

Targeted Engagement Session: Macquarie-Castlereagh Regional Water Strategy

The Department of Planning and Environment convened a targeted engagement session on the Macquarie-Castlereagh Regional Water Strategy in Dubbo on 8 November 2022. The session was during the public exhibition period for the Strategy and provided the department with an opportunity to hear diverse perspectives ahead of its finalisation.

The session was run by an independent facilitator and attended by representatives of the following groups:

- Tubba-Gah Maing Wiradjuri Aboriginal Corporation
- NSW Nature Conservation Council
- Macquarie River Food and Fibre
- Bathurst Regional Council
- Bogan Shire Council
- Cabonne Shire Council
- Cobar Shire Council/ Cobar Water Board
- Central Tablelands Water
- Dubbo Regional Council
- Gilgandra Shire Council
- Mid-Western Regional Council
- Oberon Council
- Orange City Council
- Warren Shire Council
- Warrumbungle Shire Council
- Narromine Shire Council
- Department of Regional NSW – Central West
- NSW Department of Planning and Environment – Water

Apologies:

- Central NSW Joint Organisation
- NSW Farmers Association
- Coonamble Shire Council
- Murray Lower Darling Rivers Indigenous Nations (MLDRIN)
- DPE - Environment and Heritage
- Murray-Darling Basin Authority
- NSW Minerals Council
- Inland Rivers Network
- National Water Grid Authority
- Commonwealth Environmental Water Office
- Macquarie Marshes Environmental Landholders Association
- Northern Basin Aboriginal Nations
- Ngemba, Ngiyampaa, Wangaaypuwan and Wayilwan Applicant Group
- NSW Aboriginal Land Council

About the session

The objective of the engagement session was to discuss shortlisted actions in the Macquarie-Castlereagh Regional Water Strategy – Consultation Paper.

The session focused on three themes:

- Water security for regional cities, towns and villages
- Economic, environmental and community resilience
- Meeting diverse water needs in the region's west

A summary of the main discussion points is given below.

The slides presented during the session are available at Attachment A.

Theme 1: Water security for regional cities, towns and villages

The department presented details on challenges for town water supply security in the region, which include:

- immediate and long-term water security risks for the large and growing regional cities of Orange, Bathurst and Dubbo
- groundwater declines during drought which impact access certainty
- ongoing water quality concerns for Oberon.

The group discussed the shortlisted actions aimed to address these challenges.

Invest in innovative water supply options (Action 1.5)

Points raised by participants

- This action was supported across the board as a priority action to progress.
- Stormwater harvesting and recycled water are considered an important long-term option for water security in the region. It was recognised that this requires significant cultural change and community acceptance.
- Participants suggested that recycled water should first be used to supply industry needs, before being considered for town water supply and that demonstration plants are needed to communicate and showcase purified recycled water.
- Participants suggested that the Strategy could include a greater focus on groundwater, and that a more detailed discussion on groundwater issues in the Macquarie Valley is needed as part of the implementation of the NSW Groundwater Strategy.
- Participants supported the actions of greater investments into groundwater modelling and a review of groundwater extraction levels.
- There was support for all water users having a multi-source supply including groundwater to increase reliability, however it was mentioned that water sharing plans didn't allow groundwater to be carried over between years and hence wouldn't provide adequate reliability for businesses and towns during drought.

Develop guidelines for managing extreme events in the upper Macquarie (Action 1.3)

Points raised by participants

- Participants suggested that clearer triggers and targets, and definitions around critical human needs and environmental needs are needed in order to implement this action.
- A suggestion was made to change legislation so critical human needs are the primary consideration.
- The difficulty managing environmental flows from a council operated dam was raised. In this situation water users can take water between the release point and the gauging station. An additional gauging station and consideration of active management to protect environmental water flows between the council owned dam and town water supply offtake was suggested.

Plan for the best long-term water security solution for the upper Macquarie (Action 1.6)

Points raised by participants

- Participants noted that there is a need to better understand the impacts of these options before decisions can be made, particularly if there is a possibility of the option impacting property rights or water availability for downstream users and communities.
- Participants questioned if Lake Rowlands had enough yield to support towns in the Upper Macquarie region.
- There was concern expressed about a sub-action under Action 1.6 Increasing the volume of water Orange can access each year from the Wambuul/Macquarie River.

Theme 2: Economic, environmental and community resilience

The department presented details on why supporting future diversification could build regional resilience to increasing climate variability and extreme weather events.

- Agriculture, mining, transport, tourism and manufacturing drive the regional economy and will continue to underpin the regional economy
- Industry expansion is already constrained by water availability
- Less reliable surface water could impact the regional economy
- There is a risk of consecutive years of no/low water availability for general security entitlement in a drier future
- High quality groundwater sources are full committed and highly used
- Need to continue to support healthy rivers in the face of future climate extremes
- Water can be used in a way that supports multiple outcomes

Addressing barriers to Aboriginal water rights

Points raised by participants

- Suggestions were made that young Aboriginal people could be involved in monitoring programs.
- One participant gave an example of an Aboriginal business initiative (Jinchilla Gardens) which offers cultural burns and walks, revegetation, tours and seed collection for sale.

Maintaining and improving the health and resilience of the region's aquatic and floodplain ecosystems

Points raised by participants

- One participant raised the concern that the water is running too fast and there was a need to re-s snag and revegetate the rivers. The pace of the current is causing erosion and other problems. Slowing the water would be good for fish and platypus.
- Aquatic animals are totems for Aboriginal people. Supporting habitats to keep them alive, and vegetation programs are needed to support Aboriginal cultural needs.

Improve public access to climate information and water availability forecasts (Action 3.2)

The department presented information on this shortlisted action. Participants were asked what information they needed to make business decisions and to assist with adaptation to a changing climate.

Points raised by participants

Participants had a variety of views, which included:

- Access to modelling and climate change projections that stakeholders can adapt and use for their local area for better local water management.
- There needs to be a single data set on nearer term climate projections that all parts of the community and different levels of government should use for water planning purposes.
- Real time data on stream flows that shows accurate information without lag time would be helpful in decision making for businesses.
- Additional gauging station in Warren area.

Modernise the water management framework so it can continue to support sustainable economic diversification (Action 3.8)

Points raised by participants

The group made the following comments.

- Efficiency incentives could be used for industry and council to reduce demand.

- Concerns were raised that larger businesses could compete for surface and groundwater with existing water needs.

Meeting diverse water needs in the region's west

The department presented details on the probability of the lowest 3-year inflows into Burrendong Dam under a long-term climate scenario and a long-term worst-case climate change scenario and proposed objectives:

- efficiently deliver water to high priority needs
- reduce town water security risks
- build industry and economic drought resilience
- not significantly reduce flows into the Macquarie Marshes.

Additional off-river storage at Nyngan (Action 2.1)

Points raised by participants

- Off-river storage was viewed as an effective solution to delivering water to the regions west.
- There was discussion about the implementation of this option which included:
 - The optimum location – stakeholders suggested that an off-river storage at Warren or Peak Hill could be alternative locations.
 - The storage should be large enough to support 2 years-worth of water needs for Nyngan and Cobar including mines.
 - Concerns were raised about the existing off-river storage at Nyngan leaking and the need for future government investments to be implemented well.

Create water savings through changed operation of regulated effluent creeks (Action 2.2)

Points raised by participants

- It was viewed that landholders on effluent creeks would strongly oppose a permanent cut-off and piping of the effluent creeks, even though this is not the intent of the option.
- Stakeholders wanted more information of what operational changes during dry times the action was proposing before deciding on this action and how efficiency savings would be used in drought
- Suggestions were made that this action would need to be facilitated through changes in the water sharing plan and an allocation change in Windamere Dam

Use of some Burrendong flood mitigation airspace for regulated water supply (Sub-action of Action 2.3)

Points raised by participants

- Using the flood mitigation zone was largely supported by stakeholders in the room and viewed as a cost-effective option that would be quicker to implement than other major infrastructure options. However, there was a level of frustration/confusion with why engineering studies and risk assessment of dam would take so long as dam has already been operating at this additional capacity and that Burrendong Dam being 120% over the last 2 years was evidence that this action was a good solution. The combination of increasing the full supply level in Burrendong Dam could create additional storage while changing the operation of regulated effluent creeks could improve water efficiency during dry periods. One participant queried whether the option would impact Planned Environmental Water.

Pipeline from Dubbo to Nyngan (Sub-action of Action 2.3)

Points raised by participants

- There was support for a pipeline but some different views on locations (which towns it should start and finish at)
- There was strong support for piping the Albert Priest channel to increase delivery efficiencies however there were questions around who would pay for the pipeline and concerns raised of the impact on rate increases. There were concerns about both capital and operational costs – beyond capacity of local government, would require State Government investment

Concluding remarks

In concluding discussion on all themes, participants commented that:

- Solutions that address problems through innovation and water recycling are key for the future – these also don't impact on water users
- Participants voiced their desire for actions to be implemented quickly to prepare the region for the next drought
- The action receiving most support in concluding remarks was using the Burrendong Dam flood mitigation zone to regulate water supply – this was seen as the least complex action to implement to address the challenges in the region. There was a desire for this action to progress quickly.

Attachment A: Session presentation

Macquarie-Castlereagh Regional Water Strategy

Focus Session

Visit www.menti.com and enter the code 1483 2245

Department of Planning and Environment - Water November 2022



Today's agenda



1. Welcome and introductions
2. Overview of the Macquarie-Castlereagh Regional Water Strategy
3. Theme-based discussions
4. Workshop wrap-up

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Today we want to discuss:

- Water security for regional cities, towns and villages
- Economic, environmental and community resilience
- Meeting diverse water needs in the region's west

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Common questions about proposed actions



- How could the action benefit or impact the people or group you represent?
- What are the opportunities for, or emerging issues about, this action?
- Are there any actions missing?
- Are there other actions that should be prioritised ahead of this action?

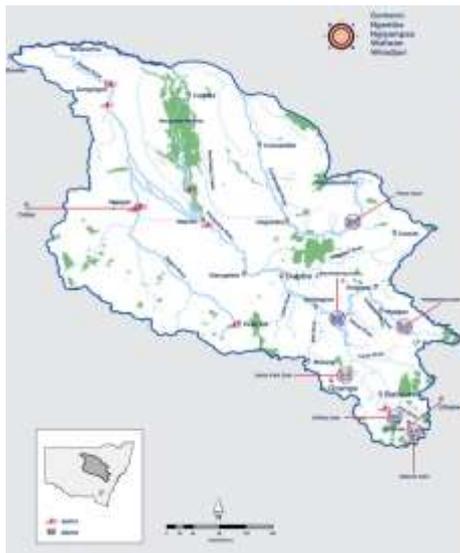
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A long-term water strategy for the Macquarie-Castlereagh region

Improving the security, reliability and quality of NSW's water resources



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Macquarie-Castlereagh Regional Water Strategy



Part of the suite of long-term water strategies that inform water planning and management

Contain priorities and actions for:

- towns and communities
- industries
- Aboriginal people
- environment

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What could the region's future climate look like?

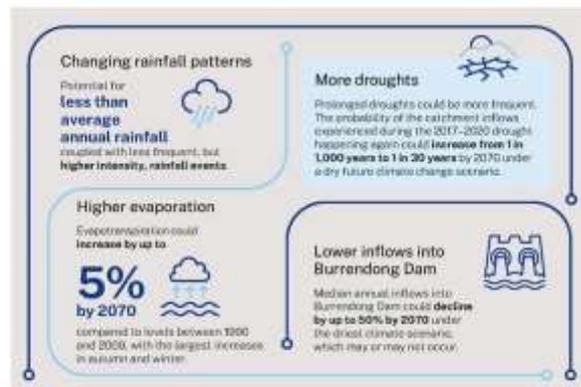


Paleo-climate data

In the last 100 years, the region has cycled between wet and dry periods.

- 1900s – 1940s: comparatively dry period
- 1950s – 1990s: comparatively wet period
- Since Millennium Drought: comparatively dry

These wet and dry cycles existed before our historical records began.



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Where should we focus first in the region?



Regional challenges to meet our vision and objectives

- Reducing water supply risks for regional cities, towns and villages
- Supplying water to high priority needs in the lower river system and connected valleys
- Supporting a growing regional economy in a future of potentially reduced water availability
- Addressing barriers to Aboriginal water rights
- Maintaining and improving the health and resilience of the region's aquatic and floodplain ecosystems

Priority 1	Priority 2	Priority 3	Priority 4
Secure water supplies for growing regional cities and towns	Reduce water security risks in the region's west	Support industry and community climate adaptation	Best use of existing water for the environment
Actions 11 – 18	Actions 21 – 24	Actions 31 – 39	Actions 41 – 48

Four strategic priorities and 29 shortlisted actions

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Theme 1.
Water security for regional cities, towns and villages

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Immediate and long-term water security risks for growing regional centres



Risk of water supply failure*

Regional city	Repeat of historic climate (1890 – 2021)	Worst case dry climate change scenario
Orange	1 in 50 years	1 in 8 years
Bathurst	1 in 60 years	1 in 16 years
Dubbo	No simulated occurrences	1 in 80 years

- Orange and Bathurst are important regional centres
- Both are expected to grow by 20-30% by 2041
- Their dams can go from full to near empty in less than 4 years

NSW Government guidelines roughly correlates to town water supplies being able to withstand a drought that has the probability of occurring 1 in 1,000 years.

Orange: Where water demands cannot be met under level 0 restrictions for Orange, which represents 60% of unrestricted demand
Bathurst: Where water demands cannot be met under level 0 restrictions for Bathurst, which represents 52% of unrestricted demand
Dubbo: Where water demands cannot be met under level 0 restrictions for Dubbo, which represents 50% of unrestricted demand

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Some towns also face water security risks



- Local water table decline during drought places water for some towns at risk.
- Oberon faces ongoing water quality challenges

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Immediate actions to support regional cities and towns



- Confirm the water security needed to support towns – move to an ‘enduring level of supply’ (Action 1.1)
- Stronger focus on water efficiency (Action 1.4)
- Innovative water supply options (Action 1.5)
 - Managed aquifer recharge
 - Stormwater harvesting
 - Recycled water
- Reduce groundwater access uncertainty for towns (Action 1.7)



These actions will

- Decrease pressure and demand on existing water sources
- Prepare us for future droughts
- Help identify the timing for future augmentations

Action 1.3. Develop guidelines for managing extreme events in the upper Macquarie



- Some dams in the region are owned and operated by local councils for town supply.
- Landholders and environmental needs rely on dam releases.
- Need greater clarity around drought operations of town water supply dams
 - Clear triggers for suspending irrigation access below town owned dams during droughts
 - Triggers and communication protocols for suspending environmental water releases



What are important considerations for development of the guidelines?

How can we balance critical human and environmental needs?

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Action 1.6. Plan for the best long-term water security solution for the upper Macquarie



- 1 Water from the Fish River or Coxs River
- 2 Water from Lachlan Valley
- 3 Additional water from the Macquarie River (Orange) (policy option)
- 4 New infrastructure in the upper Macquarie, which could include a new dam at Dixons Long Point

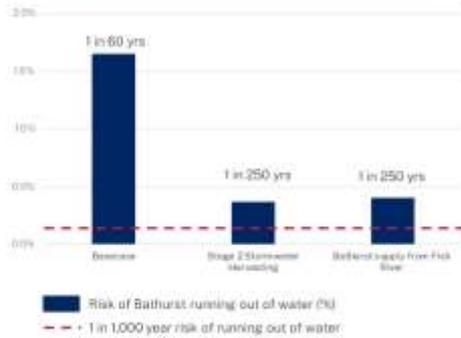
Every long-term option will be challenging - costs, impacts and risks need further investigation

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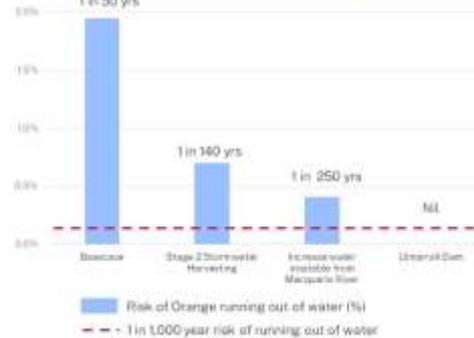
Effectiveness of options in reducing water security risks assuming our future climate is similar to our historical climate



Bathurst: effectiveness of options



Orange: effectiveness of options



Action 1.6. Plan for the best long-term water security solution for the upper Macquarie



On a scale of 1 to 5 please indicate your support for the following options:

- Water from the Fish River or Coxs River
- Water from Lachlan Valley
- Additional water from the Macquarie River (Orange) (policy option)
- New infrastructure in the upper Macquarie, which could include a new dam at Dixons Long Point

How can we progress the options in a way that limits or offsets impacts on water users and the environment and bring communities along the journey?

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**Theme 2.
Economic, environmental and community resilience**

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Supporting a growing regional economy in a future of reduced water availability



- Agriculture, mining, transport, tourism and manufacturing drive the regional economy.
- Water reliant industries are important to the regional economy
- Less reliable surface water could impact the regional economy

Challenges

- Risk of consecutive years of no/low water availability for general security entitlement in a drier future
- Small volume of high security entitlement
- High quality groundwater sources are full committed and highly used
- Industry expansion already constrained by water availability

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Challenge: Addressing barriers to Aboriginal water rights



- Aboriginal people have lost access to water
- Seek to be involved in water consultation
- Needs between communities vary

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- Existing industries will continue to underpin the regional economy
- Government investment is stimulating growth in high value industries in the region
- Need to continue to support healthy rivers in the face of future climate extremes
- Water can be used in a way that supports multiple outcomes

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Action 3.2. Improve public access to climate information and water availability forecasts



Good climate information ahead of time, sound risk management and business planning support resilience of businesses and communities in prolonged droughts.



What water availability or climate information and information products do you need to make decisions?

Action 3.5. Develop ongoing arrangements for participation of local Aboriginal people in water

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Action 3.8. Modernise the water management framework so it can continue to support sustainable economic diversification



- Emerging opportunities and industries can deliver new income streams.
- They will be important for building regional resilience.
- The water entitlement and access framework will need to cater to these new industries by supporting sustainable access to water.



- How do we support the existing and new industries?
- What are the economic opportunities for First Nations people?

Action 3.7. Support the development of new water related Aboriginal business opportunities

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Action 4.8. Identify regionally significant riparian, wetland and floodplain areas to protect or rehabilitate



- Conserving remnant biodiversity and restoring riverine and wetland ecosystems can:
 - Improve water quality
 - Strengthen resilience
 - improve ecological responses and benefits from environmental watering.



- What locations should be targeted for on-ground activities to conserve and protect:
- critical riparian, wetland and floodplain habitat and species
 - areas of high cultural value.

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Theme 3.

Meeting diverse water needs in the region's west

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Challenge: Supplying water to the lower system and connected valleys



Burrendong Dam: minimum inflow sequence	When did it occur in the historical record?	Probability in the long-term climate scenario	Probability in the long-term dry climate scenario
3-year	2017-2020	~0.1% (1 in 1,000 years)	~2-3% (1 in 30 - 50 years)
10-year	1932-1942	~1% (1 in 100 years)	~20-25% (1 in 4 - 5 years)

The probability of the lowest 3-year inflows (2017-2020) into Burrendong Dam increases from a 1 in 1000-year event to a 1 in 50-year event under a dry climate scenario.

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Challenge: Maintaining and improving the health and resilience of aquatic and floodplains ecosystems



There are challenges to achieving ecological outcomes from water for the environment:

- Public and private infrastructure limits fish movement and impact water quality
 - algal blooms
 - cold water pollution
- Pest fish species are common throughout most of the catchment.
- Quality of riparian vegetation in the region has changed over time



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There are high priority water needs in the region's west



- Nyngan and Cobar towns
- Internationally important Macquarie Marshes
- High-tech metal mines
- Landowners on rivers and creeks

There are also high value irrigated agriculture and livestock enterprises. The challenges in delivering water along the length of the system in drought creates economic and social risks for towns, communities and industries.



Actions to respond to this challenge



- Additional off-river storage at Nyngan
- Create water savings through changed operation of regulated effluent creeks
- Comparative analysis of major regional infrastructure:
 - Use of some Burrendong flood mitigation airspace for regulated water supply
 - New mid-system 6GL re-regulating weir (existing govt commitment)
 - Pipeline from Dubbo to Nyngan
- Investigate ways to improve connectivity with the Barwon-Darling on a multi-valley scale



These actions will

- efficiently deliver water to high priority needs
- reduce town water security risks
- build industry and economic drought resilience
- not significantly reduce flows into the Macquarie Marshes

Actions 2.1 – 2.3. reducing water security risks for the region's west



Please rank in these options in order of priority for investigation and implementation

- Additional off-river storage at Nyngan
- Create water savings through changed operation of regulated effluent creeks
- Comparative analysis of major regional infrastructure.

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Action 2.3. Continue to investigate regional water security solutions for the lower Macquarie



On a scale of 1 to 5 please indicate your support for the following shortlisted actions:

- use some of the flood mitigation storage in Burrendong Dam for water supply
- a new re-regulating weir in the mid-Macquarie (Gin Gin)
- a regional pipeline connecting Dubbo to Nyngan and other towns.

How can we progress the actions in a way that limits or offsets impacts on water users and the environment and bring communities along the journey?

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Action 4.6. Assess gaps in the flows regime and identify cooperative actions to improve ecological outcomes



- Investigate opportunities to provide flexibility to manage environmental flows in changing climate conditions
- Better coordinate the management of consumptive flows and water for the environment
- Achieve more natural flow patterns without impacts on water users.



What opportunities exist to coordinate releases of consumptive water and held environmental water to achieve environmental watering needs?

What information or tools are needed to support this?

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Action 4.1. Modify or remove barriers to delivering water for the environment



Remove physical and operational barriers that constrain:

- the delivery of water for the environment
- the ability of water to move through rivers and across floodplains.

Macquarie Marshes Enhanced Watering Project

- Investigating the potential to deliver larger flows to the Macquarie Marshes
- Will assist with connection of the river and wetlands to key areas of the floodplain.



What other strategic opportunities exist for removing physical and operational barriers?

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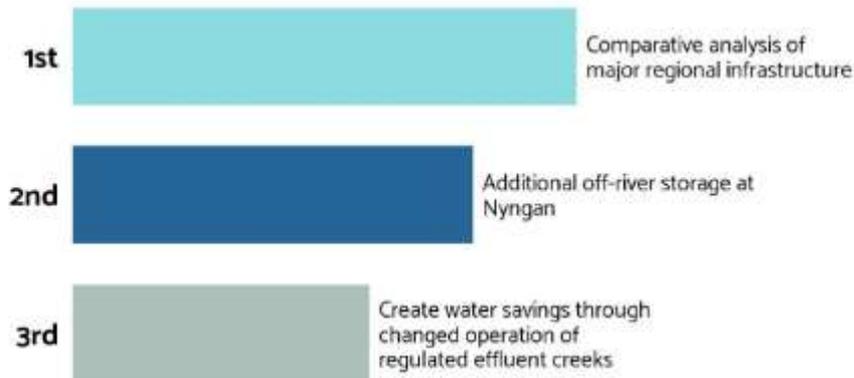
Attachment B: Post It note feedback on actions

Proposed action	Participant feedback
1.1 Confirm the level of water security needed to support regional cities	Should include all towns
	Benefit Oberon and Bathurst
	Also include better restriction levels and dam control instead of waiting for it to get very low/critical or waiting for new financial year
1.2 Establish a governance framework to coordinate actions under Priority 1	In conjunction with local councils. Each community should have a water board
1.3 Develop guidelines for managing extreme events in the upper Macquarie	All data needs to be considered including recent droughts and floods
1.4 Adopt a stronger focus on urban water conservation and efficiency	Government programs (funding) for water conservation, particularly in ageing systems
1.5 Invest in innovative water supply options	Innovative water supply options will mitigate groundwater need to some extent and will provide sustainable yield for surface water through increased water security
	Stormwater is extremely wasted so seems to be the most sustainable outcome. In return it would be economically beneficial to local communities
	As lack of desal water availability for western towns, groundwater, recycled water (especially for major towns) create opportunity.
	Groundwater (high salinity) should also consider
	Policy augmentation of regulator policy
	Groundwater access for town supply
1.7 Reduce uncertainty in groundwater security for the region's towns	All towns in drought security perspective should have multiple sources rather than single surface water supply
	Resolving groundwater uncertainty is important.
3.1 Invest in continuous improvement to surface and groundwater modelling	Opportunity to develop a standard water security model for water managers to utilise and make real time water management decisions
3.2 Improve public access to climate information and water availability forecasts	
3.4 Undertake research to inform reviews of groundwater extraction and condition limits	Groundwater, as discussed in this session, is an important drought relief water supply. Investment should be made to better understand groundwater availability and sustainability

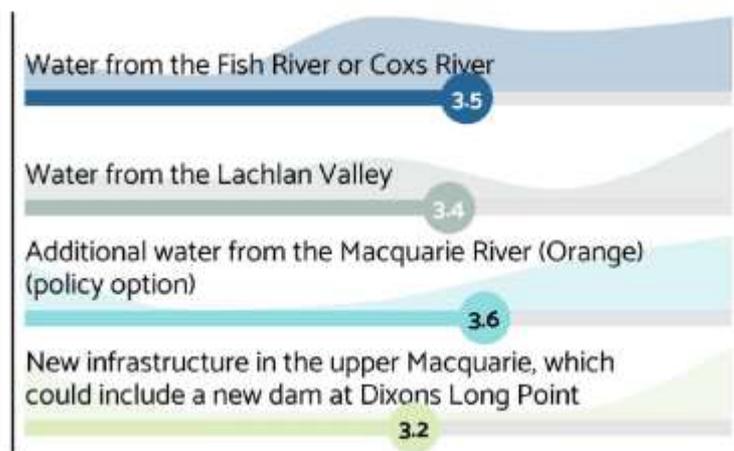
Proposed action	Participant feedback
<p>4.8 Identify regionally significant riparian, wetland and floodplain areas to protect and rehabilitate</p>	<p>Off-stream wetlands and wetland investment program will improve water quality, and this has economic and environmental benefits to all stakeholders particularly downstream stakeholders</p> <p>Funding towards off-stream wetland programs for water quality management and ecology benefits</p>

Attachment C – Menti results

Please rank these options in order of priority for investigation and implementation



On a scale of 1 to 5 indicate your support for the following options



On a scale of 1-5, please indicate your support for the following shortlisted options

