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Requirements of SDL adjustment projects to ensure they are consistent with the Water Act 2007, Basin Plan 2012, MDBA policies and intergovernmental agreements

Summary

The Murray-Darling Basin Plan is an agreement to recover 3,200 GL of environmental water or equivalent outcomes to help restore the health of the Murray-Darling Basin. Under Chapter 7 of the Basin Plan, this volume may be reduced if state governments can demonstrate alternative ways of delivering similar outcomes for the environment, as part of a process known as the Sustainable Diversion Limit (SDL) adjustment. The SDL adjustment process also allows for the easing or removal of constraints to environmental water delivery and the addition of 450 GL per year of environmental water above the 2,750 GL target to deliver outcomes of 3,200 GL (Basin Plan s7.09 (e)).

The following standards must be guaranteed to ensure that all four components of the SDL adjustment mechanism are delivered in full as per the Basin Plan and Water Act:

1. **Supply measures:** All supply measure projects meet the 12 conditions of approval as required by the Basin Plan and other government agreements, based on a transparent assessment;
2. **Constraints measures**: Constraints proposals are modified in line with the targets in the Constraints Management Strategy set by the Murray-Darling Basin Authority;
3. **Efficiency measures:** The full 450GL of real water savings are guaranteed to be recovered, within budget and statutory requirements, accounting for the impact of efficiency measures on return flows; and
4. **Pre-requisite policy measures:** All pre-requisite policy measures proposed by Basin states are consistent with model assumptions, based on publicly available review by the MDBA using hydrological models.

1. Supply measures

Twelve conditions in Table 1 are needed to ensure that supply measures will deliver “equivalent environmental outcomes with a lower volume of held environmental water than would otherwise be required” (the requirement of section 7.09 in Basin Plan).

Eleven of these conditions have been agreed by Basin governments and are sourced from the Basin Plan itself, or policies that have been agreed by Basin governments or adopted by the Authority (see references in Table 1). One further condition (Condition 8) was a recommendation from an independent stocktake of SDL projects commissioned by the Authority in 2015. This condition applies to projects that generate water savings (e.g. evaporative or operational loss savings), and is designed to ensure that these savings will be available for environmental use and are not consumptive use.

The twelve conditions are safeguards against obvious risks and avoidable failures, such as the failure to secure landholder approval which has hampered operation of the $80 million Koondrook-Perricoota The Living Murray project. The conditions are also necessary to give the public confidence that $1.3 billion of taxpayers’ money spent on projects will deliver the expected outcomes without

unacceptable risks to communities and the environment (e.g. salinity, blackwater, unforeseen collateral damage), including the Coorong and Lower Lakes.

New South Wales, Victoria and South Australia have brought forward a package of 36 projects to be considered for a reduction under the SDL adjustment process. This package includes engineering works, changes in river operations, evaporative savings, and enhancements to ease or remove constraints to the delivery of environmental water. The Murray-Darling Basin Authority has estimated the outcomes that could be achieved by this package is equivalent of up to 605GL of environmental water.

Our assessment of supply measure projects showed that:

1. Only one project, the *South Australian Murray Key Focus Area* meets the necessary conditions for approval. Approval of this project for SDL adjustment is however, contingent on upstream constraints proposals meeting targets in the Constraints Management Strategy, which they currently do not.
2. Eleven of the projects (representing in the order of 150-270 GL water savings) require additional information before a proper assessment can be undertaken. With such information it might be possible for some or all of the projects to satisfy the 12 conditions for approval. However, all projects would need to ensure there is no significant change in environmental flows reaching the Lower Lakes and Coorong (Condition 3).
3. Twenty five projects (representing in the order of 316-436 GL) do not satisfy these conditions and should not be approved in their current form. This includes The Living Murray works which, although they are able to be considered for an SDL adjustment, they are not likely to result in equivalent environmental outcomes because of the environmental risks identified.

We have identified the specific conditions that should apply to individual supply measure projects so they can be modified in line with the twelve conditions (Attachment A). The specific conditions are based on our assessment of projects, updated with information from the Murray-Darling Basin Authority's assessments of supply measure projects[1] made publicly available on the 22 March 2018 through a Senate order for production of documents.

The Australian Parliament should agree to legislative amendments to the Basin Plan 2012 (Attachment B) and Water Act 2007 (Attachment C) which will ensure that all supply measure projects will satisfy these 12 conditions (Table 1). The amendments include a requirement that the conditions should be met as part of funding approval, and if any project cannot meet the 12 conditions, the project should be withdrawn as a notified measure prior to the mandatory reconciliation process in 2024 (Basin Plan section 7.11).

The proposed legislative amendments to the Basin Plan (Attachment B) also provide for greater transparency in the hydrological modelling in the 2024 reconciliation process, by requiring that the Murray-Darling Basin Authority publishes evidence to demonstrate that model assumptions reflect actual management practices with respect to modelling of SDL adjustment proposals, environmental watering demands and pre-requisite policy measures.

Recommendation 1: Prior to any decision to adjust the sustainable diversion limits, the Australian Parliament should agree to legislative amendments to the Basin Plan 2012 (Attachment B) and Water Act 2007 (Attachment C) which would require that (a) all supply measure projects are consistent with the Basin Plan as part of funding approval, and that any supply measure that fails to meet such conditions prior to the mandatory 2024 reconciliation process should be withdrawn as a notified measure; and (b) as part of the reconciliation process, the Murray-Darling Basin Authority publishes evidence to demonstrate that model assumptions reflect actual management

practices, with respect to modelling of SDL adjustment proposals, environmental watering demands and pre-requisite policy measures.

Table 1. Conditions to ensure supply measures projects are consistent with the Basin Plan.

Condition of Approval	Statutory Reference	Proposed legislative amendment
1. Works-based projects must align with Basin Plan targets.	Basin-wide environmental watering strategy [2]	Projects have agreed quantified environmental objectives that align with Basin Plan targets, as set out in Chapter 5, Schedule 5, Schedule 7 and the Basin-wide Environmental Watering Strategy.
2. All works-based projects must be assessed using a scientifically robust method.	Basin Plan S6.05	Works-based project were assessed using the Ecological Elements scoring method developed by CSIRO.
3. Any adjustment of the sustainable diversion limit must ensure that there is no change in flow indicators.	Basin Plan S6.07	Limits of change rules are satisfied as per clause 6.07 in Schedule 6 of the Basin Plan.
4. Sustainable diversion limit must not change by more than ±5% overall.	Basin Plan s7.19	Sustainable diversion limit is within the overall limits specified in section 7.19 of the Basin Plan.
5. Environmental risks must be mitigated to acceptable levels.	Phase 1 Assessment Guidelines for Constraint and Supply Proposals, Overarching Evaluation Criteria #4.	Environmental risks are mitigated to acceptable (low risk) levels, ensuring that: a) All risk mitigation measures are funded as part of the proposed project; b) The use of planned and held environmental water in addition to that required to fulfil ecological objectives, is not proposed as a risk mitigation measure; c) Projects are operated to avoid inundation at frequencies above natural levels; and d) Cumulative effects are assessed via strategic assessment under the Part 10 of the *Environment Protection and Biodiversity Conservation Act 1999*.
6. Long-term governance arrangements must be secured.	Phase 1 Assessment Guidelines for Constraint and Supply Proposals, Overarching Evaluation Criteria #3.	Long-term governance arrangements are secured, specifically: a) Ownership and management responsibilities are clearly defined, and operations and maintenance are borne by the owner; b) Projects will be independently audited and periodically re-licensed; c) Funding is committed for ongoing operation, risk mitigation measures, long-term monitoring and auditing; d) Agreement is secured from landholders affected by the project; e) The Office of the Commonwealth Environmental Water Holder is capable of delivering the proposed environmental water regime, as modelled by the Authority (see Basin Plan Sch 6.06 (3)).
7. Environmental water must be able to reach works	Basin-wide environmental watering strategy [2]	Projects can operate in a natural way with all structures open during regulated and

projects and the broader floodplain in the future.		unregulated flows, and under a range of future water availability scenarios, incorporating an assessment of climate change impacts.
8. Any water savings from rules-based projects will be converted into a water entitlement.	Recommended in the SDL Adjustment Stocktake report commissioned by MDBA "Converting savings to licence entitlements is required to achieve a supply contribution" [3]	Any water savings (e.g. evaporative savings or operational loss savings) are converted into an equivalent volume of water entitlements by June 30, 2019.
9. Projects must deliver value for money.	*Intergovernmental Agreement on Implementing Water Reform in the Murray-Darling Basin*, and Phase 1 Assessment Guidelines for Constraint & Supply Proposals, Overarching Evaluation Criteria #2	Projects are cost effective, defined to mean an overall average of not more than $1,900/ML.
10. Projects must be monitored to ensure outcomes are delivered.	Basin-wide environmental watering strategy [2]	Monitoring arrangements are in place to manage risks and enable quantitative assessment of outcomes against agreed environmental objectives.
11. Projects are consistent with the Constraints Management Strategy, including that constraint levels as at 2012 must be used as a benchmark to compare changes.	Constraints Management Strategy, Phase 2 Assessment Guidelines for Supply & Constraint Measure Business Cases #3.2.2	Constraints measures achieve the operational flow targets in the Murray-Darling Basin Authority's Constraints Management Strategy.
12. Pre-requisite policies proposed by states for managing environmental water must be configured in the model used to calculate an adjustment.	Basin Plan s7.15 (1) (ii)	Pre-requisite policy measures implemented by states for managing environmental water are configured into the SDL adjustment Benchmark model used to calculate the reconciliation amount.

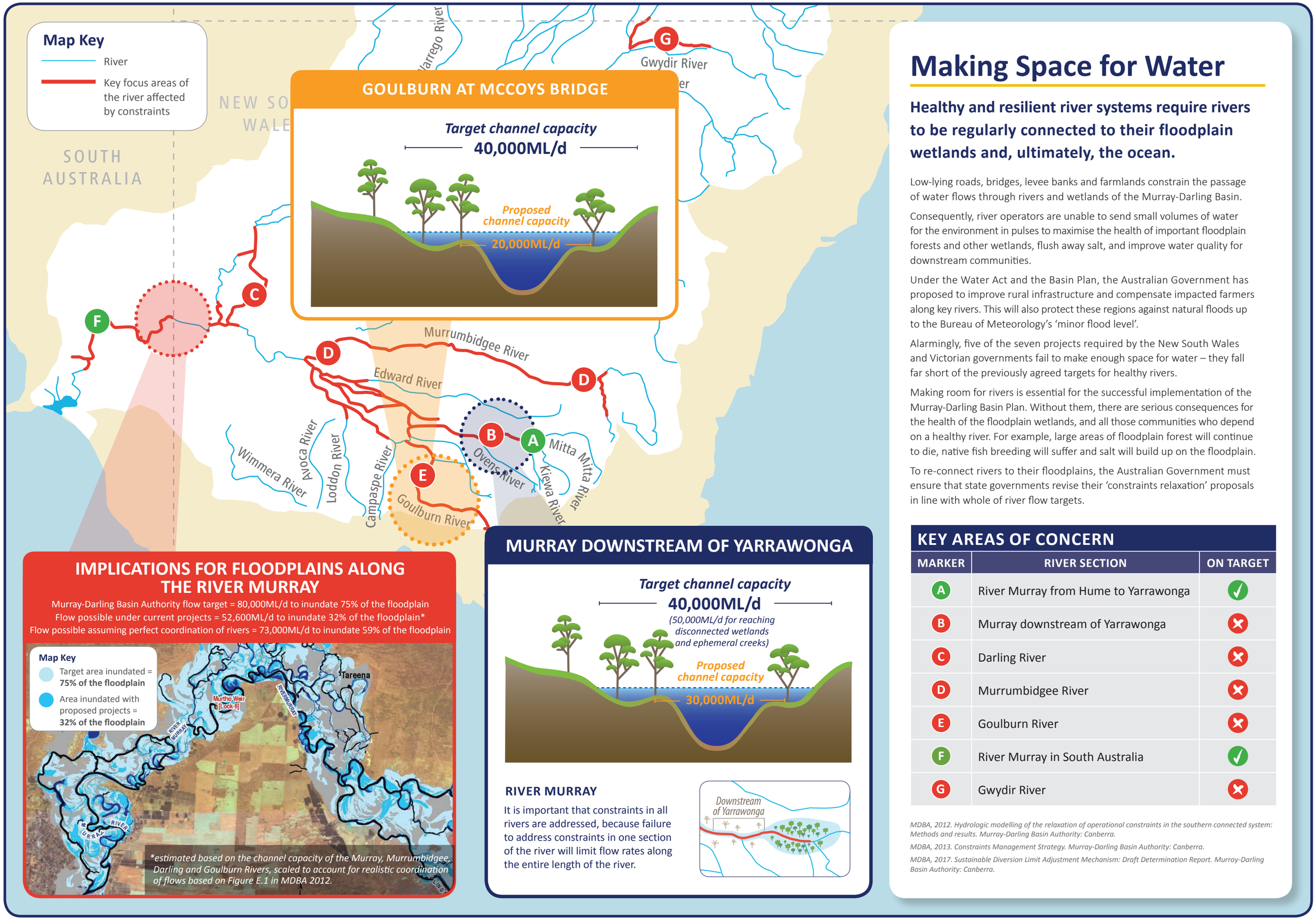
2. Constraints measures

The level of constraint relaxation being proposed by Victoria and New South Wales is not sufficient to satisfy the aims of the Constraint Management Strategy to achieve 80,000ML/d at the South Australian border or enhanced environmental outcomes in Schedule 5 of the Basin Plan (Figure 1).

In some cases the proposed constraint levels actually represent a return to what could be delivered prior to the Basin Plan, reflecting the fact that constraints in these areas have not improved since the Basin Plan came into effect in 2012. For example, the Goulburn River constraints project proposed the delivery of regulated flows up to 20,000 ML/d at McCoys Bridge, the same flow rate identified by the Murray-Darling Basin Authority in 2012.

Modelling by the Murray-Darling Basin Authority in 2012 showed that a flow of 80,000 ML/d into South Australia was needed to provide sufficient water to enable 75% of wetlands and flood dependent vegetation in South Australia to be inundated, compared to just 40% with the river system constraints possible in 2012.[4] This target is necessary to allow environmental water to reach the floodplain forests in a timely manner, maintain connection between the river and the floodplain

Figure 1



Making Space for Water

Healthy and resilient river systems require rivers to be regularly connected to their floodplain wetlands and, ultimately, the ocean.

Low-lying roads, bridges, levee banks and farmlands constrain the passage of water flows through rivers and wetlands of the Murray-Darling Basin.

Consequently, river operators are unable to send small volumes of water for the environment in pulses to maximise the health of important floodplain forests and other wetlands, flush away salt, and improve water quality for downstream communities.

Under the Water Act and the Basin Plan, the Australian Government has proposed to improve rural infrastructure and compensate impacted farmers along key rivers. This will also protect these regions against natural floods up to the Bureau of Meteorology's 'minor flood level'.

Alarmingly, five of the seven projects required by the New South Wales and Victorian governments fail to make enough space for water – they fall far short of the previously agreed targets for healthy rivers.

Making room for rivers is essential for the successful implementation of the Murray-Darling Basin Plan. Without them, there are serious consequences for the health of the floodplain wetlands, and all those communities who depend on a healthy river. For example, large areas of floodplain forest will continue to die, native fish breeding will suffer and salt will build up on the floodplain.

To re-connect rivers to their floodplains, the Australian Government must ensure that state governments revise their 'constraints relaxation' proposals in line with whole of river flow targets.

KEY AREAS OF CONCERN

MARKER	RIVER SECTION	ON TARGET
A	River Murray from Hume to Yarrawonga	✓
B	Murray downstream of Yarrawonga	✗
C	Darling River	✗
D	Murrumbidgee River	✗
E	Goulburn River	✗
F	River Murray in South Australia	✓
G	Gwydir River	✗

MDBA, 2012. Hydrologic modelling of the relaxation of operational constraints in the southern connected system: Methods and results. Murray-Darling Basin Authority: Canberra.

MDBA, 2013. Constraints Management Strategy. Murray-Darling Basin Authority: Canberra.

MDBA, 2017. Sustainable Diversion Limit Adjustment Mechanism: Draft Determination Report. Murray-Darling Basin Authority: Canberra.

(Basin Plan s5.02) and achieve better outcomes with the water available. On the basis of the modelling, the Murray-Darling Basin Authority identified the flow targets for each key constraint area, which reflected the minimum flow rates required to achieve outcomes in the Basin-wide Environmental Watering Strategy[2] and in Schedule 5 of the Basin Plan.

Of the six nominated constraints proposals submitted for assessment under the sustainable diversion limit adjustment mechanism, only two are consistent with the Constraints Management Strategy (River Murray from Hume to Yarrawonga, and River Murray in South Australia). All constraints measures are essential to the successful implementation of the Murray-Darling Basin Plan. Therefore, any constraints proposal that does meet these targets should not be considered in the adjustment determination. Constraints proposals should be modified in line with the Constraints Management Strategy and funding should be reallocated to support the amended projects.

The following constraints proposals need to be modified in line with the target, and sufficient funding needs to be made available: Murray River downstream of Yarrawonga, Darling River (Weir 32/Increase Menindee outlet capacity), Murrumbidgee River at Gundagai and Balranald and the Goulburn River at McCoys Bridge (Table 2). Constraint levels as at 2012 when the Basin Plan was introduced should be used as the benchmark to compare changes.

Table 2. Removing physical constraints to permit delivery of water to floodplains and wetlands in the southern Murray-Darling Basin. Constraints highlighted in red are proposed levels that will fail to meet the Murray-Darling Basin Authority's target as specified in the Constraints Management Strategy.

Region	**Location**	**Pre-Basin Plan:** Constraint in 2012[5] (ML/d)	**MDBA Target:** In MDBA Constraints Management Strategy (ML/d)	**Proposed by States:** In business case [6] (ML/d)
Murray	Hume to Yarrawonga	25,000	40,000	40,000
	Downstream of Yarrawonga	40,000 (but effectively 22,000* due to upstream constraint of 25,000)	40,000 (50,000 for reaching disconnected wetlands and ephemeral creeks) [7]	30,000
Darling	Weir 32/Increase Menindee outlet capacity	9,300	18,000	14,000
	Darling anabranch	Water flows into anabranch over 9,300ML/d	Regulator added and closed above 9,300ML/d when environmental water is supplied from Menindee	n/a
Murrumbidgee	Gundagai	30,000	50,000	40,000 at Wagga (~30,000 at Gundagai)
	Balranald	9,000	13,000	9,000
Goulburn	Seymour	12,000	15,000	n/a
	McCoys Bridge	20,000	40,000	20,000
Total flow at South Australian border		66,000 **(assuming 26,000 from Goulburn)	111,000 **assuming Menindee allowed 18,000	73,000**

* 10,600 ML/d in regulated periods in summer and in other periods Hume to Yarrawonga constraint of 25,000 ML/d was in place meaning that flows downstream of Yarrawonga were effectively restricted to 22,000 ML/d.

** This number assumes perfect co-ordination of flows between the Murray, Darling, Goulburn and Murrumbidgee Rivers, something which is highly unlikely. The 111,000ML/d target is most likely to achieve the outcomes in schedule 5 of the Basin Plan (i.e. 80,0000 ML/d).

Recommendation 2: Prior to any decision to adjust the sustainable diversion limits, the Australian Parliament should amend the Basin Plan 2012 (Attachment B) and Water Act 2007 (Attachment C) to ensure that constraints proposals will be modified in line with the MDBA's Constraints Management Strategy targets and the Water Act 2007, and ensure that adequate funding is available to implement the MDBA's Constraint Management Strategy in full by 2024.

3. Efficiency measures

Basin governments have listed water use efficiency projects to contribute to recovering 450GL of water to enhance the health of the Basin's environment while achieving neutral or improved socio-economic outcomes. The current amendment will require recovering at least 61GL of water towards the 450GL target. Recovering the full 450GL is essential for achieving the outcomes in the Water Act and Schedule 5 of the Basin Plan, including "providing opportunities for environmental watering of an additional 35,000 ha of floodplain in South Australia, New South Wales and Victoria, improving the health of forests and fish and bird habitat, improving the connection to the river, and replenishing groundwater."

A report by Ernst and Young for the Murray-Darling Basin Ministerial Council has concluded that it is possible to deliver the 450GL of water with neutral or positive socio-economic impacts. However, there has been no specific projects agreed nor any reported recovery of this water to date. The EY report identified a "significant risk in achieving the recovery of the 450GL within the statutory budget", given the volatility of water prices and anticipated increase in future water prices.

Recommendation 3: The Australian Parliament amends the Basin Plan 2012 (Attachment B) and Water Act 2007 (Attachment C) to guarantee that 450GL of real water savings will be achieved as per the Water Act 2007, by ensuring: (a) sufficient budget to recover the full 450GL; (b) a guarantee that funding contracts and proposed water savings take into account the impact of efficiency measures on return flows; and (c) a requirement for appropriate monitoring and auditing to be undertaken.

4. Pre-requisite policy measures

When setting the Sustainable Diversion Limit, the Murray-Darling Basin Authority assumed that specific policy measures would be implemented to allow the maximum environmental benefit to arise from use of water recovered under the Basin Plan. These measures included crediting return flows and calling environmental water from storage (s7.15 (b) (ii), including shepherding arrangements). Unless these measures are implemented in a way that is consistent with the modelled assumptions, more water will be required to meet the environmental outcomes of the Basin Plan, leaving less for consumptive users.

Full transparency is required to ensure that pre-requisite policy measures brought forward by States are consistent with the SDL adjustment benchmark model. The benchmark model is the hydrological model of the Basin that was used to estimate the unadjusted SDLs, with some modifications (see Basin Plan Schedule 6.02). In determining the reconciliation adjustment, the Murray-Darling Basin Authority should provide evidence to demonstrate that the pre-requisite policy measures configured in the SDL adjustment Benchmark model are consistent with those implemented by Basin states. This should include hydrological monitoring or auditing as appropriate.

Recommendation 4: The Australian Parliament amends the Basin Plan 2012 (Attachment B) and Water Act 2007 (Attachment C) to ensure that pre-requisite policy measures implemented by Basin states for managing water are configured into the SDL adjustment Benchmark model used to

determine the reconciliation amount, to ensure that policies presented by Basin governments enable the same outcome as the benchmark model assumptions for sustainable diversion limit adjustment.

References

1. MDBA, 2018. *Senate orders for production of documents—Environment—Murray-Darling Basin Authority—Adjustment mechanism projects—Assessments—Order agreed to on 7 February 2018—Letter to the President of the Senate from the Minister for Resources and Northern Australia (Senator Canavan), and attachments*. 2018 19 April 2018]; Available from: http://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id%3A%22publications%2Ftabledpapers%2F1c583c50-c828-4334-98f4-db01a74c7a35%22.
2. MDBA, 2014. *Basin-wide environmental watering strategy*. Murray-Darling Basin Authority.
3. Martin, W. and Turner, G., 2015. *SDL Adjustment Stocktake Report*. Independent Report to the Murray-Darling Basin Ministerial Council: Canberra.
4. MDBA, 2012. *Hydrologic modelling of the relaxation of operational constraints in the southern connected system: Methods and results*. Murray-Darling Basin Authority: Canberra, Australia. p. 129.
5. MDBA, 2013. *Constraints Management Strategy*. Murray-Darling Basin Authority: Canberra.
6. Murray-Darling Basin Ministerial Council, 2016. *Package of supply, constraints and efficiency measures agreed by the Murray–Darling Basin Ministerial Council on 22 April 2016.*
7. MDBA, 2014. *Flow inundation mapping and impact analysis: CMS prefeasibility technical report*. Murray-Darling Basin Authority: Canberra.

Attachment A

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Conditions necessary for individual supply measure projects notified for SDL adjustment

The Wentworth Group has identified what we believe are the twelve conditions necessary for supply measure projects to be consistent with the Water Act 2007, Basin Plan 2012, MDBA policies and intergovernmental agreements (Table 1). These conditions are necessary to give the Commonwealth Government and the general public confidence that $1.3 billion of taxpayers' money spent on projects will deliver the expected outcomes without unacceptable risks to communities and the environment.

Eleven of these conditions have been agreed by Basin governments and are sourced from the Basin Plan itself, or policies that have been agreed by Basin governments or adopted by the Authority (see references in Table 1). One further condition (Condition 8) was a recommendation from an independent stocktake of SDL projects commissioned by the Authority in 2015. This condition applies to projects that generate water savings (e.g. evaporative or operational loss savings), and is designed to ensure that these savings will be available for environmental use and not consumptive use.

This document describes specific conditions that should apply to individual supply measure projects so they can be modified in line with the twelve conditions. The specific conditions are based on information from business cases provided by some Basin states to the Wentworth Group in 2016-17, updated with information from the Murray-Darling Basin Authority's assessments of supply measure projects (MDBA, 2018) made publicly available on the 22 March 2018 through a Senate order for production of documents.

Table 1. Twelve conditions of supply measure projects proposed by state governments to ensure all projects are consistent with the Basin Plan.

Condition of Approval	Reference in Water Act, Basin Plan, MDBA policies and intergovernmental agreements
1. Works-based projects must align with Basin Plan targets.	Basin-wide environmental watering strategy (MDBA, 2014a)
2. All works-based projects must be assessed using a scientifically robust method.	Basin Plan S6.05
3. Any adjustment of the sustainable diversion limit must ensure that there is no change in flow indicators.	Basin Plan S6.07
4. Sustainable diversion limit must not change by more than ±5% overall.	Basin Plan s7.19
5. Environmental risks must be mitigated to acceptable levels.	Phase 1 Assessment Guidelines for Constraint and Supply Proposals, Overarching Evaluation Criteria #4.(MDBA, 2014d)
6. Long-term governance arrangements must be secured.	Phase 1 Assessment Guidelines for Constraint and Supply Proposals, Overarching Evaluation Criteria #3. (MDBA, 2014c)
7. Environmental water must be able to reach works projects and the broader floodplain in the future.	Basin-wide environmental watering strategy (MDBA, 2014a)
8. Any water savings from rules-based projects will be converted into a water entitlement.	Recommended in the SDL Adjustment Stocktake report commissioned by MDBA "Converting savings to licence entitlements is required to achieve a supply contribution" (Martin and Turner, 2015)
9. Projects must deliver value for money.	*Intergovernmental Agreement on Implementing Water Reform in the Murray-Darling Basin* (COAG, 2013), and Phase 1 Assessment Guidelines for Constraint & Supply Proposals, Overarching Evaluation Criteria #2 (MDBA, 2014b)
10. Projects must be monitored to ensure outcomes are delivered.	Basin-wide environmental watering strategy (MDBA, 2014a)
11. Projects are consistent with the Constraints Management Strategy, including that constraint levels as at 2012 must be used as a benchmark to compare changes.	Constraints Management Strategy (Table 5) (MDBA, 2013), Phase 2 Assessment Guidelines for Supply & Constraint Measure Business Cases #3.2.2 (MDBA, 2016)
12. Pre-requisite policies proposed by states for managing environmental water must be configured in the model used to calculate an adjustment.	Basin Plan s7.15 (1) (ii)

1. 2011 Snowy Water Licence Schedule 4 Amendments to River Murray Increased Flows Call Out Provisions

Proponent(s)	New South Wales / Victoria
Project description	Amendments to Snowy Hydro licence in 2011 allow the water recovered by the River Murray Increased Flows (RMIF) to be held and called out. Previously the release of the water was at the discretion of Snowy Hydro and was generally at times suited to Snowy Hydro's commercial outcomes. The proposal intends to provide a means to control the timing of RMIF water releases from the Snowy Scheme, allowing more flexibility to achieve environmental outcomes targeted in the Murray River below Hume Dam.
Assessment of Project against Conditions	Satisfied = 3
	Required = 6, 10 (MDBA, 2014a, MDBA, 2014c)
	Insufficient information = 10
	Not applicable = 1,2,4,5,7,8,9,11,12
Conditions to be met	6 - Need to secure long term governance arrangements because there is "no accepted agreement of ownership and responsibility for ongoing charges for the NSW RMIF water licence. Without agreement, this would likely result in environmental water holders being reluctant to utilise this water portfolio." (MDBA, 2018) 10 - The modelled representation of the project must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation and availability of callable RMIF.

2. Barmah-Millewa Forest Environmental Water Allocation

Proponent (s)	Victoria / New South Wales
Project description	Rule change to vary the rules associated with the use of water set aside by Victoria and New South Wales in the Barmah-Millewa Forest Environmental Watering Account or BMFEWA. This measure proposes to not initiate or continue environmental release in December from BMFEWA if a four monthly flood has already occurred.
Assessment of Project against Conditions	Satisfied = 3,9
	Required = 5, 10 (MDBA, 2014a, MDBA, 2014d)
	Insufficient information = 10
	Not applicable = 1,2,4,6,7,8,11,12
Conditions to be met	5 - Environmental risks must be mitigated to acceptable levels. Need to ensure there is no reduction in planned environmental water currently used in Barmah-Millewa, as consistent with s10.28 of the Basin Plan given the MDBA is concerned how "modelling, particularly for the preferred rule change (model run number 23479) confirms the proposal is consistent with the original intent of the [Barmah-Millewa Forest Environmental Water Allocation] BMFEWA." (MDBA, 2018) 5 - Environmental risks must be mitigated to acceptable levels. Need to guarantee that NSW/VIC are responsible for and capable of supporting a bird breeding event in December if it occurs, because of the risk that Commonwealth water could be used if there was a bird breeding event in December. If there was previously a 4 month flood, there is a risk that a bird breeding event in December would not be supported under proposed rule change. This risk was also identified by the MDBA: "the proposal potentially shifts flooding events earlier than originally intended. This may result in different or lower environmental outcomes to what was originally intended in the creation of the BMFEWA." (MDBA, 2018) 5 - Environmental risks must be mitigated to acceptable levels. To ensure the EWA meet all BMFEWA objectives, the proponent needs to "provide analysis which investigates the frequency of above channel capacity flows in December and the four month flow event under the new rules to demonstrate that the ecological objectives of the BMFEWA are still met … This analysis should demonstrate that the lower overall use of the BMFEWA as per the proposal, which allows more borrowing opportunities for consumptive use (as described on page 28 of the proposal), does not result in adverse environmental impacts across the system." (MDBA, 2018) 10 - Operation of the proposal must be carefully monitored to ensure outcomes are delivered. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation.

3. Computer Aided River Management (CARM) Murrumbidgee

Proponent(s)	New South Wales
Project description	The CARM project aims to use better information in the form of metering, inundation models and more accurate loss estimates to allow operators to more accurately make releases to meet downstream orders. The saved operational loss may then be calculated and set aside to achieve environmental outcomes. A callable entitlement as a result of the envisaged saving will allow delivery of previous losses (which were also contributing to environmental outcomes) in a more managed way.
Assessment of Project against Conditions	Satisfied = 3,
	Required = 5, 8, 10 (MDBA, 2014a, MDBA, 2014d, Martin and Turner, 2015)
	Insufficient information = 10
	Not applicable = 1,2,4,6,7,9,11,12
Conditions to be met	5 - Environmental risks must be mitigated to acceptable levels. Need to ensure Planned Environmental Water is protected given that "MDBA considers the risk assessment to have underestimated reduced operating losses, impacting downstream flow reliability and existing environmental/ecological river services. There is concern this proposal substitutes held environmental water for planned environmental water (PEW), resulting in a net reduction of the protection of PEW (contrary to s10.28 BP). The MDBA is undertaking consideration of NSW advice on concerns relating to a potential for the net reduction in the protection of planned environmental water. The MDBA considers that the use of environmental equivalence scoring framework to verify equivalent ecological outcomes from PEW is not appropriate." (MDBA, 2018) 8 - Entitlement must be issued associated with water (loss) savings as described by the MDBA in its assessment: "The water savings are to be converted to a general security access licence account. While the proposal is to create an entitlement from anticipated water savings, the entitlement must have normal general or high security characteristics for environmental water recovery to be reduced on a one-one basis. Otherwise an equivalent yield must be calculated to remove any third party impacts." (MDBA, 2018) 10 - Operation of the proposal must be carefully monitored to ensure outcomes are delivered. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. This is confirmed by MDBA's own assessment which stated: "Monitoring and evaluation (ME) is integral to the proposal's successful implementation, and to inform the 2024 reconciliation, but there is no clear indication that ME funding is available." (MDBA, 2018)

4. Enhanced environmental water delivery (Hydro Cues)

Proponent(s)	New South Wales / Victoria / South Australia
Project description	This project will achieve enhanced environmental outcomes by increasing environmental water holders' ability to time releases of environmental water from dams with increases in natural flows caused by rainfall. Proponents and environmental water holders will work together to explore opportunities to better mimic natural conditions without impacting long and short term reliability. The environmental benefits, in part, will be dependent on the extent to which constraints projects are implemented. Any changes will be tested progressively and monitored in an adaptive management process consistent with agreed constraints outcomes. Proponents acknowledge the need for focussed engagement and consultation with communities on this project.
Assessment of Project against Conditions	Satisfied = 3
	Required = 6, 10 (MDBA, 2014a, MDBA, 2014c)
	Insufficient information = 10
	Not applicable = 1,2,4,7,8,9,11,12
Conditions to be met	6 - Long-term governance arrangements must be secured. Approval from CEWO must be sought to use Commonwealth environmental water to operate according to the proposal so that the changes do not simply represent a model optimisation, as per Basin Plan s6.06 (3). 10 - The operation of the proposal must be carefully monitored to ensure outcomes are as modelled, particularly as the model assumes CEWO watering using Hydro Cues every year which is unlikely. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation.

5. Flexible Rates of Fall in River Levels Downstream of Hume Dam

Proponent(s)	Victoria / New South Wales
Project description	Rule change to allow Hume releases to be reduced more quickly when flows have not been elevated for an extended period beforehand, with the water saved released at a different point in time or in a different flow pattern that would provide additional environmental benefits. The additional flexibility improves Hume Dam operational efficiency.
Assessment of Project against Conditions	Satisfied = 3,6,8,9
	Required = 5, 10 (MDBA, 2014a, MDBA, 2014d)
	Insufficient information = 5,10
	Not applicable = 1,2,4,7,11,12
Conditions to be met	5 - Environmental risks must be mitigated to acceptable levels. The proponent must ensure that more rapid reduction in releases from Hume does not lead to bank slumping or other unforeseen detrimental environmental consequences because "An Earth Tech 2008 report on the proposal notes that whilst proposed changes have been developed to minimise the risk of bank erosion, there is an increased risk of bank failure due to drawdown with monitoring required." (MDBA, 2018). This could involve amending proposed rules based on a "trial of the rule changes being undertaken in 2014-15 and 2015-16 [which] is intended to determine if bank failure and other erosional processes pose a significant risk" (MDBA, 2018) 10 - Operation of the proposal must be carefully monitored to ensure outcomes are delivered and modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation.

6. Hume Dam airspace management and pre-release rules

Proponent(s)	Victoria / New South Wales
Project description	Rule change to allow future environmental water releases in airspace management.
Assessment of Project against Conditions	Satisfied = 3
	Required = 5,6,10,11 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, MDBA, 2013, MDBA, 2016)
	Insufficient information = 10,11
	Not applicable = 1,2,4,7,8,9,12
Conditions to be met	5 - Environmental risks must be mitigated to acceptable levels. There should be no reduction of planned environmental water (including dam spill events). 6 - Long-term governance arrangements must be secured. There needs to be greater transparency regarding airspace management, and agreement by the Commonwealth Environmental Water Holder (CEWH) on the proposal as CEWH may be expected to underwrite storage airspace. For example, "the MDBA is actively investigating and pursuing better ways to manage airspace and large parcels of held environmental water to avoid increased flood risk, and the results of these investigations may assist the proponents to refine the proposal." (MDBA, 2018) 10 - Operation of the proposal must be carefully monitored to ensure outcomes are delivered. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. For example, "the MDBA is actively investigating and pursuing better ways to manage airspace and large parcels of held environmental water to avoid increased flood risk, and the results of these investigations may assist the proponents to refine the proposal." (MDBA, 2018) 11 - Need a guarantee that the changed pre-release strategy in this proposal does not result in additional flood risk downstream which has not been mitigated by an adequate operational flow constraint relaxation program downstream. Details on how this proposal interacts with the Natural Cues project and the necessity for constraint relaxation needs to be available. This is confirmed by the MDBA which found "that managing the storage according to these rules, with the environmental water demand that now occurs, can lead to Hume Reservoir being kept close to full for prolonged periods of time which may create risks to third parties. Although there is also significant potential for the proposal to interact with constraints measures as noted in the MDBA's interim advice on supply measures (June 2015) it should be noted that pre-release is a spill which is not subject to flow limits that apply for regulated releases. There may also be impacts on other water accounts which are subject to spill. It is the MDBA's view that the proposal could be refined so that the storage in managed in a way that minimises third party risks" (MDBA, 2018)

7. Improved Regulation of the River Murray

Proponent(s)	Victoria / New South Wales
Project description	The proposal locks in place recent observed improvements in operational loss performance. The agreement to proceed with the project as a supply measure is subject to resolution by the Basin Officials Committee (BOC) by September 2017 of an approach that secures enduring environmental outcomes, which may include environmental water entitlements or equivalent arrangements.
Assessment of Project against Conditions	Satisfied = 3,9
	Required = 8, 10 (MDBA, 2014a, Martin and Turner, 2015)
	Insufficient information = 10
	Not applicable = 1,2,4,5,6,7,11,12
Conditions to be met	8 - Guarantee that the proposal will issue an entitlement to the environment associated with the claimed water savings to safeguard against the savings not being realised. This condition is supported by MDBA's own assessment which states: "The intent to provide confidence that the proposal will lead to an enduring change by creating an environmental entitlement is considered to outweigh the substitution concern." (i.e. substituting for PEW) "Furthermore having an environmental entitlement which has the same reliability characteristics as consumptive entitlements is particularly pertinent given the Business case identifies future demand patterns (and hence potential operational losses) may change in response to external factors." (MDBA, 2018) 10 – Project requires careful monitoring of river operations to ensure that the model change proposed by Victoria and New South Wales ends up being an accurate reflection of reality rather than just a model optimisation. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. This condition is supported by MDBA's own assessment which states "These possible changes mean that it is important procedures are developed for monitoring ongoing operational loss performance as part of the project implementation phase. This is supported to regularly review whether the models reasonably reflect on-ground performance." (MDBA, 2018)

8. Structural and operational changes at Menindee Lakes

Proponent(s)	New South Wales
Project description	This project is a package of operational changes and infrastructure works designed to improve the efficiency of the Menindee Lakes system. The enhanced Menindee project introduces some new works and measures to incorporate a wider range of infrastructure, operations, regulatory and adjustment options which in combination will deliver greater water efficiency savings. The proponent acknowledges the need for consultation with communities and the need to set out transparent governance arrangements.
Assessment of Project against Conditions	Satisfied = 2,3
	Required = 5,6,8,9,10 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, Martin and Turner, 2015, COAG, 2013, MDBA, 2014b)
	Insufficient information = 9,10,
	Not applicable = 1,4,7,11,12
Conditions to be met	5 - Environmental risks must be mitigated to acceptable levels. The proponent must demonstrate that environmental risks are mitigated to acceptable levels, including those risks identified by the MDBA, for example: • "Further details on protection of the ecological values of the site is required, in particular golden perch and the lowland Darling River Endangered Ecological Community, listed under the NSW Fisheries Management Act 1994." (MDBA, 2018) • "The proposal does not fully address potential risks and impacts to downstream water users, including reliability of supply, water quality and interactions with planned environmental water (PEW)." (MDBA, 2018) • "quantitative objectives for each of the lakes of and the downstream/upstream environments should be clearly articulated. Given their ecological connectivity, rivers in the northern Basin should also be considered." (MDBA, 2018) • "Evidence suggests Lake Cawndilla already exhibits high levels of productivity under current operations — hence its importance as a fish nursery. There is the potential for adverse ecological impacts given the filling regime proposed is much drier than would have occurred naturally." (MDBA, 2018)

- "Under The Living Murray (TLM) program, the Great Darling Anabranch Pipeline project recovered 47 GL/y for the environment at a cost of $54 million. The works allowed the re-introduction of more natural flow conditions along 460 kilometres of the Anabranch. Modelling has shown a risk under the Menindee Lakes proposal that environmental flows may not be met at the frequency envisaged by TLM project, potentially undermining previous Commonwealth investment to restore the environment." (MDBA, 2018)
- "Potential adverse impacts for which MDBA seeks further assessment as part of the EIS include:
  - The potential implications for water dependent biota and ecological functions of the altered rates of rise and fall in Lake Cawndilla. The EIS process should undertake a formal cost/benefit assessment of the trade-offs associated with different filling regimes at Lake Cawndilla.
  - how remaining entitlements will be managed if not fully purchased.
  - how targeted environmental watering to Lake Cawndilla using held environmental water entitlement is accounted for against the environmental account. The business case provides the provision for held entitlement to be used between periods of sufficient water coming from the north to trigger the filling of Lake Cawndilla using planned environmental water. There should be no assumption that held environmental water will be used in the intervening period and even if so, it may not be sufficient to maintain environmental outcomes (especially during extended droughts)." (MDBA, 2018)
- The following concern should also be addressed: "Mitigation measures generally lack detail and may not appropriately mitigate the risks." (MDBA, 2018)

6 - Long-term governance arrangements must be secured by "identify[ing] clearly ownership and maintenance responsibilities for the proposed measures" (MDBA 2018). In addition, the proponent must guarantee they have the responsibility and capacity to support environmental values at Lake Cawndilla and the Darling Anabranch without depending on CEWH entitlements, otherwise the savings will be undermined. Potential adverse impacts for which further assessment is required as part of the EIS include:

- "The potential implications for water dependent biota and ecological functions of the altered rates of rise and fall in Lake Cawndilla. The EIS process should undertake a formal cost/benefit assessment of the trade-offs associated with different filling regimes at Lake Cawndilla.
- how remaining entitlements will be managed if not fully purchased.
- how targeted environmental watering to Lake Cawndilla using held environmental water entitlement is accounted for against the environmental account. The business case provides the provision for held entitlement to be used between periods of sufficient water coming from the north to trigger the filling of Lake Cawndilla using planned environmental water. There should be no assumption that held environmental water will be used in the intervening period and even if so, it may not be sufficient to maintain environmental outcomes (especially during extended droughts)." (MDBA, 2018)
- "Protection of additional inflows from the northern Basin under the Basin Plan needs to be addressed. Further management actions linked to flows at Bourke should also be linked into the new management arrangements." (MDBA, 2018)

8 - Ensure the proposal is issuing an entitlement to the environment associated with the claimed evaporation saving which will be increasing consumptive reliability either in the Darling or the Murray compared to Benchmark levels. Securing the use of the water savings for environmental use is also identified by the MDBA: "The nature of how the water savings from the project will be captured as an enduring change requires agreement." (MDBA, 2018)

9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. The MDBA is concerned that the project does not represent value for money given the Stocktake estimate of a 50 GL SDL adjustment and comments by the MDBA such as: "At an estimated cost of $6m for the Cawndilla regulator, additional detail on the ecological benefits is required to better assess the value for money of this structure. Average annual operating and maintenance costs are estimated at $438,500, approximately 0.3% of the project cost, which appears very low. Insufficient budgets may reduce asset longevity and use and result in sub-optimal operational performance." (MDBA, 2018)

10 - Project must be monitored to ensure the savings claimed eventuated while maintaining the environmental values at Lake Cawndilla and the Darling Anabranch. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. This requirement is confirmed by the MDBA: "Further clarification is required from the proponent regarding the assessment of local environmental needs and how this information will be used to revise the proposal as required. At minimum, MDBA would expect that a qualitative assessment will be undertaken to confirm that the net environmental outcomes of the final proposal are environmentally equivalent." (MDBA, 2018)

9. South East Flows Restoration Project

Proponent(s)	South Australia
Project description	The project will use a combination of newly constructed drains and widened existing drains within the Upper South East drainage system to divert additional water that currently flows to the sea from the Blackford Drain in the Upper South East into the Coorong South Lagoon. The diverted water will provide significant environmental outcomes for en route wetlands of the Upper South East through the provision of additional water of suitable quality, as well as salinity improvements in the Coorong South Lagoon.
Assessment of Project against Conditions	Satisfied = 3,5,8,9
	Required = 6,10 (MDBA, 2014a, MDBA, 2014c)
	Insufficient information = 10
	Not applicable = 1,2,4,6,7,11,12
Conditions to be met	5 - Risks must be mitigated to acceptable levels as per the business case. 6 – Long-term governance arrangements must be secured because "The proponent identifies the ability to deliver the project within budget as a high risk to be mitigated by robust project management processes. MDBA suggests insufficient information has been provided about resourcing and administration of ongoing operations and maintenance. MDBA would like greater detail provided concerning governance arrangements to ensure accountability for ongoing resourcing." (MDBA, 2018) and "The proponent identifies gaining access and investing in infrastructure on private land as a high risk even with mitigation strategies in place. MDBA would like greater detail provided about land acquisition processes and alternative arrangements to should the proponent fail to reach agreement with landholders to allow access to works for ongoing operation/maintenance." (MDBA, 2018) 10 - Operation of the proposal must be carefully monitored to ensure outcomes are delivered as "there is insufficient information about reporting and monitoring provided to support operations and allow for adaptive management." (MDBA, 2018). Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation.

10. Flows for the Future

Proponent(s)	South Australia
Project description	The project proposes activities that reduce the interception of low flows and result in additional flows to riverine environments in the Eastern Mount Lofty Ranges (EMLR) and to the Murray River including the Coorong, Lower Lakes and Murray Mouth in South Australia. The project will help restore the natural low flow patterns within the EMLR through measures that will improve the passage of low flows and freshes to improve ecological habitat conditions.
Assessment of Project against Conditions	Satisfied = 3,8,9
	Required = 10 (MDBA, 2014a)
	Insufficient information = 10
	Not applicable = 1,2,4,5,6,7,11,12
Conditions to be met	10 - Project must be monitored to ensure natural low flow and fresh patterns within the EMLR improve the ecological habitat conditions. This is confirmed by the MDBA: "A well designed monitoring program is identified as a key risk treatment to demonstrate the benefits of the proposal. A monitoring and evaluation program of the impact of the low flow devices (including ecological response monitoring) and a compliance and audit program are funded activities within the State Priority Project (SPP) funding component of the proposal." (MDBA, 2018)

11. SDL offsets in the Lower Murray NSW

Proponent(s)	New South Wales
Project description	The project aims to improve environmental water delivery and achieve better environmental and operational outcomes than achieved under the SDL benchmark model. This is to be done through the manipulation of weir pools, construction of a replacement pump station for Lake Cullulleraine (in Victoria), and works in the Carrs, Capitts and Bunberoo Creek (CCB) systems to provide evaporative and seepage water savings. Weir pools can create unnatural inundation of connected wetlands when the river is held artificially high. Lowering the weir pool can be used to return wetlands to a more

	natural wetting/drying regime, while raising it can allow water to reach areas that would be difficult to water under most conditions. The strategy of raising and lowering the weirs should provide an environmental benefit compared to an artificially constant weir pool level.
Assessment of Project against Conditions	Satisfied = 1,2,3
	Required = 5,6,8,9,10 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, Martin and Turner, 2015, COAG, 2013, MDBA, 2014b)
	Insufficient information = 5,6,9,10,
	Not applicable = 4,7,11,12
Conditions to be met	5 - Guarantee that environmental risks of proposal are managed within acceptable limits (low risk category), including the risk of salinity exceeding the salt load targets, and the following additional risks identified by the MBDA (MDBA, 2018): • "The proposal effectively seeks a 52,000 ML/d flow at lock 9 to provide flows to the CCB creek system year round. This appears to be an above natural flow through this system based on the hydrological analysis presented in Figure 7-4 and further consideration of the operating regime is required." • "The business case highlights the very high risk of enhanced carp recruitment and notes that mitigation strategies are only marginally effective (i.e. reduced from very high to highor very high to medium depending on the proposal element). As highlighted by the proponent and in the MDBA's "Interim advice on supply measures - November 2015", the potential for increased carp populations is of concern for all environmental works. • "The proponent has not provided the required assessment of any potential adverse water quality impacts in line with Chapter 9, Divisions 2 and 3 of the Basin Plan. Mitigation measures should be developed where water quality risk is found to be significant." 6 - Long-term governance arrangements must be secured, including from landholders affected by the project. 8 - An entitlement should be issued associated with the claimed saving which may be improving consumptive reliability. 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. 10 – Project must be monitored to ensure environmental conditions improve and the frequency of operation over time realise the modelled savings. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. The need for this condition is confirmed by the MDBA's assessment which states "Given that monitoring and evaluation is therefore integral to the successful implementation of the proposed measure, there should be the clear identification and confirmation of a funding source for ongoing monitoring to support these information needs. This would be expected as part of ongoing operational and maintenance costs." (MDBA, 2018)

12. Hume to Yarrawonga key focus area

Proponent(s)	New South Wales
Project description	The project aims to improve environmental water delivery and achieve better environmental and operational outcomes than achieved under the SDL benchmark model. Investigation of opportunities to address physical and policy constraints to the delivery of higher regulated flows (up to 40,000 megalitres per day from Hume Dam). Investigations will include the potential effects of higher flows on third parties and mitigation options to address unacceptable impacts (including easements and/or infrastructure) to allow the delivery of these flows (to support improved river and wetland health outcomes). Landholder acceptance of potential works will be critical. This project must be considered in relation to the other southern connected Basin constraints projects.
Assessment of Project against Conditions	Satisfied = 1,2,3
	Required = 6,9,10,11 (MDBA, 2014a, MDBA, 2014c, MDBA, 2013, COAG, 2013, MDBA, 2014b, MDBA, 2016)
	Insufficient information = 5,6,9,10,
	Not applicable = 4,7,12
Conditions to be met	6 - Long-term governance arrangements must be secured. Funding must be committed in advance for ongoing construction, operation, risk mitigation measures, long-term monitoring and auditing. 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. The MDBA has stated "The costing is considered to have a very high level of contingency

	and further refinement in the future may be beneficial to ensure no overestimated costings." (MDBA, 2018) 10 - Project must be monitored to ensure 40,000 ML/d was able to be delivered from Hume Dam to meet hydrological and environmental objectives downstream. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. 11 - Projects are consistent with the Constraints Management Strategy, including that constraint levels as at 2012 must be used as a benchmark to compare changes. There is concern by the MDBA that "the bottleneck of 30,000 ML/day at Yarrawonga proposed in the downstream Yarrawonga to Wakool reach materially affects the ability of this project to achieve its objectives. However, if the flow limit downstream of Yarrawonga was increased, then the Hume to Yarrawonga proposal could provide significant benefit, noting that some issues remain to be resolved." (MDBA, 2018)

13. Yarrawonga to Wakool junction key focus area

Proponent(s)	New South Wales
Project description	Investigation of opportunities to address physical and policy constraints to enable the delivery of higher flows (up to 30,000 megalitres per day downstream of Yarrawonga Weir, with a buffer for flows up to 50,000 megalitres per day). New South Wales will consult communities on mitigation options to address unacceptable impacts (including easements and/or infrastructure) to allow the delivery of these flows (to support improved river and wetland health outcomes). Landholder acceptance of potential works will be critical. This project must be considered in relation to the other southern connected Basin constraints projects.
Assessment of Project against Conditions	Satisfied = 1,2,3,5
	Required = 6,9,10,11 (MDBA, 2014a, MDBA, 2014c, MDBA, 2013, COAG, 2013, MDBA, 2014b, MDBA, 2016)
	Insufficient information = 6,9,10,
	Not applicable = 4,7,8,12
Conditions to be met	6 - Long-term governance arrangements must be secured. Funding must be committed in advance for ongoing construction, operation, risk mitigation measures, long-term monitoring and auditing. This is necessary given the MDBA has stated "the MDBA is supportive of the proposal to conduct trial releases to test and monitor the augmentation of tributary inflows. This is consistent with the concept of commissioning structures in stages rather than operating at full capacity on the initial event. However, the process for implementing these arrangements is not provided. Specifically, will easement agreements be established to allow initial "trial" flows, or will another method of compensation be used during this period?" (MDBA, 2018) 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. The MDBA has raised concerns that the proposal does not relax constraints sufficiently given the cost when it stated: "The cost estimates for the proposal are in excess of $306 million. The MDBA is of the opinion that the proposal in its current state does not justify this significant expenditure. The concept proposal requires significant further work in order for the benefits, impacts and risks of this proposal to be fully assessed and the investment justified." (MDBA, 2018) 10 - Project must be monitored to ensure the modelled flow constraint are realised in the real world to meet hydrological and environmental objectives. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. 11 - Ensure project is consistent with Constraints Management Strategy: 30,000 ML/d does not allow flows greater than were able to be delivered prior to the Basin Plan and in the Benchmark model. "In 2014 Basin governments, through their water ministers, agreed that, as a first priority, the three River Murray constraint measures be developed as integrated business cases. To this end, the MDBA does not consider that this concept proposal reflects a consistent or integrated approach with the other two River Murray key focus areas. Specifically, the three River Murray proposals do not all assume the same flow rates in the Yarrawonga-Wakool reach. The flow rate proposed downstream of Yarrawonga affects the viability of both the Hume-Yarrawonga and River Murray in South Australia business cases." (MDBA, 2018) 11 - Ensure modelling reflects river operation: The operational target is 30,000 ML/d however 50,000 ML/d has been modelled for estimating the SDL adjustment. This condition is particularly necessary given MDBA's own assessment stated: "The proposal has been nominated as a supply measure, however the nominated flow rate – 30,000 ML/d downstream of Yarrawonga is below the benchmark of 40,000 ML/d used in the Sustainable Diversion Limit adjustment assessment method." (MDBA,

	2018) and "The proposed flow limit of 30,000 ML/d would only meet limited environmental water requirements within the reach and would contribute very little to improving downstream environmental indicators compared to what is already feasible under existing constraints. The proposal would prevent both the River Murray in South Australia and Hume to Yarrawonga constraints proposals from achieving their objectives, rendering both upstream and downstream Murray constraints proposals unviable." (MDBA, 2018)

14. South Australian Murray key focus area

Proponent(s)	South Australia
Project description	Investigation of opportunities to address physical and policy constraints to the delivery of higher regulated flows up to 80,000 megalitres per day at the South Australian border. Higher flows are important for maintaining longitudinal connectivity from the border to the Coorong, Lower Lakes and Murray Mouth and promoting lateral connectivity to deliver water to the wetlands, floodplains, creeks and anabranches connected to the main river channel. Landholder acceptance of potential works will be critical. This project must be considered in relation to the other southern connected Basin constraints projects.
Assessment of Project against Conditions	Satisfied = 1,2,3,5,6,7,8,9,10
	Required = 11 (MDBA, 2013, MDBA, 2016)
	Insufficient information = n/a
	Not applicable = 4,12
Conditions to be met	11 - Ensure all constraints projects are consistent with Constraints Management Strategy (CMS), because of concerns that failure to implement upstream constraints proposals in line with CMS targets will impair the effectiveness of this proposal. MDBA has stated: "The effectiveness of the measures proposed in the South Australian business case is dependent on the proposed flows in the Yarrawonga-Wakool reach. The South Australian River Murray constraints measure will not achieve its stated outcomes if the proposed maximum flow rate downstream of Yarrawonga Weir remains at 30,000 ML/d. It is unlikely that flows in the range of 60,000 to 80,000 ML/d at the South Australian border would be achievable unless the proposed flow rate downstream of Yarrawonga is increased, making it difficult to justify implementing this proposal given upstream constraints." (MDBA, 2018)

15. New Goulburn key focus area*

Proponent(s)	Victoria
Project description	Investigation of opportunities to address in-channel constraints to the delivery of higher regulated flows up to 25,000 megalitres per day at Shepparton. Allowing the delivery of flows to the top of the bank would improve river health outcomes. This work will be done in a staged and bottom-up way with communities to understand the risks, impacts and costs, and develop feasible, practical and acceptable solutions to mitigate third party impacts. Building on this work, in close consultation with landholders and communities, further improvements to environmental water delivery will also be investigated. Landholder acceptance of potential works will be critical. This project must be considered in relation to the other southern connected Basin constraints projects.
Assessment of Project against Conditions	Satisfied = 1,2,3,5
	Required = 6,9,10,11 (MDBA, 2014a, MDBA, 2014c, MDBA, 2013, COAG, 2013, MDBA, 2014b, MDBA, 2016)
	Insufficient information = 6,9,10,
	Not applicable = 4,7,8,12
Conditions to be met	6 - Long-term governance arrangements must be secured. Funding must be committed in advance for ongoing construction, operation, risk mitigation measures, long-term monitoring and auditing. 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. 10 - Operation of the proposal must be carefully monitored to ensure outcomes are delivered. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. Project must be monitored to ensure the modelled flow constraint was realised in the real world in delivering hydrological and environmental objectives and reviewed to ensure consistency with the model at reconciliation date.

	11 - Ensure the project is consistent with the Constraints Management Strategy of 40,000ML/d: the current proposal is not consistent with the Constraint Management Strategy or the Hydrologic modelling of the relaxation of operational constraints in the southern connected system. This may not allow flows greater than were able to be delivered prior to the Basin Plan and in the Benchmark (see Basin Plan S7.12(3)(b)).

*This project was not a notified measure. The MDBA's assessment of this business case did not appear in the Senate Order for Production of documents: http://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id%3A%22publications%2Ftabledpapers%2F1c583c50-c828-4334-98f4-db01a74c7a35%22

16. Lower Darling key focus area

Proponent(s)	New South Wales
Project description	As part of the 'Structural and operational changes at Menindee Lakes' project, investigation of opportunities to address physical and policy constraints to the delivery of higher regulated flows (up to 14,000 megalitres per day at Weir 32). Investigations will include the potential effects of higher flows on third parties and mitigation options to address unacceptable impacts (including easements and/or infrastructure) to allow the delivery of these flows (to support improved river and wetland health outcomes). Landholder acceptance of potential works will be critical. This project must be considered in relation to the other southern connected Basin constraints projects.
Assessment of Project against Conditions	Satisfied = 1,2,3,5,11
	Required = 6,9,10,11 (MDBA, 2014a, MDBA, 2014c, MDBA, 2013, COAG, 2013, MDBA, 2014b, MDBA, 2016)
	Insufficient information = 6,9,10
	Not applicable = 4,7,8,12
Conditions to be met	6 - Long-term governance arrangements must be secured. Funding must be committed in advance for ongoing construction, operation, risk mitigation measures, long-term monitoring and auditing. 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. 10 - Operation of the proposal must be carefully monitored to ensure outcomes are delivered. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. Project must be monitored to ensure the modelled flow constraint was realised in the real world in delivering hydrological and environmental objectives and reviewed to ensure consistency with the model at reconciliation date. 11 - Ensure the project is consistent with the Constraints Management Strategy

* The MDBA's assessment of this business case did not appear in the Senate Order for Production of documents: http://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id%3A%22publications%2Ftabledpapers%2F1c583c50-c828-4334-98f4-db01a74c7a35%22

17. Murrumbidgee key focus area

Proponent(s)	New South Wales
Project description	Investigation of opportunities to address physical and policy constraints to the delivery of higher regulated flows (up to 40,000 megalitres per day at Wagga Wagga). Investigations will include the potential effects of higher flows on third parties and mitigation options to address unacceptable impacts (including easements and/or infrastructure) to allow the delivery of these flows (to support improved river and wetland health outcomes). Landholder acceptance of potential works will be critical. This project must be considered in relation to the other southern connected Basin constraints projects.
Assessment of Project against Conditions	Satisfied = 1,2,3,5
	Required = 6,9,10,11,12 (MDBA, 2014a, MDBA, 2014c, MDBA, 2013, COAG, 2013, MDBA, 2014b, MDBA, 2016, Commonwealth of Australia, 2012c)
	Insufficient information = 6,9,10,11
	Not applicable = 7,8,4

Conditions to be met	6 - Long-term governance arrangements must be secured. Funding must be committed in advance for ongoing construction, operation, risk mitigation measures, long-term monitoring and auditing. MDBA assessment supports this condition with statements such as: "The concept proposal suggests the use of trial flows to progressively build confidence in the area inundated and impacts. This adaptive management MDBA Provisional Assessment approach is sensible. However, no detail is provided about how these will be undertaken and how landholder agreement and potential compensation issues will be handled or funded. No risk assessment is provided – only an identification of some of the most significant risks is included. The proposal states that a process of detailed risk identification and analysis will be undertaken as part of the detailed design and planning phase. One risk which will require further assessment is the safety risk to third parties due to environmental watering events. No assessment of potential adverse environmental effects is provided. This was attached in the draft concept proposal but is missing here." (MDBA, 2018) 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. MDBA has stated "The costing is considered to have a very high level of contingency and further refinement in the future may be beneficial to ensure no overestimated costings." (MDBA, 2018) 10 - Operation of the proposal must be carefully monitored to ensure outcomes are delivered. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. Project must be monitored to ensure the modelled flow constraint was realised in the real world in delivering hydrological and environmental objectives and reviewed to ensure consistency with the model at reconciliation date. 11 - Assess whether 40,000 ML/d at Wagga is consistent with the Constraint Management Strategy target of 50,000 ML/d at Gundagai as the MDBA has raised the following concern "The business case proposes flow limits of 40,000 ML/day at Wagga Wagga. However, the benchmark conditions in the Murrumbidgee include a flow limit of 30,000 ML/day at Gundagai. The discrepancy between this benchmark flow limit and that used in practice may affect the degree to which the measure is able to provide a supply benefit." (MDBA, 2018) 12 -"The project is likely to have limited benefit unless prerequisite policy measures are implemented (ability to deliver water on top of unregulated flows and crediting of environmental return flows for downstream environmental use)." (MDBA, 2018)

18. Lindsay Island (Stage 2) Floodplain Management Project

Proponent(s)	Victoria
Project description	The Lindsay Island Floodplain Project will inundate 5,152 hectares of the floodplain and connect many parts of the floodplain through tiered watering events, including areas of unique fast-flowing aquatic habitat, through to sections of black box, lignum and onto the higher alluvial terraces. The proposed works will be operated in tandem with the recently completed TLM works at this site (Lindsay State 1) and Lock 7 to mimic flows of 40,000 megalitres per day to 120,000 megalitres per day.
Assessment of Project against Conditions	Satisfied = 2,3
	Required = 1,5,6,7,9,10 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, COAG, 2013, MDBA, 2014b)
	Insufficient information = n/a
	Not applicable = 4,8,11,12
Conditions to be met	1 – Need to ensure project aligns with Basin Plan targets. Review assumption that areas of floodplain (described as higher alluvial terraces) associated with flows of 120,000 ML/d should be targeted when these flows would only have occurred less than 1 in 10 years under natural conditions. MDBA confirms this condition is necessary when it stated "There is evidence that the project will provide ecological benefits, however there are issues where proposed hydrological targets exceed natural flows and are inconsistent with the Basin Plan." (MDBA, 2018) 5 - The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. MDBA assessment statements also support these conditions such as:

"Decommissioning works is not a suitable risk management action as this would negate the SDL adjustment benefits. Of particular concern is the risk posed to the EPBC listed Murray cod. Reduced hydrodynamic diversity is assessed as having a moderate residual risk after mitigation measures are applied. The Expert Panel (Terry Hillman) expressed the opinion that landscape effects of potential failure (Lindsay Island cod populations are lost in the absence of preventative actions) are an unacceptable option and therefore outweigh the other ecological gains offered by the proposed supply measure." (MDBA, 2018)

6 - Long-term governance arrangements must be secured. Ownership and management responsibilities must be clearly defined and operations and maintenance must be borne by the owner; MDBA has raised a number of concerns in this regard supporting the need for this condition including:

- "Information provided for ongoing operations and maintenance resourcing does not currently meet the phase 2 business case criteria and until this issue is resolved, there will be a significant risk for this project" (MDBA, 2018)
- "The MDBA considers that funding of operations and maintenance of these assets must be assured by the relevant state" (MDBA, 2018)
- "Achieving proposed flows will require close collaboration with river operators and other environmental water holders, such as the CEWH and VEWH. There is insufficient information to assess whether arrangements are in place to ensure that environmental water can be delivered to the asset" (MDBA, 2018)
- "Delivering proposed flows to watering sites will involve the use of held environmental water and it may not be possible in practice to deliver flows according to the preferred timing, frequency and duration detailed in proposed operating scenarios. There may be issues with an environmental water holder's watering priorities and whole-of-system operational considerations and allowing for this is not apparent in the business case" (MDBA, 2018)
- "Although the business case includes some information about the need for easements and access rights, there is insufficient information about who is responsible for ensuring they are obtained, or who the beneficiary of the rights will be. The MDBA's experience with similar infrastructure suggests that not addressing these issues early can impact the effective operation of the assets. The business cases should include a commitment by the relevant state that they will obtain and hold these rights" (MDBA, 2018)
- "This assessment does not consider the risk of insufficient resourcing for operations and maintenance from the perspective of being able to operate works into the future to achieve the benefits upon which the SDL adjustment is based. A failure to operate due to lack of funding would result in the intended ecological equivalent outcomes not being achieved, in effect a project in which the adjustment is not delivered on an ongoing basis. As such, this risk is not adequately mitigated without a clear funding source." (MDBA, 2018)

7 - Ensure structures can operate naturally (e.g. all regulators open) except during periods of stress.

9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement.

10 – Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. The need for this condition is supported by MDBA assessment statements such as:

- "There is therefore the potential that ecological risks have been underestimated due to a lack of available information. Given this uncertainty, these risks require further consideration throughout the life of the project i.e. detailed design, construction and operation and a monitoring and evaluation program will be essential to mitigate these risks." (MDBA, 2018)
- "There is not enough information about the monitoring activities to determine if there is sufficient monitoring planned to support operations and water accounting. Information about water entering, flowing within and exiting the site is necessary for the effective management of environmental watering events and their co-ordination with other river operations activities." (MDBA, 2018)

19. Wallpolla Island Floodplain Management Project

Proponent(s)	Victoria
Project description	Wallpolla Island is part of TLM's Lindsay-Wallpolla Islands Icon Site. The proposed works will complement existing TLM works at this icon site. This project will increase the frequency and duration of floodplain inundation across 2,650 hectares, providing significant benefit to nationally important species, threatened vegetation communities, ecological values, carbon cycling and downstream water quality. This will benefit both Wallpolla Island and the broader Lower Murray region. The proposed works include four major regulators, 22 smaller containment regulators and 4.5 kilometres of levees (raised tracks). The works have been designed to complement weir pool manipulation activities (Locks 8 and 9) and connect areas of flowing aquatic habitat with sections of black box, lignum and higher alluvial terraces. This will enable watering at a landscape scale, mimicking flows of 30,000 megalitres per day to 120,000 megalitres per day.
Assessment of Project against Conditions	Satisfied = 2,3
	Required = 1,5,6,7,9,10 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, COAG, 2013, MDBA, 2014b)
	Insufficient information = n/a
	Not applicable = 4,8,11,12
Conditions to be met	1 - Need to ensure that the project aligns with Basin Plan targets. Uncertainty about why areas of floodplain (described as higher alluvial terraces) associated with flows of 120,000 ML/d are being targeted when these flows would only have occurred less than 1 in 10 years even under natural conditions. Need to ensure watering of these areas does not exceed natural frequencies which would be inconsistent with Basin Plan targets. This is supported by MDBA assessment which states "There is evidence that the project will provide ecological benefits, however there are issues where proposed hydrological targets exceed natural flows and are inconsistent with the Basin Plan." (MDBA, 2018) "The proposal also suggests inundating parts of the floodplain associated with flows up to 170,000 ML/d. Justification for this is lacking given that the frequency of these flows even under natural conditions may not support flood dependent species. It should be noted the floodplains associated with these flows are outside the highest Basin Plan flow indicator for this part of the Murray River." (MDBA, 2018) 5 - The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. This condition is supported by MDBA assessment which states: • "Decommissioning works is not a suitable risk management action as this would negate the SDL adjustment benefits" (MDBA, 2018) • "Specifically, the operation of the Wallpolla works proposes to re-use water from the different hydraulic units within the site which is identified as a potential risk in the accumulation of high loads of bioavailable carbon" (MDBA, 2018) • "Increased carp populations – Recent carp population modelling undertaken by ARI highlight the significant risk of works sites providing conditions favourable to carp" (MDBA, 2018) • "Reduced hydrodynamic diversity – Impacts on the EPBC-listed Murray cod must be minimised (and will be subject to EPBC approvals). Detailed design phase will need to carefully consider how to optimise outcomes for native fish and avoid favouring exotic pest species noting this is a knowledge gap (see below)" and • "Permanent removal or disturbance of flora and fauna habitat during construction – identified as a potentially very high risk after mitigation measures. This will require careful consideration during both the design and construction phases." (MDBA, 2018) 6 - Long-term governance arrangements must be secured. Ownership and management responsibilities must be clearly defined and operations and maintenance must be borne by the owner. This condition is supported by MDBA assessment which states: • "Information provided for ongoing operations and maintenance resourcing does not currently meet the phase 2 business case criteria and until this issue is resolved, there will be a significant risk for this project. A clear statement of ownership, funding and responsibility for ongoing operations and maintenance is required to meet phase 2 business case requirements" (MDBA, 2018) • "Achieving proposed flows will require close collaboration with river operators and other environmental water holders, such as the CEWH and VEWH. There is insufficient information to

	assess whether arrangements are in place to ensure that environmental water can be delivered to the asset." (MDBA, 2018) • "Delivering proposed flows to watering sites will involve the use of held environmental water and it may not be possible in practice to deliver flows according to the preferred timing, frequency and duration detailed in proposed operating scenarios. There may be issues with an environmental water holder's watering priorities and whole-of-system operational considerations and allowing for this is not apparent in the business case." (MDBA, 2018) • "Although the business case includes some information about the need for easements and access rights, there is insufficient information on who is responsible for ensuring that they are obtained, or who the beneficiary of the rights will be." (MDBA, 2018) 7 - Ensure structures can operate naturally (e.g. all regulators open) except during periods of stress. The need for this condition is supported by MDBA assessment which states "Specifically, the operation of the Wallpolla works proposes to re-use water from the different hydraulic units within the site which is identified as a potential risk in the accumulation of high loads of bioavailable carbon." (MDBA,2018) 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. MDBA has also raised concerns about costs estimates when it stated "The Wallpolla cost estimates are of considerable concern." (MDBA, 2018) 10 – Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. This condition is also supported by MDBA assessment which stated "There is not enough information about the monitoring activities to determine if there is sufficient monitoring planned to support operations and water accounting." (MDBA, 2018)

20. Belsar-Yungera Floodplain Management Project

Proponent(s)	Victoria
Project description	This proposed supply measure will maintain and improve flora and fauna habitat values and provide periodic breeding opportunities for wetland species, such as fish, frogs and waterbirds. Managed flows will be able to be delivered to 2,370 hectares of highly valued floodplain, representing one third of the total area. The works can be operated flexibly to meet the water requirements of different vegetation communities, mimicking a broad range of River Murray flows up to 170,000 megalitres per day. Through the construction of three large regulators, a series of smaller supporting regulators, track raising (levees) and a pipeline (to allow use of temporary pumps), this project will connect extensive areas of floodplain through tiered watering events. These works will make use of natural flow paths to increase the extent, frequency and duration of inundation from either Basin Plan flows or pumping during low flow events.
Assessment of Project against Conditions	Satisfied = 2,3
	Required = 1,5,6,7,9,10 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, COAG, 2013, MDBA, 2014b)
	Insufficient information = n/a
	Not applicable = 4,8,11,12
Conditions to be met	1 - Need to ensure that the project aligns with Basin Plan targets. Review assumption that areas of floodplain (described as higher alluvial terraces) associated with flows of 170,000 ML/d are being targeted when these flows would only have occurred less than 1 in 10 years even under natural conditions. Need to ensure watering of these areas does not exceed natural frequencies. 5 - The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. This is supported by MDBA concerns about risks such as: • "The MDBA is particularly concerned about fish outcomes in Narcooyia Creek which is known to represent good Murray Cod habitat. Given similar concerns have created difficulties and additional costs at Chowilla it will be imperative to know how the fish issues will be handled for this proposal." (MDBA, 2018) • "Decommissioning works is not a suitable risk management action as this would negate the SDL adjustment benefits." (MDBA, 2018)

	• "There is evidence that the project will provide ecological benefits, however there are issues where proposed hydrological targets exceed natural flows and are inconsistent with the Basin Plan." (MDBA, 2018) • "Specifically, the potential risk of hypoxia with Lakes Powell and Carpul has been identified. In addition the aggregated risk posed by multi-site watering is also raised although robust data does not exist." (MDBA, 2018) • "Increased carp populations – recent carp population modelling undertaken by the Arthur Rylah Institute highlights the significant risk of works sites providing conditions favourable to carp. Permanent removal or disturbance of flora and fauna habitat during construction – identified as a potentially very high risk after mitigation measures." (MDBA, 2018) • "The fishway enables fish to migrate up into the environmental water stored on the floodplain but there is no provision for them to pass further upstream back into the main River Murray system. It is not clear if there is a substantial improvement in the fish ecology on the floodplain under this restriction. Such a large expenditure needs robust justification." • "However, the design only includes eight bays and one of those is permanently 40% blocked off for irrigation purposes. The "ninth" is a fishway opening that is an ineffective floodway. Even allowing for the fact that the area of the waterway is "fuzzy" definition the design needs to be checked that it complies with the stated natural flood passage criterion." (MDBA, 2018) 6 - Long-term governance arrangements must be secured. Ownership and management responsibilities must be clearly defined and operations and maintenance must be borne by the owner. This condition is particularly relevant given MDBA concerns such as: • "Information provided for ongoing operations and maintenance resourcing does not currently meet the phase 2 business case criteria and until this issue is resolved, there will be a significant risk for this project." (MDBA, 2018) • "A clear statement of ownership, funding and responsibility for ongoing operations and maintenance is required to meet phase 2 business case requirements." (MDBA, 2018) • "While the business case outlines the issues to be taken into consideration for determining governance arrangements, it does not provide information on important issues such as the ownership of the assets created as part of this project and responsibility for on-ground operation of the works." (MDBA, 2018) • "Some limitations to the information provided are: • Secondary works would water areas of private land are proposed and agreement with landholders would need to be negotiated, however a management plan has not been provided. It is noted that these works may not proceed." (MDBA, 2018) 7 - Ensure structures can operate naturally (e.g. all regulators open) except during periods of stress. 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. Concerns about costs have also been raised by the MDBA such as: "These features have driven the cost / hectare of inundated floodplain up to about $23,500 per ha. This is about twice Lindsay Island, about four times the cost per hectare for Engineering Assessment of SDL Adjustment Business Cases submitted by Victoria Hattah and about five times that for Koondrook-Perricoota (even allowing for the latter's large cost overrun)." (MDBA, 2018) 10 – Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. This condition is supported by MDBA: "There is not enough information on monitoring activities to determine if there is sufficient monitoring planned to support operations and water accounting." (MDBA, 2018)

21. Guttrum and Benwell State Forests Floodplain Environmental Works Project

Proponent(s)	Victoria
Project description	The project will reinstate a more natural flooding regime for the Guttrum and Benwell Forests, addressing, in particular, the reduced frequency and duration of floods. The proposed works will water 1,200 hectares via pump stations, including semi-permanent wetlands and 82% of the river red gum forest with flood dependent understorey. The works will include two separate pump stations to deliver environmental water into Guttrum Forest, one pump station in Benwell Forest and containment works (regulators and levees) in both forests to contain water on the floodplain. The works have been designed to meet the environmental watering requirements of the ecological values by mimicking a 26,000 megalitres per day flood event in the River Murray for Guttrum Forest and a 24,000 megalitres per day flood event for Benwell Forest.

Assessment of Project against Conditions	Satisfied = 2,3
	Required = 1,5,6,7,9,10 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, COAG, 2013, MDBA, 2014b)
	Insufficient information = n/a
	Not applicable = 4,8,11,12
Conditions to be met	1 – Need to ensure that the project aligns with Basin Plan targets. This condition is required to ensure hydrological targets are consistent with the Basin Plan given MDBA assessment has stated "There is evidence that the project will provide ecological benefits, however there are issues where proposed hydrological targets exceed natural flows and are inconsistent with the Basin Plan." (MDBA, 2018) 5 - The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. Condition 5 is particularly relevant given MDBA assessment has stated: • "The MDBA is particularly concerned about the impacts on aquatic fauna through disconnecting main channel flows during inundation events through gated structures." (MDBA, 2018) • The impacts of the construction of works that pond water and change connectivity needs to be further researched and articulated to assist assessors evaluate the environmental benefits and trade-offs, particularly for aquatic species." (MDBA, 2018) • "The risk management approach adopted is consistent with the AS/NZS ISO 31000:2009 standard and the level of detail is appropriate for application at the concept design stage. However, a number of risks have not been mitigated in the current business case to a level which meets Guideline criteria (Risks not dealt with included Operations and maintenance, Ownership and governance, and Water Quality risks)" (MDBA, 2018) • "A risk mitigation strategy includes an initial high outflow to the Murray River before the forests are emptied to send a signal for native fish to escape. However, the operating strategy does not include this." (MDBA, 2018) 6 - Long-term governance arrangements must be secured. Ownership and management responsibilities must be clearly defined and operations and maintenance must be borne by the owner. This condition is supported by MDBA assessment statements such as: • "Upgrades to existing levees is proposed as part of the project. Clearly stated and supporting documentation of who owns the levees, their current condition and who funds and carries out the repairs and maintenance now, and under the FEP proposed." (MDBA, 2018) • "MDBA's understanding is that the wetlands may have environmental value, however there is also grazing and sand mining in the area. A question regarding disturbance or risks associated with recreational hunting activities and associate management plans also needs exploration." (MDBA, 2018) • "Information provided for ongoing operations and maintenance resourcing does not currently meet the phase 2 business case criteria and until this issue is resolved, there will be a significant risk for this project." (MDBA, 2018) • "There is insufficient information to assess whether arrangements are in place to ensure that environmental water can be delivered to the asset." (MDBA, 2018) • "Delivering proposed flows to watering sites will involve the use of held environmental water and it may not be possible in practice to deliver flows according to the preferred timing, frequency and duration detailed in proposed operating scenarios." (MDBA, 2018) • "There may be issues with an environmental water holder's watering priorities and whole-of-system operational considerations and allowing for this is not apparent in the business case." (MDBA, 2018) 7 - Ensure structures can operate naturally (e.g. all regulators open) except during periods of stress. 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. 10 – Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. This condition is supported by MDBA assessment statements such as: • "There is not enough information about the monitoring activities to determine if there is sufficient monitoring planned to support operations and water accounting." (MDBA, 2018)

	• "Lloyd Environmental (2014) identify a number of ecological risk knowledge gaps across all proposal sites (inadequate knowledge of biotic water requirements, presence and distribution of threatened species, effect of watering frequency on accumulation of organic material on the floodplain) which are considered likely to be applicable to the North Central CMA. There is therefore the potential that ecological risks have been underestimated due to a lack of available information. Given this uncertainty, these risks require further consideration throughout the life of the project i.e. detailed design, construction and operation and a monitoring and evaluation program will be essential to mitigate these risks." (MDBA, 2018) • "Implementation of identified mitigation measures and proposed monitoring will be essential to manage this issue." (MDBA, 2018) • "The mitigation strategy for several of the environmental impacts is to develop an environmental watering plan and adaptively manage using a thorough monitoring and evaluation program. The steps required to establish these management tools is not described in any detail in the business case (responsibilities, resourcing, timeframes, and scope). There is a long-term monitoring and evaluation plan for ecological targets but this does not provide information on sampling intervals or cover intervention monitoring (i.e. monitoring individual managed events to observe ecological response)." (MDBA, 2018)

22. Hattah Lakes North Floodplain Management Project

Proponent(s)	Victoria
Project description	This project will complement TLM works at the Hattah Lakes Icon Site by enhancing flooding across higher floodplain terraces. The project will also increase the flexibility for environmental water management across the lakes. The proposed works will water an additional 1,130 hectares of floodplain through the construction of two new regulators, a causeway across an existing track and 1.7 kilometres of levees along track alignments.
Assessment of Project against Conditions	Satisfied = 2,3
	Required = 1,5,6,7,9,10 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, COAG, 2013, MDBA, 2014b)
	Insufficient information = n/a
	Not applicable = 4,8,11,12
Conditions to be met	1 – Need to ensure that the project aligns with Basin Plan targets as "there is evidence that the project will provide ecological benefits, however there are issues where proposed hydrological targets exceed natural flows and are inconsistent with the Basin Plan." (MDBA, 2018) 5 - The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. This condition is supported by MDBA assessment statements such as: • "Decommissioning works is not a suitable risk management action as this would negate the SDL adjustment benefits." (MDBA, 2018) • "The residual risk rating is assessed as moderate for a number of key risks (low dissolved oxygen levels, blackwater events, increased carp populations) despite proposed mitigation measures." (MDBA, 2018) • "Lloyd Environmental (2014) identify a number of ecological risk knowledge gaps across all proposal sites (presence and distribution of threatened species, threats from episodic reduction in hydrodynamic diversity, stranding/isolation of native fish)." (MDBA, 2018) • "there is the potential for adverse impacts on species through the implementation of above natural flows, which needs consideration." (MDBA, 2018) 6 - Need to secure long term governance arrangements because: • "Information provided for ongoing operations and maintenance resourcing does not currently • meet the phase 2 business case criteria and until this issue is resolved, there will be a significant • risk for this project." (MDBA, 2018) • "While the business case outlines the issues to be taken into consideration for determining governance arrangements, it does not provide information on important issues such as the ownership of the assets created as part of this project and responsibility for on-ground operation of the works." (MDBA, 2018) • "A clear statement of ownership, funding and responsibility for ongoing operations and maintenance is required to meet phase 2 business case requirements." (MDBA, 2018)

	• "Although the business case includes some information about the need for easements and access • rights, there is insufficient information on who is responsible for ensuring that they are obtained, or • who the beneficiary of the rights will be." (MDBA, 2018) 7 - Ensure structures can operate naturally (e.g. all regulators open) except during periods of stress. 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. 10 – Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. Monitoring provisions seem inadequate given MDBA assessment statements such as: "There is not enough information about the monitoring activities to determine if there is sufficient monitoring planned to support operations and water accounting." (MDBA, 2018)

23. Gunbower National Park Floodplain Management Project

Proponent(s)	Victoria
Project description	The project has been developed to enable the delivery of environmental water to the wetlands and forest of the Gunbower National Park. It will mimic a natural flood event of up to 50,000 megalitres per day across 500 hectares. This includes almost half of the permanent and temporary wetlands in the project area and 20% (250 hectares) of river red gum with flood dependent understorey. The package of works include regulator and creek enhancement works. The mid forest works will consist of a 100 megalitres per day pump station location on the Murray River and a number of regulators. This will enable the provision of water to approximately 500 hectares of Gunbower National Park, currently unable to be watered by any other infrastructure.
Assessment of Project against Conditions	Satisfied = 2,3
	Required = 1,5,6,7,9,10 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, COAG, 2013, MDBA, 2014b)
	Insufficient information = n/a
	Not applicable = 4,8,11,12
Conditions to be met	1 - Need to ensure project aligns with Basin Plan targets as "there is evidence that the project will provide ecological benefits, however there are issues where proposed hydrological targets exceed natural flows and are inconsistent with the Basin Plan." (MDBA, 2018) 5 - The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. This condition is supported by MDBA assessment statements such as: • "Decommissioning works is not a suitable risk management action as this would negate the SDL adjustment benefits." (MDBA, 2018) • "Two potential adverse ecological impacts that either do not appear to be covered or where further information is requested are: hypoxic blackwater events and the impact on fish and other aquatic fauna (particularly if a hybridoperation is used following a natural winter/spring event). The risk of blackwater forming in Gunbower Forest is assessed as high however the risk of ecological impact is considered low and the rationale is not well explained; and alterations to Gunbower Forest connectivity through the use of irrigation channels rather than natural connections between the River Murray and the forest." (MDBA, 2018) • "The residual risk rating is assessed as moderate for a number of key risks (low dissolved oxygen levels, blackwater events, increased carp populations) despite proposed mitigation measures." (MDBA, 2018) • "Lloyd Environmental (2014) identify a number of ecological risk knowledge gaps across all proposal sites (inadequate knowledge of biotic water requirements, presence and distribution of threatened species, effect of watering frequency on accumulation of organic material on the floodplain) which are considered likely to be applicable to the North Central CMA. There is therefore the potential that ecological risks have been underestimated due to a lack of available information.." and • "there is the potential for adverse impacts on species through the implementation of above natural flows, which needs consideration." (MDBA, 2018)

	6 - Need to secure long term governance arrangements because: • "Information provided for ongoing operations and maintenance resourcing does not currently meet the phase 2 business case criteria and until this issue is resolved, there will be a significant risk for this project." (MDBA, 2018) • "While the business case outlines the issues to be taken into consideration for determining governance arrangements, it does not provide information on important issues such as the ownership of the assets created as part of this project and responsibility for on-ground operation of the works." (MDBA, 2018) • "Achieving proposed flows will require close collaboration with river operators and other environmental water holders, such as the CEWH and VEWH. There is insufficient information to assess whether arrangements are in place to ensure that environmental water can be delivered to the asset." (MDBA, 2018) • "Delivering proposed flows to watering sites will involve the use of held environmental water and it may not be possible in practice to deliver flows according to the preferred timing, frequency and duration detailed in proposed operating scenarios. There may be issues with an environmental water holder's watering priorities and whole-of-system operational considerations and allowing for this is not apparent in the business case." (MDBA, 2018) • "A clear statement of ownership, funding and responsibility for ongoing operations and maintenance is required to meet phase 2 business case requirements." And "Although the business case includes some information about the need for easements and access rights, there is insufficient information on who is responsible for ensuring that they are obtained, or who the beneficiary of the rights will be." (MDBA, 2018) • "Where irrigation infrastructure is used to deliver water to environmental sites, it is expected that arrangements will be put in place to secure delivery and set out how competing demands will be managed." (MDBA, 2018) 7 - Ensure structures can operate naturally (e.g. all regulators open) except during periods of stress. 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. 10 - Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. Monitoring provisions seem inadequate given MDBA assessment statements such as: • "There is not enough information about the monitoring activities to determine if there is sufficient monitoring planned to support operations and water accounting." (MDBA, 2018) • "Recent carp population modelling undertaken by the Arthur Rylah Institute highlights the significant risk of work sites providing conditions favourable to carp, and the potential for increased carp populations is of concern for all environmental works. The implementation of identified mitigation measures and proposed monitoring will be essential to manage this." (MDBA, 2018) • "The business proposal will alter the frequency, duration and extent of inundation floodplain. There is the potential for salt to be mobilised through changes in groundwater level and surface wash-off with subsequent impacts on the River Murray. Significant resources for monitoring and modelling are required to assess these adverse impacts and the proponent needs to articulate clearly management options for allocating appropriate resources for this purpose." (MDBA, 2018)

24. Burra Creek Floodplain Management Proposal

Proponent(s)	Victoria
Project description	The proposed works will enable inundation of an area of 407 hectares. This represents 33% of the total forest area and almost all of the flood dependent communities found within the forest, and provides a greater extent of watering than is possible under Basin Plan flows. The works involve the construction of three large regulators, raising tracks to form levees, and the removal of barriers to flow on the floodplain.
Assessment of Project against Conditions	Satisfied = 1,2,3
	Required = 5,6,7,9,10 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, COAG, 2013, MDBA, 2014b)
	Insufficient information = n/a
	Not applicable = 4,8,11,12

Conditions to be met	5 - The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. This condition is supported by MDBA assessment statements such as: • "The business case states that Burra Creek when flowing would have supported large channel-specialist fish such as the EPBC listed Murray cod. Unlike other works proposals within Victoria the risk assessment did not consider the potential for episodic reductions in hydrodynamic diversity due to the construction of regulators. As such it remains unclear if the net effect of the proposed measure is expected to maintain or enhance habitat for these species." (MDBA, 2018) • "Decommissioning works is not a suitable risk management action as this would negate the SDL adjustment benefits." (MDBA, 2018) • "The residual risk rating is assessed as moderate for a number of key risks (low dissolved oxygen levels, blackwater events, increased carp populations) despite proposed mitigation measures." (MDBA, 2018) • "Lloyd Environmental (2014) identify a number of ecological risk knowledge gaps across all proposal sites (presence and distribution of threatened species, threats from episodic reduction in hydrodynamic diversity, stranding/isolation of native fish)." and "However, a number of risks have not been mitigated in the current business case to a level which meets Guideline criteria" such as "operations and maintenance, ownership and governance and water quality" (MDBA, 2018) 6 - Long-term governance arrangements must be secured. Ownership and management responsibilities must be clearly defined and operations and maintenance must be borne by the owner. This condition is supported by MDBA assessment statements such as: • "Information provided for ongoing operations and maintenance resourcing does not currently meet the phase 2 business case criteria and until this issue is resolved, there will be a significant risk for this project." (MDBA, 2018) • "While the business case outlines the issues to be taken into consideration for determining governance arrangements, it does not provide information on important issues such as the ownership of the assets created as part of this project and responsibility for on-ground operation of the works." (MDBA, 2018) • "Achieving proposed flows will require close collaboration with river operators and other environmental water holders, such as the CEWH and VEWH. There is insufficient information to assess whether arrangements are in place to ensure that environmental water can be delivered to the asset." (MDBA, 2018) • "Delivering proposed flows to watering sites will involve the use of held environmental water and it may not be possible in practice to deliver flows according to the preferred timing, frequency and duration detailed in proposed operating scenarios. There may be issues with an environmental water holder's watering priorities and whole-of-system operational considerations and allowing for this is not apparent in the business case." (MDBA, 2018) 7 - Ensure structures can operate naturally (e.g. all regulators open) except during periods of stress. 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. 10 – Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. Monitoring provisions seem inadequate given MDBA assessment statements such as: "There is not enough information about the monitoring activities to determine if there is sufficient monitoring planned to support operations and water accounting." (MDBA, 2018)

25. Nyah Floodplain Management Project

Proponent(s)	Victoria
Project description	The proposed works will water almost 500 hectares of floodplain within Nyah Forest, replicating River Murray flows of up to 25,000 megalitres per day. The works will influence over 53% of the total forest area and almost all of the flood dependent communities. The works consist of four regulators, three on the downstream end of Parnee Malloo Creek and one on the upstream end. Additional works to contain water within the forest include 1.7 kilometres of low level track raising, forming a levee at the downstream end of the forest.

Assessment of Project against Conditions	Satisfied = 2,3
	Required = 1,5,6,7,9,10 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, COAG, 2013, MDBA, 2014b)
	Insufficient information = n/a
	Not applicable = 4,8,11,12
Conditions to be met	1 - Need to ensure that the project aligns with Basin Plan targets as "there are issues where proposed hydrological targets exceed natural flows and are inconsistent with the Basin Plan." (MDBA, 2018) 5 - The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. This condition is supported by MDBA assessment statements such as: • "Decommissioning works is not a suitable risk management action as this would negate the SDL adjustment benefits." (MDBA, 2018) • "The Lloyd Environmental (2014) risk assessment highlights a moderate residual risk of reduced hydrodynamic diversity however this risk is not presented within the business case." (MDBA, 2018) • "Lloyd Environmental (2014) also identify a number of ecological risk knowledge gaps across all sites (presence and distribution of threatened species, threats from episodic reduction in hydrodynamic diversity, stranding/isolation of native fish). There is therefore the potential that ecological risks have been underestimated due to a lack of available information." (MDBA, 2018) • "Three risks of particular concern where mitigation measures and monitoring will be essential are: Low dissolved oxygen levels, Increased Carp populations, and Permanent or temporary removal or disturbance of flora and fauna habitat during construction" (MDBA, 2018) 6 - Long-term governance arrangements must be secured. Ownership and management responsibilities must be clearly defined and operations and maintenance must be borne by the owner because: • "Information provided for ongoing operations and maintenance resourcing does not currently meet the phase 2 business case criteria and until this issue is resolved, there will be a significant risk for this project." (MDBA, 2018) • "a number of risks have not been mitigated in the current business case to a level which meets Guideline criteria" such as "operations and maintenance, ownership and governance" • "Although the business case includes some information about the need for easements and access rights, there is insufficient information about who is responsible for ensuring they are obtained, or who the beneficiary of the rights will be." (MDBA, 2018) • "Achieving proposed flows will require close collaboration with river operators and other environmental water holders, such as the CEWH and VEWH. There is insufficient information to assess whether arrangements are in place to ensure that environmental water can be delivered to the asset. Delivering proposed flows to watering sites will involve the use of held environmental water and it may not be possible in practice to deliver flows according to the preferred timing, frequency and duration detailed in proposed operating scenarios." (MDBA, 2018) 7 - Ensure structures can operate naturally (e.g. all regulators open) except during periods of stress. 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. 10 – Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. This condition is supported by MDBA assessment statements such as: "There is not enough information about the monitoring activities to determine if there is sufficient monitoring planned to support operations and water accounting." (MDBA, 2018)

26. Vinifera Floodplain Management Project

Proponent(s)	Victoria
Project description	The Vinifera Floodplain project will water up to 350 hectares of floodplain within Vinifera Forest. This represents 55% of the total forest area (638 hectares) and almost all of the flood dependent communities. The proposed works involve construction of four regulators and 1.1 kilometres of low level track raising to enable control of both flood and pumped flows into and out of Vinifera Creek. Water will be delivered to the site through a combination of natural inflows or temporary pumping when river flows are insufficient.
Assessment of Project against Conditions	Satisfied = 2,3
	Required = 1,5,6,7,9,10 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, COAG, 2013, MDBA, 2014b)
	Insufficient information = n/a
	Not applicable = 4,8,11,12
Conditions to be met	1 - Need to ensure project aligns with Basin Plan targets as "hydrological targets in Appendix B appear to be close to or exceed the frequency and/or duration of flows which would have occurred under natural conditions." (MDBA, 2018) 5 - The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. This condition is supported by MDBA assessment statements such as: • "Decommissioning works is not a suitable risk management action as this would negate the SDL adjustment benefits." (MDBA, 2018) • "Lloyd Environmental (2014) also identify a number of ecological risk knowledge gaps across all sites (presence and distribution of threatened species, threats from episodic reduction in hydrodynamic diversity, stranding/isolation of native fish)." (MDBA, 2018) • "Four risks of particular concern where mitigation measures and monitoring will be essential are: Low dissolved oxygen levels, Increased Carp populations, Reduced hydrodynamic diversity, Permanent or temporary removal or disturbance of flora and fauna habitat during construction" (MDBA, 2018) 6 - Long-term governance arrangements must be secured. Ownership and management responsibilities must be clearly defined and operations and maintenance must be borne by the owner because: • "Information provided for ongoing operations and maintenance resourcing does not currently meet the phase 2 business case criteria and until this issue is resolved, there will be a significant risk for this project." (MDBA, 2018) • "a number of risks have not been mitigated in the current business case to a level which meets Guideline criteria" such as "operations and maintenance, ownership and governance" • "Although the business case includes some information about the need for easements and access rights, there is insufficient information about who is responsible for ensuring they are obtained, or who the beneficiary of the rights will be." • "Achieving proposed flows will require close collaboration with river operators and other environmental water holders, such as the CEWH and VEWH. There is insufficient information to assess whether arrangements are in place to ensure that environmental water can be delivered to the asset. Delivering proposed flows to watering sites will involve the use of held environmental water and it may not be possible in practice to deliver flows according to the preferred timing, frequency and duration detailed in proposed operating scenarios." (MDBA, 2018) 7 - Ensure structures can operate naturally (e.g. all regulators open) except during periods of stress. 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. 10 – Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. This condition is supported by MDBA assessment statements such as: "There is not enough information about the monitoring activities to determine if there is sufficient monitoring planned to support operations and water accounting." (MDBA, 2018)

27. Gunbower Forest TLM Project

Proponent(s)	Victoria / New South Wales / South Australia
Project description	A suite of engineering works have been built through TLM to deliver environmental water to the Gunbower Forest Icon Site, watering up to 4,800 hectares. These works and associated operating regime have been designed to achieve the ecological objectives that have been set for the forest. The works include two main components:
Assessment of Project against Conditions	Satisfied = 2,3
	Required = 1,5,6,7,9,10 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, COAG, 2013, MDBA, 2014b)
	Insufficient information = n/a
	Not applicable = 4,8,11,12

Conditions to be met	1 - Need to ensure project aligns with Basin Plan targets as "there are issues where proposed hydrological targets exceed natural flows and are inconsistent with the Basin Plan." (MDBA, 2018)
	5 - The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. This condition is supported by MDBA assessment statements such as: "Decommissioning works is not a suitable risk management action as this would negate the SDL adjustment benefits." (MDBA, 2018)
	• "Lloyd Environmental (2014) identify a number of ecological risk knowledge gaps across all proposal sites (inadequate knowledge of biotic water requirements, presence and distribution of threatened species, effect of watering frequency on accumulation of organic material on the floodplain) which are considered likely to be applicable to the North Central CMA. There is therefore the potential that ecological risks have been underestimated due to a lack of available information." (MDBA, 2018)
	• "Two potential adverse ecological impacts that either do not appear to be covered or where further information is requested are:
	  ○ hypoxic blackwater events and the impact on fish and other aquatic fauna (particularly if a hybrid operation is used following a natural winter/spring event). The risk of blackwater forming in Gunbower Forest is assessed as high however the risk of ecological impact is considered low and
	  ○ the rationale is not well explained; and alterations to Gunbower Forest connectivity through the use of irrigation channels rather than natural connections between the River Murray and the forest."
	6 - Long-term governance arrangements must be secured. Ownership and management responsibilities must be clearly defined and operations and maintenance must be borne by the owner because:
	• "Achieving proposed flows will require close collaboration with river operators and other environmental water holders, such as the CEWH and VEWH. There is insufficient information to assess whether arrangements are in place to ensure that environmental water can be delivered to the asset. Delivering proposed flows to watering sites will involve the use of held environmental water and it may not be possible in practice to deliver flows according to the preferred timing, frequency and duration detailed in proposed operating scenarios. There may be issues with an environmental water holder's watering priorities and whole-of-system operational considerations and allowing for this is not apparent in the business case." (MDBA, 2018)
	• "a number of risks have not been mitigated in the current business case to a level which meets Guideline criteria" such as "operations and maintenance, ownership and governance" (MDBA, 2018)
	• "Although the business case includes some information about the need for easements and access rights, there is insufficient information about who is responsible for ensuring they are obtained, or who the beneficiary of the rights will be". (MDBA, 2018)
	7 - Ensure structures can operate naturally (e.g. all regulators open) except during periods of stress.
	9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. This is particularly relevant for all works proposals as costs are uncertain. MDBA assessment statements support this such as: "Water delivery costs through the Old Cohuna Main Channel via the Torrumbarry Irrigation area are mentioned in the business case but no ongoing costs

	are provided for this, as a review of Goulburn-Murray Water tariff structure is currently underway." (MDBA, 2018) 10 – Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. This condition is supported by MDBA assessment statements such as: "There is not enough information about the monitoring activities to determine if there is sufficient monitoring planned to support operations and water accounting." (MDBA, 2018)

28. TLM environmental works and measures – Koondrook-Perricoota Forest Flood Enhancement proposal

Proponent(s)	New South Wales / Victoria / South Australia
Project description	Koondrook-Perricoota Forest is a highly significant floodplain ecosystem on the Murray River in New South Wales. The Koondrook– Perricoota Forest is a large mosaic of river red gum, black box and grey box communities, interspersed by wetland ecosystems in New South Wales. Covering 32,000 hectares the state forest (Crown land) is managed by Forests NSW and is listed on the Register of the National Estate. The structures have been built and partially commissioned by NSW Water and MDBA River Murray Operations.
Assessment of Project against Conditions	Satisfied = 1,2,3
	Required = 5,6,7,9,10 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, COAG, 2013, MDBA, 2014b)
	Insufficient information = n/a
	Not applicable = 4,8,11,12
Conditions to be met	5 - The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. This condition is supported by MDBA assessment statements such as: "In the SDL adjustment modelling, there are no indices that recognise negative environmental impact, such as an increase in inundation to blackbox/grey box occurring at the end of the KP forest, or negative impact from restrictions at Barbers creek." (MDBA, 2018). The MDBA assessment included an explanation of the ecological risks arising from ponding on the floodplain: • "Natural flooding transports carbon from the floodplain into the river system. Carbon-rich water can become oxygen-depleted and cause death to fish and other aquatic fauna. Hypoxic water (also known as blackwater) is more likely to develop under limited outflow scenarios due to increased water depth higher water temperatures and an increased concentration of organic material. Local communities are particularly sensitive to blackwater due to their interest in recreational fishing,and the occurrence of fish deaths in recent years. • Natural floods benefit native fish by providing connectivity between river systems and between rivers and the floodplain. This enables fish to access additional foraging and breeding habitat. When the downstream regulators are used to control outflows, fish are unable to pass upstream through the structures, despite the cue provided by the flooding. Structures that are closed prevent fish passage in both an upstream and downstream direction. • Floodplain flooding benefits exotic fish species such as Common Carp by providing suitable breeding and foraging conditions. Holding water on the floodplain for extended periods is expected to provide more favourable conditions for Carp than would occur in a natural flow-through event. • Regular, deep pooling within the forest is likely to drown understorey plant species and replace them with wetland species. River Red Gum seedlings and flood-dependent understorey species germinate naturally in spring and early summer following the recession of floodwaters. Understorey vegetation is not expected to grow in the parts of the pool that persist into late summer. • Natural flows rise and fall. Despite the relatively stable status of the Barber Creek, release of flows at a constant rate over many months is likely to contribute to notch development and channel widening along the length of the creek. Geomorphic assessments of the Barber Creek in 2010 and 2011 have already identified minor notch development and channel widening occurring within the regulated section of the Creek. Geomorphic consultants have recommended that the release rate from the Forest be varied to mitigate the risk.

	• Finally, ponding water within a natural flow-through system constitutes a major obstruction to the natural carbon dynamic processes. Ponding on the floodplain is likely to deprive downstream systems of essential carbon and nutrients as these will be processed within the forest rather than being exported downstream." (MDBA, 2018) 6 - Long-term governance arrangements must be secured. Ownership and management responsibilities must be clearly defined and operations and maintenance must be borne by the owner; 7 - Ensure structures can operate naturally (e.g. all regulators open) except during periods of stress. 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. 10 – Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. This need to monitor and revise the modelling of the proposal is supported by MDBA assessment statements such as: "There are additional modelling related differences that require recognition in the SDL adjustment process. • Generally the current SDL adjustment modelling categorises watering events as large over-bank or hybrid events (Scenario 1, 3 or 4) where flows would pass through the system relatively unrestrained. Scenario 2 is assumed within scenario 4. • Current SDL adjustment modelling has estimated Barbers creek outflows to be 400ML/day, whereas current operations has a restriction to 250ML/day during regulated conditions, or 500ML/day7 during "managed hybrid events". • In the SDL adjustment modelling, it is assumed that managed TLM water will be released up to 400ML/day to Barbers Creek when the Koondrook-Perricoota works are operated in conjunction with any natural overbank flow (which is most of the cases under the Basin Plan) then the release rate will bigger than 400ML/day. • The SDL adjustment modelling inundation is between ~ 8,400 to 15,200ha, whereas with the scheme's restrictions this inundation will reduce significantly. In 2014 the first commissioning reduced inflows to manage risks with inundation of approximately 4,200ha. • The River Murray return flows at Crooked Creek regulator only engages minorly under high flow events or when water backed up from the bottom end (~20kms). It may be that estimated return flows will need to be revised once flows are better known." (MDBA, 2018)

29. Mulcra Island Environmental Flows TLM Project

Proponent(s)	Victoria / New South Wales / South Australia
Project description	Mulcra Island is part of the Lindsay-Wallpolla Islands Icon Site. The works have been funded through TLM and will assist in achieving the ecological objectives that have been set for the icon site by increasing the frequency, duration and extent of wetland and floodplain inundation, improving fish access to the creek and introducing flows to the upper Potterwalkagee Creek. The works enable watering of 820 hectares included the construction of seven environmental regulators and associated works, including sill lowering, stream rehabilitation and upgrading access tracks.
Assessment of Project against Conditions	Satisfied = 1,2,3
	Required = 5,6,7,9,10 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, COAG, 2013, MDBA, 2014b)
	Insufficient information = n/a
	Not applicable = 4,8,11,12
Conditions to be met	5 - The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. 6 - Long-term governance arrangements must be secured. Ownership and management responsibilities must be clearly defined and operations and maintenance must be borne by the owner; 7 - Ensure structures can operate naturally (e.g. all regulators open) except during periods of stress. 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement.

	10 – Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation.

30. Lindsay Island (Stage 1) Upper Lindsay watercourse Enhancement TLM Project

Proponent(s)	Victoria / New South Wales / South Australia
Project description	Lindsay Island is part of the Lindsay-Wallpolla Icon Site. The Stage 1 works were funded by TLM and aimed to maintain existing high quality habitat for native fish, increase the extent of flowing habitat on Lindsay Island by about 28 kilometres, improve fish passage between the Lindsay Island anabranches and the River Murray and improve the condition of riparian vegetation. These works will contribute to achieving the ecological objectives that have been set for the site, focusing on in-stream habitat. The works include three new regulators: • Upper Lindsay River regulators (north and south inlets) • Mullaroo Creek regulator and fishway.
Assessment of Project against Conditions	Satisfied = 1,2,3
	Required = 5,6,7,9,10 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, COAG, 2013, MDBA, 2014b)
	Insufficient information = n/a
	Not applicable = 4,8,11,12
Conditions to be met	5 - The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. 6 - Long-term governance arrangements must be secured. Ownership and management responsibilities must be clearly defined and operations and maintenance must be borne by the owner 7 - Ensure structures can operate naturally (e.g. all regulators open) except during periods of stress. 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. 10 – Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation.

31. Hattah Lakes Environmental Flows TLM Project

Proponent(s)	Victoria / New South Wales / South Australia
Project description	The project aims to deliver a watering regime that will achieve the ecological objectives for the Hattah Lakes Living Murray Icon Site. The on-ground works have been designed to increase the frequency, duration and extent of flooding across the lakes and surrounding floodplain. The package of works enables watering of 6,000 hectares and includes:
Assessment of Project against Conditions	Satisfied = 1,2,3
	Required = 5,6,7,9,10 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, COAG, 2013, MDBA, 2014b)
	Insufficient information = n/a
	Not applicable = 4,8,11,12
Conditions to be met	5 - The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. 6 - Long-term governance arrangements must be secured. Ownership and management responsibilities must be clearly defined and operations and maintenance must be borne by the owner 7 - Ensure structures can operate naturally (e.g. all regulators open) except during periods of stress.

	9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. 10 – Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation.

32. Chowilla Floodplain TLM Project

Proponent(s)	South Australia / New South Wales/ Victoria
Project description	The Chowilla Floodplain works is part of a program of The Living Murray (TLM) works at icon sites along the River Murray to ensure that environmental water recovered as part of TLM is used efficiently and ecological elements are maintained. The Chowilla Floodplain project involves a major environmental regulator on the Chowilla Creek and a range of complementary works. The environmental regulator will allow flows to be managed to enable flooding across the floodplain under relatively low river flow conditions.
Assessment of Project against Conditions	Satisfied = 1,2,3
	Required = 5,6,7,9,10 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, COAG, 2013, MDBA, 2014b)
	Insufficient information = n/a
	Not applicable = 4,8,11,12
Conditions to be met	5 - The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. 6 - Long-term governance arrangements must be secured. Ownership and management responsibilities must be clearly defined and operations and maintenance must be borne by the owner; 7 - Ensure structures can operate naturally (e.g. all regulators open) except during periods of stress. 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. 10 – Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation.

33. Improved Flow Management Works at the Murrumbidgee River – Yanco Creek Offtake

Proponent(s)	New South Wales
Project description	This proposal aims to return the Yanco Creek system closer to a pre-development wetting/drying regime, while improving infrastructure that supplies irrigation and stock and domestic water. Upgrades to Yanco Weir on the Murrumbidgee River would result in more control over flows through the proposed Yanco Creek regulator. This may provide the Commonwealth Environmental Water Holder and the Office of Environment and Heritage with more flexibility in managing flows within the Murrumbidgee River system.
Assessment of Project against Conditions	Satisfied = 2,3,7,
	Required = 1,3,5,6,8,9,10,11 (MDBA, 2014a, Commonwealth of Australia, 2012b, MDBA, 2014d, MDBA, 2014c, Martin and Turner, 2015, COAG, 2013, MDBA, 2014b, MDBA, 2013, MDBA, 2016)
	Insufficient information = 1,6,9,10,
	Not applicable = 4,11,12
Conditions to be met	1 – Need to ensure project aligns with Basin Plan targets. Need to demonstrate that the project is consistent with outcomes in the Basin-wide environmental watering strategy. This condition is supported by MDBA assessment statements such as: “The justifications provided in the business case for ecological objective trade-offs may not be entirely appropriate and have not undergone an external review by an independent expert. For example, as discussed below there could be an opportunity to improve fishway designs to accommodate all fish sizes. Unless it can be demonstrated that the hydrological regime of Yanco Creek is not diminished relative to the benchmark,

environmental outcomes for Yanco Creek floodplain should be explicitly scored using the established framework." (MDBA, 2018)

3 - Any adjustment of the sustainable diversion limit must ensure that there is no change in flow indicators. This condition is supported by MDBA assessment statements such as: "The business case presents analysis of achievement of surface flow indicators (SFIs) under benchmark conditions and with the inclusion of the proposal. The discrepancy between the benchmark SFI success in Table 8 and MDBA's analysis indicates that the benchmark model has been modified. Any changes need to be appropriately justified and the updated modelling provided to the MDBA in sufficient time to allow its validation and approval by the BOC before subsequent use to assess the notified package of measures." (MDBA, 2018)

5 - The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. This requires NSW to guarantee they are responsible for and capable of supporting environmental requirements of Yanco Creek, and in modelling the proposal the environmental requirements are met as part of calculating the saving. This condition is supported by MDBA assessment statements such as:

- "Yanco Creek has significant environmental values, including populations of EPBC listed Murray cod and Trout cod remaining in areas of permanent flow. There is a risk that the changed operating regime (with overall lower flows) will result in adverse environmental outcomes. It is not yet clear that these risks have been comprehensively assessed or how they will be managed." (MDBA, 2018)
- "The proponent is requested to provide a written assurance from the NSW Department of Primary Industry fisheries section that risks have been assessed and potential negative effects on fish populations including EPBC listed species are considered acceptable." (MDBA, 2018)
- "The proponent has indicated that the final set of operating rules will determine how well various adverse impacts are mitigated, and resolution of these rules is a significant piece of work that is yet to be done. This constitutes the most significant risk to the project." (MDBA, 2018)
- "There is a moderate residual risk that construction of a new regulator will impact on small bodied fish movement and there is an opportunity to improve fishway designs to accommodate all fish sizes which has not been explored. It is recommended that further consideration is given to the design of appropriate fishways with the designs undergoing an external review." (MDBA, 2018)
- "The business case states that the proposal generally maintains benchmark environmental flow results throughout Yanco Creek. This assertion is not well supported by information within Table 15 which shows that bankfull flows in particular are affected by the proposed operating regime changes. Similarly for some flow components the business case assessment suggests 'negligible change' with no basis for this categorisation. Negligible change is the assessment for reach 1 however modelling results show there is a consistent reduction in frequency of fresh, bankfull and overbank events, which could be ecologically significant." (MDBA, 2018)
- "The lack of clear operating rules represents a key risk for the project as the scale of the negative environmental outcomes of raising the Yanco Weir by 2.5m define how this additional weir capacity is used (e.g. as a re-regulating storage for irrigation supply)." (MDBA, 2018)
- "The business case notes a number of potential adverse ecological impacts, including: reduced hydrodynamic diversity (water ponding); overwatering of a threatened ecological community from the weir pool raising on the Murrumbidgee; blockage of fish passage (especially small-bodied species) from Yanco Creek to the Murrumbidgee River; and no further facilitation of the movement of small-bodied fish through the structures on the Murrumbidgee." (MDBA, 2018)

6 - Long-term governance arrangements must be secured. Ownership and management responsibilities must be clearly defined and operations and maintenance must be borne by the owner

8 - An entitlement should be issued associated with the claimed saving to protect the savings from re-regulation in the Murray River. This condition is supported by MDBA assessment statements such as: "The business case would benefit from a summary of the outcomes for the Yanco Ck environmental flows as well as for the Murrumbidgee / Murray system. There is concern that the water savings are largely taken up in delivering environmental flows back to the system they were saved from." (MDBA, 2018)

9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. This condition is supported by MDBA assessment statements such as:

	• "there appears to be minimal reasoning to raise the Yanco Weir by 2.5m and further justification should be provided." (MDBA, 2018) • "If the proponent reduced the size of the regulator to accommodate the lower flows it would reduce the required height of the weir, reducing costs and the area flooded by the weir pool. It may even mean that a completely new Murrumbidgee Weir at Yanco Creek was no longer needed." and • "The Authority is of the view that a second option the 'No increase in weir pool level', as identified in the Business Case but not investigated, requires serious consideration. The 'No increase in weir pool level' option represents a significant cost saving (about half the cost)." (MDBA, 2018) 10 – Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. This condition is supported by MDBA assessment statements such as: "Given that monitoring and evaluation are integral to the successful implementation of the proposed measure, there should be a clear indication that funding is available and identification of how this will be funded." (MDBA, 2018) 11 – Projects are consistent with the Constraints Management Strategy, including that constraint levels as at 2012 must be used as a benchmark to compare changes. This condition is supported by MDBA assessment statements such as: "If the constraints project does not proceed then the environmental benefits of the Yanco Creek regulator are likely to be negligible for the following reasons: There is no guarantee that increased flows from the Yanco regulator would be deliverable as increased flows would cause flooding of private land. The rationale behind the new higher weir on the Murrumbidgee is to send up to 2,500 ML/day down the Yanco Creek with only moderate flows in the Murrumbidgee. A flow of 2,500 ML/day in Yanco Creek would also flood private land and without permission to do so (through the constraints project) it will not be able to be used for that purpose." (MDBA, 2018)

34. Modernising Supply Systems for Effluent Creeks – Murrumbidgee River

Proponent(s)	New South Wales
Project description	This proposal involves returning parts of three creek systems closer to a pre-development wetting/drying regime, while improving infrastructure that supplies irrigation and stock and domestic water. This project may provide the Commonwealth Environmental Water Holder and the Office of Environment and Heritage with more flexibility in managing flows within the Murrumbidgee River system.
Assessment of Project against Conditions	Satisfied = 3,7,
	Required = 1,2,5,6,8,9,10 (MDBA, 2014a, Commonwealth of Australia, 2012a, MDBA, 2014d, MDBA, 2014c, Martin and Turner, 2015, COAG, 2013, MDBA, 2014b)
	Insufficient information = 1,6,9,10,
	Not applicable = 4,11,12
Conditions to be met	1 – Need to ensure that the project aligns with Basin Plan targets, including demonstrating that the project is consistent with outcomes in the Basin-wide environmental watering strategy. 2 – All works-based projects must be assessed using a scientifically robust method particularly given MDBA assessment statements such as: • "the operation of the Yanco regulator allows for increased inundation of the mid Murrumbidgee Floodplain for a given flow event, however, this occurs at the expense of inundation in the Yanco Creek system. This trade-off of environmental outcomes will need to be explicitly scored and will affect the net benefit of the proposal (see below potential adverse ecological impacts)" (MDBA, 2018) • "Unless it can be demonstrated that the hydrological regime of Yanco Creek is not diminished relative to the benchmark, environmental outcomes for Yanco Creek floodplain should be explicitly scored using the established framework." (MDBA, 2018) 5 – The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. NSW needs to guarantee they are responsible for and capable of supporting environmental requirements of the Effluent Creeks, and in modelling the proposal the

	environmental requirements are met as part of calculating the saving. This condition is supported by MDBA assessment statements such as: • "The proponent has indicated that the final set of operating rules will determine how well various adverse impacts are mitigated, and resolution of these rules is a significant piece of work that is yet to be done. This constitutes the most significant risk to the project." (MDBA, 2018) • "Yanco Creek has significant environmental values, including populations of EPBC listed Murray cod and Trout cod remaining in areas of permanent flow. There is a risk that the changed operating regime (with overall lower flows) will result in adverse environmental outcomes." (MDBA, 2018) • "The Yanco modernisation project results in less return flows to the river and greater diversions." (MDBA, 2018) • "There is a moderate residual risk that construction of a new regulator will impact on small bodied fish movement and there is an opportunity to improve fishway designs to accommodate all fish sizes which has not been explored." (MDBA, 2018) • "The proponent is requested to provide a written assurance from the NSW Department of Primary Industry fisheries section that risks have been assessed and potential negative effects on fish populations including EPBC listed species are considered acceptable." (MDBA, 2018) • "modelling results show there is a consistent reduction in frequency of fresh, bankfull and overbank events, which could be ecologically significant." (MDBA, 2018) • "MDBA's preliminary assessment is that the water requirements specified are not inconsistent with accepted literature (e.g. Roberts and Marston 2011)." (MDBA, 2018) • "The business case notes a number of potential adverse ecological impacts, including: reduced hydrodynamic diversity (water ponding); overwatering of a threatened ecological community from the weir pool raising on the Murrumbidgee; blockage of fish passage (especially small-bodied species) from Yanco Creek to the Murrumbidgee River; and no further facilitation of the movement of small-bodied fish through the structures on the Murrumbidgee." (MDBA, 2018) 6 - Long-term governance arrangements must be secured. Ownership and management responsibilities must be clearly defined and operations and maintenance must be borne by the owner; 8 - An entitlement should be issued associated with the claimed saving to protect the savings from re-regulation in the Murray River. "There is concern that the water savings are largely taken up in delivering environmental flows back to the system they were saved from." (MDBA, 2018) Therefore NSW should guarantee the environmental requirements of Yanco Creek and effluent creeks will be met and an entitlement created from the water savings that can be used elsewhere. 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. 10 – Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. This condition is required: "Given that monitoring and evaluation are integral to the successful implementation of the proposed measure, there should be a clear indication that funding is available and an identification of how this will be funded." (MDBA, 2018)

35. Murray and Murrumbidgee Valley National Parks SDL Adjustment Supply Measure

Proponent(s)	New South Wales
Project description	The proposal is for a suite of works across the national park estate in the Murray and Murrumbidgee valley. It aims to deliver more targeted environmental watering than achieved under benchmark conditions of development and benefit public land areas exceeding 70,000 hectares. Benefits identified include improved native fish outcomes and a reduction in the frequency and level of flooding on private land holdings and blackwater events.
Assessment of Project against Conditions	Satisfied = n/a
	Required = 5,6,7,8,9,10 (MDBA, 2014a, Commonwealth of Australia, 2012b, MDBA, 2014d, MDBA, 2014c, Martin and Turner, 2015, COAG, 2013, MDBA, 2014b)
	Insufficient information = 1,2,3,5,6,7,8,9,10,
	Not applicable = 4,11,12
Conditions to be met	5 - The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not

	assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. These condition are supported by MDBA assessment statements such as: • "Regarding potential adverse impacts (page 108), ponding is considered to have the potential to reduce the availability of suitable habitat for some threatened species. The proponent should clarify if there are particular species identified to be at risk." (MDBA, 2018) • "The proposed works and measures are expected to deliver additional flows into the Murray and Murrumbidgee National Parks (NPs). There is a likelihood of salt mobilisation and increased risk of salinity impacts, however water quality and salinity risks have not been addressed." (MDBA, 2018) 6 - Long-term governance arrangements must be secured. Ownership and management responsibilities must be clearly defined and operations and maintenance must be borne by the owner; 7 - Ensure structures can operate naturally (e.g. all regulators open) except during periods of stress. 8 - An entitlement should be issued associated with the claimed saving to protect the savings from re-regulation in the Murray River and this condition is confirmed by MDBA assessment which stated: "Water savings are to be made secure through a new water entitlement issued to the Commonwealth Environmental Water Holder." (MDBA, 2018) 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. This condition is particularly relevant given: "The benefit of the Murrumbidgee element of the proposal seems to hinge on Nimmie-Caira being adequately operated. The Murray element provides a small additional inundation at specified flow rates, with low overall additional adjustment potential." (MDBA, 2018) 10 - Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. This condition is particularly relevant given: "The proposal indicates that a conservative approach has been used to estimate the potential savings. Despite this, the limited modelling, and the need to test the operational efficiencies, raises concerns that the benefits could be overestimated and a reconciliation adjustment may be required in 2024." (MDBA, 2018)

36. Nimmie Caira Infrastructure Modifications Proposal

Proponent(s)	New South Wales
Project description	Reconfigure water delivery infrastructure to more effectively deliver environmental flows to the Nimmie-Caira floodplain and other parts of the Lowbidgee. This project, along with the Murray and Murrumbidgee Valley National Parks SDL adjustment supply measure, has the potential to supply significant additional environmental benefit to the area.
Assessment of Project against Conditions	Satisfied = 2,3,
	Required = 5,6,7,9,10 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, COAG, 2013, MDBA, 2014b)
	Insufficient information = 1, 5,6,7, 9,10,
	Not applicable = 4,8,11,12
Conditions to be met	5 - The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. This condition is particularly relevant given: • "the Biosis 2015 report identifies that grazing impacts cannot be excluded from wetlands and important habitat areas due to a lack of fencing, MDBA supports that the development of a land management plan with fencing and grazing strategy is a priority foundational activity." (MDBA, 2018) • "the Biosis 2015 risk assessment identifies that "the majority of ecological assets of the Nimmie-Caira project area at high to extreme risk from a range of failure modes. Clarification is sought whether this refers to existing arrangements or with the proposal in place?" (MDBA, 2018) 6 - Long-term governance arrangements must be secured. Ownership and management responsibilities must be clearly defined and operations and maintenance must be borne by the owner

	because: “Consideration also needs to be given in the Business Case to the timing of deliverables for SDL adjustment in the proposal in relation to the deliverables required in the ‘Nimmie-Caira enhanced environmental water delivery project’ agreement.” (MDBA, 2018) 7 - Ensure structures can operate naturally (e.g. all regulators open) except during periods of stress. 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. 10 - Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation.

37. Riverine Recovery Project

Proponent(s)	South Australia
Project description	This project aims to return a number of wetlands to a more natural wetting/drying regime which results in evaporative savings. These savings are assigned to the Commonwealth Government as a South Australian Class 9 water access entitlement. This entitlement can be used for environmental purposes either within or upstream of the South Australian/Victorian border.
Assessment of Project against Conditions	Satisfied = 1,2,3,
	Required = 5,6,8,9,10 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, Martin and Turner, 2015, COAG, 2013, MDBA, 2014b)
	Insufficient information = n/a
	Not applicable = 4,7,11,12
Conditions to be met	5 - The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. Need to guarantee the proposed operation will support the environmental requirements. 6 - Long-term governance arrangements must be secured. Ownership and management responsibilities must be clearly defined and operations and maintenance must be borne by the owner because: • “The proponent identifies ongoing operational funding as an extreme risk. The proponent suggests mitigation strategies (e.g. investigating alternative funding) may reduce the residual risk to high, however, MDBA does not consider this residual risk acceptable.” (MDBA, 2018) • “MDBA would like greater detail provided concerning governance arrangements to ensure accountability for ongoing resourcing.” (MDBA, 2018) • “MDBA would like greater detail provided about land acquisition processes and alternative arrangements to should the proponent fail to reach agreement with landholders to allow access to works for ongoing operation/maintenance.” (MDBA, 2018) 8 - An entitlement should be issued associated with the claimed saving and this is supported by MDBA: “Wetland drying will deliver water savings within the SA entitlement flow.” (MDBA, 2018) 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. This condition is particularly relevant given MDBA assessment statements such as: “the estimated operation and maintenance cost for the works is $800,000 per year appears to be quite low. It may be close for new assets, however, a typical cost estimate for operation, maintenance and renewal for this class of asset is more likely to be in the order of 3% of capital cost. As total capital cost of the combined projects is ~$55 million, an O&M budget of $1.65 million would be usual, which is double the estimate provided.” (MDBA, 2018) 10 - Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. This condition is supported by MDBA assessment statements such as: “There is insufficient information about monitoring and reporting to support operations and allow for adaptive management. Without ongoing monitoring data, there is a risk that the operation of the works will compromise the delivery of ecological benefits, or that opportunities to improve operation of the works will be missed.” (MDBA, 2018)

38. South Australian Riverland Floodplain Integrated Infrastructure Program (SARFIIP)

Proponent(s)	South Australia
Project description	The project aims to create an integrated and resilient floodplain along the South Australian River Murray, between the border and Lock 1, through a package of works and measures that enable floodplain inundation and freshening of groundwater lenses with particular focus on the Pike and Katarapko floodplains. Environmental works on the Pike and Katarapko floodplains will optimise the frequency, duration and extent of inundation events to protect and restore these floodplain ecosystems and contribute to Basin Plan environmental outcomes. Salinity management measures will complement the floodplain inundation works to manage ecological risk, enhance ecological condition by maximising the area of soil salinity that is within the tolerances of target vegetation and to manage any long term and real time in-stream salinity risk.
Assessment of Project against Conditions	Satisfied = 1,2,3
	Required = 5,6,7,9,10 (MDBA, 2014a, MDBA, 2014d, MDBA, 2014c, COAG, 2013, MDBA, 2014b)
	Insufficient information = n/a
	Not applicable = 4,8,11,12
Conditions to be met	5 - The following conditions are necessary: (1) Guarantee that risks of environmental works proposals are managed within acceptable limits (low risk category), (2) ensure that held or planned environmental water is not used as part of the risk mitigation measure, and (3) ensure project is not assumed to be operated every year, rather its operation should be a last resort during droughts. These practices should be reflected in project implementation and operation, management rules and models to help avoid some risks associated with environmental works proposals such as salinity, blackwater and fish migration. 6 - Long-term governance arrangements must be secured. Ownership and management responsibilities must be clearly defined and operations and maintenance must be borne by the owner. This condition is supported by MDBA assessment which states: “Given that ecological monitoring and evaluation is integral to the successful implementation of the proposal, there is no clear indication that funding is available nor how it will be obtained.” (MDBA, 2018) 7 - Ensure structures can operate naturally (e.g. all regulators open) except during periods of stress. 9 - Assessment required of value for money to ensure that construction and on-going costs do not exceed $1900/ML as a package, as per Phase 1 assessment guidelines and Intergovernmental Agreement. 10 – Project must be monitored to ensure outcomes are realised and the proposal operated as intended. Also the modelled representation must be reviewed as part of the SDL adjustment reconciliation process in 2024 and adjusted where necessary to ensure it represents actual operation. This condition is supported by MDBA assessment which states: “Monitoring and evaluation (ME) is required to maximise ecological outcomes, manage risks and to refine ecological objectives and targets.” (MDBA, 2018)

References

COAG 2013. Intergovernmental agreement on implementing water reform in the Murray-Darling Basin. Canberra: Council of Australian Governments.

COMMONWEALTH OF AUSTRALIA 2012a. Basin Plan S6.05. Canberra, Australia.

COMMONWEALTH OF AUSTRALIA 2012b. Basin Plan S6.07. Canberra, Australia.

COMMONWEALTH OF AUSTRALIA 2012c. Basin Plan s7.15 (1) (ii). Canberra, Australia.

MARTIN, W. & TURNER, G. 2015. SDL Adjustment Stocktake Report. Canberra: Independent Report to the Murray-Darling Basin Ministerial Council.

MDBA 2013. Constraints Management Strategy. Canberra: Murray-Darling Basin Authority.

MDBA 2014a. Basin-wide environmental watering strategy. Murray-Darling Basin Authority.

MDBA 2014b. Phase 1 Assessment Guidelines for Constraint and Supply Proposals, Overarching Evaluation Criteria #2.

MDBA 2014c. Phase 1 Assessment Guidelines for Constraint and Supply Proposals, Overarching Evaluation Criteria #3.

MDBA 2014d. Phase 1 Assessment Guidelines for Constraint and Supply Proposals, Overarching Evaluation Criteria #4.

MDBA 2016. Phase 2 Assessment Guidelines for Supply and Constraint Measure Business Cases. Requirement 3.2.2.

MDBA. 2018. *Senate orders for production of documents—Environment—Murray-Darling Basin Authority—Adjustment mechanism projects—Assessments—Order agreed to on 7 February 2018—Letter to the President of the Senate from the Minister for Resources and Northern Australia (Senator Canavan), and attachments* [Online]. Available: http://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id%3A%22publications%2Ftabledpapers%2F1c583c50-c828-4334-98f4-db01a74c7a35%22 [Accessed 19 April 2018].

Proposed amendments to Basin Plan

Chapter 7—Adjustment of SDLs

Note: The SDLs will constitute limits from 1 July 2019. The surface water SDLs set out in Schedule 2 on the commencement of the Basin Plan in 2012 were based on:

- infrastructure and other measures that were in operation or expected to be in operation by 2019, including as a result of investments that the Commonwealth is committed to funding, that would recover at least 600 GL of water per year ('anticipated measures' in this Chapter); and
- the level of scientific understanding of the Basin hydrology and ecology at that time.

This Chapter provides for the Authority to propose adjustments to the SDLs under section 23A of the Act. These will be made by amendment of the Basin Plan under section 23B of the Act.

Under Part 2, the Authority can propose adjustments to surface water SDLs to take account of certain additional changes in infrastructure and other measures that will come into operation by 30 June 2024.

In this Chapter a 'supply measure' is a measure that increases the quantity of water available before take for consumptive use. The measure may do this either by making water available for environmental management without reducing consumptive take (e.g. through reducing evaporation losses at suitable storages) or by allowing environmental managers to achieve equivalent outcomes more efficiently, thus reducing the amount of water needed for the environment. Supply measures allow equivalent environmental outcomes to be achieved without needing to reduce consumptive take as much as originally anticipated in the Basin Plan.

The additional water provided by supply measures will be made available for consumptive use (as it will no longer need to be recovered from such use). An adjustment made because of supply measures will increase the SDL (decrease the reduction amount).

An 'efficiency measure' is one that makes savings in the amount of water required for consumptive purposes. Examples include investment in more efficient irrigation infrastructure. The water saved by efficiency measures will be allocated to environmental use but, due to the nature of efficiency measures, this will achieve neutral or improved social and economic impacts. An adjustment made because of efficiency measures will decrease the SDL (increase the reduction amount).

Under Part 3, the Authority can propose adjustments to surface water SDLs to re-allocate SDL shared reduction amounts set under section 6.05. If Basin States request a particular re-allocation, the Authority must propose it.

Under Part 4, the Authority can propose adjustments to groundwater SDLs to reflect new or improved information relating to the groundwater of the groundwater SDL resource units.

Part 1—Preliminary

7.01 Simplified outline

(1) This section sets out a simplified outline of this Chapter.

(2) This Chapter provides a mechanism for the Authority to propose adjustments to the SDLs under section 23A of the Act on the basis of:

(a) new measures that will increase the supply of water or the efficiency of water use (Part 2); or

(b) a request by a Basin State to re-allocate the SDL resource unit shared reduction amounts among surface water SDL resource units within the State (Part 3); or

(c) new or improved information relating to groundwater SDL resource units (Part 4).

7.02 Interpretation

In this Chapter:

additional efficiency entitlement, for a surface water SDL resource unit, is a water access entitlement that:

(a) is sourced from the unit; and

(b) is held environmental water; and

(c) is acquired by the Commonwealth or another person in conjunction with, or to take advantage of the water savings achieved by, an additional efficiency measure.

additional efficiency measure means a measure that has been notified under subsection 7.12(2).

affected unit means a surface water SDL resource unit that is an affected unit for a notified measure or additional efficiency measure under paragraph 7.12(4)(b).

anticipated measure means a measure that is part of the benchmark conditions of development.

Note: This includes various measures expected to be in operation by 2019, including as a result of investments that the Commonwealth is committed to funding, that are expected to recover the equivalent of at least 600 GL of water per year.

benchmark conditions of development means the conditions of development that were assumed in the benchmark model described in Schedule 6 when the model was used to set the unadjusted SDLs for the Basin Plan.

Note 1: These conditions include the infrastructure, rules and practices that were assumed in the benchmark model, including certain measures that were not yet in effect but were expected to be in place by 2019, including as a result of investments that the Commonwealth is committed to funding and are expected to recover the equivalent of at least 600 GL of water per year.

Note 2: The Authority will, in consultation with the Basin Officials Committee, prepare and publish a report detailing the benchmark conditions of development as soon as practicable after the Basin Plan is made.

benchmark environmental outcomes has the meaning given in subsection 7.15(2).

constraint measure means a measure that removes or eases a physical or other constraint on the capacity to deliver environmental water to the environmental assets of the Murray-Darling Basin.

Note: Examples include:

raising of bridges to allow higher regulated flows in watercourses and floodplains;

acquisition of easements to allow inundation of private land in conjunction with making regulated releases of environmental water.

efficiency contribution has the meaning given by Division 4 of Part 2 (in particular section 7.16).

efficiency entitlement, for a surface water SDL resource unit, means a water access entitlement that:

(a) is sourced from the unit; and

(b) is held environmental water; and

(c) is acquired by the Commonwealth or another person in conjunction with, or to take advantage of the water savings achieved by, a notified efficiency measure.

efficiency measure has the meaning given by section 7.04.

measure means a set of works or measures undertaken or funded by the Commonwealth or a Basin State, including but not limited to the following:

(a) changes to water infrastructure;

(b) changes to other infrastructure that affect the hydrology of the Basin;

(c) changes to legal requirements, including to Commonwealth or State laws, that affect the way water is used;

(d) changes in river management and river operational practices;

(e) changes in methods of delivering water.

notified measure means a measure that has been notified under subsection 7.12(1) or (1A), and ***notified efficiency measure*** and ***notified supply measure*** have corresponding meanings.

reference time has the meaning given by subsection 23A(5) of the Act.

supply contribution has the meaning given by Division 4 of Part 2 (in particular section 7.15).

supply measure has the meaning given by section 7.03.

supply measure conditions means the twelve conditions provided for below.

1) Projects have agreed quantified environmental objectives that align with Basin Plan targets, as set out in Chapter 5, Schedule 5, Schedule 7 and the Basin-wide Environmental Watering Strategy.

2) Works-based project were assessed using the Ecological Elements scoring method developed by CSIRO.

3) The Limits of change rules are satisfied as per clause 6.07 in Schedule 6 of the Basin Plan.

4) The Basin-wide SDL is within the overall limits specified in section 7.19 of the Basin Plan.

5) Environmental risks are mitigated to acceptable (low risk) levels, ensuring that:

   a) All risk mitigation measures are funded as part of the proposed project;

   b) The use of planned and held environmental water in addition to that required to meet

environmental objectives, is not proposed as a risk mitigation measure;

c) Projects are operated to avoid inundation at frequencies above natural levels; and

d) Cumulative effects are assessed via strategic assessment under Part 10 of the *Environment Protection and Biodiversity Conservation Act 1999*.

6) Long-term governance arrangements are secured, specifically:

a) Ownership and management responsibilities are clearly defined, and operations and maintenance are borne by the owner; and

b) Projects will be independently audited and periodically re-licensed; and

c) Funding is committed for ongoing operation, risk mitigation measures, long-term monitoring and auditing; and

d) Agreement is secured from landholders affected by the project; and

e) The Office of the Commonwealth Environmental Water Holder is capable of delivering the proposed environmental water regime, as modelled by the Authority (see Basin Plan Schedule 6.06 (3)).

7) Projects can operate in a natural way with all structures open during regulated and unregulated flows, and under a range of future water availability scenarios, incorporating assessment of climate change impacts.

8) Any water savings (e.g. evaporative savings or operational loss savings) are converted into an equivalent volume of water entitlements by June 30 2019.

9) Projects are cost effective, defined to mean an overall average of not more than $1,900/ML).

10) Monitoring arrangements are in place to manage risks and enable quantitative assessment of outcomes against agreed environmental objectives.

11) Constraints measures achieve the operational flow targets in the Murray-Darling Basin Authority's Constraints Management Strategy.

12) Pre-requisite policy measures proposed by states for managing environmental water are configured into the SDL adjustment Benchmark model used to calculate the reconciliation amount.

7.03 Meaning of supply measure

A ***supply measure*** is a measure that operates to increase the quantity of water available to be taken in a set of surface water SDL resource units compared with the quantity available under the benchmark conditions of development.

Note: Examples include:

re-configuring suitable lakes or storage systems to reduce evaporation;

reducing the quantity of water required to deliver water at a particular place, whether for purposes of consumptive use or for environmental use;

changing the methods of environmental watering in such a way that equivalent environmental outcomes can be achieved with a smaller quantity of water than was required under the benchmark conditions of development.

7.04 Meaning of efficiency measure

An ***efficiency measure*** is a measure that operates to decrease the quantity of water required for one or more consumptive uses in a set of surface water SDL resource units, compared with the quantity required under the benchmark conditions of development.

Note: Examples include:

lining channels to reduce water losses within an irrigation network;

replacement of less efficient irrigation methods with drip irrigation.

7.05 Consultation with Basin Officials Committee

(1) In determining the amounts of proposed adjustments in accordance with this Chapter, the Authority must seek and consider advice from the Basin Officials Committee.

(2) The Authority must seek the advice of the Basin Officials Committee at least 1 month before proposing adjustments in accordance with this Chapter.

7.06 Public consultation

Before finalising a determination of the amounts of proposed adjustments in accordance with this Chapter, the Authority must:

(a) publish a draft determination of the amounts of the proposed adjustments on its website, with an account of how they were arrived at and the reasons for decisions made in arriving at the draft determination; and

(b) for the purposes of proposing a reconciliation adjustment in 2024 pursuant to section 7.11, publish its assessments of each of the notified measures against the supply measure conditions; and

(c) invite the public to make submissions about the draft determination and assessments of each of the notified measures against the supply measure conditions within a period of not less than 3 months.

7.07 Combined proposals

(1) The Authority may make proposals under more than one of Parts 2, 3 and 4 at the same time.

(2) Where this is done, the Authority may, for the purpose of section 23B of the Act, treat the proposals as a single proposal and prepare a set of amendments that gives effect to the net effect of the proposals.

7.08 Constraints management strategy

(1) Within 12 months after the commencement of the Basin Plan, the Authority must prepare a constraints management strategy that:

(a) identifies and describes the physical, operational and management constraints that are affecting, or have the potential to affect, environmental water delivery; and

(b) assists all jurisdictions to participate in constraint measures in order to allow environmental water to be used to maximum effect and to maximise the benefits of any increase in held environmental water; and

(c) evaluates options, opportunities and risks to water users, communities and the environment, associated with addressing key constraints, including through constraint measures that are relevant to measures that might be notified under section 7.12; and

(d) assesses the impacts of modifications of constraints on environmental water delivery and third parties, as well as downstream impacts, and assesses options to address those impacts; and

(e) identifies mechanisms by which impacts on third parties can be addressed.

(2) The strategy, and any substantive amendments to the strategy, must be prepared in consultation with the Basin States and the public.

(3) The Authority must annually give a report to the Murray-Darling Basin Ministerial Council on progress on the matters covered by the strategy.

(4) The Authority must publish the strategy on its website.

Part 2—Adjustment of surface water SDLs for notified measures

Division 1—Objective

7.09 Objective

The objective for this Part is to allow surface water SDLs to be adjusted to reflect the effects of measures that increase the supply of water or the efficiency of water use, and are notified under this Part, so that:

(a) for efficiency measures—environmental outcomes are increased while maintaining or improving social and economic outcomes; and

(b) for supply measures—equivalent environmental outcomes are achieved with a lower volume of held environmental water than would otherwise be required; and

Note: Some jurisdictions anticipate that such measures may be able to provide the equivalent of 650 GL per year of water, reducing the quantity of water access rights the Commonwealth will need to acquire to 'bridge the gap'.

(c) where constraints on the capacity to deliver environmental water are removed or eased—available environmental water can be used to maximum effect; and

(d) enhanced economic, social and environmental outcomes compared with the benchmark environmental outcomes and benchmark conditions of development can be achieved for the Murray-Darling Basin, including through more efficient water use, improved river operations, improved outcomes for the River Murray floodplain, River Murray river water quality, estuarine health, Murray Mouth opening, higher average lake levels and increased in-stream flows and variability; and

(e) the easing or removal of constraints and the addition of 450 GL per year of environmental water above the 2750 GL benchmark conditions of development, under the Commonwealth's program, allow the enhanced environmental outcomes as set out in Schedule 5 to be pursued as compared to the benchmark environmental outcomes.

Note 1: The Commonwealth program to ease or remove capacity constraints and deliver 450 GL of additional environmental water is to improve the environmental outcomes beyond those achievable under the 2750 GL benchmark by a further 450 GL and thus pursue the environmental outcomes set out in Schedule 5 that reflect the results of the 3200 GL per year modelling with relaxed constraints scenario reported in: MDBA (Murray-Darling Basin Authority) 2012, *Hydrologic modelling of the relaxation of operational constraints in the southern connected system: Methods and results*, MDBA publication no: 76/12, Murray-Darling Basin Authority, Canberra. http://download.mdba.gov.au/altered-PBP/Hydrologic-modelling-relaxed-constraints-October-2012.pdf

Note 2: The Commonwealth's program referred to in paragraph (e) is the program to spend $1.77 billion over 10 years from 2014–15 under the proposed Water for the Environment Special Account.

Division 2—When Authority must propose appropriate adjustments

7.10 Initial adjustments to be proposed in 2017

(1) If the Authority has received a notification of measures under subsection 7.12(1) or (1A), it must, as soon as practicable after 30 June 2017 and no later than 15 December 2017:

(a) for each affected unit, determine the amounts of proposed adjustments resulting from the notified measures in accordance with Division 4; and

(b) propose accordingly, under section 23A of the Act:

(i) an adjustment of the SDL for each affected unit; and

(ii) an adjustment of the SDL for the Basin water resources equal to the net effect of the adjustments for all the affected units.

Note: Under section 23B of the Act, the Authority is then required to prepare appropriate amendments of the Basin Plan, for adoption by the Minister.

(2) The Authority must advise the Minister on the implications of a proposal for any declared Ramsar wetland.

7.11 Reconciliation adjustments to be proposed in 2024

(1) The Authority:

(a) is to undertake an assessment by 30 June 2023 to determine whether each of the notified measures satisfies each of the supply measure conditions; and

(b) must cause its assessments of each of the notified measures to be independently reviewed by a panel of appropriately qualified experts appointed by the Ministerial Council by 30 June 2023; and

(c) must publish each of its assessments of each of the notified measures – as well as the independent panel's review report - on its website by 30 June 2023.

(2) If it appears to the Authority that a new determination, as at 30 June 2024, of the appropriate adjustment amounts resulting from the notified measures and any additional efficiency measures would produce a result different from the determination made for the purpose of section 7.10, the Authority must, by that date:

(a) determine the amounts of proposed adjustments for each affected unit resulting from the notified measures and any additional efficiency measures, in accordance with Division 4; and

(b) propose accordingly, under section 23A of the Act:

(i) an adjustment of the SDL for each affected unit; and

(ii) an adjustment of the SDL for the Basin water resources equal to the net effect of the adjustments for all the affected units.

Note 1: Under section 23B of the Act, the Authority is then required to prepare appropriate amendments of the basin Plan, for adoption by the Minister.

Note 2: This section might apply if, for example, a notified measure has been withdrawn as it is unable to meet all of the supply measure conditions or an additional efficiency measure has been registered.

Note 3: It is expected that the Authority will propose adjustments under this section in sufficient time for the amendments to commence by 30 June 2024.

(3) The Authority must advise the Minister on the implications of a proposal for any declared Ramsar wetland.

Division 3—Notification and recording of relevant matters

7.12 Notification of measures relevant to adjustment of SDLs

First notification of supply measures or efficiency measures

(1) The Basin Officials Committee may, by 30 June 2016, notify the Authority of 1 or more supply measures or efficiency measures that, in the view of the Committee, should be taken into account in proposing adjustments under section 7.10 or 7.11.

Second notification of supply measures or efficiency measures

(1A) The Basin Officials Committee may, after 30 June 2016 but on or before 30 June 2017, notify the Authority of 1 or more supply measures or efficiency measures that, in the view of the Committee, should be taken into account in proposing adjustments under section 7.10 or 7.11.

Notification of additional efficiency measures

(2) The person (the Basin State or Commonwealth) funding or undertaking an efficiency measure may, after 30 June 2017 but on or before 31 December 2023, notify the Authority of 1 or more efficiency measures that, in the view of the person, should be taken into account in proposing adjustments under section 7.11.

Requirements for all notifications

(3) A measure may be notified only if:

(a) it will enter operation by 30 June 2024; and

(b) it is not an anticipated measure; and

(c) the person (the Basin State or Commonwealth) funding or undertaking the measure agrees with the notification.

(4) A notification must include, for each measure:

(a) details of the measure; and

(b) the surface water SDL resource units affected by the measure (the ***affected units*** for the measure); and

(c) details of any constraint measure that may be relevant; and

(d) the date on which the measure entered into operation, or by which it will enter into operation.

Amendment of notifications

(5) A notification must be amended as soon as practicable after any information under subsection (4) has changed.

(6) A notification must be amended to withdraw a measure if the measure will not enter into operation by 30 June 2024 or cannot satisfy any of the supply measure conditions.

(7) Subsections (5) and (6) do not apply after 31 December 2023. To avoid doubt, this does not override the requirements set out in section 7.11.

7.13 Register of measures

(1) The Authority must maintain a register of notified measures and additional efficiency measures that includes:

(a) the information mentioned in section 7.12; and

(b) for each surface water SDL resource unit:

(i) the efficiency entitlements and additional efficiency entitlements for the unit from time to time; and

(ii) the long-term average quantity of water, in GL per year, that is available under the efficiency entitlements for the unit from time to time; and

(iii) the long-term average quantity of water, in GL per year, that is available under the additional efficiency entitlements for the unit from time to time.

(2) If an adjustment is likely to be proposed under section 7.10 or 7.11, the register must include estimates of the likely supply contribution, efficiency contribution and overall SDL adjustment amount and, to the extent practicable, the likely SDL adjustment amounts for the affected units.

(3) The Authority must publish the register on its website.

(4) Paragraph (1)(b) applies to a water access entitlement whether it becomes held environmental water before or after the measure is notified.

Division 4—Determining amounts of adjustments

7.14 Preliminary

(1) This Division sets out the steps the Authority must take to determine the amounts of adjustments to SDLs that it will propose because of the notified measures and additional efficiency measures.

(2) If a request by a Basin State for adjustments under Part 3 has been received by the Authority, the Authority must determine the amounts of adjustments under this Division as if the adjustments referred to in the request had been made.

7.15 Contribution to adjustments from supply measures

(1) Subject to this Division, the total ***supply contribution*** of the notified measures is the total increase in the SDLs for all the units affected by notified supply measures that will ensure that, calculated in accordance with the applicable method on the basis of:

(a) a repeat of the historical climate conditions; and

(b) the benchmark conditions of development modified by:

(i) the addition of the notified supply measures; and

(ii) the removal of any unimplemented policy measures;

the following results occur, as compared with the benchmark environmental outcomes:

(c) there are equivalent environmental outcomes; and

(d) there are no detrimental impacts on reliability of supply of water to the holders of water access rights that are not offset or negated.

Note: The determination is based on the effect that the supply measures will have when they come into operation, whether or not they have done so by the time the measures are notified under section 7.12.

(2) In calculating supply measure contributions for the purpose of section 7.11, the Authority must also:

(a) ensure that any change to the sustainable diversion limits remain with the overall limits on adjustments specified in section 7.19; and

(b) account for impacts of the SDL adjustment volume on flow indicators in the Authority's report 'Hydrologic modelling to inform the proposed Basin Plan' (2012), by comparing pre-Basin Plan hydrological model data against gauged data up to 2023; and

(c) configure the pre-requisite policy measures into the model used to calculate an SDL adjustment, ensuring those measures are consistent with 2023 practices as based on the review specified in subsection (f); and

(d) update the modelling of SDL adjustment proposals and their water demands so they reflect actual 2023 management practices, as based on the review specified in subsection (f); and

(e) ensure there are no changes to the Benchmark Model Run (number 847) used to calculate the supply contribution, apart from those specified in Schedule 6.02; and

(f) publish a review and consequent model changes arising from subsection (c) and (d) by 30 June 2023.

(3) In this section:

applicable method means:

(a) the default method set out in Schedule 6; or

(b) if the Authority and the Basin Officials Committee agree to use another method—that method.

benchmark environmental outcomes means the environmental outcomes in the model that, in accordance with the applicable method, would be achieved if:

(a) the SDLs were at the levels set in the Basin Plan when it commenced; and

(b) the benchmark conditions of development applied in the Murray-Darling Basin.

unimplemented policy measure means an anticipated measure consisting of a policy to:

(a) credit environmental return flows for downstream environmental use; or

(b) allow the call of held environmental water from storage during un-regulated flow events;

to the extent, if any, that the measure, at the time of the determination, is not expected to, or did not, come into effect by 30 June 2019. Where such a measure is expected to, or did come into effect by 30 June 2019, it is known as a ***pre-requisite policy measure***.

7.16 Contribution to adjustments from efficiency measures

Efficiency contribution for 2017 determination

(1) For a determination for the purpose of section 7.10, and subject to this Division, the ***efficiency contribution*** of the notified measures for each affected unit at a particular time is a decrease in the SDL for the unit equal to the quantity of water, in GL per year, that is registered as being available under the efficiency entitlements for the unit.

Note 1: The efficiency contributions are expected to vary over time as relevant water access entitlements are acquired.

Note 2: The Authority will use long-term diversion limit equivalent factors to convert water access entitlements into a common unit for the purpose of the determinations.

Efficiency contribution for 2024 determination

(2) For a determination for the purpose of section 7.11, and subject to this Division, the ***efficiency contribution*** of the notified measures and additional efficiency measures for each affected unit is a decrease in the SDL for the unit equal to the quantity of water, in GL per year, that is expected to be registered as being available under the efficiency entitlements and additional efficiency entitlements for the unit on 30 June 2024.

(3) In this section, ***registered*** means shown on the register maintained under section 7.13.

7.17 Ensuring that criteria for amounts of adjustments are satisfied

(1) If, after calculating the total supply and efficiency contributions under sections 7.15 and 7.16, the Authority is not satisfied that a determination of proposed adjustments based on those amounts can be made under this

Division that satisfies the criteria below, the Authority may reduce the total supply contribution, or the efficiency contribution for any affected unit, to a level at which such a determination can be made.

(2) The applicable criteria are the following:

Equivalent environmental outcomes

(a) The supply contributions to the proposed adjustments achieve equivalent environmental outcomes compared with the benchmark environmental outcomes.

Neutral or improved socio-economic outcomes

(b) The efficiency contributions to the proposed adjustments achieve neutral or improved socio-economic outcomes compared with the outcomes under benchmark conditions of development as evidenced by:

(i) the participation of consumptive water users in projects that recover water through works to improve irrigation water use efficiency on their farms; or

(ia) the participation of consumptive water users in projects that recover water through works to improve water use efficiency off-farm; or

(ii) alternative arrangements proposed by a Basin State, assessed by that State as achieving water recovery with neutral or improved socio-economic outcomes.

Use of approval process

(c) Any processes approved by the Murray-Darling Basin Ministerial Council for developing initiatives for satisfying these criteria, including opportunities for public consultation, have been observed.

7.18 Apportionment of supply contribution to affected units

The Authority must apportion the total supply contribution for the notified measures to give each affected unit a supply contribution in a way that:

(a) ensures that the sum of the supply contributions is the total supply contribution; and

(b) complies with any agreement relating to the apportionment of supply contributions that has been reached by the Commonwealth and States.

7.19 Overall limitation on size of adjustment amounts

If, at a particular time, the net effect of the total supply contribution and the total efficiency contribution under sections 7.15 to 7.17 is an increase or decrease of more than 5% of the total surface water SDL for the Basin water resources as it stood at the reference time, the size of the supply contribution and the efficiency contribution for each affected unit are reduced in proportion so that the net effect is equal to that amount.

Note: This section allows a supply contribution or an efficiency contribution of more than 5% of total surface water SDL to each be given full effect in an

adjustment, provided that the net effect across the Basin is within the 5% limit.

7.20 Final determination of amounts in 2017

(1) For the purpose of section 7.10, the Authority may make a determination to propose adjustments only if:

(a) it has considered any advice from the Basin Officials Committee and submissions from members of the public; and

(b) it is satisfied that the proposed adjustments meet the criteria under section 7.17.

(2) The Authority must determine supply contributions as at 30 June 2017.

Note: Some of the supply measures may not be operating by that date. The determination is based on the effect that they will have when they have come into operation by 2024.

(3) The Authority must determine the amounts of the proposed adjustments as:

(a) an adjustment of the SDL for each affected unit equal to the net effect of supply and efficiency contributions for the unit; and

(b) an adjustment of the SDL for the Basin water resources equal to the net effect of the adjustments for all the affected units.

(4) A proposed adjustment must be in the form of a formula as a function of time, either varying continuously or changing at specified times, that reflects the changes up until 30 June 2024 of:

(a) the relevant efficiency contributions; and

(b) the operation of the overall limit on adjustments in section 7.19.

7.21 Final determination of amounts in 2024

(1) For the purpose of section 7.11, the Authority may make a determination of the proposed adjustments only if:

(a) it has considered any advice from the Basin Officials Committee and submissions from members of the public; and

(b) it is satisfied that the proposed adjustments meet the criteria under section 7.17.

(2) To avoid doubt, the Authority must make a determination of the proposed adjustments if, for the purpose of section 7.11, any of the notified measures do not satisfy all of the supply measure conditions.

(3) The Authority must determine supply contributions and efficiency contributions as they are expected to be on 30 June 2024.

(4) The Authority must:

(a) determine the adjustments that would be appropriate to reflect the notified measures and additional efficiency measures as if no adjustment had been made as a result of a proposal under section 7.10 (the ***overall adjustments***); and

(b) calculate, for each affected unit, the difference between the overall adjustment and any adjustment actually made as a result of a proposal under section 7.10 (the ***difference*** for the unit); and

(c) determine the amounts of the proposed adjustments as:

(i) an adjustment of the SDL for each affected unit equal to the difference for the unit; and

(ii) an adjustment of the SDL for the Basin water resources equal to the net effect of the adjustments for all the affected units.

Part 3—Adjustments relating to shared reduction amounts

7.22 Objective

The objective for this Part is to allow SDLs to be adjusted to re-allocate the SDL resource unit shared reduction amounts among surface water SDL resource units within a Basin State.

7.23 Adjustments relating to shared reduction amounts

(1) A Basin State may request the Authority to propose, in accordance with this section, a re-allocation adjustment for the State.

(2) If the Authority has not received a request for a proposal from a Basin State by 31 May 2016, the Authority must invite the State to make a request, and inform the State of the SDL resource unit shared reduction amounts that are expected to apply to SDL resource units in the State if no request is received from the State.

Note: The SDL resource unit shared reduction amounts that will apply are set under subsection 6.05(4).

(3) As soon as practicable after 30 June 2016 the Authority must propose, under section 23A of the Act, re-allocation adjustments in accordance with any requests received from Basin States by that date.

Note 1: Under section 23B of the Act, the Authority is then required to prepare appropriate amendments of the Plan, for adoption by the Minister.

Note 2: SDL adjustments proposed under this Part will be used for the purpose of calculating any adjustment amounts under Part 2.

Note 3: For adjustments relating to a zone that lies in 2 Basin States, both States will need to request a proposal to ensure that the definition of re-allocation adjustment is satisfied.

(4) For this section:

re-allocation adjustment, for a Basin State, means a set of adjustments to the SDLs of its SDL resource units that are within a zone mentioned in section 6.05 with the effect that:

(a) the total of the SDLs for each zone remains the same; and

(b) no resource unit has an SDL that is larger than would result from replacing its shared reduction amount with zero.

Part 4—Adjustments relating to groundwater

7.24 Objective

The objective for this Part is to allow SDLs for groundwater SDL resource units to be adjusted to reflect new or improved information about their groundwater resources.

7.25 Adjustments relating to groundwater

(1) The Authority may propose, under section 23A of the Act, an adjustment of the SDL for a groundwater SDL resource unit if better information becomes available about the groundwater resources of the unit and the factors relevant to setting the SDL, in particular information about:

(a) recharge rates; or

(b) connectivity with surface water; or

(c) usage patterns; or

(d) Basin State policy and planning settings.

(2) In determining the amount of the proposed adjustment, the Authority must be satisfied that, in the light of the better information, the SDL for the unit:

(a) may be increased by the amount of the proposed adjustment and still represent an environmentally sustainable level of take; or

(b) should be decreased by the amount of the proposed adjustment to represent an environmentally sustainable level of take.

Note: Under section 23B of the Act, the Authority is then required to prepare appropriate amendments of the Basin Plan, for adoption by the Minister.

(3) A proposal in accordance with this section may be made as soon as practicable after 30 June 2016, or at any time after 30 June 2019.

7.26 Overall limitation on size of groundwater adjustment amounts

The Authority may not propose an adjustment under this Part if the result would be that the net effect of all adjustments proposed under this Part since the reference time would represent an increase or decrease of more than 5% of the total groundwater SDL for the Basin water resources as it stood at the reference time.

Part 5—Independent audit of calculations

7.27 Independent audit of Authority's calculations

(1) The Authority may appoint or establish a person or body that is independent of the Authority to audit calculations made by the Authority for the purpose of Parts 2 and 4.

(2) The person or body conducting any audit must:

(a) produce a report setting out the findings of the audit; and

(b) before the report is finalised, provide the Authority, the Commonwealth and each Basin State with an opportunity to comment on the proposed findings.

Amendments to the Water Act 2007 (Cth)

Part 2 – Management of Basin Water Resources

Division 1 – Basin Plan

…

23A Proposing adjustments of long-term average sustainable diversion limits

(1) The Basin Plan may provide for the Authority to propose:

(a) an adjustment of the long-term average sustainable diversion limit for the water resources of a particular water resource plan area (or a particular part of those water resources) by an amount determined by the Authority (subject to subsection (4)); and

(b) as a result of one or more adjustments under paragraph (a) of this subsection, an adjustment of the long-term average sustainable diversion limit for the Basin water resources by an amount determined by the Authority.

(2) If the Basin Plan includes provisions as described in subsection (1), the Plan must also include:

(a) criteria for determining whether the Authority should propose an adjustment, and the amount of an adjustment, referred to in paragraph (1)(a) or (b); and

(b) a requirement for the Authority to determine whether it is satisfied that the criteria referred to in paragraph (a) of this subsection have been met; and

(c) a requirement for the Authority not to propose an adjustment under paragraph (1)(a) or (b) without seeking and considering advice from the Basin Officials Committee; and

(d) a requirement for the Authority not to propose an adjustment under paragraph (1)(a) or (b) without:

(i) inviting members of the public to make submissions to the Authority on the proposed adjustment; and

(ii) providing a reasonable amount of time for those submissions to be made and considered by the Authority.

(3) To avoid doubt:

(a) the Authority may propose an adjustment under paragraph (1)(a) or (b) without preparing an amendment of the Basin Plan under Subdivision F; and

(b) a long-term average sustainable diversion limit that is produced after the adjustment proposed by the Authority under paragraph (1)(a) or (b) has been taken into account must reflect an environmentally sustainable level of take.

Note: A proposed adjustment may be adopted by the Minister as an amendment of the Basin Plan under subsection 23B(6).

Limit on proposed adjustments

(4) One or more adjustments may be proposed by the Authority under paragraph (1)(a), and an adjustment may be proposed under paragraph (1)(b) as a result of those adjustments, only if the total Basin adjustment percentage is no more than 5%.

Definitions

(5) In this Act:

Basin reference limit means the long-term average sustainable diversion limit for the Basin water resources that applies at the reference time.

proposed Basin limit means the long-term average sustainable diversion limit for the Basin water resources:

(a) that is produced after the adjustment proposed by the Authority under paragraph (1)(b) has been taken into account; and

(b) that replaces the previous long-term average sustainable diversion limit for the Basin water resources.

proposed plan area limit means the long-term average sustainable diversion limit for the water resources of a particular water resource plan area (or a particular part of those water resources):

(a) that is produced after the adjustment proposed by the Authority under paragraph (1)(a) has been taken into account; and

(b) that replaces the previous long-term average sustainable diversion limit for those water resources (or the particular part of those water resources).

reference time means:

(a) unless paragraph (b) or (c) applies—the time the Basin Plan first takes effect; or

(b) if, as a result of the most recent review of the Basin Plan under Subdivision G, an amendment of any one or more long-term average sustainable diversion limits is adopted—the time when the amendment or amendments take effect; or

(c) if, after the most recent review of the Basin Plan under Subdivision G, the Authority advises the Minister, when giving a report of the results of the review to the Minister under subsection 50(5), that the Authority has decided not to prepare any amendment of any long-term average sustainable diversion limit—the time when the report is given to the Minister.

total Basin adjustment percentage, in relation to one or more adjustments proposed under paragraph (1)(a), is the amount of the difference between:

(a) the proposed Basin limit that is proposed as a result of those adjustments; and

(b) the Basin reference limit;

expressed as a percentage of the Basin reference limit.

(6) If the amount of the difference between the limits in paragraphs (a) and (b) of the definition of ***total Basin adjustment percentage*** in subsection (5) is negative, express that amount as a positive amount.

23B Adopting proposed adjustments as amendments of Basin Plan

(1) This section applies if the Authority proposes one or more adjustments of the long-term average sustainable diversion limits for the water resources of particular water resource plan areas (or particular parts of those water resources) under paragraph 23A(1)(a).

(2) For each water resource plan area (or each part) for which an adjustment is proposed, the Authority must include the following information in a notice:

(a) the long-term average sustainable diversion limit, for the water resources of the plan area (or the particular part of those water resources), that applied at the reference time;

(b) the proposed plan area limit;

(c) the amount of the difference between the limits referred to in paragraphs (a) and (b) of this subsection, expressed as a percentage of the amount of the limit referred to in paragraph (a);

(d) if, on one or more occasions since the reference time, adjustments of the long-term average sustainable diversion limit for the water resources of that plan area (or the particular part of those water resources) have been adopted as amendments by the Minister under subsection (6)—the limit as so adjusted;

(e) an outline of the material on which the Authority based its decision in determining that the criteria referred to in paragraph 23A(2)(a) had been met in relation to the adjustment and the amount of the adjustment.

(3) A notice made under subsection (2) must also include:

(a) the proposed Basin limit that is proposed as a result of the proposed adjustments referred to in subsection (1); and

(b) the total Basin adjustment percentage; and

(c) an outline of the material on which the Authority based its decision in determining that the criteria referred to in paragraph 23A(2)(a) had been met in relation to the adjustment, and the amount of the adjustment, of the long-term average sustainable diversion limit for the Basin water resources; and

(d) the assessments against the supply measure conditions undertaken by the Authority and the Independent Panel, respectively, for each notified measure.

Note: The assessments against the supply measure conditions are provided for in section 7.11 of the Basin Plan.

(4) The Authority must also prepare an amendment of the Basin Plan that sets out each proposed plan area limit, and the proposed Basin limit, that is included in the notice.

Note: The amendment is a legislative instrument (see section 33).

(5) The Authority must:

(a) give the notice made under subsection (2) to the Minister; and

(b) give the amendment of the Basin Plan prepared under subsection (4) to the Minister for adoption.

(6) As soon as practicable after receiving the amendment, the Minister must:

(a) consider the amendment; and

(b) either:

(i) adopt, in writing, the amendment if all of the requirements of Chapter 7 of the Basin Plan have been satisfied; or

(ii) give the Authority notice, in writing, that the Minister has decided not to adopt the amendment, including because all of the requirements of Chapter 7 of the Basin Plan have not been satisfied.

Note: If a long-term average sustainable diversion limit for the water resources of a particular water resource plan area (or a particular part of those water resources) is amended, the long-term annual diversion limit for those water resources is also amended (see table item 7 of the table in subsection 22(1)).

(7) Where the Minister decides not to adopt the amendment because all of the requirements of Chapter 7 have not been satisfied, the Minister must direct the Authority to satisfy those requirements and to resubmit the amendment accordingly. The Minister must then reconsider the amendment pursuant to subsection (6).

(8) The notice made under subsection (2):

(a) must accompany the amendment when the amendment is laid before a House of the Parliament under section 38 of the *Legislation Act 2003*; and

(b) is not a legislative instrument.

Division 5, Part 2 – 1,500 Gigalitre Limit on Water Purchases

REPEAL ENTIRE DIVISION

Part 2AA—Water for the Environment Special Account

86AA Object of this Part

(1) The object of this Part is to achieve the enhanced environmental outcomes set out in s. 86AB by:

(a) protecting and restoring the environmental assets of the Murray-Darling Basin; and

(b) protecting biodiversity dependent on the Basin water resources;

(c) removing constraints, as required under s. 86AAB(1)(a); and

(d) increasing the volume of Basin water resources that is available for environmental use by 450 gigalitres, as required under s. 86AA(1)(b).

so as to give effect to relevant international agreements.

86AB Enhanced environmental outcomes

(1) Environmental outcomes are to be enhanced in the following ways:

(a) further reducing salinity levels in the Coorong and Lower Lakes so that improved water quality contributes to the health of insects, fish and plants that form important parts of the food chain, with the aim of achieving the following outcomes:

(i) the maximum average daily salinity in the Coorong South Lagoon is less than 100 grams per litre;

(ii) the maximum average daily salinity in the Coorong North Lagoon is less than 50 grams per litre;

(iii) the average daily salinity in Lake Alexandrina is less than 1000 microsiemens per centimetre for 95% of years and 1500 microsiemens per centimetre all of the time;

(b) keeping water levels in the Lower Lakes above:

(i) 0.4 metres Australian Height Datum for 95% of the time; and

(ii) 0.0 metres Australian Height Datum at all times;

to provide additional flows to the Coorong, and to prevent acidification, acid drainage and riverbank collapse below Lock 1;

(c) ensuring the mouth of the River Murray is open without the need for dredging in at least 95% of years, with flows every year through the Murray Mouth Barrages;

(d) discharging 2 million tonnes of salt per year from the Murray-Darling Basin as a long-term average;

(e) further increasing flows to the Coorong through the Murray Mouth Barrages, and supporting fish migration;

(f) in conjunction with removing or easing constraints referred to in subparagraph (h)(ii), providing opportunities for environmental watering of an additional 35,000 hectares of floodplains in the River Murray System, to do the following:

(i) improve the health of forests and the habitats of fish and birds;

(ii) improve connections between the floodplains and rivers in the River Murray System;

(iii) replenish groundwater;

(g) increasing the flows of rivers and streams, and providing water to low and middle level floodplains and habitats that are adjacent to rivers and streams, in the River Murray System:

(i) to enhance environmental outcomes within those floodplains, habitats, rivers and streams; and

(ii) to improve connections between those floodplains and habitats, and those rivers and streams;

(h) in any other way that is consistent with:

(i) the Authority's modelling of the effect of increasing the volume of the Basin water resources that is available for environmental use by 3200 gigalitres; and

(ii) easing or removing constraints on the capacity to deliver environmental water to the environmental assets of the Murray-Darling Basin.

86AAB How to achieve enhanced environmental outcomes

(1) The enhanced environmental outcomes set out in s. 86AB are to be achieved by:

(a) easing or removing constraints on the capacity to deliver environmental water to the environmental assets of the Murray-Darling Basin; and

(b) increasing the volume of the Basin water resources that is available for environmental use by 450 gigalitres.

(2) The requirements set out in subsection (1) must be achieved by June 30 2024.

Note: To avoid doubt, constraints proposals must be modified to reflect the agreed operational flow targets set by the Authority in the Constraints Management Strategy. The benchmark for comparing changes with respect to constraints' levels are those in Benchmark model run 847 developed by the Authority in 2012.

86ABC Water for the Environment Special Account

(1) The Water for the Environment Special Account is established by this section.

(2) The Account is a special account for the purposes of the *Public Governance, Performance and Accountability Act 2013*.

86AC Credits to the Water for the Environment Special Account

(1) There must be credited to the Water for the Environment Special Account the following amounts:

(a) all amounts appropriated by the Parliament for the purposes of that Account;

(b) amounts paid by a Basin State, under an agreement between the Commonwealth and the State, for crediting to that Account;

(c) amounts received for crediting to that Account by the Commonwealth under any other agreement;

(d) amounts equal to money received by the Commonwealth in relation to property paid for with amounts debited from that Account;

(e) amounts equal to amounts of any gifts given or bequests made for the purposes of that Account.

Note: An Appropriation Act provides for amounts to be credited to a special account if any of the purposes of the special account is a purpose that is covered by an item in the Appropriation Act.

(2) Amounts equal to money received by the Commonwealth from the disposal of or other dealings with water access rights paid for with amounts debited from the Water for the Environment Special Account are not to be credited to that Account.

Note: Such amounts are instead credited to the Environmental Water Holdings Special Account (see paragraphs 105(2)(a) and 112(1)(b)).

86AD Purposes of the Water for the Environment Special Account

(1) This section sets out the purposes of the Water for the Environment Special Account.

(2) Amounts standing to the credit of the Water for the Environment Special Account may be debited for any of the following purposes:

(a) making payments in relation to projects that will further the object of this Part and help to achieve one or more of the requirements of ss. 86AB and either 86AAB(1)(a) or 86AAB(1)(b) by doing one or more of the following:

(i) improving the water efficiency of the infrastructure that uses Basin water resources for irrigation, taking into account impacts on return flows where this is hydrologically relevant;

(ii) improving the water efficiency of any other infrastructure that delivers, stores or drains Basin water resources for the primary purpose of providing water for irrigation;

(iii) improving or modifying any infrastructure (including bridges and roads) that constrains the delivery of environmental water to the environmental assets of the Murray-Darling Basin in order to ease or remove those constraints;

(iv) better utilising existing dams and storages to deliver environmental water to the environmental assets of the Murray-Darling Basin;

(v) entering agreements to acquire an interest in, or in relation to, land (including easements) to facilitate environmental watering of the environmental assets of the Murray-Darling Basin;

(vi) improving the rules, policies, practices and procedures in relation to the use and management of the Basin water resources;

(b) purchasing water access rights in relation to Basin water resources for the purpose of furthering the object of this Part and achieving one or more of the requirements of ss. 86AB and the requirement set out in 86AAB(1)(b);

(c) making any other payments:

(i) in relation to projects whose aim is to further the object of this Part and help to achieve one or more of the requirements of ss. 86AB and either 86AAB(1)(a) or 86AAB(1)(b); or

(ii) to address any detrimental social or economic impact on the wellbeing of any community in the Murray-Darling Basin that is associated with a project or purchase referred to in paragraph (a) or (b) or subparagraph (c)(i) so as to offset any such impact;

(d) meeting the expenses of administering the Account.

(3) A Proposal to receive a payment under s. 86AD (2) must:

(a) specify how the project, agreement or purchase will further the object of this Part and help to achieve one or more of the requirements of ss. 86AB and either 86AAB(1)(a) or 86AAB(1)(b); and

(b) be placed on public exhibition for a minimum of 28 days, during which time the public may make submissions about the proposal; and

(c) not be approved until the Minister has taken into account submissions received under subsection 3 and is satisfied that it will further the object of this Part and help to achieve one or more of the requirements of ss. 86AB and s. 86AAB(1)(a) or 86AAB(1)(b).

(4) To avoid doubt, a payment under s. 86AD(2)(a), (b) or (c)(i) may only be made where the project, agreement or purchase will further the objects of this Part and help to achieve one or more of the requirements of ss. 86AB and either 86AAB(1)(a) or 86AAB(1)(b).

(5) Payments for any notified supply measure may only be made where the Minister is satisfied that the supply measure conditions will be met for the notified supply measure.

(6) For the purposes of this section, the expenses of administering the Water for the Environment Special Account do not include the cost of salaries of the Department.

Note: The supply measure conditions are defined and provided for in Chapter 7 of the Basin Plan.

86AAD Monitoring and reporting

(1) Any project for which a payment under 86AD(2)(a)(i) or 86AD(2)(c)(i) has been received must be monitored in order to ensure that it is furthering the objects of this Part and helping to achieve one or more of the requirements of ss. 86AB and 86AAB(1)(b).

(2) The results of this monitoring must be published in the annual report provided for in s. 86AI.

(3) If the monitoring demonstrates that the project is not furthering the objects of this Part and helping to achieve one or more of the requirements of ss. 86AB and 86AAB(1)(b), any subsequent funding may be withdrawn.

86AE Commonwealth environmental water holdings

(1) To avoid doubt, water access rights acquired by the Commonwealth with amounts debited from the Water for the Environment Special Account form part of the Commonwealth environmental water holdings (see section 108).

Note: The Commonwealth Environmental Water Holder must (subject to subsection (2) of this section) dispose or otherwise deal with Commonwealth environmental water holdings in accordance with sections 105 and 106.

(2) Paragraphs 105(3)(b) and (4)(b), subparagraphs 106(3)(c)(ii) and (iii), and subsection 105(5), do not apply in relation to any water access right that forms part of the Commonwealth environmental water holdings if the water access right was acquired by the Commonwealth with amounts debited from the Water for the Environment Special Account.

86AF Arrangements to make payments

(1) The Minister may, on behalf of the Commonwealth, enter into arrangements and make payments for the purposes of subsection 86AD(2). Any subsequent arrangements and/or contracts are to be made publicly available.

(2) If a Basin State is granted financial assistance with an amount debited from the Water for the Environment Special Account, the terms and conditions on which that financial assistance is granted are to be set out in a written agreement between the Commonwealth and the Basin State. These agreements are to be made publicly available.

86AG Amounts to be credited to the Water for the Environment Special Account

At the beginning of 1 July in each financial year specified in the following table, the amount specified in the table for that year is credited by force of this section to the Water for the Environment Special Account.

Yearly payments

Item	Financial year	Amount for financial year
1	2014-2015	$15,000,000.00
2	2015-2016	$40,000,000.00
3	2016-2017	$110,000,000.00
4	2017-2018	$430,000,000.00
5	2018-2019	$320,000,000.00
6	2019-2020	$350,000,000.00
7	2020-2021	$315,000,000.00
8	2021-2022	$105,000,000.00
9	2022-2023	$60,000,000.00
10	2023-2024	$30,000,000.00

86AI Annual report

Annual report to be given to Minister

(1) As soon as practicable after 30 June in each financial year (the ***report year***), the Secretary of the Department must prepare and give to the Minister, for presentation to the Parliament, a report on the Water for the Environment Special Account during that year.

Contents of annual report

(2) The Secretary of the Department must include in each annual report particulars of the following:

(a) the objectives and priorities for amounts debited during the report year from the Water for the Environment Special Account;

(b) how those objectives and priorities helped to achieve the objects of this Part and the requirements set out in ss. 86AA and 86AB;

(c) taking into account subsection (2)(b), achievements against those objectives and priorities, including the following:

(i) the increase during the report year in the volume of the Commonwealth environmental water holdings as a result of amounts debited from the Water for the Environment Special Account (whether the amounts were debited in that or any other year);

(ii) a description of the water access rights acquired by the Commonwealth during the report year as a result of amounts debited from the Water for the Environment Special Account (whether the amounts were debited in that or any other year);

(iii) the water resource plan areas in which water access rights referred to in subparagraph (ii) have been acquired;

(d) for each project in relation to which an amount was debited from the Water for the Environment Special Account during the report year for the purposes of paragraph 86AD(2)(a) or subparagraph 86AD(2)(c)(i):

(i) a description of the project; and

(ii) the aim of the project; and

(iii) the water resource plan area in which the project is to take place or is taking place;

(iv) information as to how the project helps to achieve the objects of this Part and the requirements set out in ss. 86AA and 86AB, including the monitoring information referred to in s. 86AAD.

(v) where relevant, the monitoring results provided for in s. 86AAD.

(e) if an amount was debited during a previous financial year for the purposes of paragraph 86AD(2)(a) or subparagraph 86AD(2)(c)(i) in relation to a project—any significant developments during the report year in relation to the project;

(f) in any case—any amount debited from the Water for the Environment Special Account during the report year, and the purpose for which the amount was debited.

Annual report to be tabled in Parliament

(3) The Minister must cause a copy of each annual report to be tabled in each House of the Parliament within 15 sitting days of that House after the day the Minister receives the report.

Annual report to be given to Basin States

(4) The Minister must cause a copy of each annual report to be given to the relevant State Minister for each of the Basin States on or before the day the report is first tabled in a House of the Parliament.

86AJ Reviews of this Part

(1) The Minister must cause 2 independent reviews to be conducted into whether the amount standing to the credit of, and to be credited to, the Water for the Environment Special Account is sufficient to increase, by 30 June 2024, the volume of the Basin water resources that is available for environmental use by 450 gigalitres, and to ease or remove constraints identified by the Authority on the capacity to deliver environmental water to the environmental assets of the Murray-Darling Basin.

(2) A review must be conducted by a panel of at least 3 persons nominated by the Minister, after consulting each Basin State.

(3) In conducting a review under subsection (1), a panel must also consider the following:

(a) the progress that has been, and is anticipated to be, made towards increasing the volume of the Basin water resources that is available for environmental use;

(b) whether the design of projects in relation to which payments have been made under section 86AD is likely to be effective in increasing the volume of the Basin water resources that is available for environmental use by 450 gigalitres;

(c) any other matter specified in writing by the Minister that is relevant to achieving the object of this Part.

(4) A panel must give the Minister a written report of a review.

(5) The report of the first review must be provided to the Minister by 30 September 2019.

(6) The report of the second review must be provided to the Minister by 30 September 2021.

(7) The Minister must cause a copy of a report of a review to be tabled in each House of the Parliament within 15 sitting days of that House after the day the report is given to the Minister.

(8) The Minister must table the Government's response to the report by the following time:

(a) for the first review—the time the Treasurer presents the budget to the Parliament for the 2020-2021 financial year;

(b) for the second review—the time the Treasurer presents the budget to the Parliament for the 2022-2023 financial year.