NSW GOVERNMENT

NSW WATER REFORM ACTION PLAN

Better management of environmental water

Consultation paper

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Better management of environmental water—Consultation paper

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More information

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Acknowledgements

Interagency Working Group for Better Environmental Water Management

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Contents

Introduction

Water is one of the most important natural assets in New South Wales (NSW). The community, business and the environment all rely on water to survive and prosper.

In December 2017, the NSW Government released the Water Reform Action Plan in response to the *Independent investigation into NSW water management and compliance*, conducted by Ken Matthews, AO (the Matthews Report) and the *Murray–Darling Basin Water Compliance Review* (MDB Compliance Review).

The plan will deliver on the state's responsibility to ensure we have an equitable and transparent approach to the management of water for current and future generations.

As part of the development process for the water reforms being introduced, the NSW Government has released three consultation papers for community input on:

- Better management of environmental water (this document)
- Water take measurement and metering
- Transparency measures

The Water Reform Action Plan sets out the government's commitment to improving how we share, allocate and manage water, including improvements to the management of environmental water. This paper seeks your views on options for how this might be achieved.

Background

The Matthews Report and MDB Compliance Review highlighted some of the problems and complexities of managing environmental water. Both reports stated that there was a need for greater protection of environmental water, particularly in the unregulated river systems in the Northern Basin.

Matthews' identification of the unregulated Northern Basin system as an area requiring urgent attention was supported by community concern regarding the long-term deterioration of riverine water quality and associated ecosystems, especially during dry periods when all water consumers (the environment, community, industry, and business) have important needs.

The NSW Government has established an Interagency Working Group (IWG) to help identify solutions for improving the management of environmental water (see key actions and indicative timeline in Figure 1). The initial focus of this group is to present a package of interim measures, focused on unregulated rivers in the Northern Basin that could be implemented in the period before Water Resource Plans (WRPs) come into effect in July 2019. Consultation on this paper will inform the development of those interim options.

The Interagency Working Group

Formed in February 2018 to advise the NSW Government on ways to better manage environmental water, the IWG includes representatives from:

- NSW Department of Industry—Water Renewal Taskforce (Chair)
- Commonwealth Environmental Water Office
- Murray–Darling Basin Authority
- NSW Department of Industry—Water
- NSW Office of Environment and Heritage
- NSW Department of Primary Industries—Fisheries
- NSW Department of Primary Industries—Agriculture
- NSW Natural Resources Commission
- WaterNSW.

This group is providing advice on an immediate response, interim solutions, legislative amendments and enduring measures as per the indicative timeline shown in Figure 1.

The IWG developed the following set of principles, which are being used to guide the assessment of the interim solutions package. :

a) **Adverse impacts are mitigated**—impacts are identified and appropriate mitigation measures are put in place.
b) **Unintended gains are avoided**—measures, where possible, should not contribute to an increase in water access reliability for downstream water users.
c) **Evidence-based and outcomes focused**—measures that look to protect environmental water use best available information and deliver environmental outcomes with considerations of social and economic outcomes, where practical.
d) **Feasible**—identify measures that are technically and operationally able to be implemented.
e) **Value for money**—measures must present value for money and not be cost prohibitive.

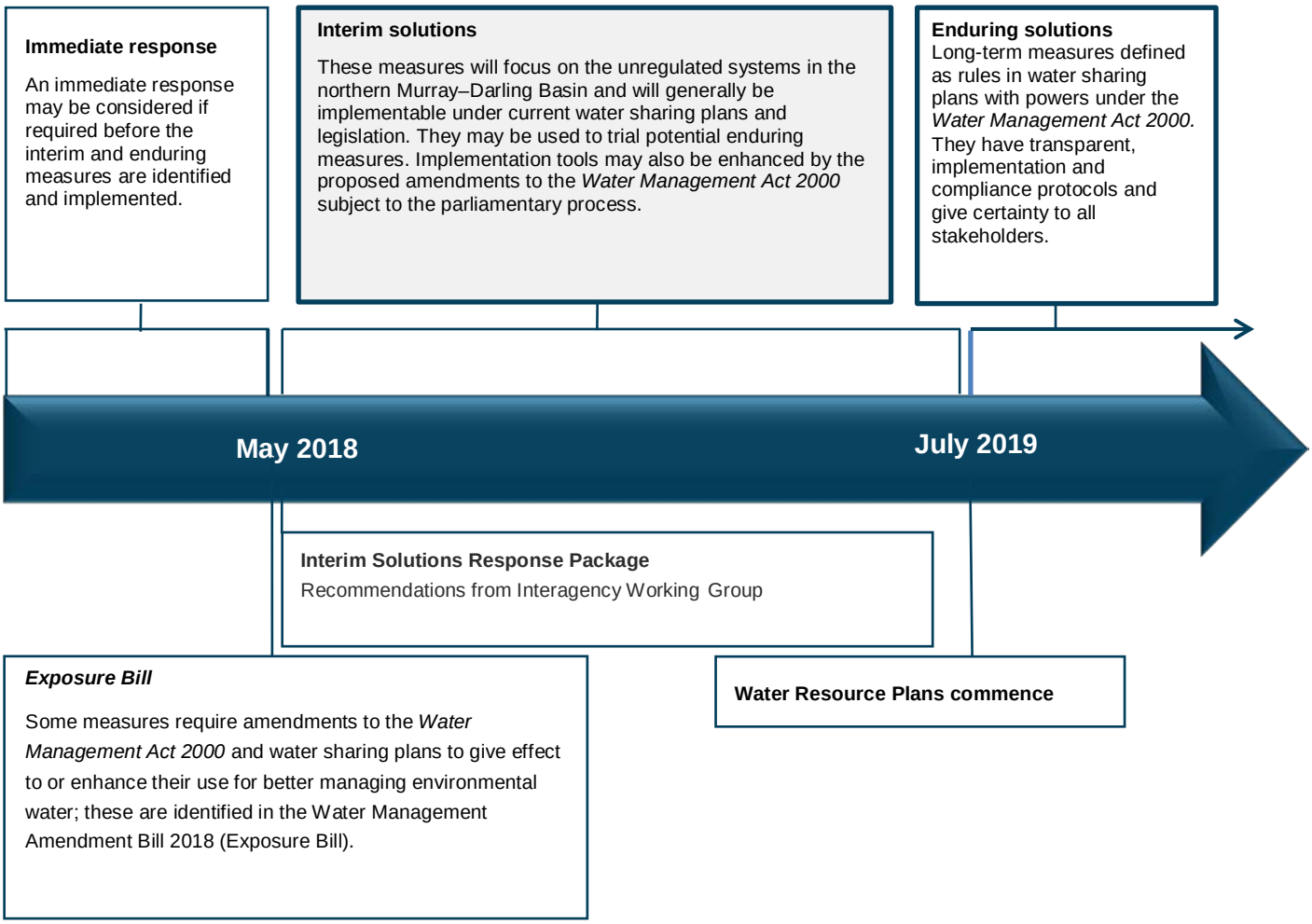

Figure 1. Indicative timeline for actions to improve the management of environmental water

Key terms

An unregulated river system is one without major storages or dams, where both licence holders and the environment rely on natural flows.

A regulated river system is one where downstream flows are regulated by a major storage or dam to supply water for multiple purposes, including the environment, basic landholder rights and downstream water access licences.

For the purposes of this consultation paper, **environmental water** can be divided into two broad categories:

- **planned environmental water**—water that is committed under the rules of a water sharing plan specifically for environmental purposes within the area covered by the plan (**Attachment A** provides a summary of types of planned environmental water rules).
- **held environmental water**—water access licences purchased for environmental use or licences for water recovered through water efficiency savings from improved infrastructure. In NSW, these licences are generally held by either the Commonwealth Environmental Water Holder or the NSW Office of Environment and Heritage. They are used for specific environmental purposes, for example, to water wetland areas, or replenish drought refuges.

Why is environmental water management challenging?

Environmental water management has evolved significantly over the past two decades through the establishment of water-sharing plans and investment in water for the environment. There has been significant investment in programs in NSW—for example, the NSW River Bank, the Rivers Environmental Restoration Program and NSW Wetland Recovery Program. In addition, in 2008, the Commonwealth Environmental Water Holder was formed to purchase and manage water for the environment in the Murray–Darling Basin (**Attachment A** shows the increase in this held environmental water from commencement of the water sharing plans to present day in the Northern Basin). More recently, the Basin Plan requires development of WRPs and Long Term Environmental Watering Plans (LTEWPs) to meet the requirements of the Murray–Darling Basin Plan.

The NSW water-sharing plan framework was not designed with Basin-scale outcomes in mind, nor the large volumes of held environmental water that governments now hold. Traditionally, each water sharing plan area (WSPA) was managed separately, with the assumption that once water (including held or planned environmental water released from an upstream storage) moved from an upstream WSPA to a downstream WSPA, it again contributed to the pool of available water in that downstream water source. This means that if held environmental water is released from an upstream regulated river storage into a downstream unregulated river, it contributes to keeping the flow above the commence-to-pump level, rather than being left instream for its intended purpose.

The Northern Basin presents particular challenges as the major regulated rivers in the northern portion of the NSW Murray–Darling Basin are connected to the southern Murray–Darling Basin by the unregulated Barwon–Darling River.

Consultation question

- The measures in this paper are focused on the unregulated systems of the Northern Basin – do you agree that this should be the main focus for the interim solutions package?

What outcomes are we seeking?

Improving the management of flows and extraction (the taking of water) within and between river systems will help to protect and improve aquatic ecosystems, while enhancing equitable cultural, social and economic outcomes from water. The frequency, timing and duration of flows are ecologically important for different reasons, but each is critical to achieving the objectives from improved management of environmental water, including:

- **breaking extended cease-to-flow periods**—cease-to-flow durations of 50 days at Bourke and 100 days at Wilcannia have been identified as critical ecological thresholds**.**
- **whole-of-river flow connectivity**—low flow connectivity is important for fish and invertebrate populations, and maintaining water quality.
- **flushing flows**—flow pulses up to approximately 2,000 megalitres per day (ML/d) are important for the spawning and migration of fish, nutrient cycling following the inundation of in-channel benches and in the movement of salt out of the system.
- **protection of held environmental water**—ensuring held environmental water is recognised and managed effectively to achieve identified ecological outcomes between river systems and within unregulated rivers, such as the Barwon–Darling.

Consultation question

- Do you agree with this mix of environmental outcomes? Are there others we should be considering?

How do regulated and unregulated rivers operate, and what does this mean for environmental water?

Regulated rivers

A regulated river is one where downstream flows are regulated by a major storage or dam to supply water for multiple purposes. The storage is operated in accordance with the rules set out in the relevant water sharing plan to ensure equitable access for the environment, basic landholder rights (BLR) and water access licences downstream within the regulated river water source. Regulated rivers allow orders to be placed for upstream storage releases of a licensed allocation.

The categories of access licence available in each valley are stipulated by the relevant water sharing plan. Water access licence categories help define the priorities between different access licences, the conditions that apply to them and, in the case of specific purpose category licences, define how water may be used.

The volume of water licensed users can have varies from year to year, based on the licence category and size of their individual share. This allocation is dependent on a range of factors including dam storage levels, river flows and catchment conditions.

Supplementary water is effectively unregulated, surplus flow in regulated systems that cannot be captured in storages. When storm events result in flows that cannot be captured (regulated) for future use, and the water is not needed to meet current demands or commitments, it is considered surplus to requirements. As soon as these conditions are identified for a particular river, a period of supplementary access is announced and details of the river reaches and time periods for supplementary access are published. Supplementary water access licence holders can only pump water against these licences during these announced periods. Supplementary flow events can occur in any regulated system at any time and therefore access is purely opportunistic.

Unregulated rivers

The term ‘unregulated river’ applies to rivers without major storages, or dams, as well as to rivers where the storages do not release water downstream. In unregulated rivers, orders cannot be placed for upstream release of a licensed allocation, and instead both licence holders and the environment rely on natural flows.

The water sharing plans for the unregulated rivers therefore require licence holders to stop pumping when the river flow falls below a certain level. When flows reach a certain level, they can commence-to-pump, referred to as commence-to-pump rules.

In addition, many of the plans set limits on how much water can be taken from different flow ranges or classes.

What does this mean for environmental water?

Regulated rivers are actively managed by releases from headwater storages and orders for water are met at any location along the river system. This means that environmental water holders can work with river operators to release flows from storages for a desired environmental outcome. In contrast, unregulated rivers are typically not managed actively, and are reliant on sporadic inflows, with access controlled by flow access rules. Upstream activity can influence river flows (and hence access) downstream. This presents an additional challenge for environmental water management because the nature of the access rules mean that any water in-stream contributes to keeping the flow above commence-to-pump levels, where access is still permitted. Accordingly the options prosed in this paper target unregulated water sources.

A summary of the existing tools available to manage environmental water is set out at **Attachment B**. Other factors which can support better management of environmental water are set out in **Attachment C**.

How can we better manage environmental water?

A brief summary of possible measures that would help improve the management of environmental water is provided below and in the 'possible measures' section of this paper.

Table 1. Snapshot of measures for improving environmental water management of unregulated rivers

	Possible measure	Description
1	Impose restrictions when held environmental water is released from an upstream storage	Restrictions would be imposed on downstream licences to recognise held environmental water when it enters the unregulated system from a regulated system. This is additional water that would otherwise not have been in the system. Restrictions on licensees' ability to access the held environmental water would help ensure this water can serve its intended environmental purpose.
2	Change access rules for flows through the Barwon–Darling	In unregulated rivers such as the Barwon–Darling, commence-to-pump thresholds are the key way in which water is shared between extractive users and the environment. Changes to access rules could be either temporary (as a trial or to protect a particular flow) or permanent through a revision of access rules in water sharing plan. Changes could include: • review of commence-to-pump thresholds for each flow class • seasonal commence-to-pump thresholds set for wet vs dry conditions • first flush flow rule that restricts access sequentially as flow moves downstream to reconnect the system.
3	Use Individual Daily Extraction Limits (IDELs) to better manage flow sharing	IDELs are a framework which limits the daily take by individual licences. They can be used to allow flows to be better shared between users or between users and the environment. IDELs can be used as a standalone mechanism or could deliver additional benefits if combined with other tools such as trading (proposed amendments included in the Exposure Bill will enable this type of dealing) or active sharing of flows on an event basis.
4	Active sharing of flows on an event basis	Active sharing of flows on an event basis outside of the IDEL framework. This could be implemented through voluntary arrangements or a 324 order, or through sharing rules set through the WSP.
5	Use of downstream environmental requirements as a trigger to manage upstream access	This framework is currently used in some water sharing plans and is based on the downstream flow requirements in the Interim Unregulated Flow Management Plan for the North–West. This option proposes actively implementing this framework in the northern regulated tributaries and in the Barwon Darling.

Possible measures

1. Impose restrictions when held environmental water is released from an upstream storage

Environmental objectives: Designed to help protect held environmental water in transit.

This option would place restrictions on downstream licensees' ability to access held environmental water that is released from an upstream storage. This will better ensure this environmental water can move through the system so that it can achieve downstream environmental outcomes.

It is necessary because the held environmental water flowing through to the downstream unregulated water source is additional to that which would otherwise be in the system. Access rules in an unregulated river generally consider all water in-stream contributes to the total flow, and if flow is of a volume that triggers the commence-to-pump rules, licence holders can extract water. As a result, held environmental water entering unregulated systems from upstream tributaries can be extracted by licence holders, which reduces the effectiveness of this water for environmental purposes.

Implementation considerations:

- Voluntary agreements have been used in the past to manage access downstream. Ongoing use of such agreements is dependent on an environmental water holder's confidence in the success of such agreements.
- Operational protocols and guidelines would be required to ensure clarity and transparency of access, and to set out rules around the recognition of environment water downstream.
- Anticipated outcomes from the delivery of environmental water may not be realised if 'losses', as water moves through the system, are higher than expected.

2. Change access rules for flows through the Barwon–Darling

Environmental objectives: Help protect first-flush flows, improve whole-of-river connectivity and contribute to breaking extended cease-to-flow periods.

The Barwon–Darling water sharing plan sets out water access rules, including establishing flow classes that set thresholds for when access licences can take water, that is, sets commence-to-pump thresholds for all A, B and C class access licences, by management zone. This option would amend the licensed water access rules either temporarily or permanently to better manage water for the environment. Changes could include:

- **review of commence-to-pump thresholds for each flow class:** a review and revision of the current commence-to-pump thresholds could be undertaken based on the latest available information. Permanent changes could be put in place via amendments to the Barwon–Darling water sharing plan or temporary changes could be made to either implement a trial or protect a particular event. Raising the commence-to-pump thresholds would aim to provide for whole-of-river connectivity and contribute to breaking extended cease-to-flow periods.
- **seasonal commence-to-pump thresholds set for wet versus dry conditions**: as above, a review and revision of the current commence-to-pump thresholds could be undertaken, but with the aim of establishing different thresholds, which would operate in dry vs wet conditions.
- **first flush flow rule:** this measure suspends access sequentially in each management zone as a flow of a determined level moves downstream, to protect the first flush/recommencement flow following an extended low flow or cease-to-flow period. First flush rules are time/duration based and when determined, provide clear thresholds that licence holders can become familiar with at each gauging station.

Implementation considerations:

- Improvements to the water gauging infrastructure and online information systems, including increased availability of telemetry, would help to provide clarity to water users about when they can start pumping.

- Identification of the required flow to ensure re-connectivity of the system will be dependent on local conditions and may need to be actively managed for each event.
- Access rules will be needed for A, B & C class licences in the Barwon–Darling to restrict access to initial flows (for first flush rules) to reach agreed downstream flow thresholds to achieve specified environmental outcomes.

3. Use IDELs to better manage flow sharing

Environmental objectives: could be used to break extended cease-to-flow periods, whole-of-river flow connectivity and protection of held environmental water in transit.

IDELs work by capping the available water for extraction on any given day. They are mechanisms to share flows above the commence-to-pump threshold. Depending on how IDELs are distributed to individuals they can ensure the equitable sharing of flows on an event-by-event basis or they can just restrict individual access independent of flows. For example current IDELs in the Barwon–Darling Water Sharing Plan would restrict access to pre-water sharing plan pumping rates. Implementation of these may restrict an individual's access but not necessarily sharing of flows if the amount of available water above commence-to-pump is less than the Total Daily Extraction Limits (TDEL), that is a daily extraction limit for all users combined.

Greater benefits are likely to be obtained from the implementation of IDELs if they are combined with other measures including:

- **trading of IDELs**—allowing for trade of IDELs would provide a market-based mechanism for the protection of environmental flows and sharing of access above commence-to-pump thresholds. Amendment to the *Water Management Act* and individual water sharing plans are required to provide for a new dealing type and associated accounting.
- **trading of IDELs plus active sharing of flows on an event basis**—could allow for held environmental water in the Barwon–Darling and tributaries to be actively managed instream (noting operational difficulty and error margins around quantifying this volume in some instances). Implementing an active management approach would make it easier to introduce trading as each customer would be provided a volumetric share, which could be traded. Sharing of the extractive use would vary depending on each event and which tributary it originated from.

Implementation considerations:

- IDELs are enabled in the current Barwon–Darling Water Sharing Plan, however the current rules around how to distribute IDELs has unintended and perverse outcomes that would need to be addressed.
- IDELs can be implemented in other relevant unregulated water sources in accordance with the amendment provisions in those water sharing plans, TDELs would have to be established in the first instance and then the TDEL shared to assign an IDEL to each licence.
- Monitoring of IDELs requires accurate monitoring of daily extraction rates (the proposed options outlined in the *Water take measurement and metering* paper could assist with this).
- Water administration system changes would be required to support implementation of new dealing and accounting framework.
- If implementing active sharing of flows on an event basis real-time operating system would be required to monitor flows and implement actions to manage these flows. In general this is not currently in place for unregulated rivers.
- Additional telemetered hydrometrics stations may contribute to improved active sharing.

4. Active sharing of flows on an event basis

Environmental objectives: could be used to break extended cease-to-flow periods and whole-of-river flow connectivity, protection of held environmental water in transit.

This is similar to the final IDEL option above, but would be implemented outside of the IDEL framework. It could also allow for held environmental water flows in the Barwon–Darling and tributaries to be actively managed instream (noting operational difficulty and error margins around quantifying this volume in some instances). Sharing could be based solely on a licensee's shares (e.g. announce access for all licences up to a percentage of an individual's shares) or through a water ordering process where unregulated licence holders express interest in accessing the flows, with flows shared between those that want to take water. This measure is similar to what is in place for sharing supplementary access in the regulated rivers.

Implementation considerations:

- Monitoring required for accurate monitoring of daily extraction (the proposed options outlined in the *Water take measurement and metering* paper could assist with this).
- Active sharing of flows on an event basis would require a real-time operating system to monitor flows and implement actions to manage these flows. In general this is not currently in place for unregulated rivers.
- Additional telemetered hydrometrics stations may contribute to improved active sharing.

5. Use of downstream environmental requirements as a trigger to manage upstream access

Environmental objectives: Help protect first-flush flows, improve whole-of-river connectivity and contribute to breaking extended cease-to-flow periods.

This option is based on the approach taken in the *Interim Unregulated Flow Management Plan for the North–West*, as referenced in the water sharing plans for the regulated tributaries of the Border Rivers, Gwydir and Namoi, and the unregulated Barwon–Darling, which set targets in the Barwon–Darling system to meet minimum riparian flows, algal suppression and fish passage.

Implementation considerations:

- The downstream flow requirements will be included in the monitoring, evaluation and reporting (MER) plan for relevant water sources. These flow requirements should be reviewed over time, based on the information collected and analysed as part of this MER plan.

Consultation questions about the possible measures

- Do the measures in this paper adequately balance the needs of the environment with the needs of other water users?
- What do you see as the likely barriers to better management of environmental water, and do the measures presented in this consultation paper help to address these?
- Are there any other measures the Government should consider?
- If the measure(s) presented in this paper are implemented, what would be the likely social and economic impacts?
- Are there any practical or other issues with implementing any of the proposed measures which have not been captured in this paper?
- Do you agree that trialling measures in these priority areas is a useful approach?

- If you are a licence holder in an unregulated water system in NSW, would you be willing to participate in a voluntary agreement to limit your water extraction, either as part of a trial or pilot, or as part of an ongoing arrangement that targeted particular water flows?

Have your say

The community is encouraged to provide feedback. These responses will be due by 11.59 pm on Sunday 15 April 2018 and can be submitted in a number of ways, including:

Online: www.haveyoursay.nsw.gov.au
Email: water.reform@industry.nsw.gov.au
Website: www.industry.nsw.gov.au/water-reform/consultation
Post: Water Renewal Task Force, Department of Industry, GPO Box 5477, Sydney NSW 2001

Next steps

The NSW Government is committed to ongoing engagement with the community and business on the proposed water reform changes and to ensuring that water users and stakeholders understand the proposed measures and their potential impacts.

This consultation paper is the start of a conversation the NSW Department of Industry is having with the community on the development of water reforms in the area of better management of environmental water.

Your input on the questions throughout the paper will help to ensure that decisions about measures for better managing environmental water are well informed and consider potential impacts on water users.

Submissions received in response to this discussion paper will inform:

- further stakeholder consultation and communications
- possible legislative amendments to effect to some of the options under consideration (outlined below)
- development of the package of interim solutions being developed by the IWG
- where amendments to the water sharing plans are considered necessary to implement identified measures, consultation of these amendments will occur through the normal Water Resource Plan Stakeholder Advisory Panel consultation processes.

A summary of all community feedback provided as part of the consultation and submission process will be released by the NSW Government in the months that follow the close of the consultation period at 11.59 pm on 15 April 2018.

Proposed legislative amendments

The Exposure Bill includes amendments to the *Water Management Act* which reflect the measures proposed in this paper:

- **individual daily extraction limits**—amendments to the dealing provisions in the *Water Management Act* to enable IDELS to be assigned between access licences. This will enable IDELs to be used as market-based instruments for sharing flows above the CTP in each flow class and as such enabling protection of held environmental water. The Exposure Bill also includes amendments to allow for the assignment of an IDEL to be recorded in the water allocation account.[1]

[1] Note: Implementation of IDELs in the Barwon–Darling will also require amendments to the *Water Sharing Plan for the Barwon–Darling Alluvial Water Sources 2012*, to avoid perverse outcomes associated with current distribution rules to avoid licenses being assigned a 0 ML/day IDEL.

- **mandatory conditions**—amendments to enable mandatory conditions to be imposed on access licences and approvals by regulation to limit, for environmental purposes, the take of water in specified circumstances.
- **section 324**—amendments to allow the minister to make an order for the purposes of managing water for the environment by restricting or prohibiting the taking of water from a specified water source for a specified period of time.

The feedback you provide in response to the questions in this paper will inform the content of the legislation introduced into Parliament by mid-2018.

Attachment A: What is held environmental water?

As stated, **held environmental water** is water access licences purchased for environmental use or licences for water recovered through water efficiency savings from improved infrastructure. In NSW, these licences are generally held by either the Commonwealth Environmental Water Holder or the NSW Office of Environment and Heritage.

Held environmental water represents a significant volume of water in the Northern Basin and has grown significantly since the original water sharing plans commenced (**Table 2**). Planned environmental water is more difficult to quantify.

Table 2. Growth in environmental water holdings since water sharing plan commencement Northern Basin

Source: NSW Environmental Water Register - https://ewp.water.dpi.nsw.gov.au/ewr/main/erShSummary, 6 March 2018

Environmental Water Holdings (unit shares)	WSP Commencement Date	Holdings at WSP Commencement	Current (as at 6 March 2018)
NSW Border Rivers	1 July 2009	0	4,243
Gwydir	1 July 2004	0	135,965
Namoi	1 July 2004	0	12,244
Macquarie	1 July 2004	0	184,387
Barwon-Darling	4 October 2012	24,073	30,170
TOTAL		**24,073**	**367,009**

Source: NSW Environmental Water Register - https://ewp.water.dpi.nsw.gov.au/ewr/main/erShSummary, 6 March 2018

What is planned environmental water?

As stated, planned environmental water is water that is prescribed under the rules of a water sharing plan specifically for environmental purposes. The environmental rules are designed to provide water for the environment across a range of flow events from floods to very low flows.

The environmental flow rules in water sharing plans vary from valley to valley, depending on which ecological objectives were considered most important for that valley. Management rules in regulated river systems have a lot of flexibility because of the ability of the major storages to provide for environmental flow management. Therefore rules may include controls on extractions under certain conditions as well as management of dam releases.

Flows in unregulated rivers can only be protected through controls on extraction. In most unregulated rivers, it is during drier periods when flows are naturally low that there is generally greatest concern for the health of the river. This is when pools contract, water quality deteriorates rapidly, algal blooms occur, oxygen levels decline and fauna compete for the reducing food supplies.

The range of rules which may apply are set out in **Table 3**.

Table 3. Examples of surface planned environmental flow rules

Environmental flow rules	Purpose	Applicability
Extraction limit	Sets a limit on the long-term average annual volume of water that can be extracted, thus protecting the major share of water for the environment.	Regulated rivers Unregulated rivers
End-of-system flow	Requires a flow to be achieved at the end of the river system (this may be specific to certain times of the year). This ensures that flow is maintained below the areas of major extraction. In regulated systems this can be achieved by using releases from storage to supplement natural flows. In unregulated systems this can only be achieved when there is flow in the system.	Regulated rivers Unregulated rivers (limited)
Transparent dam release	Requires all dam inflows occurring at certain times to be passed immediately downstream, as though no dam was present. This maintains natural flow variability for that part of the year (usually the winter months) when dam releases would otherwise be minimal.	Regulated rivers
Translucent dam release	Requires a proportion of dam inflows occurring at certain times to be passed immediately downstream. This restores the natural flow variability associated with specific flow ranges, usually freshes and minor floods.	Regulated rivers
Limits on taking high flows	Limits pumping when the dam spills (regulated rivers) or high flows enter the river from tributaries. This protects either some or all of these naturally occurring high flows which are important for flooding of wetland areas.	Regulated rivers Unregulated rivers
Limits on taking low flows	Limits pumping from lower flows that enter the river from tributaries. This ensures that sufficient water is retained in the river for the environment.	Regulated rivers Unregulated rivers
Supply minimum flows downstream of dam	Minimum release to maintain continuous low flow in the section of river immediately downstream of the dam wall.	Regulated rivers
Environmental water allowances or releases	Creates a 'bank' ‘bank’ or volume of water stored in the dam which that can be released for specific environmental purposes, such as flushing blue-green algal blooms, reducing salinity or supporting bird breeding or fish spawning events.	Regulated rivers

Attachment B: What existing tools can be used to better manage environmental water?

- **Section 324 orders**—this provision under the *Water Management Act* allows the minister to implement temporary water restrictions that restrict or prohibit the taking of water from a specified water source for a period of time if these restrictions are determined to be in the public interest. Use of section 324 orders would generally be used by exception where other tools may not be available.

- **Voluntary agreements—**agreements that are negotiated with individual access licence or approval holders to achieve specific environmental outcomes. These agreements require parties to act in good faith and are not enforceable under the *Water Management Act*. These agreements can be arranged independently by environmental water managers, if necessary, in conjunction with any approach used.

- **Mechanisms and rules in water sharing plans**—rules and/or mechanisms that can be implemented either under current WSP provisions or through plan amendments. Rules that relate to management of environmental water may include:
    - **TDELs and IDELs**—all unregulated river WSPs allow TDELs and IDELs to be imposed. TDELs and IDELs are a form of extraction component; daily extraction limits are intended as a way to share access to particular flow events between licensees and the environment, in addition to the commence-to-pump levels. The framework for TDELs and IDELs exists in most water sharing plans, but most would require amendments to the water sharing plans to enable implementation.
    - **Environmental flow rules**—such as rules that establish sharing arrangements between the users and the environment through the establishment of flow class and commence-to-pump rules, and/or rules that implement the Interim North–West Unregulated Flow Management Plan (see **Attachment A** for further examples of environmental water rules).

- **Water buybacks/conversions**—this involves the purchasing of licences or share components that may be deemed important for achieving desired environmental outcomes.

Attachment C: Other factors which can support better management of environmental water

The measures considered in the paper will be more effective should other improvements be put in place. Implementation of such improvements will be considered over the long-term, although most of these could be fulfilled sufficiently to undertake trials of measures in the short-term.

Table 4. Factors that contribute to improved environmental water management

Factor	Description
Transparency	Providing better and more transparent information about how environmental water is managed will be key to rebuilding public trust and confidence.
Strong and transparent regulatory and compliance framework	The establishment of the Natural Resources Access Regulator and the proposed metering reforms, will contribute to an improved regulatory and compliance framework.
Monitoring, evaluation and reporting of outcomes	Monitoring, evaluating and reporting on outcomes achieved is important for supporting adaptive management and decision-making about possible long-term solutions, i.e. to know what works and what doesn't. Monitoring and evaluation plans are being developed across the Basin.
Flow forecasting and event tracking	Forecasting flows and tracking events will help with both communication efforts and monitoring, evaluation and reporting. It is critical to inform the implementation of measures which manage water for the environment and flow sharing.
Improved measurement and contemporary information capture, including real-time operational systems	Use of more contemporary technologies, including telemetry could help improve data capture on water take and river gauging. Ideally, real-time operational systems would be in place to monitor flows and implement actions to manage these flows. Better infrastructure that supports increased levels of metering could help feed into an improved understanding of water take and better hydrometric networks to facilitate more effective monitoring of flows as they move through the system.
Accounting for environmental water	To allow for environmental water to be debited from accounts and to report on where environmental water was delivered, there needs to be rules that are agreed, transparent and consistently applied.
Improved modelling capability	Improved modelling capabilities are being progressively delivered as part of the eWater Source platform. The new model platform provides an improved ability to model connectivity across water sources and provides an important tool for analysing different scenarios for environmental water management. The new models will also be more accurate for compliance purposes, using updated flow and water usage information.