

DEPARTMENT OF SUSTAINABILITY & ENVIRONMENT

WATER SAVINGS FRAMEWORK

FOR

NORTHERN VICTORIA IRRIGATION RENEWAL PROJECT

**FINAL
Version 4.0
June 2009**



Acknowledgements

This document has been prepared by the Department of Sustainability and Environment in collaboration with Goulburn-Murray Water, the Northern Victoria Irrigation Renewal Project (NVIRP) with technical advice provided by Hydro Environmental.

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1. Introduction

This document, “Water Savings Framework for Northern Victoria Irrigation Renewal Project” (the Framework), outlines the water savings policy setting in which the Northern Victorian Irrigation Renewal Project (NVIRP) will be implemented. It outlines how the key government commitments in water savings, the key principles of the Northern Region Sustainable Water Strategy (SWS), the environmental approvals process and the State-wide Water Savings Protocol will be integrated in the role out of the NVIRP.

A Glossary of Terms related to water savings, entitlements and infrastructure is included at the back of this document.

2. The Northern Victoria Irrigation Renewal Project (NVIRP)

2.1. Development of NVIRP

The Victorian State Government formulated a long-term plan for water “*Our Water Our Future*” to assist in managing Victorian’s water resources and to promote water efficiency and water conservation. In June 2007, due to the ongoing drought conditions, the Victorian Government announced “*Our Water Our Future – The Next Stage of the Government’s Water Plan*”. The Water Plan describes a \$4.9 billion investment in major water infrastructure projects that will provide Victoria with water security for the State’s growing population and economic development in the face of climate change.

The Water Plan contains five key actions, of which one was the modernisation of the Goulburn Murray Irrigation District (GMID) to reduce system losses and then capture these as water savings for the benefit of irrigators, the environment and Melbourne.

Following the release of the Water Plan, the Victorian Government appointed a Steering Committee in July 2007 to make recommendations to Government on key Project implementation options for modernising the GMID. The Steering Committee presented its Final Report to Government, following public consultation, in November 2007.

On 20 December 2007, the State Owned Enterprise for Irrigation Modernisation in Northern Victoria [Northern Victoria Irrigation Renewal Project (NVIRP)] was established to implement the modernisation of the GMID.

NVIRP was appointed with the key functions of planning, designing and delivering the Program for modernising the GMID and Campaspe Irrigation District water delivery systems, excluding the Shepparton Irrigation Area and the eastern part of the Central Goulburn Irrigation Area, which are currently being modernised under other water recovery programs.

2.2. The NVIRP Objectives

The NVIRP aims to increase irrigation delivery efficiency from approximately 70% to at least 85% based on experience with existing water savings projects in the Goulburn system, the Macalister Irrigation District and Coleambally in New South Wales. Across the total system, improving delivery efficiency to 85% would capture at least half the current system water losses.

Generically, modernisation of an irrigation system can mean two things, both of which have been incorporated into this Project:

- Reconfiguration - re-design of the irrigation systems, including the retirement of channels, to meet the future needs of irrigators, to accommodate future operational needs and reduce system water losses.
- Automation, remediation and accurate measurement technology - replacement of manual flow-control structures in channels with automated gates that accurately measure flows and provide real-time measurement data and replacement of out-dated flow meters at farm service points with National Standard compliant meters. This will inturn, allow the

targeting of channel remediation works such as channel lining and channel reconstruction based on locations of the worst seepage and leakage losses.

The works program of NVIRP has been separated into two stages. Stage 1 mainly focuses on automation, remediation and measurement with some reconfiguration and includes:

- modernisation of the larger carrier and trunk channels which will form the core ‘Backbone’ from which new connections will be made to more distant properties
- creating new direct connections to the Backbone for those customers who are currently connected to other distribution and spur channels
- replacement, rationalisation (decommissioning) of existing service points. New accurate meters will be installed on all customer service points on the Backbone and to all new service points to connections.

Stage 2 of the NVIRP will mainly comprise of the connections program as described in Figure 2 and will include service enhancement, improved measurement and system reconfiguration. The Stage 1 works package will create the environment that is consistent with, and facilitates the implementation of, Stage 2.

Figure 1 and Figure 2 outline the generic steps that will be undertaken in the NVIRP program of irrigation modernisation with the development of new connections (service types) to the automated ‘Backbone’ delivery system.

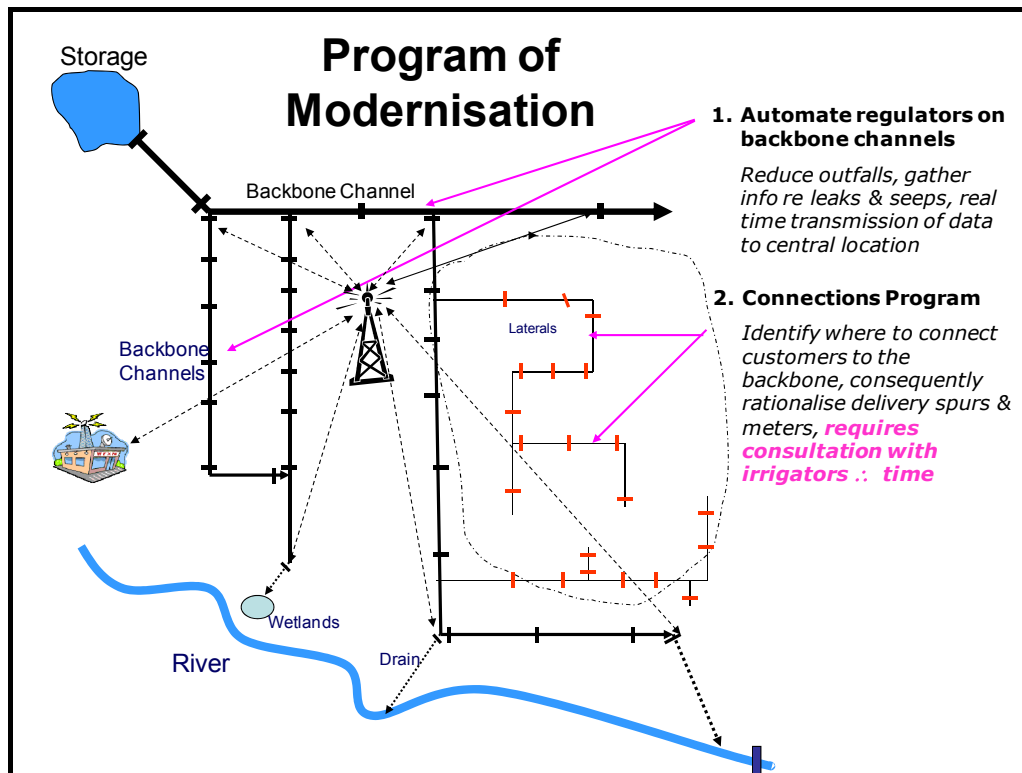


Figure 1: Irrigation System Modernisation (Steps 1 and 2) (Source *Water for Rivers/DSE*)

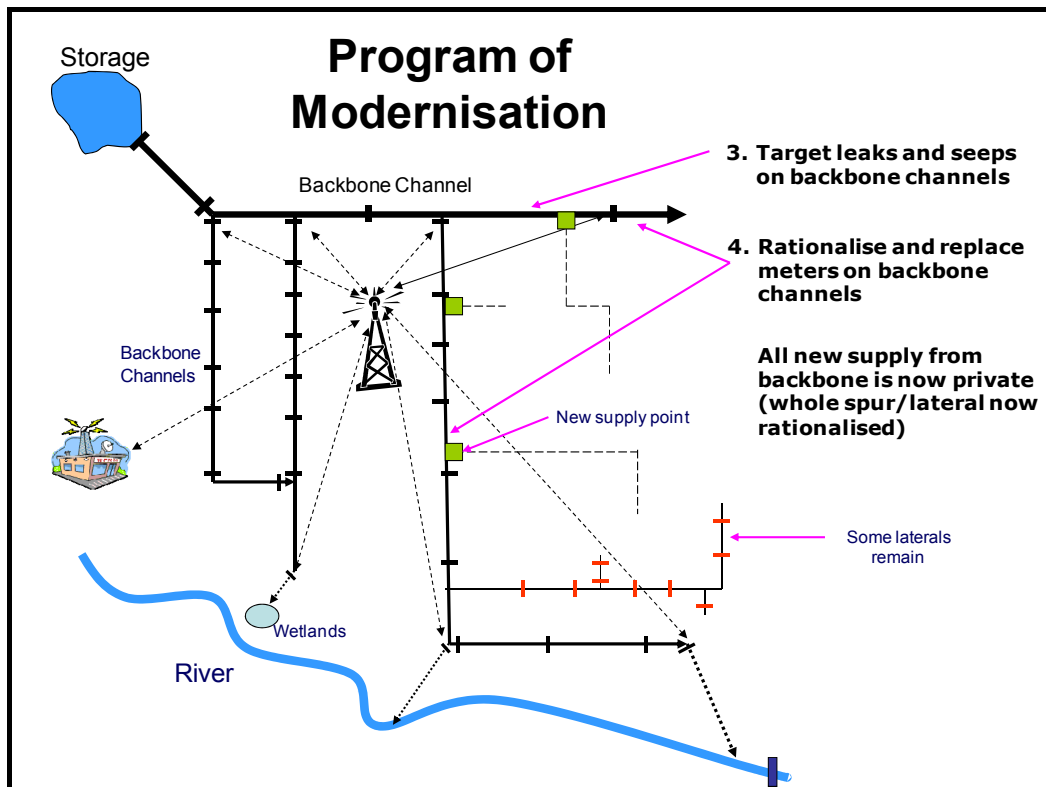


Figure 2: Irrigation Modernisation (Steps 3 & 4) (Source *Water for Rivers/DSE*)

3. Key NVIRP Commitments

The key commitments of the NVIRP for Stage 1 of the Project are to:

- i) implement water distribution and delivery efficiency improvements by 2012/13 to deliver an estimated 225 GL (long term average) of water savings by 2013/14 within the agreed budget of \$1,004 million. This water is to be shared equally between the environment, the GMID irrigators and Melbourne
- ii) deliver a fully automated (real-time) water distribution operating system that will provide near on-demand water supply to those irrigators in the GMID with modernised connections by 2012/13 and result in water savings
- iii) in 2010 contribute part of the 75 GL of water to be supplied to Melbourne via the Sugarloaf Pipeline and after 2010/2011, Melbourne will receive a one-third share of the water saved by the works installed to generate the first 225 GL of savings from NVIRP alongside irrigators and the environment
- iv) provide a catalyst for regional economic development opportunities and improved productivity.

The key commitments of Stage 2 of the Project is to generate up to an additional estimated 200 GL (long-term average) of water savings per annum by completing the remainder of customer connections, including replacement of remaining inaccurate meters within an estimated budget of \$1 billion. This is based on the in principle agreement with the Federal Government to contribute up to 90% of the Stage 2 costs up to \$1 billion subject to a due diligence assessment and half the Stage 2 water savings (100 GL) to be returned to the River Murray.

The Victorian Government is developing further detail on the scope of Stage 2 works concurrently with the implementation of Stage 1.

4. Water Saving Policy

4.1. Key Water Saving Principles

The following principles apply to all irrigation modernisation projects, including the NVIRP, when assessing and allocating water savings:

- i) the volume and reliability of the new water entitlements will reflect the volume and reliability of the water that has been saved (by converting the savings to an appropriate volume of either high-reliability or low-reliability water shares for the appropriate system)
- ii) the water savings must be real (ongoing and sustainable in the long term) and quantifiable
- iii) the conversion of water savings to water entitlements must have no long term impact on existing water entitlements
- iv) water savings are the total (gross) volumes saved less the volume of water required to ensure no net impacts due to the project on high environmental values
- v) in quantifying water savings and creating associated entitlements, the same baseline year will be used as that used to quantify the system operating water needs (expressed in the bulk entitlement) and recognising the impact of changing maintenance programs and operational changes which may have resulted in improved efficiency
- vi) project proponents will, at their cost, arrange an independent audit to verify the savings calculation.

The following key activities have been established to facilitate the realisation of the water savings from the NVIRP program in accordance with the above key principles:

- i) a set of water savings accounts have been established.
- ii) to support these water savings accounts, a Protocol has been developed. The Protocol provides a transparent, defensible and repeatable methodology for quantifying water savings from irrigation modernisation projects. The protocol also includes an audit process to ensure the savings are not over-estimated;
- iii) the environmental obligations on system operating water pre and post modernisation have been recognised
- iv) a process for conversion of the water savings into entitlements has been established.

These are described within the following sections.

4.2. Water Saving Accounts

In June 2009, a water savings commitment was created in Goulburn-Murray Water's (G-MW) Goulburn System bulk entitlement. This new commitment allows water savings generated from irrigation modernisation, and calculated in accordance with a Government endorsed methodology, to be progressively set aside in an account for future supply in accordance with Government

commitments. The Murray System bulk entitlement allows savings to be set aside, however to improve transparency a similar water savings commitment will also be created in G-MW's Murray System bulk entitlement.

The rules in the bulk entitlement specify that water savings can only be allocated from the water savings account once that have been audited and deemed to comply with the Water Savings Protocol. Unless requested otherwise, the water savings generated from the NVIRP will be audited at the end of each irrigation season. It is after the reconciliation of the water savings account to reflect the audit findings that the savings can be allocated. To allow sufficient time for the audit, the savings will generally be allocated the year after they occur.

4.3. Water Savings Protocol

The "*Water Savings Protocol for the Quantification of Water Savings from Irrigation Modernisation Project*" (the Protocol) is a key document which guides the quantification and auditing of the water savings from the NVIRP. The Protocol was developed by the Department of Sustainability and Environment (DSE) and endorsed by the Minister for Water.

The Protocol is applicable state-wide and aims to:

- specify a reliable and repeatable process and methods to estimate water savings from irrigation modernisation projects
- provide the best estimate of water savings for inclusion in economic assessments of investments in irrigation modernisation projects
- establish a transparent process which can be readily audited and reported on to enable actual water savings to be converted to entitlements at an appropriate time.

The Protocol is a series of documents, which together, provides transparency, and consistency in the estimation and allocation of water savings derived from irrigation modernisation projects. It has been developed based on the key principles in the Draft Northern Region Sustainable Water Strategy and is applicable State-wide.

The Protocol consists of:

- Technical Manual for the Quantification of Water Savings
- Roles and Responsibilities
- Water Savings Audit Process

Figure 3 shows the integration of the Framework for NVIRP and the Water Savings Protocol.

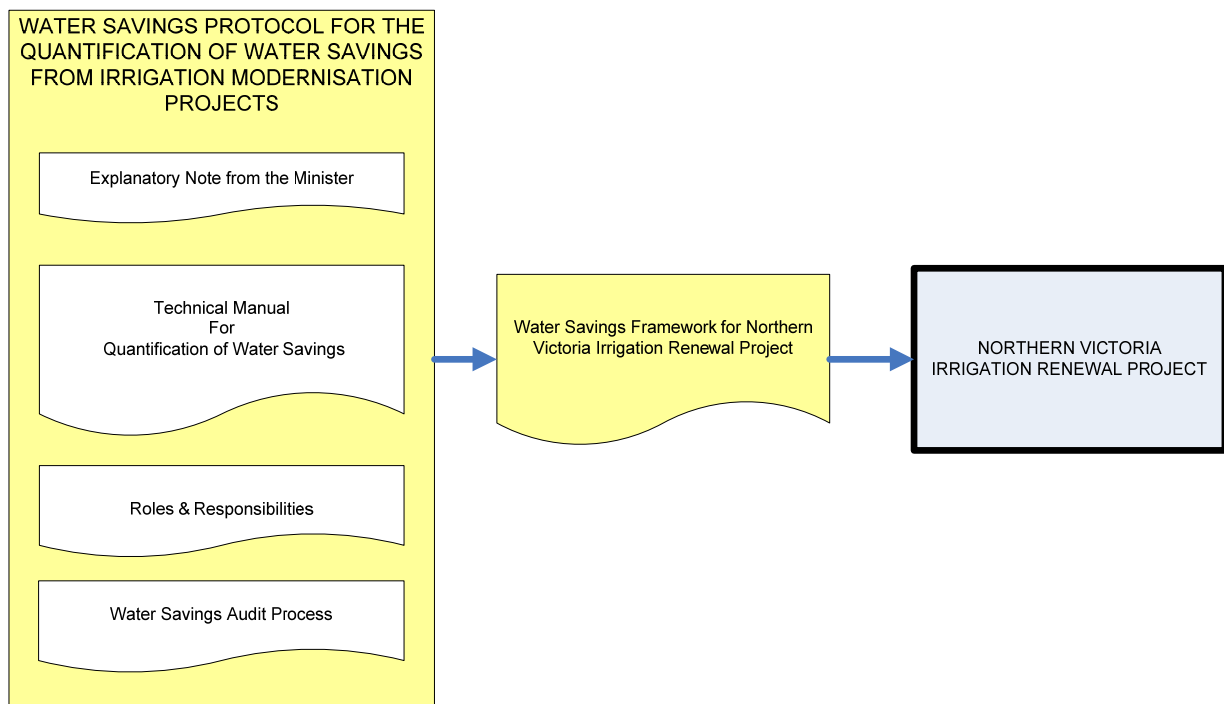


Figure 3: Water Savings Framework for NVIRP including the State-wide Water Savings Protocol

4.3.1. Technical Manual for the Quantification of Water Savings

The Technical Manual for the Quantification of Water Savings provides guidelines for:

- setting targets for irrigation modernisation projects
- projecting actual savings due to water savings interventions in order to set aside water within the water savings reserve
- quantifying the actual volumes to be allocated from the water savings reserve on a year to year basis
- estimating the long term water delivery system efficiency gains (and savings) through the implementation of the overall modernisation program.

The need for the Technical Manual arose from recognition of the significance of the extent of the Victorian Government’s proposed investment in the irrigation water delivery system modernisation projects planned within Victoria and the need for consistent and scientifically defensible approaches to be used when calculating water savings associated with modernisation interventions. The Technical Manual also provides a transparent means of calculating water savings and a basis on which to audit water savings claims.

The Technical Manual has been developed using the best available technical knowledge and information. In view of the rapid knowledge advancements in the field of water savings science, annual reviews of the Technical Manual will be required to confirm/ improve upon the technical assumptions made within the first version of the Technical Manual. Revisions to the Technical Manual will be done by the Minister for Water with support from DSE.

4.3.2. Roles & Responsibilities

The Roles & Responsibilities of the Water Savings Protocol sets out the expected roles and responsibilities of the various organisations involved in irrigation modernisation projects. These roles and responsibilities are guided by the obligations outlined in the Northern Region Sustainable Water Strategy (NRSWS).

4.3.3. Audit Processes

Objective, transparent and clear guidelines and processes are required for the audit of water savings, whether it be on an interim year to year basis, or on a long term water savings verification basis. The Water Savings Audit Process of the Water Savings Protocol sets out the guidelines for the appointment of the independent auditor as well as defining the scope of the work brief to be undertaken by the independent auditor.

The Business Case for Stage 1 of the NVIRP documents the application of the Water Savings Protocol.

4.4. Allocating Water Savings

NVIRP is not directly responsible for the allocation of the water savings, but is responsible for delivering the modernisation program through which the savings are to be achieved.

It is proposed after the completion of the Stage 1 works of NVIRP and the completion of an independent audit of the water savings, that DSE, with the aid of system models, will convert the water savings into entitlements in accordance with the *Water Act 1989* and Government commitments, which include:

- Savings from Stage 1 of the NVIRP will be shared equally between Melbourne, irrigators and the environment.
- The Melbourne's share of the savings will be delivered as bulk entitlements.
- Melbourne's share of the savings is to be capped at 75 GL long term entitlement volume. This means in some years the allocation of savings will be more and some years they will receive less. Melbourne's annual usage if their share of the allocated savings will be limited to 75GL/year
- The Minister for Environment will hold the environment's share of the savings as an Environmental Entitlement.
- The Goulburn and Murray water user share of the savings will be converted into water shares at the completion of Stage 1.

Government's commitments to irrigation system modernisation also include the recognition of existing environmental watering obligations of high environmental values within the irrigation delivery network prior to the calculation of the savings. The process for identifying these environmental watering obligations of the NVIRP is discussed in the next chapter.

5. Environmental Approvals

Under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act), assessment and approval is required for actions that are likely to have a significant impact on:

- A matter of national environmental significance, including Nationally threatened species and ecological communities, migratory species protected under international agreements, and Ramsar wetlands of international importance;
- The environmental of Commonwealth land (even if taken outside Commonwealth land).

The EPBC Act is administered by the Commonwealth Department of Environment, Water, Heritage and the Arts (DEWHA).

Additionally, the Victorian Environment Effects Act 1978 sets out the requirements and process for determining if an Environment Effects Statement is required. Any project that could have significance environmental effects should be referred to the Minister for Planning for a decision under this legislation. In cases where an Environment Effects Statement is not required, assessment of environmental impacts may still be required under the *Planning and Environment Act 1987* or the *Environment Protection Act 1970*.

This Project has been referred by NVIRP under the EEA for consideration and decision. The Minister for Planning has given his decision that the Project does not require a formal EES subject to NVIRP meeting a series of conditions. One of these conditions is that NVIRP must prepare an environmental management framework for water management based on advice from an Expert Review Panel. The appointment conditions of the Expert Review Panel are described in the Minister for Planning's decision.

The environmental framework for water management is to set out the process by which the effects to ecological values as a result of modernisation (including the reduction of outfalls) are to be managed. Ecological effects will be assessed and where appropriate mitigation water will be identified to ensure the Project delivers an overall net benefit. The savings allocated to the environment as a result of this project will be included in this assessment.

Although the environmental framework for water management is not covered in this document, principles, consistent with existing policies and the Water Act 1989, relevant to the identification of offset water are.

5.1. Key NVIRP Environmental Principles

NVIRP has developed a set of principles and environmental commitments in relation to managing the ecological consequences of hydrological changes arising from implementation of NVIRP, including to avoid any contribution to diminishing ecological values in waterways and wetlands.

The overarching principles with respect to environmental management for the operation of the modified GMID are:

- NVIRP will strive for efficiency in both water supply and farm watering systems.
- NVIRP will design and construct the modernised GMID system to comply with environmental requirements as specified in the no-EES conditions

- NVIRP will develop management and mitigation measures consistent with established environmental policies and programs in place in the GMID.
- Renewal or refurbishment of water infrastructure will be undertaken to the current best environmental practice, including any requirements to better provide environmental water. Best environmental practice will require irrigation infrastructure required to deliver environmental water to be retained (no rationalisation at these sites) or upgraded to allow for future use.
- Management and mitigation measures will be maintained into the future through establishment of or modification to operating protocols and operational arrangements.

NVIRP is not responsible for mitigating the impacts on the environment due to water trade and climate change.

In addition to meeting legislative conditions, the Project (Stage 1 and 2) will result in the provision of up to 175 GL of the savings being dedicated to environmental flows. This environmental water is in addition to Government's commitments to provide water for the Living Murray process and will be used to help improve the health of stressed rivers and wetlands in Northern Victoria and the River Murray.

5.2. Environmental Watering Obligations of Water Saving Projects

The assessment of the project impacts will include the risks, associated with the works and future operation of the modernised system, to:

- ecological values within the irrigation distribution system (from the river offtake to outfall structures); and
- opportunistic ecological values that have developed external to the system (wetlands and waterways downstream of outfalls).

Where the impacts to high environmental values are unacceptable, measures (including mitigation water) will be identified to mitigate these impacts to ensure the project has no net impacts on high environmental values

The source(s) of the mitigation water depends on the location of the ecological value (within or external to the system) and the history of its water supply.

Protecting high environmental values within the irrigation delivery network

To protect high environmental values within the irrigation delivery network, mitigation water (where required) will be provided taking into account the existing operating arrangements in place. As such mitigation water can be a combination of (in no particular order):

- unregulated flows (including flood mitigation releases from major storages and runoff from the local non-irrigated catchments);
- drainage flows from irrigation practices on-farm;
- the project's water savings, required for mitigating (project) impacts on high environmental values, which is set aside before savings are allocated as per Government commitments;
- existing passing flow requirements as specified in bulk entitlements;

- obligations on the loss provision as specified in bulk entitlements.

The system operator will be required to maintain key environmental values within the irrigation distribution. Water for this purpose will continue to be provided by the loss provision in their bulk entitlement.

Protecting high environmental values outside of the irrigation delivery network

To protect the high environmental values outside the irrigation delivery network, mitigation water (where required) will be provided taking into account the existing operating arrangements in place. As such it can be a combination of (in no particular order):

- unregulated flows (including flood mitigation releases from major storages and runoff from the local non-irrigated catchments)
- drainage flows from irrigation practices on farm
- the project's water savings, required for mitigating (project) impacts on high environmental values, which is set aside before savings are allocated as per Government commitments;
- managed transfer of water from allocation established in inter-valley trade accounts
- existing passing flow requirements as specified in bulk entitlements

Delivery of mitigation water will also take to into account environmental entitlements that were previously delivered to the site.

Mitigation water (where appropriate) will initially be specified as an obligation within the system operator's bulk entitlement and should be deployed according to agreed environmental watering plans as required under the no-EES conditions.

In the longer term the use mitigation water may be considered with the context of other environmental water to maximise environmental outcomes.

These principles for mitigation water will be incorporated into the NVIRP water management and environmental management framework as required under the no-EES conditions.

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