

# Response to the Snowy Scientific Committee report on 'Adequacy of environmental releases to the Snowy River'



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*Response to the Snowy Scientific Committee report on the adequacy of  
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## Introduction

The Department of Water and Energy has reviewed the first report of the Snowy Scientific Committee on the adequacy of the environmental releases to the Snowy River.

The report and the work of the Committee is an important step in the development of a comprehensive strategy for environmental flow releases.

The Committee makes a number of recommendations on the timing, variability and seasonality of the environmental releases to the Snowy River. The Department will work with the Committee to incorporate the recommendations into the annual operating plans for the Snowy Environmental Flow Releases where these are appropriate and are consistent with the Snowy Water Licence.

Responses to each of the key recommendations made by the Snowy Scientific Committee can be found on page 3.

## Background

The Snowy Mountains Hydro-electric Scheme collects and stores water from the head waters of the Snowy River and diverts it westward through trans-mountain tunnels and power stations creating hydro-electricity and providing water for consumptive use in the Murray and Murrumbidgee Valleys.

The water diverted into the Murrumbidgee Valley is available for NSW use only, while water diverted into the Murray Valley is shared between NSW, Victoria and South Australia under the Murray-Darling Basin Agreement.

While water from the Snowy Scheme provides many significant social and economic benefits, the flows into the Snowy River were severely reduced by the scheme to less than one per cent of mean natural flow immediately downstream of Jindabyne Dam.

The Snowy Mountains Hydro-electric Scheme is operated and maintained by Snowy Hydro Ltd which is jointly owned by the New South Wales, Victoria and Australian Governments. An inquiry in 1998 identified options for improving environmental outcomes.

As a result it was agreed that 212 GL, which with 9 GL for Base Passing Flow is equivalent to 21% of the average natural flow, would be returned to the Snowy River and 70 GL to the Murray River in a staged approach over 10 years. These targets were to be achieved by water savings projects that would reduce the volumes diverted from the Snowy Mountains Hydro Scheme into the Murray and Murrumbidgee Valleys, without impacting on water available for consumptive water use or the environment in those valleys.

The partner Governments collectively committed \$375 million to securing this water and in December 2003, Water for Rivers was established to develop water efficiency projects and measures to recover water to provide for environmental flows.

## Providing environmental releases

In the development of the use of environmental flows for the Snowy River, the priority of environmental benefits was considered. The main outcome of those considerations was that the priority environmental outcome would be achieved by storing and releasing sufficient volumes to provide 'flushing flows' that would facilitate the transport of sediment.

To enable the release of sufficient volumes to provide 'flushing flows', outlet works from Jindabyne Dam were required to accommodate these releases. These works were undertaken between 2003 and 2006.

The first environmental flows to the Snowy River began in August 2002. Releases are to progressively increase over the subsequent ten years as the water savings are made.

Because in 2002 the water savings had not yet been achieved, the first environmental releases were made from water borrowed from the Snowy Scheme. These volumes are required to be repaid as they would otherwise reduce the volume of water available for consumptive water users and the environment in the Murray and Murrumbidgee Valleys. This is known as the Mowamba Borrowings Account.

The initial 3 years of environmental flows from 2002 to 2005 were made via the Mowamba River as outlet works needed to be constructed at Jindabyne Dam.

At June 2008, 140.5 GL of water entitlements had been recovered by Water for Rivers. Of this, 115.7 GL of entitlements or 82% came from water recovery projects within NSW and 28.8 GL from Victoria through a mixture of infrastructure projects that create water savings and water licence purchases. Two-thirds will be available to the Snowy (93.5 GL) and one-third to the Murray River.

The target for water recovery by Water for Rivers is 14% of average natural flow, equal to 142 GL be recovered by June 2009. Water for Rivers has advised that at January 2009, 159 GL is on the register (106 GL for the Snowy River) and that sufficient entitlements have been recovered and will be registered by June 2009 to achieve this target.

## Water available for release

The Scientific Committee's report correctly points out that actual environmental flow releases into the Snowy River have been less than the original targets and also less than the entitlements that have been recovered.

Between 2002 and 2008 the releases into the Snowy have not exceeded 38 GL per year although the original average annual target volume was 120 GL by 2008.

This is the result of a number of factors:

While the total of various entitlements, up to approx 93 GL, have been recovered this does not directly equate into volumes of water available for release into the Snowy River. Depending on water availability in any season, a licensed entitlement holder is allocated a proportion of the entitlement. In many years that may be 100% of entitlement, but in drought years, that proportion may be significantly reduced.

This means that the volume of water available may be significantly lower than the total of entitlements.

Further, over the last few years, the amount of water made available as a proportion of entitlements has been at very low levels as a consequence of drought. For example, the allocation for NSW general security entitlements in the Murray River in 2006-07 and 2007/08 has been zero. This means that no water was allocated to NSW Murray general security entitlements in those years.

The water required to make the initial releases to the Snowy River in 2002 to 2005 is also required to be repaid to the Mowamba Borrowings Account.

Finally, the targets are long-term average targets. Continuing drought conditions have meant that the water available has been significantly below average since 2002. Over the longer period, water availability is expected to improve and greater quantities of water will be available for release into the Snowy in most years.

## Annual allocation of Snowy River Environmental Flow and payback of Mowamba Borrowings Account

The allocation of water for environmental flows in the Snowy River in any year is prescribed in Sections 19.5 and 19.6 of the Snowy Water Inquiry Outcomes Implementation Deed (SWIOID). Effectively this requires that, of the water available in the coming year, two-thirds is apportioned to the Snowy River and one-third is apportioned to the Murray River.

Clauses 19.5 and 19.6 (3) of the SWIOID provide that, of the two-thirds apportioned to the Snowy River, the first 38 GL is to be made available for environmental flows, the second 38 GL is to be returned to the Mowamba Borrowings Account and any additional water over and above these volumes, collectively 76 GL, is to be shared equally until the Mowamba Borrowings account is paid off.

Due to the limited water available to the Snowy River in the past 5 years, the volume available for release as environmental flow has been limited to about 38 GL per year and the volume repaid to the Mowamba Borrowings Account is only 4.4 GL and 60.6 GL remains outstanding in the Account.

In a year where full allocation of entitlement is available it would be expected that a significant component of the Mowamba Borrowings Account would be repaid.

## Responses to key recommendations made by the Snowy Scientific Committee

### **1. Flows need to be made more variable.**

The Department of Water and Energy will work with the Snowy Scientific Committee to develop a release strategy from Jindabyne Dam that provides greater daily and seasonal variability in flows and consider, where water availability allows, the Committee's recommendations on critical environmental flow thresholds, including maintenance of deep habitats, channel maintenance flows and high flushing flows. This would include the timing of releases to coincide with natural high flow events.

The release strategy will be incorporated into Snowy Hydro Annual Water Operating Plan.

## **2. The role of Mowamba River needs to be more precisely understood, and to be documented, so as to better inform restoration of the Snowy River.**

Although releases through the Mowamba aqueduct were only planned as a short term measure until releases could be made through the outlet works at Jindabyne Dam, the Committee recommends investigation of the importance of restoring flows in the Mowamba River.

The Committee's advice regarding the importance of daily and seasonal variability in the pattern of flow releases is acknowledged. However, the Mowamba aqueduct has been re-commissioned, consistent with the SWIOLD and the Snowy Water Licence, both of which were agreed by the partner Governments. The Mowamba Aqueduct has been raised in submissions to the to the 5 Year review of the Snowy Water Licence.

However, any consideration of decommissioning the Mowamba Aqueduct will need to consider the potential impacts on the ability to store and release 'flushing flows', the reduced capacity to generate hydro-electricity through a generation facility constructed at the Jindabyne outlet, the investment in increasing outlet works at Jindabyne, scientific data supporting improved environmental outcomes and any potential reduction in water availability in the Murray and Murrumbidgee Valleys.

## **3. Flow volumes could be larger than at present if the process of converting identified savings into Environmental Entitlements could be accelerated.**

The Department will examine measures to expedite the conversion of licence entitlements. However, there is a lead time between when a water savings projects is initiated, the savings determined and then the savings converted into a real volume that is available for release into the Snowy.

## **4. The Deep Pool habitat needs to be improved.**

The Department has commissioned studies to define the flow thresholds required to protect pool habitats, by scouring the substrate. It is anticipated once sufficient volumes of water are available in the Snowy Environmental Account, releases to rehabilitate the instream habitats will be identified and incorporated into the Snowy Hydro Annual Operating Plans.

### **5a) Channel maintenance flows should be scheduled to follow as soon as possible after a major wildfire.**

The Department will consider implementing this recommendation in consultation with the Snowy Scientific Committee and Snowy Hydro Ltd at appropriate times.

### **5b) Flushing flows of 1000 ML/d should be released every year.**

The Department will consider this recommendation in consultation with the Snowy Scientific Committee in developing the release pattern for environmental flows in each year.

**5c) Fluvial disturbance by flows of between 12000 and 20000 ML/d should be planned for all years in which water is available.**

The Department will consider this recommendation in consultation with the Snowy Scientific Committee in developing the release pattern for environmental flows in each year.

**6a) The target for a release from Jindabyne Dam should be to aim for a natural water regime.**

Australian rivers have some of the most variable flow regimes in the world and a flow regime that re-introduces elements of natural flow regime would provide for the range of environmental flow needs. The Department supports the need to optimise flow releases that provide for these ecological water requirements.

**6b) There is a requirement for greater flows to prevent pool stratification.**

The Department recognises the need to provide environmental water to address the development of thermal stratification in the deeper pools of the Snowy River. The Department is undertaking investigations to quantify the level of stratification in the upper reaches and to define flow thresholds that will provide sufficient mixing of the deeper pools during the summer months. It is expected the studies will be completed by the end of 2009.

## **7. Water quality monitoring program**

The Department has established the Snowy River Flow Response Monitoring and Modelling program to assess the changes in river conditions. Monitoring began in 2000 and has continued during the release of the first and subsequent flows of water for the environment. More information is available from the Department's website at: [http://www.dwe.nsw.gov.au/water/monitor\\_snowy.shtml](http://www.dwe.nsw.gov.au/water/monitor_snowy.shtml).

The Flow Response program has undertaken a water quality assessment of the first stage of the environmental flow releases, using two variables - temperature and electrical conductivity. The program did not address other water quality variables such as nutrients and metals.

The Department has initiated the upgrade of some of the existing water quality stations to monitor some of these other variables. Additionally, a small pilot study to identify the water quality issues relating to Snowy River below Jindabyne was commissioned in October 2008. This study will address some of the issues raised by the Committee.

Additionally, the Department is also undertaking a review of all available water quality data in the study area.

The Department will continue to work with the Snowy Scientific Committee to improve water quality and flow measurement within budget constraints, specifically to assist the Committee to identify the potential impacts of environmental flow releases and to enable the Committee to advise on release patterns to be included in the Snowy Hydro Annual Water Operating Plans.

**8. Greater flexibility is needed in institutional arrangements in order to improve the flow regime.**

The Department will work with partner Governments and Snowy Hydro Ltd to review the institutional arrangements so that the environmental outcomes created by the use of the Snowy Environmental Allocation can be maximised.