Implementing actions from the Snowy Water Licence Review

Environmental water delivery investigations

NSW Department of Climate Change, Energy, the Environment, and Water

February 2024

Format of webinar

Image: Snowy River looking from Charlotte's Pass

Objective

A status update on implementing the actions of the 10-Year Snowy Water Licence Review

Image: Snowy River near Charlotte's Pass

Contents

Image: Downstream of Guthega Dam

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Legislative context

1

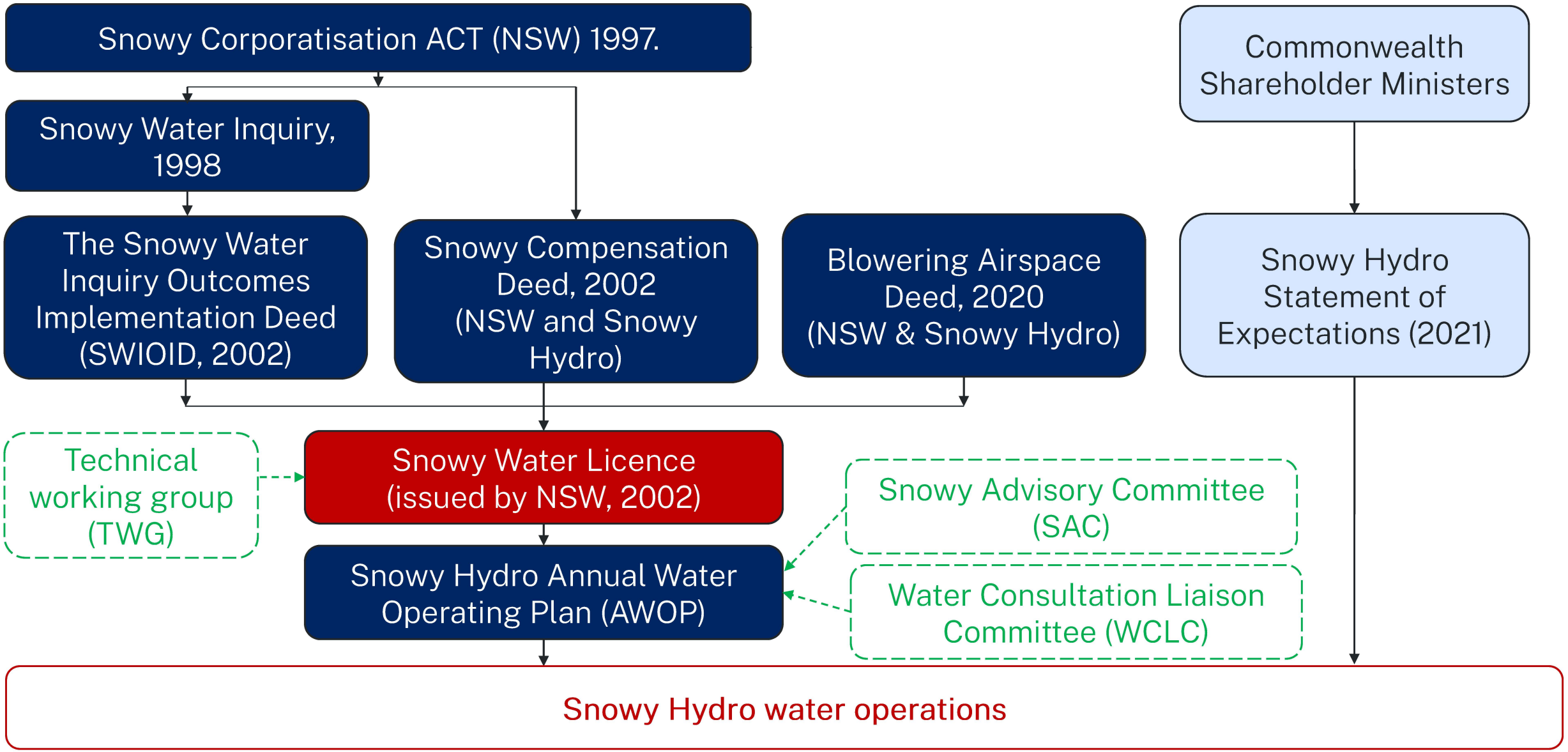
Implementing the actions from the Snowy Water Licence Review

Snowy Water Licence

- Sets obligations on both Snowy Hydro and NSW Government
- Not a standard NSW water licence
- More of an operating ‘contract’

Image: Environmental release from Jindabyne dam

Snowy scheme legislative context within NSW



Reviewing and amending the Licence

- Review required every 10 years.
- Changes can be made by agreement with Snowy Hydro.
- Compensation may be payable if a change is made without agreement.
- Aiming for a package of amendments achieved by agreement, that provides net benefits to all interests.

Image: Thredbo River

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10-Year Snowy Water Licence Review

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Implementing the actions from the Snowy Water Licence Review

10-Year Snowy Water Licence Review

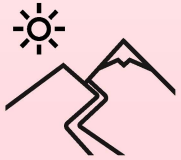
- Completed Dec 2018
- Final report recommends 23 actions for investigation
- We have been working to implement actions of the review
- Work led by NSW DCCEEW, overseen by the TWG

Licence Review actions

Category	Snowy Licence Review Actions
Administrative licence amendments (complete)	1(a), 2, 4, 5, 6, 9, 10,17
Best practice licence management	21
Water release investigations	11, 12, 13, 14, 15, 16, 18, 19, 20, 22
Environmental water delivery investigations	7, 8a, 8b

Environmental delivery actions

Action 7



Evaluate using the Mowamba River as a way to provide environmental water to the Snowy River.

Recommend an environmental flow regime for the Snowy River consisting of a combination of releases from Jindabyne Dam and the Mowamba River.

Action 8a

Investigate more flexible delivery to achieve better environmental outcomes from the available SRIF.

Action 8b

Work together to ensure governments can deliver an average annual flow of 212 gigalitres per year down the Snowy River cost-effectively in accordance with the intent of the SWIOID.

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Action 7 – Mowamba River

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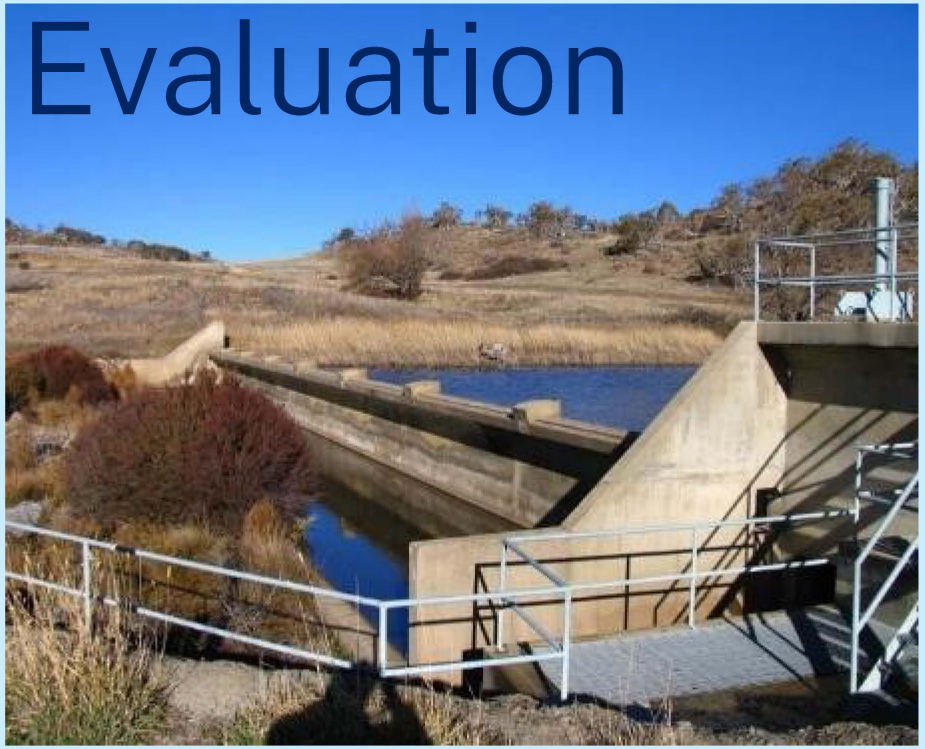
Implementing the actions from the Snowy Water Licence Review

Mowamba River background – mud map

Evaluation



Action 7

Evaluate using the Mowamba River as a way to provide environmental water to the Snowy River.

Recommend an environmental flow regime for the Snowy River consisting of a combination of releases from Jindabyne Dam and the Mowamba River.

Mowamba River upstream of weir

Mowamba River near Barry Way Bridge

Mowamba River near Big Yard Rd

Mowamba Weir

Mowamba Weir

Weir outlet for base passing flow

Mowamba River downstream of weir

Mowamba River near weir

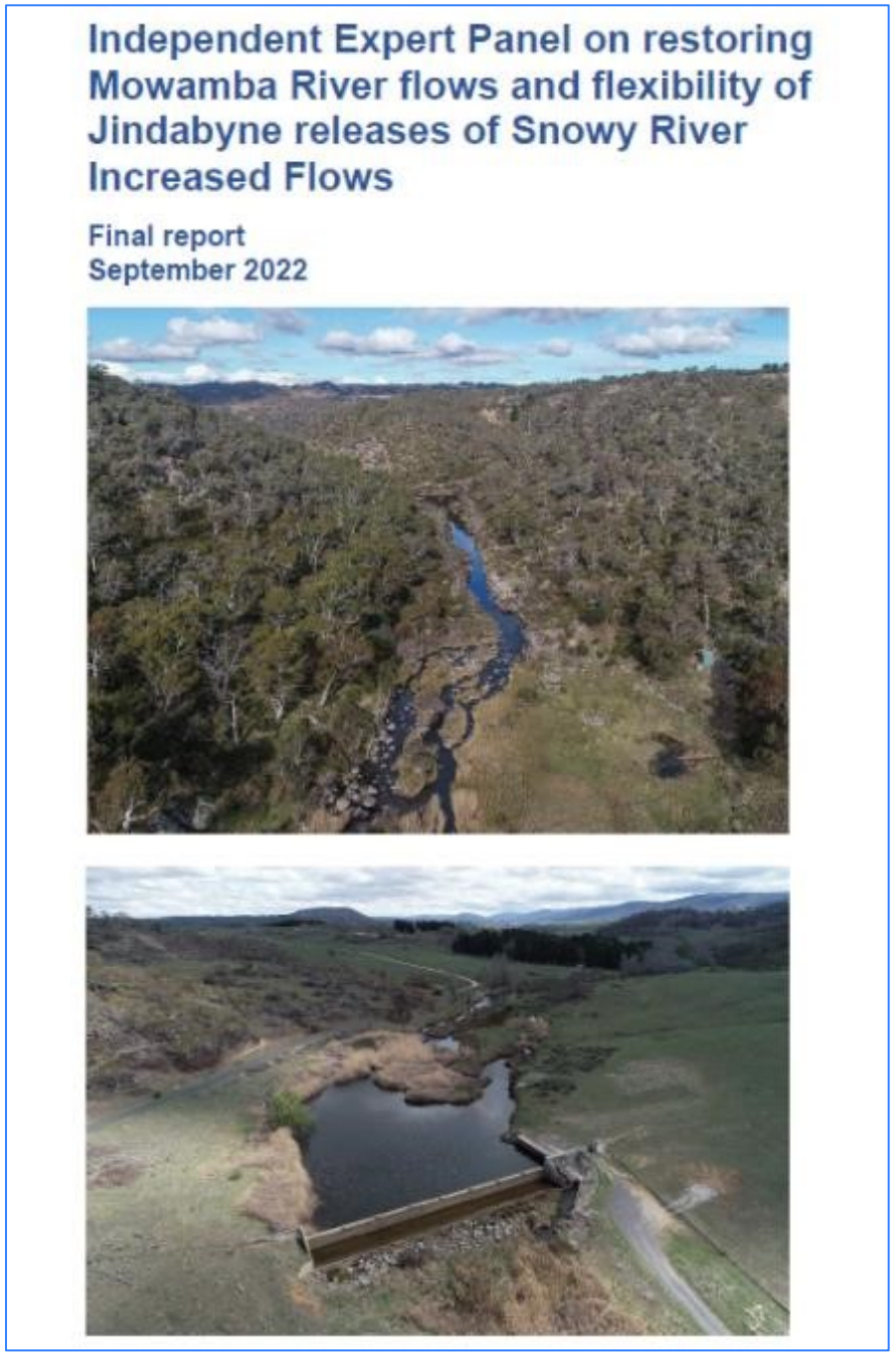
Beginning of gorge section

Ecological assessment

Panel members:

- Professor Ian Rutherford (Geomorphology, Melbourne University, later consultant)
- Dr Bruce Chessman (Aquatic ecology, consultant)
- Professor Simon Mitrovic (Aquatic ecology/chemistry, University of Technology Sydney).

Image: Mowamba Weir



Ecological assessment

- Options considered:
  1. Allow weir to overtop (weir retained)
     - All Mowamba flow
     - Proportion of Mowamba flow
  2. Remove weir

Report available at:

https://www.environment.nsw.gov.au/topics/water/water-for-the-environment/snowy-and-montane/mowamba-and-jindabyne-release-flexibility

Image: Expert Panel report title page

Ecological assessment findings

Image: Mowamba River gorge section downstream of weir

Expert Panel's findings:

- Effect of removing the weir on the Mowamba River - restores flow regime, water quality, channel form and ecology of the downstream 5km of Mowamba River
- Effect of removing the weir on the Snowy River - more modest effects including increased productivity for food web, bed and sediment loads for channel building.
- Benefits outweigh minor loss of controlled releases from Jindabyne Dam.

Social assessment

Professor Richard Baker commissioned to facilitate Snowy Advisory Committee workshop on social and community values of returning Mowamba flows

Report from this found removing the Mowamba Weir would:

- restore life and connectivity to the Mowamba River and more generally to the upper Snowy River system
- create a fully connected snow melt sourced river
- ecological benefits would in turn have a wide range of social benefits

Image: Mowamba River gorge section downstream of weir

Move to feasibility

- TWG (other than Snowy Hydro) agreed sufficient evidence of ecological and social benefits to proceed to investigate feasibility of implementation.

Image: Downstream of Mowamba Weir

Feasibility assessment

Alluvium commissioned to undertaken preliminary feasibility:

- Phase 1 – This Licence review
- Phase 2 – before 2027 review
- Phase 3 – post 2027 review

Image: Alluvium feasibility report

Feasibility assessment findings: Phase 1

- Phase 1 would be to allow weir to overtop, with the weir retained
- Key issues:
  - Flow gauge
  - Reduction of Jindabyne releases (variable yearly amount)
  - Foregone generation at Jindabyne in 100-180 ML/day range.
- More on this later…

Image: Mowamba River overtopping weir

Feasibility assessment findings: Phase 2

- Phase 2 would be to remove weir and all above ground works, and retain but decommission below ground works
- Key issues:
  - ~$2 million including contingencies
  - Operational software ~$200k for daily adjustments
  - Remaining aqueduct works

Image: Upper Mowamba River

Feasibility assessment findings: Phase 3

- **Remove Weir and all underground infrastructure (aqueduct)**
- Key issue:
  - ~$34 million including contingencies

Image: Lower Mowamba River (while weir overtopping)

Phase 1 detail: Flow gauge

- Previous gauge until 2021
- Replacement required
- WaterNSW assess and quote
- Capital cost to install ~$55k
- Maintain ~$15k/yr

Image: Lower Mowamba River

Phase 1 detail: Jindabyne flow releases

How to reduce Jindabyne flows so that:

- the additional volume from Mowamba River is covered (feasible – some unders and overs)
- the effect on generation from Jindabyne is minimised (cost involved – see next slide)
- the effect on high flows and the flow regime from Jindabyne is minimised (feasible)

Image: Jindabyne Dam

Phase 1 detail: Energy generation

Cost of generation:

- Operates from 100 ML/day – max at 180 ML/day
- Reduce impact on this operating window
- Cost in order of $110k/year if cuts in flows include the generation window. Government liable to pay Snowy Hydro for such losses
- Currently refining methods to significantly reduce this by moderating cuts in the generation window.
- Report on this expected in March.

Image: Jindabyne Dam

Next steps - Workplan

- No licence amendments currently proposed for this Review.
- Workplan for further investigation has been presented to TWG for endorsement.
- Licence Review outcomes report would include agreed workplan
- Workplan would be implemented following completion of this Licence Review phase, with oversight from the WCLC.
- All future work subject to agreements and funding.

Image: Mowamba Weir looking upstream

Workplan

Phase 1: Weir overtopping

- once findings of Alluvium study complete proposal put to WCLC for consideration
- funding will be required for gauge and any potential compensation for generation losses

Phase 2 and 3: Partial or full infrastructure removal

- further work required in lead up to 2027, dependent on resources to do so.

Image: Downstream of Mowamba Weir

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Action 8a – Flexible delivery

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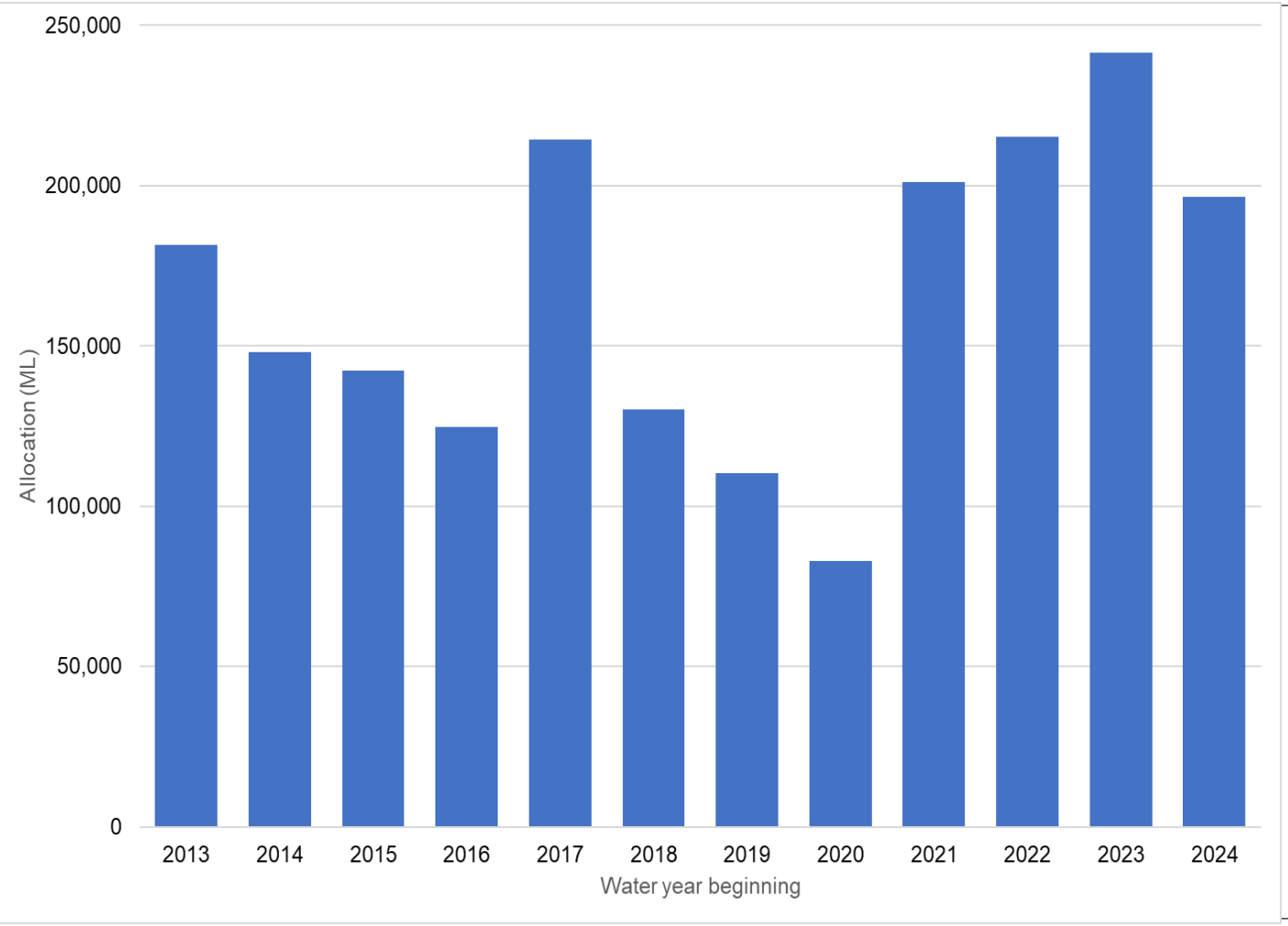
Implementing the actions from the Snowy Water Licence Review

Action 8a

Investigate more flexible delivery to achieve better environmental outcomes from the available Snowy River Increased Flows.

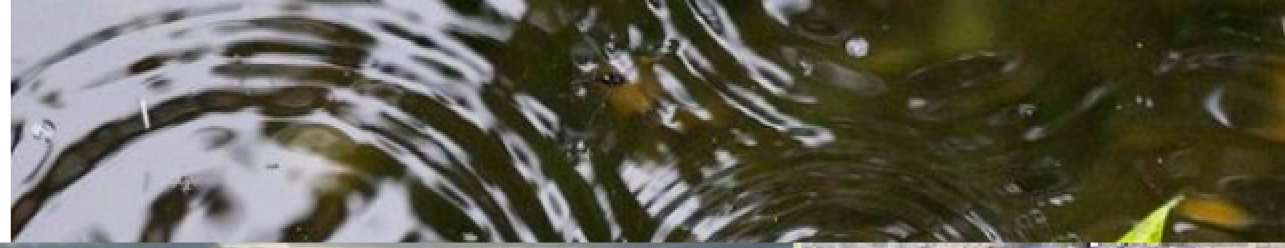
Delivery restriction – Fixed yearly use



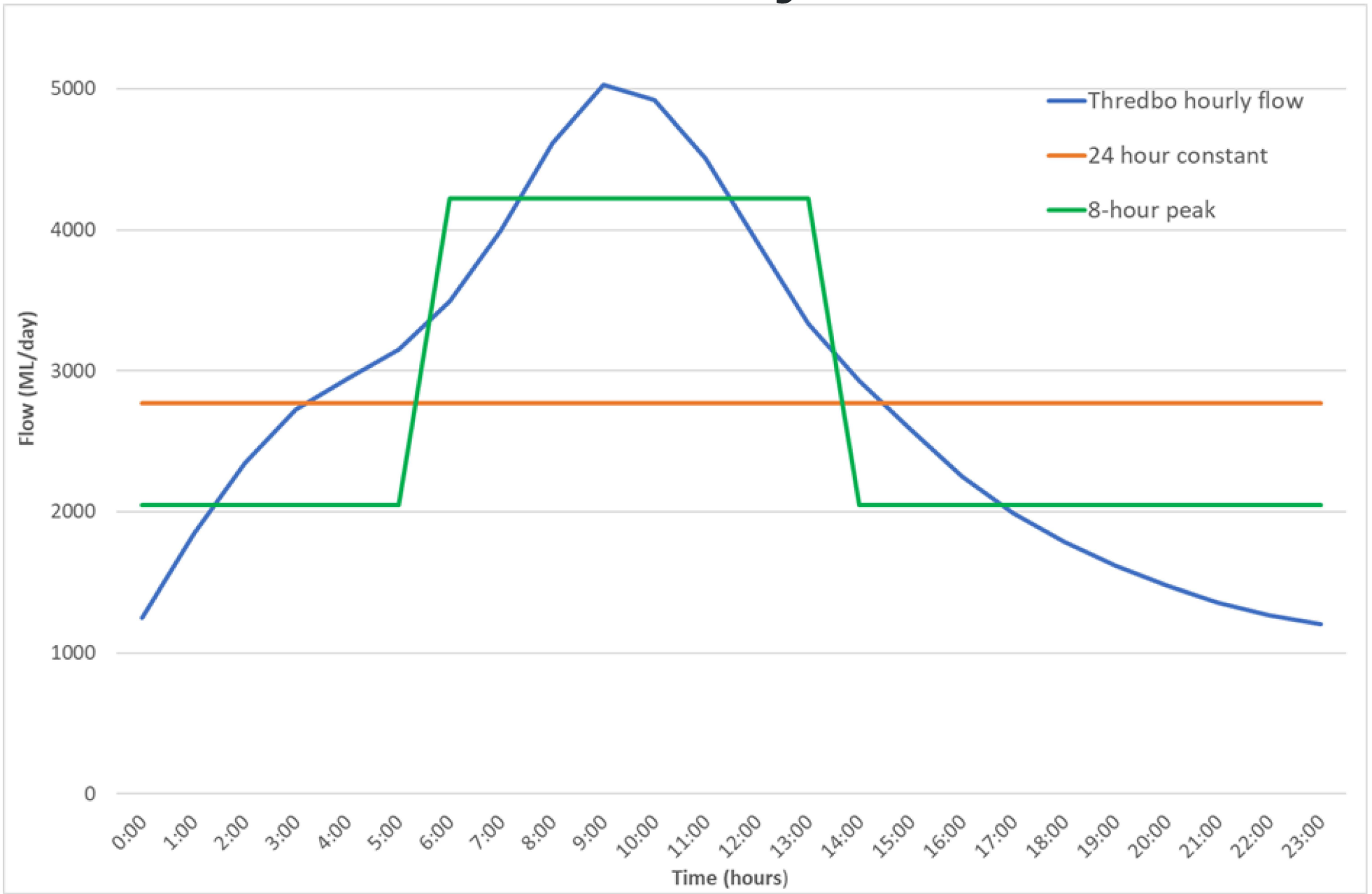
- Water must be used in year allocated
- No carryover into dry years

Graph: Yearly allocation of water for the Snowy River

Restriction: flows fixed a year in advance



Restriction: constant daily releases



Ecological and social assessments

Recommended for Jindabyne Dam releases:

- Allowing carryover of Snowy River allocations between years.
- Allowing releases to be adjusted to synchronise with the Thredbo or another naturally flowing river
- Allowing changes in flows within the year to respond to environmental contingencies
- Allowing more intra-day variability (changing release rates so flows are not held constant for 24 hours)

Image: Expert Panel report title page

Background

Technical Working Group agreed sufficient case to continue to feasibility.

Image: Snowy River upstream of Dalgety

Feasibility assessment

Alluvium commissioned to undertaken preliminary feasibility:

- Phase 1 – This Licence review
- Phase 2 – before 2027 review
- Phase 3 – post 2027 review

Image: Alluvium feasibility report

Feasibility assessment findings: Phase 1

- Phase 1 would be to allow 4 ‘synchronised’ flows per year from Jindabyne Dam to be released based on a Thredbo River flow trigger
- More on this later…

Image: Thredbo River

Feasibility assessment findings: Phase 2

- Phase 2 would allow fuller synchronisation of releases with Thredbo
- Key issues:
  - Operational software ~$200k for daily adjustments
  - Role (person) to review and approve dam releases ~$100k/yr
  - Analyse and optimise method to scale releases in a variable way (to better match allocation) ~$70k

Image: Thredbo River

Feasibility assessment findings: Phase 2

- Further flexibility in adjusting releases to respond to environmental events or opportunities
- Key issues:
  - Less certainty of release timing for Snowy Hydro
  - Potential increased unders/overs for flows in autumn

Image: Snowy River upstream of Dalgety showing sedimentation

Feasibility assessment findings: Phase 2

- Increased intra-daily variable release rates (e.g. 8-hour peaks)
- Key issues:
  - Operator time-$5k to 1k per event; or
  - Operational software ~$200k

Image: Aquatic plants in the Snowy River

Feasibility assessment findings: Phase 2

- **A trial of balancing interannual water accounts to enable limited strategic banking of water**
- Effect on Snowy Hydro's ability to predict energy generation capacity?

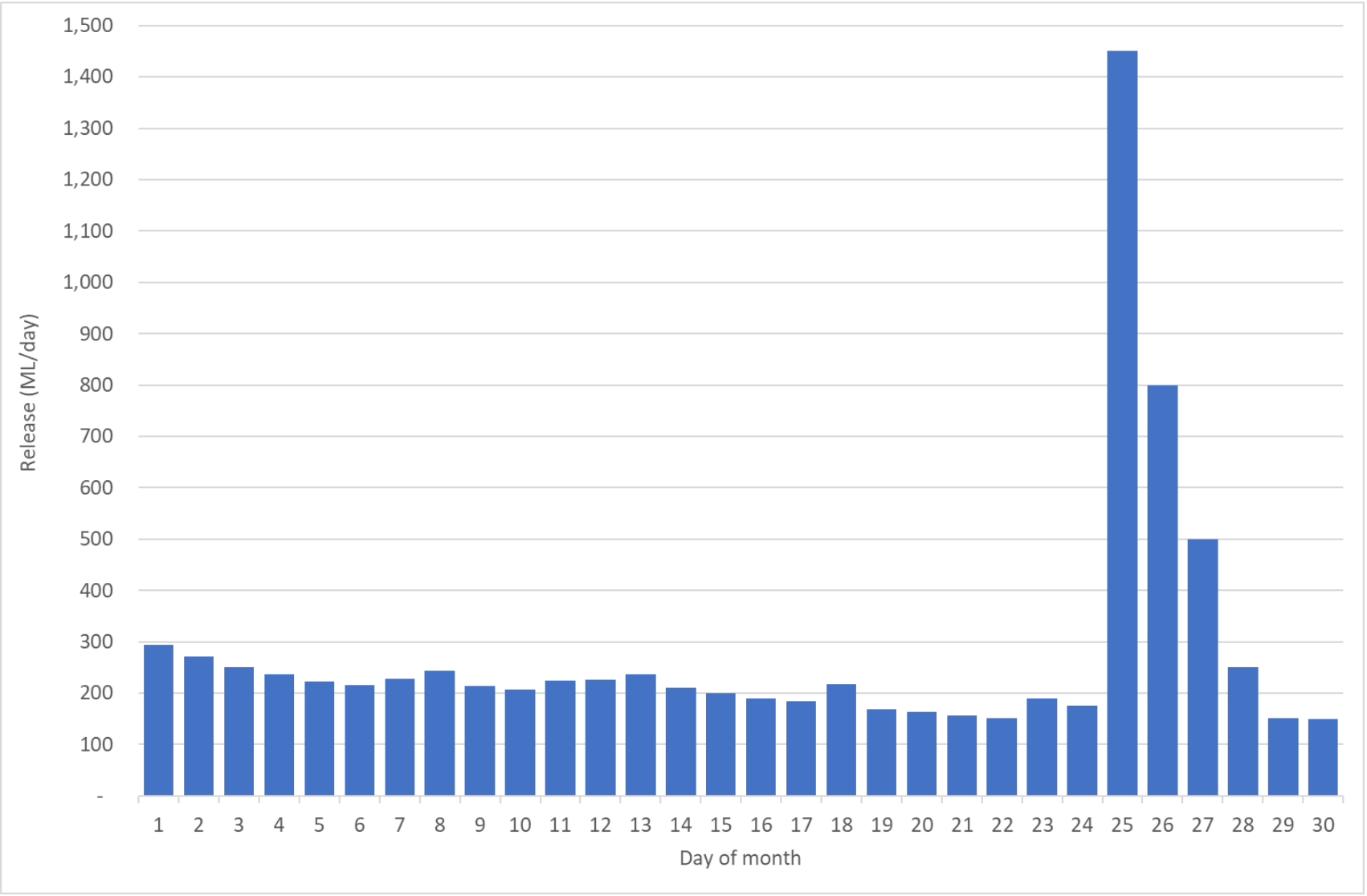
Image: Monitoring in the Snowy River downstream of Jindabyne Dam

Feasibility assessment findings: Phase 3

- **Balancing interannual water accounts to enable strategic banking of water**
- Further development

Image: Monitoring for tadpoles in the Snowy River downstream of Jindabyne Dam

Phase 1 detail: 4 synchronised flow releases



- 4 flows per year
- High flow nominally at ~25th of month
- If triggered, released one day after trigger
- If no trigger, released on default date (25th of month)
- Planning to implement cooperation with Snowy Hydro this year (potentially from May this year)

Next steps – Operating protocol and workplan

- No licence amendments currently proposed.
- TWG suggest preference to implement phase 1 through a protocol.
- Design principles for protocol presented to TWG for endorsement.
- Workplan for Phase 2 and 3 investigations presented to TWG for endorsement.
- Licence Review outcomes report would include agreed protocol principles and workplan.
- Workplan would be implemented following completion of this Licence Review phase, with oversight from the WCLC.
- All future work subject to agreements and funding.

Image: Snowy River from Jindabyne dam showing cone valves for environmental releases

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Action 8b –SRIF delivery limit

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Implementing the actions from the Snowy Water Licence Review

NSW GOVERNMENT

Action 8b

Work together to ensure governments can deliver an average annual flow of 212 gigalitres per year down the Snowy River cost-effectively in accordance with the intent of the SWIOID

Context

- Issue relates to delivery of the allocated annual volume of Snowy River Increased Flows (SRIF)
- SRIF historically less than 212 GL.
- However, SRIF allocation has exceeded 212 GL in recent wet years:
  - 2017-18: 214.3 GL
  - 2022-23: 215.3 GL.
  - 2023-24: 241.3 GL.
- Snowy Hydro caps delivery at 212 GL.

Image: Tributary of the Thredbo River near Mt Kosciuszko

Issue

- Target levels of SRIF are set in the Snowy Water Inquiry Outcomes Implementation Deed (SWIOD), not the Licence.
- Issue relates to differing interpretations of the SWIOID.
- Government and Snowy Hydro maintain positions documented in the Final Report as:
  - Snowy Hydro considers the SWIOID established a maximum annual flow target of 212 GL
  - Governments consider 212 GL to represent an average annual flow target.
- TWG has not reached consensus.
- Undelivered water remains unresolved.

Image: Jindabyne Dam

Challenges

- Cannot be addressed by a licence change alone, because the Licence cannot be amended to be inconsistent with the SWIOID.
- The licence cannot be amended without agreement from Snowy Hydro unless NSW pays compensation.
- The SWIOID cannot be reviewed/amended without agreement from all parties.

Image: Dalgety Weir on the Snowy River

Next steps

- Discussions continuing through the WCLC.
- The Commonwealth Government is considering a review of the SWIOID.

Image: Snowy River approx. 8km downstream of Jindabyne Dam

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Next steps for the program

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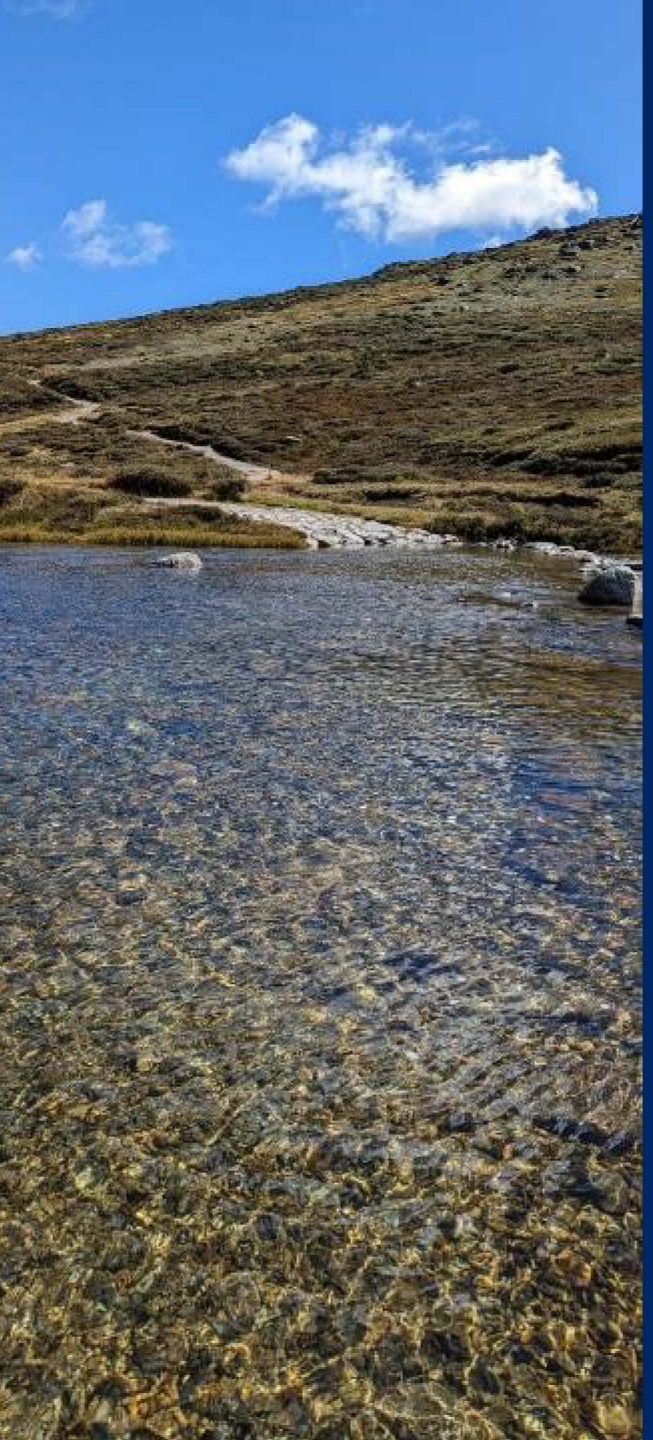
Implementing the actions from the Snowy Water Licence Review

Next steps for the program

- Final TWG agreement on decision package (including amendments, principles for operating protocols, workplans)
- Develop public Outcomes Report
- Review by WCLC, SWGOC and approval by NSW
- Public exhibition of package and report
- Review feedback and finalise amendments
- Amend licence and complete Licence Review
- Implement operating protocols and workplans through WCLC

Image: Guthega Dam



Questions

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