Long Term Plan for Kangaroo Island

Stakeholder Reference Group Meeting 6

19 April 2018

Government of South Australia

SA Water

Agenda

10 min
Aaron

Acknowledgement of Country

Welcome and Apologies

Minutes of the previous meeting and Action Items

Ranking of options

Update on Next Steps

Other Business

Acknowledgement of Country

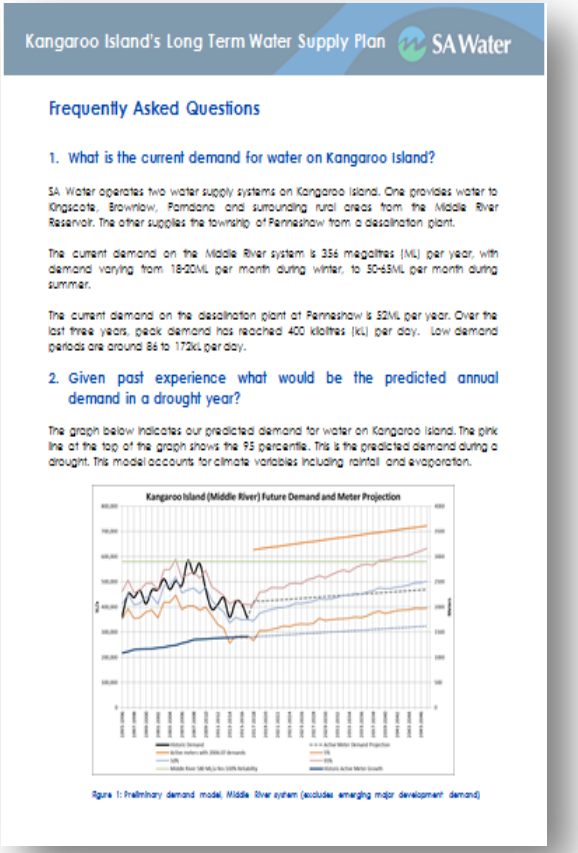
We acknowledge and respect the traditional custodians of the land on which we meet.

We appreciate and thank them for their care of this land.

Welcome and Apologies

Welcome everyone!

Apologies received, delegates and information to be shared.



Kangaroo Island's Long Term Water Supply Plan SA Water

Frequently Asked Questions

1. **What is the current demand for water on Kangaroo Island?**

SA Water operates two water supply systems on Kangaroo Island. One provides water to Kingscote, Brownlow, Parndana and surrounding rural areas from the Middle River Reservoir. The other supplies the township of Penneshaw from a desalination plant.

The current demand on the Middle River system is 356 megalitres (ML) per year, with demand varying from 18-20ML per month during winter, to 50-65ML per month during summer.

The current demand on the desalination plant at Penneshaw is 52ML per year. Over the last three years, peak demand has reached 400 kilolitres (kL) per day. Low demand periods are around 86 to 172kL per day.

2. **Given past experience what would be the predicted annual demand in a drought year?**

The graph below indicates our predicted demand for water on Kangaroo Island. The pink line at the top of the graph shows the 95 percentile. This is the predicted demand during a drought. This model accounts for climate variables including rainfall and evaporation.

Kangaroo Island (Middle River) Future Demand and Meter Projection

Figure 1: Preliminary demand model, Middle River system (excludes emerging major development demand)

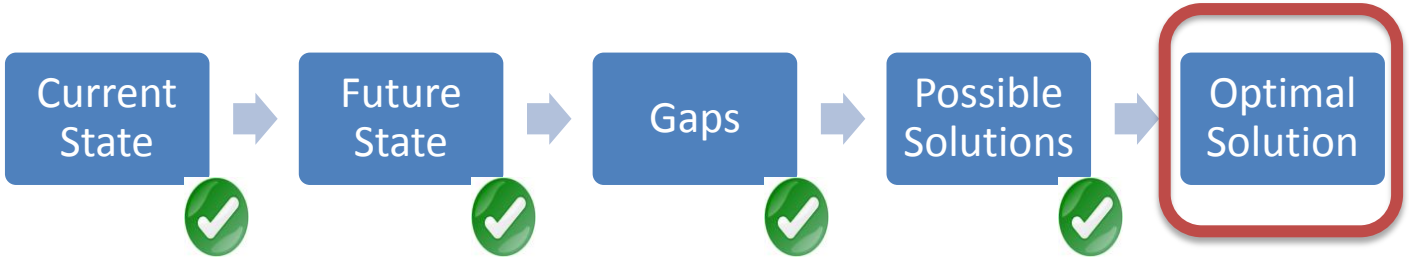
Minutes and Action Items

Minutes of last meeting tabled.

Review of action items.

Recap: purpose of today's meeting

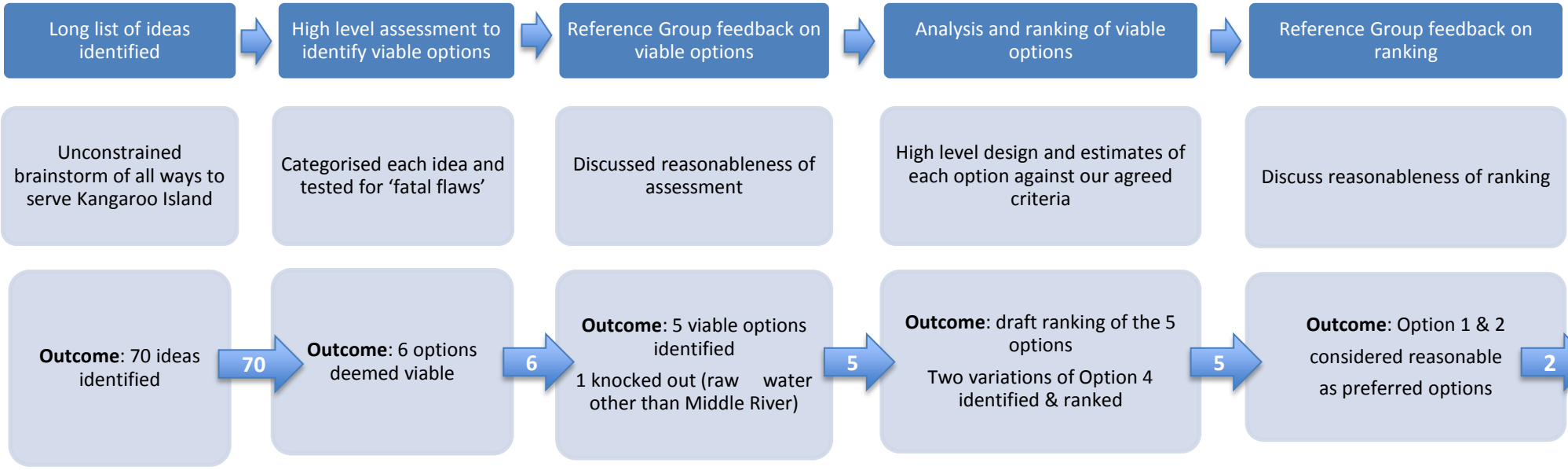
5 min
Erin



Since last meeting we've been busy analysing each of our 5 shortlisted options to ensure water security over the long term for Kangaroo Island.

Today we want your feedback on how we've assessed and ranked these options against the criteria we agreed at meeting # 4 in February.

From 70 ideas to 2 preferred options



Viable options

1. Expand Penneshaw to serve the whole Island
2. New source – desalination to meet all Middle River demand
3. New source – desalination to supplement existing Middle River supply
4. New raw water storage – Middle River
   - 4a) Upgrade Middle River reservoir
   - 4b) New storage near Water Treatment Plant
5. New storage – treated water covered lined storage

High-level outline of viable options

1. Expand Penneshaw to serve the whole Island:

Construct:

- A 4 mega-litre a day (MLD) sea water desalination plant near Penneshaw desalination plant
- A 2 km transfer pipe to Penneshaw covered lined storage (CLS)
- A 26km pipeline from CLS to booster pump station & a 22km pipeline from booster pump station to the airport corner
- A booster pump station to Kohinoor & a pump station at Kohinoor
- A 1ML storage at Kohinoor

Upgrade/ decommission:

- Upgrade the Penneshaw storage & the Kingscote tanks (4.5 ML + 2 x 9 ML)
- Decommission Middle River dam & Middle River water treatment plant (MR WTP)

High-level outline of viable options

2. New source – desalination to meet all Middle River demand

Construct:

- A 4 MLD sea water desalination plant near Kingscote
- A 16 KM transfer main to Kingscote tanks
- A pump Station at Kingscote tanks & a pump station at Kohinoor
- A booster Pump Station feed to Kohinoor
- A 1ML storage at Kohinoor

Upgrade/ decommission:

- Upgrade Kingscote tanks (4.5 ML + 2 x 9 ML)
- Decommission Middle River dam & Middle River water treatment plant

High-level outline of viable options

3. New source – desalination to supplement existing Middle River supply

Construct:

- A 1 MLD desalination near Kingscote
- A 16 KM transfer main to Kingscote tanks
- A pump Station at Kingscote tanks

Install:

- Chemical storages (10 kL) with receiving area and transfer pumping
- Granulated activated Carbon (GAC)
- Chlorination at Kohinoor & a 1ML storage at Kohinoor

Upgrades:

- Middle River water treatment plant renewals to maintain it's asset life & operational capacity
- Upgrade the Middle River Dam wall to maintain current capacity

High-level outline of viable options

4a. New raw water storage – upgrade Middle River reservoir

Upgrade:

- The Middle River dam to ~ 925 ML
- Upgrade / relocate raw water pump station duty/standby
- Upgrade Middle River water treatment plant capacity to 4 MLD
- Middle River water treatment plant chlorine dosing & UV upgrade

Construct/ install:

- A 4.1ML treated water storage
- A new ~15km main from Middle River water treatment plant to Parndana, a ~13km main from Parndana to Kohinoor & a ~24km main from Kohinoor to Kingscote
- Side stream Brackish Water Desalination plant
- A 450 m x 450m evaporation lagoon
- A 1ML storage at Kohinoor
- Install Granulated activated Carbon

High-level outline of viable options

4b. New raw water storage – new storage near Water Treatment Plant

Similar to 4a plus -

- Construct a new 300 ML covered lined storage within current catchment
- Additional pumping at Middle River dam wall
- Raw water pumping station duty/ standby at raw water storage
- Pumping at treatment area

High-level outline of viable options

5. New storage – treated water covered lined storage

Install:

- 2 new 125 ML earthen storage lagoons with floating covers and mixers
- Granulated activated Carbon (GAC)
- Distribution pumps (where necessary) & recycling pumps

Upgrade:

- Chlorination at Middle River water treatment plant
- Middle River Dam wall to maintain current capacity & renew Middle River water treatment plant to maintain it's asset life and operational capacity

Draft ranking of options

40 min
Tara

We've collected data for each option and used it to *score* each option against the criteria.

Our decision support tool then uses this scoring to *rank* the options and recommend one.

We ran two scenarios through the tool to us test how 'sensitive' the recommended option is:

- Do you have to change a lot to change the recommendation?
- Or if you change just one score does it change the recommendation?

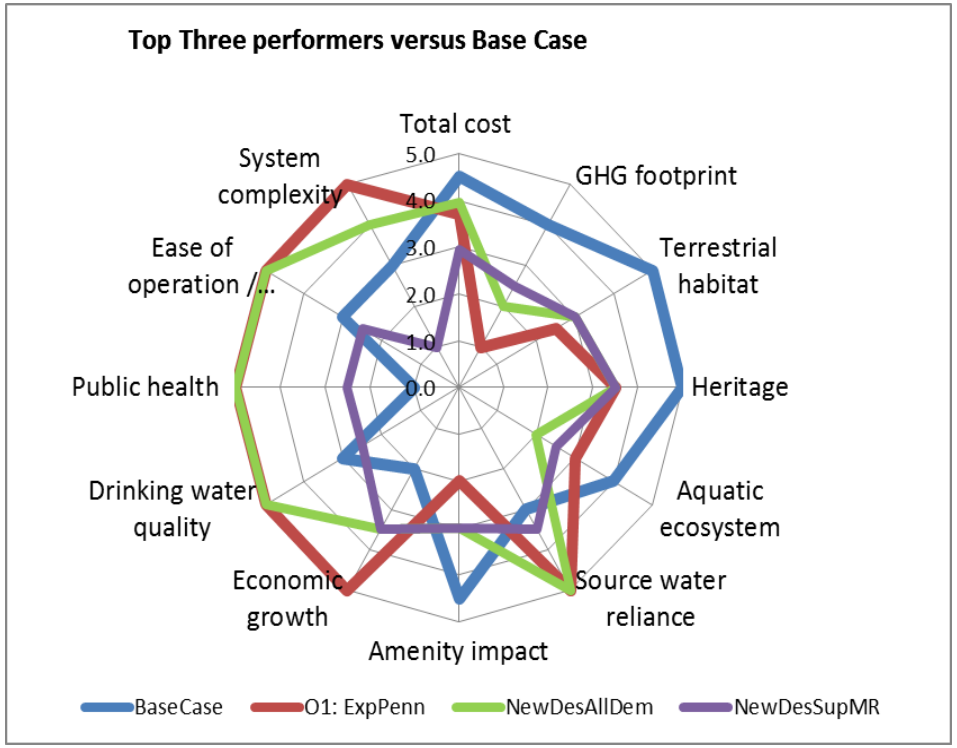
This helps to understand how 'risky' our assumptions and estimates are, and how adaptive our plans need to remain.

Draft ranking of options

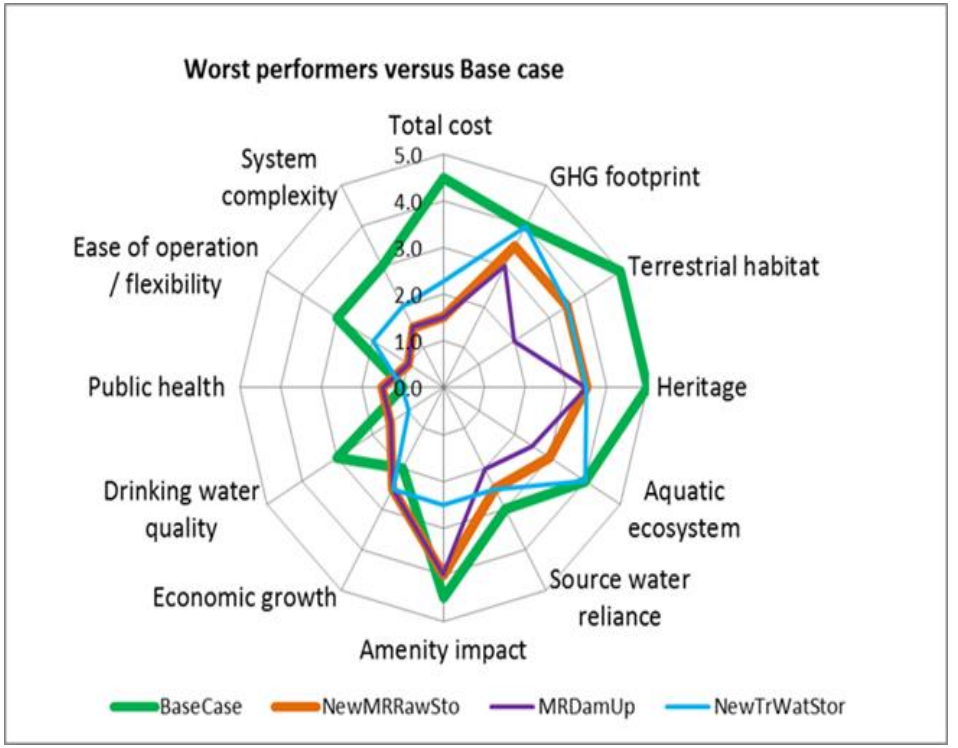
Lets look at the draft ranking results.

Discussion: does this ranking seem fair and reasonable?

Draft ranking

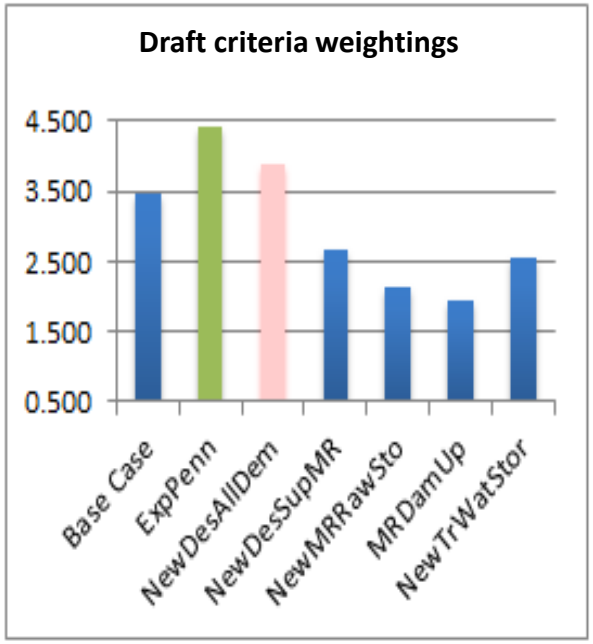


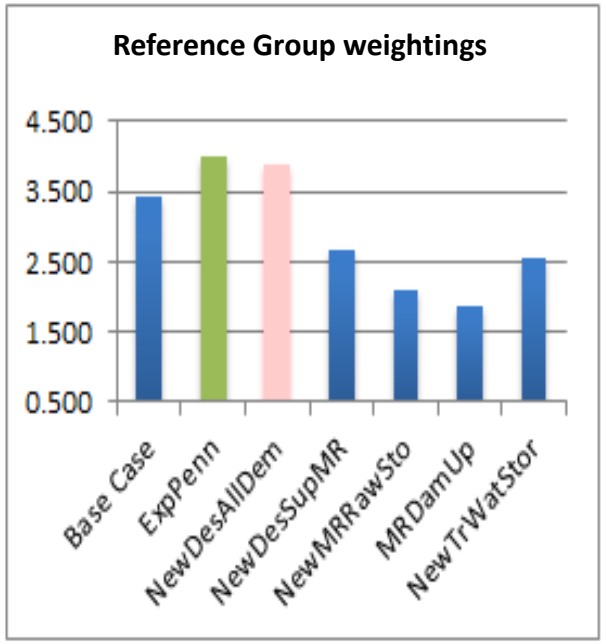
Desalination options

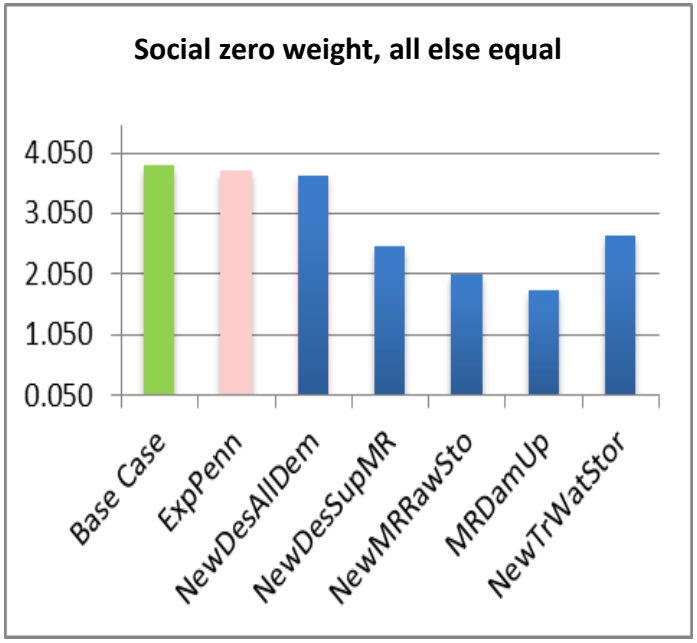


Storage options

Draft ranking - scenario testing







- Base case is the preferred option when no consideration to social aspects is given (economic growth, customer acceptability)
- New desalination (option 2) looks more favourable when the technical consideration are removed
- New Treated water storage is more preferable compared with desalination to supplement Middle River when cost is not a limiting factor, or when the social aspects are ignored

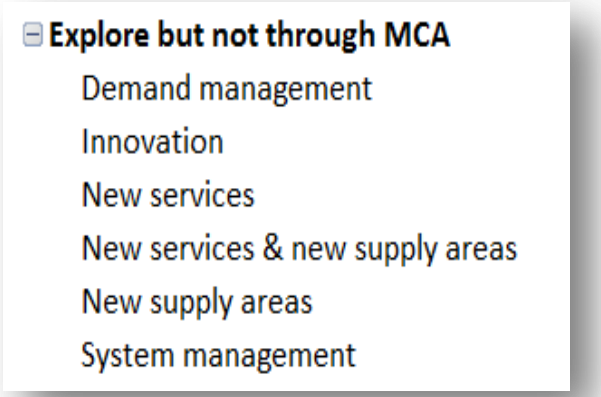
Update on ‘explore but not through MCA’ ideas

10 min
Erin

Together we identified a number of opportunities to work differently with various stakeholders and communities.

These are being explored in parallel to our water security options process.

Our Long Term Plan document will summarise our commitments and actions relating to these items as well.



Next Steps – community consultation

10 min
Aaron

Meeting 1-3

- What matters to you and the communities you represent
- Confirm objectives and planning assumptions e.g. growth, climate change

Meeting 4

- Understanding the Multi Criteria Analysis approach
- Criteria and weightings for evaluating options

Meeting 5 – 15th March

- Feedback on possible (shortlisted) options

Meeting 6 – 19th April

- Ranking of options and sensitivity analysis to arrive at optimal solution

New optional meeting 7 – 8th May

- Feedback on the draft Long Term Plan before wider community consultation

Ongoing - conduit for information to and from the communities you represent

Other Business

Any other business?

Our eternal thanks for your insights, dedication and for working together with us!

Thank you.

Reference Slides if required

Reference Group Criteria and Weightings

TBL category	%	Main criteria	%	Sub criteria	
Social	25%	Security of supply	40	Peak system demands	50
				Source water accessibility	50
		Customer and community acceptability of options	40	Impact on amenity	10%
				Impact on access to energy	30%
				Economic growth, security & new customers	40%
				Acceptability of **drinking water** taste and odour	20%
		Safety customer- community	20	Public health	100
Economic	25	Cost	100	Total cost to utility	100
Technical	25	Operational complexity	50	Ease of operation and flexibility	100
		Complexity	50	System complexity	100
Environment	25	GHG emissions	15%	GHG footprint	100
		Terrestrial ecosystem	70%	Significant vegetation and fauna	50
				Inland and marine	50
		Heritage	15%	Significant heritage	100