



# Guideline for the implementation of the NSW Floodplain Harvesting Policy

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## Introduction

Floodplain harvesting is the capture and use of water flowing across a floodplain. Historically, the take of water associated with floodplain harvesting has been unlicensed and unmonitored in NSW. Under the *Water Management Act 2000*, the take of water, including that taken by floodplain harvesting, must be accounted for under a water access licence, basic landholder right or licence exemption.

In 2013, the NSW Government introduced the NSW Floodplain Harvesting Policy to announce the process the department would follow to bring floodplain harvesting activities into the *Water Management Act 2000* water sharing and licensing framework. The NSW Floodplain Harvesting Policy is currently being implemented in the five northern inland valleys of the Gwydir, Namoi, Macquarie, Border Rivers and Barwon-Darling.

For the purposes of licensing, floodplain harvesting includes captured rainfall runoff, whether it is contaminated or not, and overbank flow. The licensing of floodplain harvesting will not apply to used irrigation water or rainfall over a water storage.

## About this guideline

This guideline provides detail on the implementation process for the NSW Floodplain Harvesting Policy. It may be amended in the future to reflect the progress of implementation.

The sections in this guideline are designed to explain the processes involved in the issuing and implementation of floodplain harvesting access licences and approvals in NSW and subsequent management of the take of water associated with floodplain harvesting. While these sections combine to form this guideline, they can also be read in isolation.

**Section 1** outlines how properties eligible for floodplain harvesting access licences were identified and the assessment process for granting of water supply work approvals.

**Section 2** explains the process for determining the entitlement associated with floodplain harvesting (unregulated river) access licences and floodplain harvesting (regulated river) access licences.

**Section 3** explains the role of the Healthy Floodplains Review Committee in relation to eligibility or entitlement determinations.

**Section 4** outlines the types of rules that will apply to floodplain harvesting access licences, the process for including these rules in the relevant water sharing plans and how floodplain harvesting is included in water resource plans.

**Section 5** outlines the environmental benefits that implementing the NSW Floodplain Harvesting Policy will have.

**Section 6** explains how the take of water associated with floodplain harvesting will be adaptively managed including monitoring and evaluation, responses to any future growth in floodplain harvesting, impacts on other water users and protection for downstream water users.

**Section 7** clarifies the interaction between harvestable rights and floodplain harvesting, flood works and water supply works, and floodplain management plans and licensing of floodplain harvesting.

# 1. Determination of eligibility for floodplain harvesting access licences and granting of approvals

The determination of eligibility for a floodplain harvesting access licence is firstly based on a process of registration of interest and assessment of eligibility of works capable of floodplain harvesting against the criteria specified in the NSW Floodplain Harvesting Policy.

If a work is deemed eligible, a further process is undertaken to assess and grant the required water supply work approvals (see section 1.4).

If a work is deemed to be ineligible and an appeal is made, a review is undertaken by the Healthy Floodplains Review Committee.

## 1.1. Registration of interest

As part of the implementation of the NSW Floodplain Harvesting Policy in five northern inland valleys (Gwydir, Namoi, Macquarie, Border Rivers and Barwon-Darling), landholders who undertake floodplain harvesting activities were invited to submit a registration of interest (ROI). The ROI was the first step for landholders in obtaining authorisation to continue floodplain harvesting activities under the NSW Floodplain Harvesting Policy. Information collected through the ROI process included:

- property details such as applicant name, property name, lot/DP and floodplain harvesting activity site number (ROI number)
- supply (interception and conveyance works) details including type, construction date and water access licence and water supply work approval details
- storage details linked to water supply works such as area, volume, construction date and water access licence and water supply work approval details
- floodplain harvesting property map with reference to relevant water access licence numbers;
- a description of past floodplain harvesting activities
- A declaration.

Initially, landholders were only required to submit basic information sufficient to determine eligibility. In some instances, registrants were asked to provide additional information at the time of assessment.

Invitations were sent to landholders in the five northern inland valleys in 2012. Table 1 lists the closing dates for the ROI.

**Table 1 ROI periods in northern inland valleys**

Valley	ROI closing date
Gwydir	30 November 2012
Namoi	1 July 2013
Border Rivers	1 July 2013
Macquarie	30 April 2014
Barwon-Darling	30 April 2014

To ensure all properties capable of floodplain harvesting were captured during this process, the department used local knowledge, discussions with relevant water user groups and satellite imagery to cross-check against the ROIs received.

Landholders in other valleys will have the opportunity to submit an ROI if implementation of the NSW Floodplain Harvesting Policy is extended beyond the five northern valleys in the future.

## 1.2. Assessment of eligibility

The NSW Floodplain Harvesting Policy specifies the eligibility criteria for works that are capable of floodplain harvesting and may subsequently be eligible to receive a floodplain harvesting access licence. The criteria relate specifically to works capable of floodplain harvesting that, on or before 3 July 2008, were:

- constructed on a floodplain in accordance with an approval granted under Part 2 or Part 8 of the *Water Act 1912* or Part 3 of Chapter 3 of the *Water Management Act 2000*,  
or
- subject to a pending application for an approval to construct on a floodplain under Part 2 or Part 8 of the *Water Act 1912* or Part 3 of Chapter 3 of the *Water Management Act 2000*,  
or
- constructed on a floodplain and it can be proven that the work did not require an approval under Part 2 or Part 8 of the *Water Act 1912*.

For any existing work capable of floodplain harvesting that requires an approval and an application for an approval was not made on or before 3 July 2008 is not eligible for a floodplain harvesting access licence. However, these works may be used for floodplain harvesting if they apply for and are granted an approval and can be linked to a relevant access licence that can account for the take of water from the work.

The department used a combination of desktop assessments and field inspections to verify data in the ROIs. Detailed irrigator behaviour questionnaires were used as a line of evidence to inform the modelling for floodplain harvesting.

### 1.2.1. Desktop assessment

Once the ROI process closed for a given valley, a desktop assessment was done to determine provisional eligibility prior to further investigation and site inspections.

The desktop assessment involved a review of evidence provided in the ROI, as well as investigations of relevant licences and an examination of relevant maps, aerial photographs and satellite imagery.

### 1.2.2. Field inspection

Following the desktop assessment, field inspections were undertaken detailing the following information and observations in a site inspection report:

- applicable water sources
- external channels or banks that form part of a supply or interception system and are capable of diverting flood water
- dimensions and capacity of works capable of floodplain harvesting
- the location of meters
- storage details including types, location and height of banks.

### 1.2.3. Irrigator behaviour questionnaires and determination of on-farm storage capacity

Irrigator behaviour questionnaires are structured surveys used to collect comprehensive information relating to, but not limited to:

- water harvesting
- farm infrastructure and on-farm water management
- planting decisions and irrigation practice
- floodplain harvesting history, capability and capacity.

In the five northern inland valleys, the data from the questionnaires confirmed that while information relating to recent farm infrastructure was readily available, information on historic floodplain harvesting development for many properties was either incomplete or inaccurate due to changes in property ownership or gaps in record keeping.

The department used the questionnaire data as one of the lines of evidence for modelling (see section 2.1.2.1). Other lines of evidence included remote sensing products such as LiDAR and Landsat, flood models, flood photography, on-ground mapping and inspection data, as well as literature.

### 1.2.4. Assessment process

Using all the information gathered, the department conducted an assessment of whether the work(s) on a property satisfied the criteria specified in the NSW Floodplain Harvesting Policy (see section 1.2). Only those works assessed as eligible progressed to the next step in the licensing process involving the granting of a water supply work approval (if required) and determination of floodplain harvesting access licence entitlement.

## 1.3. Eligibility/Ineligibility determination and notification to registrants

Once the assessment of eligibility was completed, the department finalised a site inspection report that provided details relating to the determined eligibility or ineligibility of an ROI. The registrant was provided with a written notification of the determination outcome.

If an ROI was determined ineligible, the reasons and evidence associated with the decision were included in the notification of determination. The registrant was also advised of their right to appeal to the Healthy Floodplains Review Committee.

The total number of ROIs received for the five northern inland valleys and the results of the determination are summarised in the table below.

**Table 2 ROIs received in northern inland valleys**

Valley	Total ROIs received	Eligible	Ineligible
Gwydir	161	135	26
Border Rivers	55	43	12
Macquarie	106	78	28
Barwon-Darling	43	33	10
Namoi	269	219	50

## 1.4. Granting water supply work approvals

Under the *Water Management Act 2000* it is an offence to take water under a water access licence unless it is through an approved water supply work nominated on the water access licence.

The department is progressively developing a water infrastructure plan for each property determined to be eligible for floodplain harvesting via the ROI process based on the information gathered during the field inspection process. The department is using the information in the water infrastructure plan to prefill an application for a water supply work approval.

The application is assessed against multiple criteria including environmental considerations, Native Title and lawful occupation of land. If the application relates to an area of key fish habitat, it is referred to NSW Department of Primary Industries - Fisheries for assessment.

The granting of a water supply work, as part of implementation of the NSW Floodplain Harvesting Policy, will only occur for eligible floodplain harvesting works that were present at the time of the site inspection and prior to 2008.

Ineligible and unapproved works may become the subject of compliance action undertaken by the Natural Resource Access Regulator.

## 2. Determination of floodplain harvesting entitlement

The determination of floodplain harvesting entitlements is based on whether a property with eligible floodplain harvesting works, as determined in line with the NSW Floodplain Harvesting Policy, is associated with a regulated or an unregulated river water source.

Properties with eligible floodplain harvesting works are defined as being associated with regulated river water sources if the property:

- held a regulated river access licence prior to 3 July 2008
- did not hold an unregulated river access licence during 1993-99 (unless its purpose was for the conveyance of regulated river supply only)

Properties with eligible floodplain harvesting works are defined as being associated with unregulated river water sources if the property held an:

- unregulated river access licence during 1993–99,  
or
- aquifer access licence (only) during 1993–99.

### 2.1. Determination of floodplain harvesting entitlements for regulated river properties

#### 2.1.1. Extraction limits and the use of models

Long-term average annual extraction limits, as specified in water sharing plans, are designed to manage the total take of water by all properties within the water sharing plan area. This area includes those properties that capture and use water flowing across a floodplain.

Extraction limits for regulated rivers (and the Barwon-Darling Unregulated River) are calculated using computer models that simulate river basin behaviour based on more than 100 years of climatic data, the amount of irrigation development in the water sharing plan area at specified points in time, and the applicable water sharing plan rules. These models use the best available data and will continue to be updated as additional information becomes available.

Managing compliance with extraction limits protects downstream water users and the environment, by ensuring that any flows in excess of that permitted to be taken under access licences or basic landholder rights remain in-stream. Similarly, the use of rules in a water sharing plan allows identified impacts to be adaptively managed.

#### 2.1.2. Steps for determining floodplain harvesting entitlement

The floodplain harvesting entitlements associated with regulated rivers will be determined by the department using three key steps:

1. update river system models to represent floodplain harvesting activities for individual properties
2. assess extraction limits to ensure compliance with them
3. determine individual floodplain harvesting entitlements - ensuring that the total take of water will be within the relevant extraction limit and that any impacts are distributed as equitably as possible among eligible floodplain harvesting properties.

##### 2.1.2.1. Update river system models to improve representation of floodplain harvesting

River system models are designed to assess the potential impacts of different water management strategies or policies for water sharing. A customised platform is needed to correctly represent

specialised water sharing plan rules. All current river system models produced by the department have been developed in the Integrated Quantity and Quality Model or eWater Source platforms.

These models will be enhanced to represent individual properties with their associated infrastructure and access to overland flow. A technical report will be published for each valley, describing how the model has been developed.

Each model will represent the components that floodplain harvesting comprises using the best available published data; runoff generated from within a farm and runoff from developed and irrigated land. The models to be used in the five northern valleys are anticipated to be finalised by mid-2020.

### 2.1.2.2. Assess extraction limits and growth in use

Updated models will be used to re-assess extraction limits established in water sharing plans and the long-term annual average take of water based on current infrastructure and management practices.

Water sharing plans define how extraction limits are calculated. For most regulated rivers, it is specified as the lesser of:

- the take of water that would occur with the infrastructure and management arrangements that existed in 1999–2000, combined with the water sharing plan rules, or
- the take of water that would have occurred under the Murray–Darling Basin ‘Cap’ conditions<sup>1</sup>.

Water sharing plans require long-term assessment, based on a fixed level of development and management rules. This type of assessment is referred to as ‘scenario modelling’. Scenarios provide an estimate of the overall take of water for the river system at a particular level of development, licence utilisation and management rules.

Assessment of long-term average annual take of water and the variability of annual take can be achieved by modelling the assumptions regarding the level of development and management rules over a long climatic sequence. Scenarios will not necessarily match the historical take of water and river flows because the level of development and management rules will have varied over time.

Based on this information, the following process is used to assess if there is a growth in use:

- scenarios are updated for Cap and water sharing plan conditions<sup>2</sup>. The long-term average take of water under both scenarios are assessed and the extraction limit is defined by the lesser of the two.
- a ‘current conditions’ scenario is created that assumes the current levels of development and management rules were in place over a long climatic period, such as 1889-2018. This is used to assess whether the current long-term average annual take of water exceeds the extraction limit.

A growth in use is identified if the model demonstrates that the current long-term average annual take of water exceeds the extraction limit.

### 2.1.2.3. Individual floodplain harvesting entitlement is determined to ensure the take of water does not exceed extraction limit

An ‘eligible floodplain harvesting unconstrained’ scenario is used to assess the floodplain harvesting that would have occurred with only floodplain harvesting works deemed eligible under

<sup>1</sup> Cap conditions are limits on the take of water, specified in Schedule E of the Murray-Darling Basin Agreement. See Schedule 1 of the *Water Act 2007* (Commonwealth)

<sup>2</sup> For the Barwon-Darling Unregulated River Water Source, only the Cap scenario will be used.

the NSW Floodplain Harvesting Policy. This is used as the starting point for determining floodplain harvesting entitlements for each individual. If the total take of water:

- does not exceed the extraction limit, each individual's floodplain harvesting entitlement will be equal to their long-term average annual floodplain harvesting take under the 'unconstrained' scenario.
- exceeds the extraction limit, individual floodplain harvesting entitlements will be determined so that, combined with the account management rules specified in the relevant water sharing plan, each property has an equal reduction in long-term average floodplain harvesting compared to the 'unconstrained' scenario. The reduction required will vary for each valley and will be based on what is required to reduce the take of water to within the extraction limit.

The 'current conditions scenario' is updated to include the floodplain harvesting entitlements and account management rules. The long-term average total take of water is assessed to ensure it does not exceed the extraction limit.

## 2.2. Determination of floodplain harvesting entitlement for unregulated river properties

In unregulated river water sources (other than the Barwon-Darling<sup>3</sup>), most of the water available for floodplain harvesting is already accounted for within the existing access licence share components and the relevant long-term average annual extraction limits. This is because, when licences in unregulated rivers were converted from the *Water Act 1912* to the *Water Management Act 2000*, they were done so using actual irrigated areas and actual crops being grown (see section 2.2.1). This conversion process, known as volumetric conversion, effectively considered all forms of water taken.

However, for some properties with floodplain harvesting works deemed eligible under the NSW Floodplain Harvesting Policy, floodplain harvesting entitlements may be issued, where it can be clearly demonstrated that the volumetric conversion process did not sufficiently cater for floodplain harvesting.

### 2.2.1. Historical volumetric conversion of unregulated river access licences

At the time of volumetric conversion, unregulated river water licence holders provided information about their irrigated areas, the types of crops planted and methods of water extraction. Licence holders had to provide up to six years of information on the area of crops grown (from 1993–94 to 1998–99).

The method used for calculating the volumetric conversion<sup>4</sup> was:

Where a survey was returned:

- if the reported total area irrigated exceeded the area authorised by the licence, the crop areas reported for that year were adjusted back to the authorised area. Volumetric conversion was only applied to the authorised area.

<sup>3</sup> In the Barwon–Darling, floodplain harvesting activities were not typically accounted for when unregulated river water licences issued under the *Water Act 1912* were volumetrically converted in 2000. As a result, the Barwon–Darling is treated like a regulated river for its long-term average annual extraction limit and floodplain harvesting entitlement determination process.

<sup>4</sup> Taken from: *Volumetric Conversion – the next stage*. A booklet for landholders with licences on unregulated rivers in NSW, DLWC, September 2000.

- ii. the areas for each crop type reported in the survey were multiplied by the appropriate crop conversion rate for the climate zone to give a volume in megalitres (ML). The perennial rate was applied where crops were over-sown on the same area.
- iii. if the total reported area in a year was less than the authorised area, the remaining area was multiplied by the inactive rate for the climate zone to give a volume in ML.
- iv. the total volume for each crop and area, plus the volume for the inactive area (if any) were added to give an annual volume.
- v. the volumes determined under (ii) or (iv) for each year were compared. The highest of these volumes was selected as the irrigation entitlement, in ML per year.

Where a survey was not returned:

- vi. the authorised area was converted at an inactive rate. This rate varied, depending on the climate zone in which they were located ranging from 1.0 to 6.0 ML per hectare.

### 2.2.1.1. Anomalies and amnesties in the volumetric conversion process

In some cases, licence holders who believed that their entitlement determined through the volumetric conversion process was insufficient or an anomaly could request a review through the *Independent Anomalies Review Committee*. Licence holders provided evidence to assist the Committee make an informed decision.

The department has identified properties with floodplain harvesting works deemed eligible under the NSW Floodplain Harvesting Policy that were dealt with through the anomalies process. These properties will be assessed to ensure any increase in entitlement that resulted from the anomalies process is considered when determining floodplain harvesting entitlement.

During the volumetric conversion process, water users were also given the opportunity to report if they were taking additional water, such as from overland flow or had unapproved works. Water use, dam sizes and so on, were verified by the department and unregulated river access licences and work approvals were issued in most cases.

The department also identified properties with floodplain harvesting works deemed eligible under the NSW Floodplain Harvesting Policy that were dealt with through an amnesty enquiry. These properties will be assessed to ensure any additional unregulated river access licence granted during the amnesty process is considered when determining floodplain harvesting entitlement.

### 2.2.1.2. Unconverted unregulated river water access licences

Unregulated river access licences (with an authorised area) that are yet to be volumetrically converted will not receive a separate floodplain harvesting entitlement. Instead, this volume will be catered for as part of the volumetric conversion process. WaterNSW is completing these volumetric conversions as a priority.

## 2.2.2. Steps for determining floodplain harvesting entitlement

Properties with eligible floodplain harvesting works that have historically held an unregulated river licence (1993-99) that has been volumetrically converted may be granted floodplain harvesting entitlement if:

- the maximum crop area between 1993–99 was greater than the authorised area, and
- a volumetric conversion or anomalies process did not account for the additional crop area, and
- repeating the volumetric conversion process for the additional crop area over the 1993–99 period and subtracting the original volumetric conversion volume (licences for unregulated river water only) and metered usage (regulated river water and groundwater access) results in a volume that is greater than zero.

The Department is currently assessing methods to determine FPH entitlements for groundwater only properties. Further information will be available to owners of affected properties in the near future.

## 2.3. Issuing floodplain harvesting access licences

Once the entitlement has been determined for each eligible property within the five northern valleys, the following process will be used to grant and issue the required floodplain harvesting access licences.

Section 57A of the *Water Management Act 2000* allows for regulations to provide for the conversion of existing floodplain harvesting usage into floodplain harvesting access licences.

The department will amend the *Water Management (General) Regulation 2018* to include all the eligible properties, type of floodplain harvesting access licence (regulated river or unregulated river) for each property and entitlement to be specified on each access licence. Commencement of the amendment will establish the access licences at a time specified in the regulation.

WaterNSW is responsible for issuing the access licences, once established, to individual properties and setting up the associated water allocation accounts for each access licence. At the same time, the department will amend the relevant water sharing plans to ensure the rules for the access licences are included and can be applied (see section 4).

## 3. Healthy Floodplains Review Committee

### 3.1. Functions

The department established the Healthy Floodplains Review Committee to:

- facilitate the orderly and equitable processing of registration of interests in accordance with the NSW Floodplain Harvesting Policy
- review and assess submissions raised by floodplain harvesting registrants who believe:
  - their determination of ineligibility for floodplain harvesting entitlement is not correct; or
  - the proposed floodplain harvesting entitlement is not correct
- provide appropriate advice and make recommendations to the Chief Regulatory Officer, Natural Resources Access Regulator (NRAR), regarding resolution of such issues.

After reviewing and assessing submissions made by a registrant, the committee prepares recommendations for the Natural Resource Access Regulator's Chief Regulatory Officer, who will consider the committee's recommendation and either:

- confirm in writing to a registrant that the original decision is upheld, and no further action is required; or
- notify the registrant that the original decision has been overturned and further analysis will be undertaken.

### 3.2. Membership

The Healthy Floodplains Review Committee is comprised of representatives from the North West Local Land Services, NSW Farmers Association, NSW Nature Conservation Council and NSW Irrigators Council. The meetings are facilitated by the department.

The committee has access to technical experts from relevant state government agencies to provide information as required. The committee can also obtain independent advice from individuals or organisations that have specific and relevant local knowledge.

## 4. Rules for floodplain harvesting access licences

### 4.1. Types of rules

To some extent, the take of water associated with floodplain harvesting activities is already incorporated into the relevant water sharing plans for the northern inland valleys of NSW.

Specifically, for some regulated rivers the area to which the relevant water sharing plan applies includes floodplain harvesting activities and, for all regulated rivers and unregulated rivers in the northern inland valleys, the relevant long-term average annual extraction limit includes the take of water associated with floodplain harvesting activities within the plan area.

In addition to this there are several types of rules that will apply to floodplain harvesting access licences once they are issued. The relevant water sharing plan will be amended to incorporate these rules, which relate to:

- share components for floodplain harvesting access licences (the total entitlements per water source at a specified point in time)
- additional compliance with extraction or diversion limit (how any new growth in floodplain harvesting is managed)
- available water determinations (how the allocation accounts will be credited each water year)
- account management (limits on annual take and ability to carryover allocations)
- accounting for the take of on-farm runoff when there are insufficient allocations in an access licence account
- trade (permanent and temporary trade)
- mandatory conditions for access licences and water supply works
- amendment provisions (to allow for adjustment of rules based on monitoring, evaluation and reporting).

### 4.2. Unique rules for each valley

There are two types of rules for floodplain harvesting access licences that will vary between regulated rivers and unregulated rivers and, for regulated rivers, from valley to valley, based on public consultation and modelling outcomes. These are:

- available water determinations in the first year following issuing of access licences
- account management rules.

Historically, an available water determination greater than 100% of the share component has been applied to some access licence categories in the first year following commencement of a water sharing plan. This ensures the volume of water in a water allocation account reflects:

- the potential amount of carry over that would have been permitted under the *Water Act 1912* licence  
or
- the use of long-term averages in the determination of the access licence entitlement and the associated need to take more in some years and less in others.

Account management rules vary across NSW and between different categories of access licences but generally consist of a combination of limits on the amount that may be:

- taken annually or over a number of consecutive years or both  
or
- held in an allocation account at any time  
or
- carried over from one year to the next.

Floodplain harvesting is highly variable in nature. The NSW Floodplain Harvesting Policy provides that account management rules will be developed on a valley-by-valley basis in conjunction with the proposed entitlements that recognise this variability. The two primary considerations that will be used to set these account management rules are:

1. ensuring compliance with the relevant long-term average annual extraction limit
2. distributing impacts as equitably as possible among eligible floodplain harvesting properties.

The account management rules for floodplain harvesting (regulated river) access licences are defined as part of the process of determining entitlements (see section 2.1.2.3).

Despite variances between valleys in relation to initial available water determinations and account management rules for floodplain harvesting (regulated river) access licences, the rules for floodplain harvesting (unregulated river) access licences (except for those located within the Barwon-Darling Unregulated River) will reflect the existing rules for unregulated river access licences. This is because most of the entitlement associated with floodplain harvesting in unregulated rivers is already provided for within the existing share components of unregulated river access licences.

### 4.3. Identical rules for each valley

Table 3 outlines the rules that already exist in water sharing plans in the five northern inland valleys (see section 4.1) or will apply to all regulated and unregulated floodplain harvesting access licences once the licences are issued and the relevant water sharing plan is amended.

The NSW Floodplain Harvesting Policy treats the Barwon-Darling Unregulated River like a regulated river. This is because a model is used in determining entitlements and, unlike other unregulated rivers, most of the entitlement associated with floodplain harvesting is not included in the existing unregulated river access licences.

**Table 3 Standard rules in water sharing plans for floodplain harvesting access licences**

Type of rule	Floodplain harvesting (regulated river)	Floodplain harvesting (unregulated river)	Comment
Long-term average annual extraction limit and long-term average sustainable diversion limit	The long-term average annual extraction limit and long-term average sustainable diversion limit includes the take of water for floodplain harvesting based on the level of development that existed at a specified period such as the 1999/2000 water year.	The long-term average annual extraction limit and long-term average sustainable diversion limit includes the take of water by floodplain harvesting based on the annual extraction averaged over the period 1 July 1993 to 30 June 1999.	The extraction and diversion limits, specified as a level of development at a specified time, associated with floodplain harvesting are already established in many water sharing plans and in the Basin Plan 2012 via sustainable diversion limits for SDL resource units.  Estimates of the volumes associated with floodplain harvesting, in ML/year, have historically been poor. However, models are

Type of rule	Floodplain harvesting (regulated river)	Floodplain harvesting (unregulated river)	Comment
			being updated to improve these estimates (see section 6.4).
Compliance with the extraction or diversion limit	If an assessment is undertaken that demonstrates that the long-term average annual extraction limit or long-term average sustainable diversion limit has been exceeded and that exceedance is a result of water taken under floodplain harvesting (regulated river) access licences, the available water determination for those licences will be reduced to the extent necessary to bring the take of water to within the extraction or diversion limit.	If an assessment is undertaken that demonstrates that the long-term average annual extraction limit or long-term average sustainable diversion limit has been exceeded, the available water determinations for floodplain harvesting (unregulated river) access licences and unregulated river access licences will be reduced at the same rate and to the extent necessary to bring the take of water to within the extraction or diversion limit.	<p>The use of models in a regulated river system allows for a more targeted response to an extraction or diversion limit being exceeded.</p> <p>Most of the entitlement associated with floodplain harvesting in unregulated rivers is already provided within existing unregulated river access licences.</p>
Available water determinations following the first year	At least 1 ML per unit share (or 100% of the share component) each year following the first year, unless a lower amount is required in response to an exceedance of the extraction or diversion limit	At least 1 ML per unit share (or 100% of the share component) each year following the first year, unless a lower amount is required in response to an exceedance of the extraction or diversion limit	This approach is consistent with other access licence categories such as local water utility access licences and unregulated river access licences.
Taking of water under a section 85A order	Section 85A of the <i>Water Management Act 2000</i> allows for the taking of contaminated rainfall runoff under a floodplain harvesting (regulated river) access licence even when there are insufficient allocations in the account. This can result in the allocation account going into a negative balance of up to a maximum of 100% of	Not applicable	<p>This rule only applies to floodplain harvesting (regulated river) access licences.</p> <p>This rule is not required for floodplain harvesting (unregulated river) access licences as the entitlements associated with these licences are based on a maximum use rather than a long-term average.</p>

Type of rule	Floodplain harvesting (regulated river)	Floodplain harvesting (unregulated river)	Comment
	<p>the share component.</p> <p>The negative balance would be rectified with the next crediting following an available water determination.</p>		
Trade rules	<p>Buying and selling of share components (permanent trade) will be permitted within an extraction management unit, water source, management zone or trading zone.</p> <p>Buying and selling of allocations (temporary trade) will not be permitted.</p>	<p>Buying and selling of share components (permanent trade) will be permitted within an extraction management unit, water source, management zone or trading zone.</p> <p>Buying and selling of allocations (temporary trade) will not be permitted.</p>	<p>This approach is consistent with the trade rules outlined in the NSW Floodplain Harvesting Policy.</p> <p>Every trade application is assessed against the general principles outlined in the <i>Access Licence Dealing Principles Order 2004</i> such as the potential impacts on other water users and the environment.</p> <p>Selling share components associated with a floodplain harvesting access licence may result in needing to remove or modify the associated water supply work to ensure the water sold can no longer be taken by the seller.</p>
Mandatory conditions	<p>Access licence condition to implement the taking of water under a section 85A order.</p> <p>Water supply work approval condition to allow for the removal or modification of a work to coincide with a permanent trade to ensure water is not being taken twice.</p>	<p>Access licence conditions reflect those for unregulated river access licences.</p> <p>Water supply work approval condition to allow for the removal or modification of a work to coincide with a permanent trade to ensure water is not being taken twice.</p>	
Amendment provisions	Ability to amend, omit or insert any rule in relation		

Type of rule	Floodplain harvesting (regulated river)	Floodplain harvesting (unregulated river)	Comment
	to floodplain harvesting access licences.		

## 4.4. Process for amending water sharing plans

The department is amending water sharing plans as part of the development of water resource plans in 2019 and early 2020, as required under the Basin Plan 2012. Rules relating to floodplain harvesting access licences have not been included in this amendment process because more public consultation is required before licences can be issued.

Prior to the issuing of floodplain harvesting access licences and the development of associated water sharing plan amendments, the department will consult with the public in each of the five valleys' on:

- modelling results that form the basis for floodplain harvesting access licence entitlements
- scope of the proposed water sharing plan amendments to be made in relation to rules for floodplain harvesting access licences.

A water sharing plan may be amended under section 45 of the *Water Management Act 2000*, including in the circumstances that the respective plan specifies. Where an amendment is not specified in a water sharing plan and results in a reduction in water allocations for the holder of an access licence, compensation may be payable in some circumstances under section 87 or 87AA of the *Water Management Act 2000*.

All amendments require approval by the NSW Minister for Water and concurrence from the NSW Minister for the Environment.

## 4.5. Water resource plans and floodplain harvesting

The Basin Plan 2012 requires water resource plans to be developed and accredited in the Murray-Darling Basin. Certain rules contained in NSW water sharing plans are included as part of each water resource plan. The proposed amendments to water sharing plans for floodplain harvesting will result in consequential amendments to the relevant water resource plan. Under the Basin Plan 2012, any change to a water resource plan requires reaccreditation.

Each water resource plan must identify all forms of take, including the take of water by floodplain harvesting, and manage the total take of water to ensure it does not exceed the sustainable diversion limit specified in the Basin Plan 2012 for each SDL resource unit.

While floodplain harvesting access licences have not yet been issued, water sharing plans still identify the take of water by floodplain harvesting by including it within the extraction and diversion limits. However, until floodplain harvesting access licences are issued, the compliance response will be applied to other licence categories such as supplementary water access licences (see section 6.2.1).

## 5. Assessment of environmental benefits

A significant benefit that will come from implementing the NSW Floodplain Harvesting Policy is that, for the first time, the water that is harvested from floodplains will be able to be accurately measured and accounted for, and can be included as part of the wider state-wide management of water resources. This will provide a better understanding of water use throughout the state, while ensuring that all water users get their fair share and the environment is kept healthy (see section **Error! Reference source not found.**).

As part of implementing the NSW Floodplain Harvesting Policy, the Department will undertake an assessment of the environmental benefits gained. The results will be published on a valley-by-valley basis as part of consultation proposed during the determination of draft floodplain harvesting entitlements.

The assessment will consider the impact the NSW Floodplain Harvesting Policy has on the volume taken by floodplain harvesting and the consequent effect on the health of the environment. They will inform active management of floodplain harvesting in order to protect licensed environmental water and inform, within the constraints of the NSW Floodplain Harvesting Policy, trade and account management rules for floodplain harvesting access licences.

The work will collate information from a variety of sources, including floodplain management plans and long-term water plans for each of the valleys. It will focus on identifying the location, type and water needs of environmental assets, and use modelled hydrologic data to compare current (pre-policy) and predicted (post-policy) flows and determine the ecological consequences of NSW Floodplain Harvesting Policy implementation. The assessment will also include consideration of cumulative benefits and/or impacts on downstream water users and the environment.

Furthermore, it will compare metrics such as the timing, extent, duration, volume and location of flows, and analyse these to predict how changes in flows contribute to changes in the condition of environmental assets. This and other lines of evidence will provide a qualitative and quantitative assessment of the benefits implementing the NSW Floodplain Harvesting Policy may provide for environmental assets.

The assessment work is particularly important in the five northern inland valleys. There is evidence to suggest that floodplain harvesting in these valleys has increased in recent years. The implementation of the NSW Floodplain Harvesting Policy will provide hard data on floodplain harvesting in these areas that will be used to determine if volumes have exceeded limits specified in relevant water sharing plans. If limits have been exceeded, active management of floodplain harvesting within each valley can be undertaken to ensure enough water is available for downstream water users and the environment.

Licensing and monitoring of floodplain harvesting will play a critical role in improving the modelling of water use. The data gathered will allow for better assessment of the impact of different water sharing plan rules for floodplain harvesting on the environment and downstream water users on an event basis, and provide the fundamental building blocks required to improve the management of floodplain harvesting over time (see section **Error! Reference source not found.**).

## 6. Adaptive management of floodplain harvesting

### 6.1. Adaptive management

Adaptive management refers to the practice of changing a management regime in response to new information, either from the results of monitoring or some other improvement in understanding. Adaptive management is a requirement of the *Water Management Act 2000* and the National Water Initiative 2004.

### 6.2. Water sharing plans

Adaptive management is incorporated into water sharing plans in two main ways. These are:

- rules to enable a response to growth in floodplain harvesting
- the inclusion of amendment provisions.

#### 6.2.1. Response to growth in floodplain harvesting

To manage the take of water long-term average annual extraction limits, and long-term average sustainable diversion limits established in the Basin Plan 2012, are specified in a water sharing plan for a water source or group of water sources. Each year, the department must assess extraction against these limits. The take of water associated with floodplain harvesting is included in this assessment.

Generally, the rules in a water sharing plan will require a reduction in the maximum allocations that can be made to specific categories of access licences as the first response to an exceedance of an extraction or diversion limit. This is referred to as a growth in use (GIU) response.

The application of and compliance with an extraction or diversion limit protects downstream water users and the environment, by ensuring that any flows in excess of those permitted to be taken under access licences or basic landholder rights remain in-stream. Similarly, the use of water sharing plan rules allows identified impacts, such as growth in water use, to be adaptively managed.

Until floodplain harvesting (regulated river) access licences are issued, a GIU response will be unable to specifically target growth in floodplain harvesting. Instead the GIU response will firstly target supplementary water access licences and then regulated river (general security) access licences.

Conversely, until floodplain harvesting (unregulated river) access licences are issued, a GIU response will target unregulated river access licences in response to a growth in floodplain harvesting. However, the impact of this is comparatively less than in regulated rivers as most of the entitlement associated with floodplain harvesting has already been incorporated into existing unregulated river access licences

Once floodplain harvesting (regulated river) access licences are issued, the proposed GIU response will target either supplementary water or floodplain harvesting (regulated river) access licences, in proportion to where the growth in extraction is occurring. The 'current development' scenario model will show where the growth is occurring. Growth in extraction will be managed by GIU responses for supplementary water and/or floodplain harvesting (regulated river) access licences.

Conversely, once floodplain harvesting (unregulated river) access licences are issued, the proposed GIU response will apply equally to unregulated river access licences and floodplain harvesting (unregulated river) access licences.

## 6.2.2. Amendment provisions

A water sharing plan contains a suite of amendment provisions that allow for rules to adapt to changing information and conditions. In addition, section 45 of the *Water Management Act 2000* further allows for water sharing plans to be amended, including if the Minister considers it to be in the public interest.

A general amendment provision for floodplain harvesting is included in water sharing plans that allows rules to be amended, omitted or inserted in relation to floodplain harvesting access licences. This amendment provision will allow the water sharing rules for floodplain harvesting to be adjusted by the Minister, without triggering the compensation provisions of the Act.

As part of remaking the relevant water sharing plans, the department will consider the effectiveness of rules for floodplain harvesting access licences in providing water to licence holders in a way that also protects downstream water users and the environment. This may result in a decision to remove or reduce the scope of amendment provisions included for floodplain harvesting.

## 6.3. Monitoring, evaluation and reporting

### 6.3.1. Individual monitoring and reporting

As part of the implementation of the NSW Floodplain Harvesting Policy, each property that takes water associated with floodplain harvesting will be required to monitor and report that take of water. This requirement relates specifically to section 60C of the *Water Management Act 2000*, which makes it an offence to take water when there is insufficient water allocation in the account for the access licence.

For more information, refer to the *Floodplain Harvesting Monitoring and Auditing Strategy* produced by the department.

### 6.3.2. Valley-scale monitoring, evaluation and reporting

Monitoring, evaluation and reporting are essential to informing adaptive management of floodplain harvesting in order to improve environmental, social, cultural and economic outcomes overtime.

While the department will undertake an assessment of environmental benefits to support the licensing framework, it recognises that this is an area of significant uncertainty and will form a focus for monitoring and evaluation.

Floodplain harvesting will be incorporated into the existing monitoring, evaluation and reporting frameworks for water sharing and water resource plans.

## 6.4. Modelling updates

The department is committed to continuously improving all components of the models used in assessing and managing floodplain harvesting. The roll out of valley-scale monitoring, evaluation and reporting on the benefits and impacts of the implementation of the NSW Floodplain Harvesting Policy will provide the department with significant additional data and will help improve on the current models over time. Updates are important because:

- using models in regulated river systems and the Barwon-Darling unregulated river allows the potential impact of any proposed changes to water sharing plan rules to be analysed prior to being implemented. This will require model enhancements to explicitly represent the return of flood flows to downstream river channels in order to assess the impacts of floodplain harvesting on downstream users and the environment during different flooding events.

- models are used to assess compliance with extraction and diversion limits, and must be deemed acceptable by the Minister and the Murray-Darling Basin Authority (further information on model updates can be found on the Murray-Darling Basin Authority website at [mdba.gov.au/basin-plan-roll-out/sustainable-diversion-limits/current-limits-basin](https://mdba.gov.au/basin-plan-roll-out/sustainable-diversion-limits/current-limits-basin))

## 7. Topics for clarification

As part of previous public consultation, stakeholders have requested more detailed information on specific aspects of floodplain harvesting. Further clarification on these topics is provided in this section.

### 7.1. Harvestable rights and floodplain harvesting

#### 7.1.1. Definition of harvestable rights

A harvestable right is a landholder's right to capture water without the need for a water access licence, water supply work approval or water use approval. The capture of water is permitted by way of building a dam or storage on a 'minor stream' according to the Strahler system of ordering watercourses. In accordance with the Strahler system, a 'minor stream' is a 1<sup>st</sup> or 2<sup>nd</sup> order watercourse (see section 7.1.2).

The amount of water that can be captured is specified in the relevant harvestable right order<sup>5</sup> and varies, with 100% of rainfall runoff being permitted in the western division of NSW and 10% in all other areas.

Harvestable rights do not exist in areas that are subject to flooding or inundation in the western division of NSW. This would include all designated floodplains.

#### 7.1.2. Strahler system of ordering watercourses

The Strahler stream classification system gives waterways an 'order' according to the number of additional tributaries associated with each waterway. The system rules are as follows:

- a 1<sup>st</sup> order watercourse is a watercourse that has no other watercourses flow into it.
- a higher order watercourse is created when two of the same numbered watercourses meet. For example, two 2<sup>nd</sup> order watercourses come together to make a 3<sup>rd</sup> order watercourse.
- when a lower order watercourse meets a higher order watercourse the stream order continues as the highest order watercourse. For example, if a 2<sup>nd</sup> order watercourse meets a 4<sup>th</sup> order watercourse the watercourse remains a 4<sup>th</sup> order watercourse.

#### 7.1.3. Interaction between harvestable rights and floodplain harvesting

In the western division of NSW, there is no intersection between harvestable rights and floodplain harvesting. This is because areas that are subject to flooding or inundation are excluded in the relevant harvestable rights order. For all other areas within the northern inland valleys, an assessment has been undertaken based on completed water infrastructure plans.

The department has completed detailed water infrastructure plans for all properties with floodplain harvesting water supply works. To-date, these water infrastructure plans have confirmed that dams used for harvestable rights are not being used in conjunction with floodplain harvesting. Therefore, there is no practical intersection between floodplain harvesting and harvestable rights.

## 7.2. Water supply works and flood works

### 7.2.1. Definition of a flood work

The *Water Management Act 2000* defines a flood work, in relation to a floodplain, to be:

- a work, such as a causeway or embankment, within a floodplain that is likely to have an effect on the:

<sup>5</sup> Government Gazette No. 40, 31 March 2006

- flow of water to or from a river or lake,  
or
- distribution or flow of floodwater in times of flood.

This includes all associated pipes, metering equipment and other equipment.

A flood work may be used to direct floodwater and/or protect property from the effects of flooding.

A flood work approval does not authorise the approval holder to take (i.e. capture or harvest) water. The take of water requires a water access licence and a water supply work approval.

The determination of whether a flood work approval should be issued is made in accordance with the relevant floodplain management plans, where applicable.

### 7.2.2. Definition of a water supply work

The *Water Management Act 2000* defines a water supply work to be:

- a work constructed/installed:
  - for the purpose of taking water from a water source  
or
  - for the purpose of capturing or storing water  
or
  - for the purpose of conveying water to the point at which it is to be used,
    - that has, or could have, the effect of diverting water to or from a water source  
or
    - that has, or could have the effect of, impounding water.

This includes all associated pipes, metering equipment and other equipment.

The primary purpose of a water supply work is to supply water associated with a water access licence or basic landholder right.

A water supply work approval is required to construct and use a work to take water associated with a water access licence. In most instances, a water use approval will also be required. In some instances, both approvals are combined into a single approval.

### 7.2.3. Interaction between a flood work and water supply work

Based on the definitions provided in the *Water Management Act 2000* there are clearly some instances where a work, such as a channel used to divert floodwater, may be both a flood work and a water supply work. In these situations, the work will require both approvals.

It is the responsibility of the landholder to ensure they hold all relevant approvals to avoid compliance action.

## 7.3. Floodplain management plans and floodplain harvesting

### 7.3.1. Licensing floodplain harvesting

Regulation of floodplain harvesting involves the issue of a water supply work approval or flood work approval, or both, and a floodplain harvesting (regulated river) access licence or floodplain harvesting (unregulated river) access licence.

The implementation of the NSW Floodplain Harvesting Policy will result in the issuing of floodplain harvesting (regulated river) access licences and floodplain harvesting (unregulated river) access licences, along with relevant rules and compliance measures for those licences. The rules for access licences and water supply works will be specified in the relevant water sharing plan.

### 7.3.2. Floodplain management plans

Floodplain management plans contain rules relating to flood work approvals. These approvals may or may not relate to floodplain harvesting. Some flood works are used to protect life and property and are not intended to collect or impound flood water.

Floodplain management plans also aim to maintain flood connectivity within a specified floodplain and protect identified environmental, cultural and heritage values.

### 7.3.3. Interaction between licensing of floodplain harvesting and floodplain management plans

A work that is capable of floodplain harvesting and eligible to receive a floodplain harvesting access licence must have received an approval, lodged an application for an approval, or have been deemed to not require an approval on or before 3 July 2008.

Rules relating to the application for and granting of flood work approvals that are capable of floodplain harvesting, as specified in floodplain management plans, only apply to applications lodged after the commencement of the relevant floodplain management plan.

Simply put, an application for an approval is assessed under the rules in place when the application was lodged.