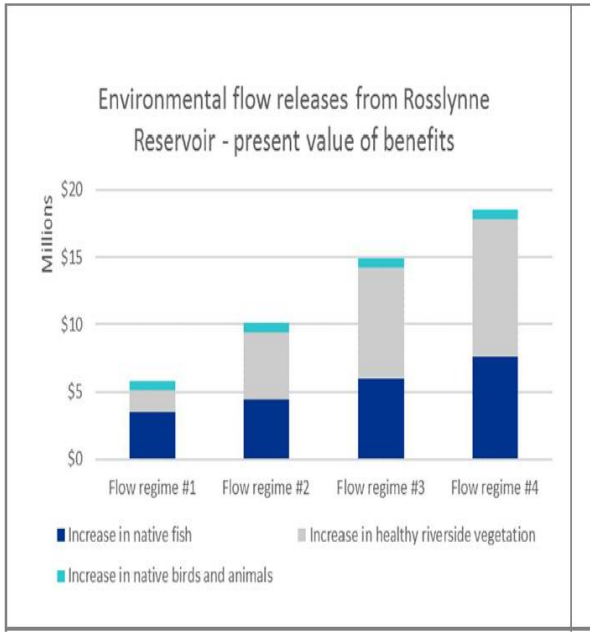


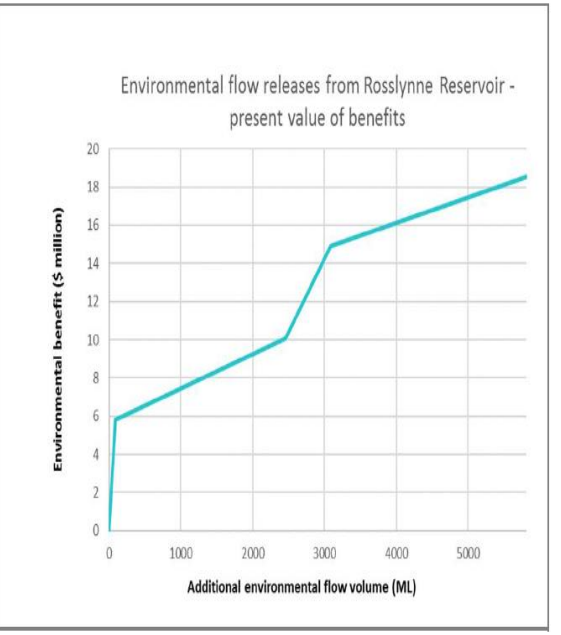
Ranking of Options

				Cost/risk		Enviro		Customer		Stakeholder		capex		community perception		regulatory barriers		
Option	**Description**	**Weighted score**	**Default ranking**	**Sensitivity 1 Score / Rank**		**Sensitivity 2 Score / Rank**		**Sensitivity 3 Score / Rank**		**Sensitivity 4 Score / Rank**		**Sensitivity 5 Score / Rank**		**Sensitivity 6 Score / Rank**		**Sensitivity 7 Score / Rank**		**Sum score**
Option S0	Base Options combined UWS aligned	0.00	5	0.00	3	0.00	5	0.00	5	0.00	5	0.00	5	0.00	4	0.00	5	37
Option S1	Base options combined with Class A (M3, plus Class A for Bacchus Marsh, Sunbury)	0.04	3	-0.23	4	0.06	3	0.13	3	0.13	2	0.08	3	-0.02	5	0.05	4	27
Option S2	Localised stormwater (M1, R1) combined with R4, W0, L1, E5, E16b	0.13	2	0.02	2	0.18	2	0.17	2	0.12	3	0.14	2	0.13	2	0.16	2	17
Option S3	All IWM options Stormwater (M1, M2, R1, R6) in combination with Class A (M3, plus Class A for Bacchus Marsh, Sunbury) and with W0, L1, E16b, E5a	0.35	1	-0.34	6	0.57	1	0.58	1	0.42	1	0.45	1	0.28	1	0.44	1	13
Option S4	Drastic changes to regional transfers: L2, R2 W1 and M6, E17	0.04	4	0.03	1	0.03	4	0.06	4	0.04	4	0.06	4	0.04	3	0.05	3	27
Option S5	Coliban to Western pipeline : M7, R3, W2, L5, E5a (ranked well in acquisition study)	-0.13	6	-0.27	5	-0.10	6	-0.09	6	-0.11	6	-0.08	6	-0.13	6	-0.13	6	47

Eflows

- The Eflows study demonstrated that economic opportunities exist that produce waterway health improvements and provide synergies with planned investment in the transfer network





- However the majority of the tangible benefits would be realised outside of the WW region.

Water Acquisition Study

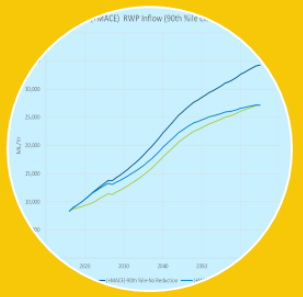
- A high-level assessment of major supply options that could meet the identified major water shortfalls to the regions supplied by WW.
- Sixteen options supplied with water from various supply sources were identified for high level assessment.
- This project demonstrated that the Melbourne system is the preferred option to supply additional water to WW in the immediate future, primarily due to
  - the existing connections & committed projects
  - time constraints associated with alternative arrangements

Parallel Project - Western Irrigation Network (WIN)

- Existing discharge licenses from Western Water's recycled water plants at Melton and Sunbury will either expire or be exceeded over time, therefore ***a solution for recycled water disposal is required***.
- ***A lack of reliable water supply is constraining agriculture*** to the West of Melbourne and a secure and reliable alternative water supply through an irrigation network will allow existing farmers to improve the yield from crops currently grown, and eventually switch into crops that are suited to irrigation.

Benefits of WIN – The Business Case

Minimised pressure on customer wastewater tariffs



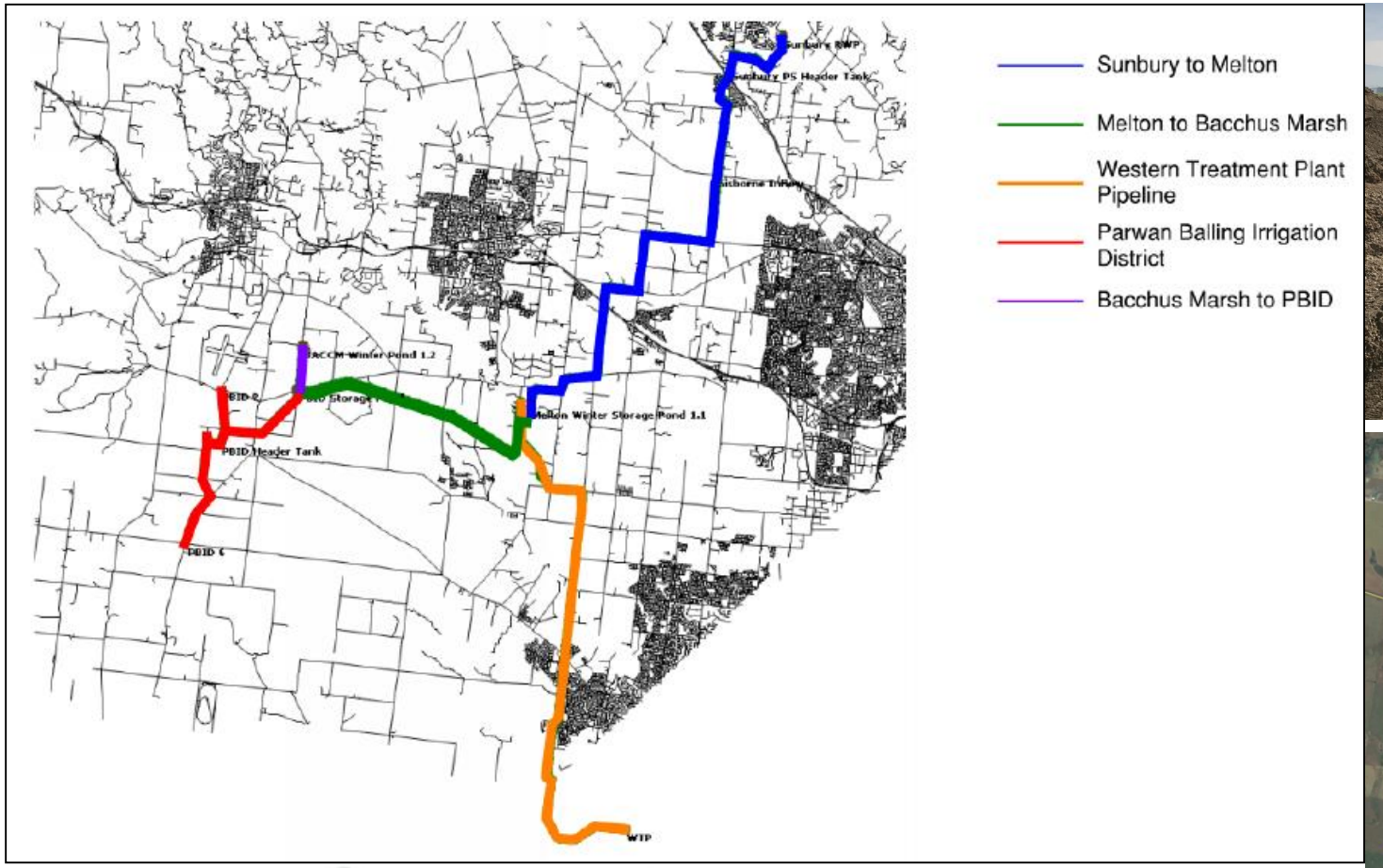
Western Water's reputation protected

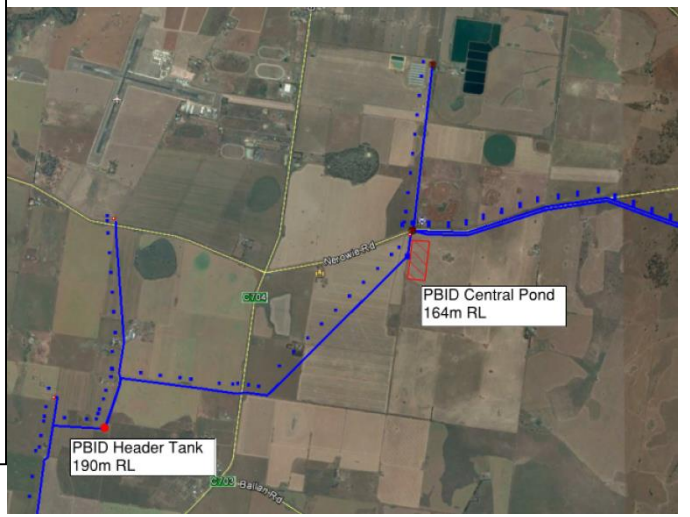
Fit for purpose irrigation supply to agricultural land in Parwan Balliang

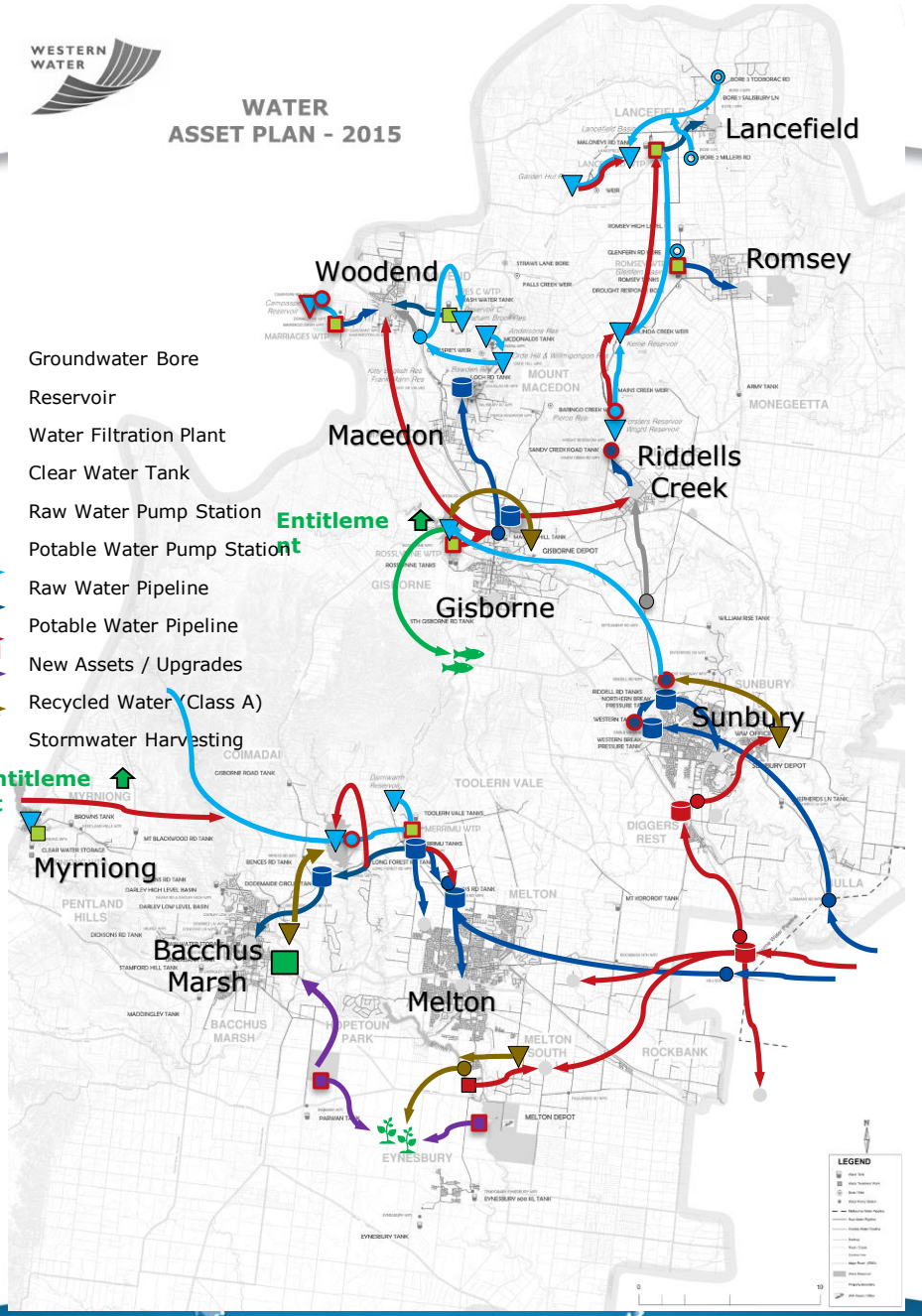
Least-cost, EPAV compliant, lowest risk means of managing RW

- Improved yield of existing crops
- Switch to higher value, more water intensive crops
- Economically beneficial use
- Better resilience to economic volatility & climate change
- Greater use of transport & supply chain infrastructure, & local labour force

Western Irrigation Network - Recycled Water







In Summary – we are investigating:

- Expansion of the Water Grid
- Investment in a more inter-connected and resilient potable water transfer network
- Sub-regional water master plans
- Water acquisition from outside the region
- Stormwater harvesting
- Treated Wastewater re-use for irrigating agricultural land and non-potable supply to domestic and commercial customers
- Returning “Eflows” to the environment to improve waterway health

Conclusion

The Grid Expansion Project and WIN are giving Western Water confidence to plan the significant investment in 3 waters infrastructure required to meet the combined challenges of growth and climate change.


WESTERN
WATER
DISCUSSION