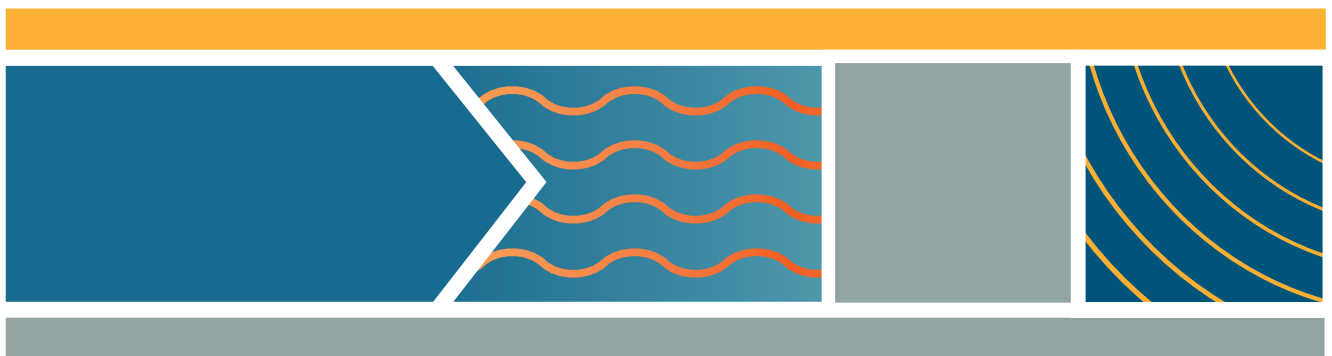


Water sharing in the Murrumbidgee Regulated River

Progress report 2004 to 2008



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Progress report 2004 to 2008*

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Contents

Introduction	1
Water for the environment	1
Managing to extraction limits	1
End of system targets	2
Protect the low flows below Blowering and Burrinjuck Dams	2
Winter flow variability below Burrinjuck Dam	3
Environmental releases from Burrinjuck and Blowering Dams	3
Environmental flows under drought management arrangements	3
Adaptive environmental water	4
Clear water rights and trading	4
Basic rights	4
Access licences	5
Available Water Determinations	5
Supplementary water access	6
Water markets	6
Water source operation	8
Monitoring	9
Plan amendments	9

Figures

Figure 1	Murrumbidgee Regulated River Water Use 2004 to 2008	1
Figure 2	Flows in the Murrumbidgee River at Balranald July 2004 to June 2008	2
Figure 3	Murrumbidgee Regulated River access licence dealings 2004 to 2008	7
Figure 4	Murrumbidgee Regulated River inter-valley access licence dealings	8

Introduction

A water sharing plan (WSP) for the Murrumbidgee Regulated River Water Source commenced on 1 July 2004. This Plan contains rules for how water is shared between the environment and water users and different categories of licences. In November 2006, the Plan was suspended due to the extremely dry conditions. Since this time, the Department of Water and Energy has put in place measures aimed at meeting critical water needs of towns, domestic and stock and industry.

In the four years, from 2004 to 2008, there has been significant progress in implementing the strategies detailed in the Plan. This report summarises key activities arising from implementation of the Murrumbidgee WSP and details how water management has differed from the rules in the Plan since its suspension in 2006. Detailed information on water availability in the Murrumbidgee and critical water planning arrangements is also available on the Department’s website www.dwe.nsw.gov.au.

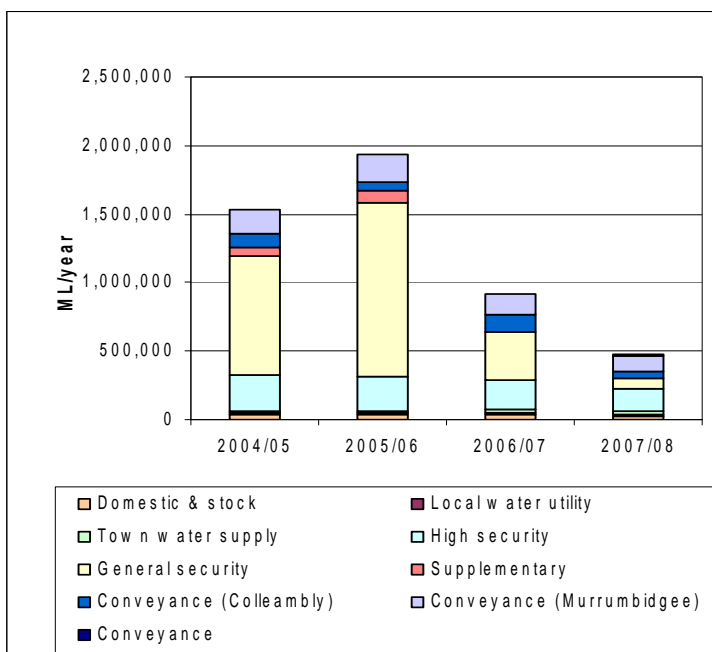
Water for the environment

Managing to extraction limits

The Plan establishes a long term average annual extraction limit estimated as 1,925,000 megalitres (ML) per year and identifies water above this limit (approximately 56 per cent of flows) as planned environmental water. This limit is determined by hydrologic modelling – it is not the volume of water extracted from the water source in any particular year.

The Department updates this model with any available new information and reruns it every year. There has been no apparent increase in irrigation development in the Murrumbidgee since the development of the Plan and actual water use has been low due to the dry conditions (see Figure 1). The Department will continue to monitor the situation and assess the long term average annual extraction against the Plan limit.

Figure 1 Murrumbidgee Regulated River Water Use 2004 to 2008



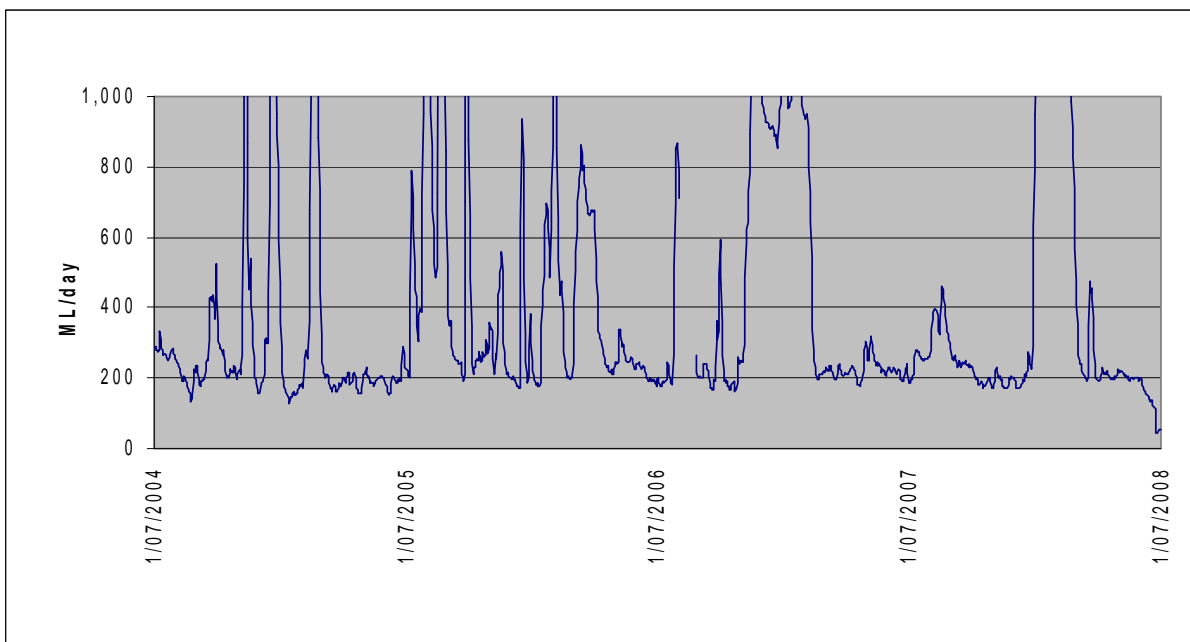
End of system targets

The Plan contains rules to ensure that a minimum level of flows are maintained downstream of the Balranald Weir and are protected from extraction. The target flows are currently set in the Plan at between 200 ML per day and 300 ML per day, depending on how much water is made available to general security licence holders. These rules are aimed at ensuring that there is connectivity throughout the river system and reintroducing a more natural flow pattern and are identified in the Plan as planned environmental water.

These flows have generally been delivered in line with the Plan rules since the commencement of the Plan, except for June 2008. In this month, as part of the emergency measures introduced in response to the drought, the Department relaxed minimum flow rules and flows went as low as 41.5 ML per day for a couple of days before increasing again. Figure 1 shows flows at in the Murrumbidgee River downstream of the Balranald Weir.

The Plan provides for a change in calculation of end of system flows aimed at reintroducing some natural variability to the flows. These changes will not be introduced until the critical water planning process is no longer needed and Plan is reinstated.

Figure 2 Flows in the Murrumbidgee River at Balranald July 2004 to June 2008



Protect the low flows below Blowering and Burrinjuck Dams

The Plan includes rules which require the release of up to 560 ML per day from Blowering Dam and between 300 and 615 ML per day from Burrinjuck Dam, depending on inflows into the storages. These rules, known as *dam transparency* rules, are aimed at protecting the low flows in the upper reaches of the river immediately below the two Dams. They are identified in the Plan as Planned Environmental Water.

From 1 July 2004 until the Plan was suspended in November 2006, transparency releases were made from Blowering Dam. Due to the complicated interaction between Snowy Hydro Limited and State

Water Corporation operated bulk water infrastructure, however, decisions about releases were not able to be made based on real time data and so these releases were a fairly constant 560 ML per day.

During the same period, transparency releases were also made from Burrinjuck Dam. For the first 18 months of the Plan, there was an under delivery of flows of approximately 26,800 ML due to incorrect application of the WSP rules. It is anticipated that when flows improve and the Plan is resumed this volume will be credited to the EWA1 reserve to be used for environmental objectives when required. (See section below on Environmental releases from Burrinjuck and Blowering Dams for a description of the three environmental water accounts).

Winter flow variability below Burrinjuck Dam

The Plan also includes rules which require a percentage of flows into Burrinjuck Dam between 22 April and 21 October to be released. These rules are known as *dam translucency rules* (occurring during periods of high flows). They are aimed at providing greater variability in winter flows downstream of the Dams. Flows which are released as a result of these rules are identified as planned environmental water. The percentage of flows to be released at any time is dependent on the climatic conditions in the catchment above the Dam and the Burrinjuck Dam storage levels.

From 1 July 2004 until the Plan was suspended in November 2006, translucency (high flows) releases were generally made from Burrinjuck Dam in line with the provisions of the Plan.

Environmental releases from Burrinjuck and Blowering Dams

The Plan establishes three separate environmental water allowances (EWA), also known as environmental contingency allowances in both Burrinjuck and Blowering Dams. There are different rules for how these accounts are credited with water and maintained. Releases from all of the allowances may be made when needed for a wide range of environmental purposes, such as assisting water bird breeding, flooding of wetlands, fish passage or breeding, restoring water quality or maintaining flows in the lower reaches of the river which better reflect natural flows. These rules are identified in the Plan as Planned Environmental Water.

Only one release was made (from the second allowance, EWA2) prior to the suspension of the WSP. In December 2005, releases totalling 14,000 ML inundated approximately 10,000 ha of wetlands, triggering successful breeding events for water birds and other threatened species.

When water availability improves in the Murrumbidgee and the Plan is reinstated, decisions about the use of these Environmental Water Allowances will be made by the Department of Environment and Climate Change (DECC) on the advice of the Environmental Water Allowance Reference Group.

Environmental flows under drought management arrangements

No dam transparency releases were made from Blowering Dam following the suspension of the Plan in November 2006. From this date, the rules for transparency and translucency releases from Burrinjuck Dam were relaxed and releases were only made when there was downstream irrigation demand for water. This meant that water for both the environment and consumptive users was able to be managed much more efficiently as otherwise high delivery losses during dry times were mitigated.

Water was credited to the environmental water reserve accounts according to the rules set out in the Plan until November 2006, when the WSP was suspended. The balance in the account at this time

was 110,000 ML. Following an assessment of water availability and likely future flows, the Department made a decision not to release water from this account for specific environmental purposes until the situation improved. Consequently, 50,000 ML was used to underpin water availability for critical needs in the Murrumbidgee valley. This water will be repaid before full allocations are made for general security licences. The remaining water was released to increase end of system flows in the Murrumbidgee and shore up the ability to meet town water supplies in the Murray valley.

Between November 2007 and April 2008, flows totalling 8,800 ML were made available from tributary flows downstream of Burrinjuck Dam to support the Southern Bell Frog populations in Yanga National Park in the Lowbidgee. This water was made available under the critical water planning process. It will be debited against the environmental water allowance 2 (EWA2) account.

Adaptive environmental water

The WSP allows for licence holders to nominate their licence as Adaptive Environmental Water. Once a nomination has been processed, the entitlement cannot be used for any purpose other than environmental benefit, outlined in an Adaptive Environmental Water Use Plan.

Since 2006, DECC purchased 4,804 shares of general security licences and 5,079 shares of supplementary access licences under the RiverBank program. It is anticipated that these licences will be nominated as Adaptive Environmental licences in late 2008, following approval of a Use Plan which sets out how these licences will be used to further the objectives of the Murrumbidgee Water Sharing Plan.

Clear water rights and trading

The Plan establishes rules for how water is shared between extractive users. Information on access licences, including conditions, entitlements, available water announcements and trading is available on public registers established by the Department in 2004 (web site reference www.dwe.nsw.gov.au).

Basic rights

The Plan provides for water to satisfy basic landholder rights. No access licences are issued for these. In the Murrumbidgee, water extracted by basic rights holders is insignificant when compared to the Plan's extraction limit. Water to meet these needs is included in State Water's operational protocols for delivery of water ordered by licence holders and via a replenishment flow up to a volume of up to 36,500 ML to Forest Creek below Warriston Weir. In 2004 an alternative supply of water was provided to domestic and stock users in Forest Creek under the Water for Rivers Water Saving Project. This enabled water to be provided via pipes from the regulated Yanco Creek system. As a result the operational targets for replenishment flows were reduced to 26,160 ML per year. In 2007, further water savings meant that replenishment flows were no longer required.

In 2004–05 total replenishment flows at this point were 28,585 ML and in 2005–06 flows were 35,511 ML, which included 7,790 ML released for the NSW Murray Wetland Working Group to provide water for the Wanganella Swamp. During this period, daily flows generally ranged between 60 and 100 ML per day, though at times were as high as 217 ML per day. In November 2006, these rules were set aside following the suspension of the Plan. From July to November 2006, total replenishment flows were 9,760 ML, with a total of 10,434 ML delivered in 2006–07. No replenishment flows were required from 2007–08.

Dry conditions since the commencement of the Plan have meant that water for basic rights holders has been curtailed and at times flows have ceased for short periods. The Department informs landholders of the projected availability of domestic and stock water periodically, highlighting those tributaries where there is or may be interruptions to supply (see www.dwe.nsw.gov.au).

Access licences

Share entitlements for access licences within the Murrumbidgee regulated river water source were estimated at the commencement of the Plan. Prior to the commencement of the Plan, the Department converted 1,482 existing licences issued under the *Water Act 1912* to new licences and approvals under the *Water Management Act 2000*.

Over the past four years, there has been a 4.5 per cent (or 91,090 unit shares) reduction in general security entitlement, a 23 per cent (or 64,416 unit share) increase in high security entitlement and a 9.5 per cent (or 16,882 unit shares) increase in supplementary entitlement. These changes reflect dealings (or trades) between the Murrumbidgee regulated river water source and other water sources and the conversion of approximately 160,000 shares of general security licences to high security in 2007–08. These conversions were made at the rate of 0.55 shares of high security for each share of general security. Such licence conversions were suspended on 2 July 2008 until further notice.

Other changes in entitlement since 2004 arise from new licences for applications made prior to the commencement of the WSP or issued under the exemptions to the embargo. These include a new high security (Aboriginal cultural) licence of 1,250 ML, 6.9 ML for new Domestic and Stock (domestic) licences and 41 ML for new Domestic and Stock (stock) licences. 14 ML of Domestic and Stock licences were also cancelled during this period.

Available Water Determinations

An Available Water Determination (AWD) is the volume of water that is made available to a category of access licence. Announcements are made at the start of the water year (July) for all categories of licence. Announcements for general security licences and conveyance licences are reviewed and updated regularly reflecting changes in the Department's assessment of available water. In December 2004, for example, three AWD announcements were made for general security, Murrumbidgee Irrigation (conveyance) and Regulated River (conveyance) licences reflecting the rapid changes in water availability during this month.

Due to record low flows, cumulative AWD announcements for general security access licences were low, ranging from 0.13 ML per share in 2007–08 to 0.54 ML per share in 2006–07. Cumulative AWD announcements for regulated river conveyance licence ranged from 0.03 ML per share in 2007–08 to a maximum of 0.54 ML per share in 2005–06.

Cumulative water announcements for Colleambally Irrigation (conveyance) ranged between 111,600 ML (or 79 per cent of unit shares) in 2006–07 to 118,806 ML (or 91 per cent of unit share) in 2005–06. Announcements for Murrumbidgee Irrigation (conveyance) also varied, ranging between 145,324 ML (or 60 per cent of unit share) in 2006–07 to a high of 221,499 ML (or 91 per cent of unit shares) in 2005–06. No water was made available for either of these conveyance licences in 2007–08.

Priority for limited water was given to towns, local water utilities and domestic and stock licences which all received AWD announcements of 100 per cent of share component in all years.

Announcements for all categories of high security access licences ranged from 100 per cent in 2004–05, 95 per cent in 2005–06 and 2007–08 to 90 per cent in 2007–08.

Available water announcements for supplementary access licences were set at 1 ML per share for the whole period from 1 July 2004 to 30 June 2008. Access to water by these licence holders, however, is determined by separate announcements when there is water flowing in the rivers which is available for extraction. For example, access to water under Supplementary Access Licences was suspended in July 2006 in order to provide as much water as possible to downstream towns and the NSW Murray Regulated river water source and no water was used by supplementary water holders in either 2006–07 or 2008 (see below).

Supplementary water access

The Plan details rules for water extraction under supplementary water access licences in the Murrumbidgee water source.

As access is dependent upon climatic conditions, opportunities for supplementary water licence holders have been very limited since the commencement of the Plan. In 2004–2005, access was available in most of the Murrumbidgee River for a total of 13 days spread across five announcements. Some sections of the Lower Murrumbidgee (below Darlington Point) received on average seven days extra access during these same periods. In the Yanco River during this same period, announced access varied across the river reaches with water being made available for an average of 17 days spread across two to four events. Total extraction by all supplementary water users during 2004–05 was 63,129 ML.

Reflecting greater winter rainfall, access to water by Supplementary Water users was greater in 2005–06 with the number of days of announced access increasing as water moved down the Murrumbidgee and Yanco river system. In the Upper Murrumbidgee (above Darlington Point) access was available for an average of 46 days across five to seven events. In the Lower Murrumbidgee, the average access was 97 days across two to four events. In the Yanco River, access was announced for between 71 and 122 days between July and November 2005. Total extraction by all supplementary water users during 2004–05 was 189,940 ML.

Access to water under Supplementary Access Licences was suspended in July 2006 in order to provide as much water as possible to downstream towns and the NSW Murray Regulated river water source.

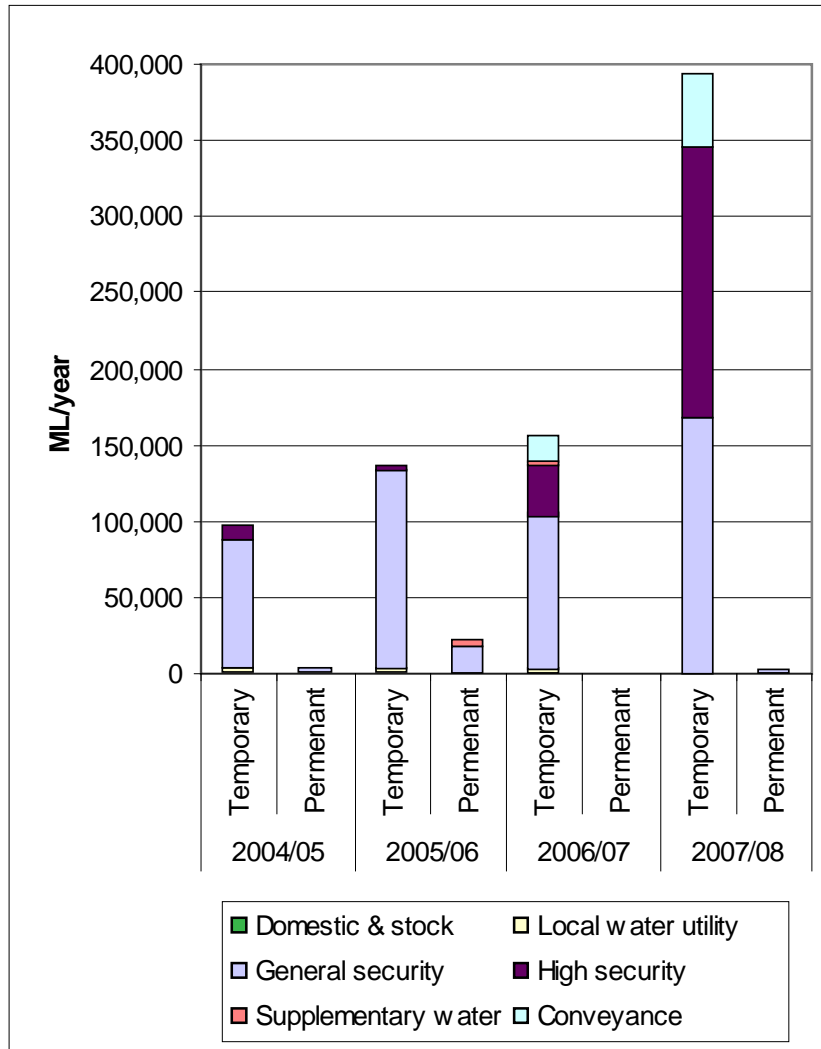
Water markets

Temporary transfers of water licences were introduced in NSW in regulated streams in 1983–84 and permanent trades in 1989.

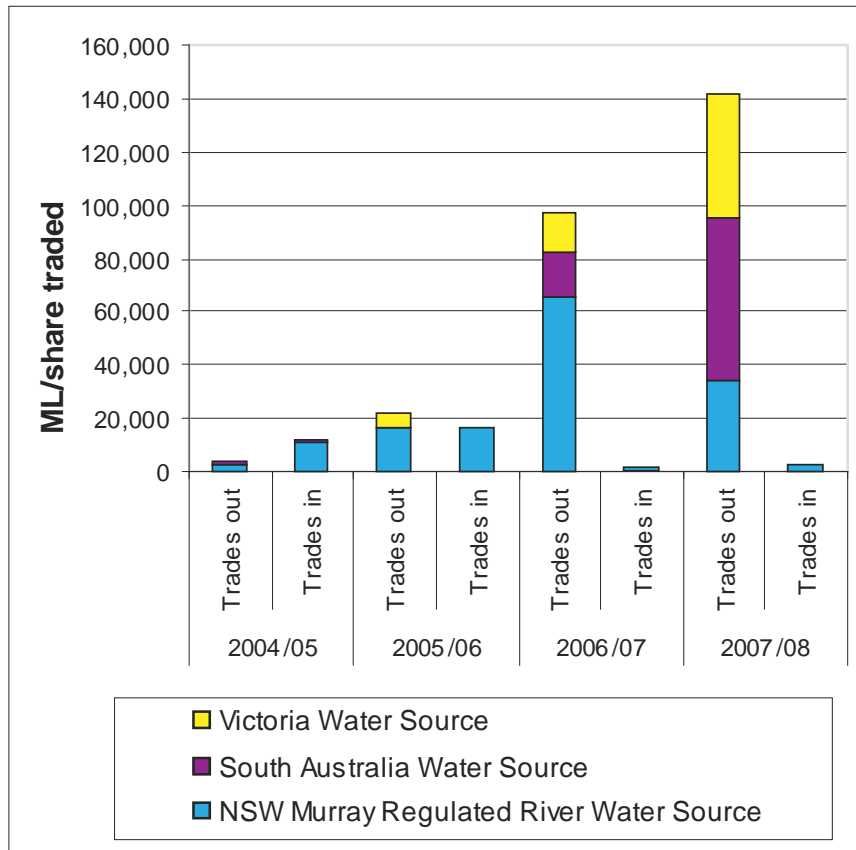
The implementation of the WSP has involved removal of barriers to the efficient operation of these water markets, facilitating more efficient and better informed trades. Key mechanisms include clear rules for trading (in the WSP), the separation of the water licence from the land title in 2004, and the establishment by the Department of Water and Energy of public registers in 2004, showing the volume and price paid for access licences. Figure 3 shows trades within the Murrumbidgee Water source and with other water sources since 2004. Variations between those years are mostly related to climatic conditions and the water availability in the different water sources. Volumes shown for temporary trades are for temporary share assignments (where water in a licence holder's account is sold, but

ownership of the licence retained). Permanent trades include both share assignments and sale of the licence entitlement. Variations between years are mostly related to climatic conditions and the volume of water made available to different licence categories.

Figure 3 Murrumbidgee Regulated River access licence dealings 2004 to 2008



The Murrumbidgee Water Sharing Plan allows trades between the Murrumbidgee Regulated Water Source and other water sources, namely NSW Murray Darling, Victoria and South Australia. Figure 4 shows inter-valley trades in water access licences (temporary and permanent) to and from the Murrumbidgee Regulated River. The high volumes of trades out of the Murrumbidgee Water Source in 2006–07 and 2007–08 (after the suspension of the Plan) indicates that there was more water available in this water source than in the Murray.

Figure 4 Murrumbidgee Regulated River inter-valley access licence dealings 2004 to 2008

There has been some modification to the rules for trading licences within the Murrumbidgee since the suspension of the Plan.

New trading rules include:

- In recognition of the priority access granted to towns, local water utilities have been prohibited from trading water (except to other local water utilities) since November 2006
- Also in late 2006, restrictions were placed on inter-valley transfers downstream of the Murray–Murrumbidgee junction
- In 2007–08 new arrangements were introduced for applications for water transfers aimed at increasing the opportunity for licence holders to meet their water needs during the current times of water scarcity and competition. All applications need to be received by the Department by 30 April (rather than 1 September for high security licences and the end of February for general security licences).

Water source operation

The Plan requires a minimum daily flow of 50 ML per day to be maintained in Billabong Creek at Darlot throughout the water year. Since the commencement of the Plan, this rule has been met, with actual flows often well above the target, reflecting water orders downstream of this point.

The Plan also provides for water to be made available to the Lowbidgee Flood Control and Irrigation District once the environmental provisions and needs of domestic and stock and native title rights, and higher priority access licences have been met. Diversion into the District is not allowed of any water that is re-regulated and can be made available to water extractors in the Murray Regulated River is not

allowed when the total carryover and allocations to Murray general security access licence holders is less than 0.6 megalitres per unit share.

Since the commencement of the Plan, water has been made available to the Lowbidgee District each year, though volumes have varied considerably. Total diversions were 78,371 ML in 2004–05, 251,746 ML in 2005–06, 2,105 ML in 2006–07 (the year the WSP was suspended) and 14,058 ML in 2007–08. Approximately 8,800 ML of the flows to the Lowbidgee in 2007–08 were made available from the EWA2 account to support Southern Bell Frog populations in Yanga National Park.

Monitoring

The effectiveness of the Murrumbidgee plan in achieving its objectives will be assessed by 2014. The Department has developed methods for long term monitoring of plans to support this assessment (see www.dwe.nsw.gov.au for more information on the ecological monitoring).

In the Murrumbidgee the ecological monitoring program, known as Integrated Monitoring of Environmental Flows (IMEF) initially focussed on Environmental Water Allowance releases for floodplain wetland inundation and the effects of translucent releases downstream of Burrinjuck. These have included:

- relating commence to fill and inundation of mid Murrumbidgee floodplain wetlands to aquatic vegetation and invertebrate response, water birds, frogs and water quality
- monitoring the effect of translucent flows in the Murrumbidgee on rocky riffle communities, including algae and invertebrates, with relation to nearby unregulated and regulated rivers and the impact of water quality.
- investigating blue green algal dynamics in Hay weir pool.

A more recent project in the Murrumbidgee is investigating alternative management of translucency using hydraulic and ecological options modelling.

IMEF funded research in the Murrumbidgee has included mapping floodplain inundation to flow events using Landsat imagery and the use of biofilms as indicators of the response to flow management in the lower Murrumbidgee River. Lidar imaging of the Lowbidgee floodplain is also being funded from IMEF.

The review of the WSP's effectiveness will also consider the economic and social elements of the Plan's objectives. To this end, key indicators for monitoring of the irrigation sector have been identified and a survey conducted in 2006 to establish baseline information for ongoing assessment.

Plan amendments

The Plan allows for a number of changes to be made to it..Since the commencement of the Plan, the following amendments have been made:

- In December 2005, the available water determination (AWD) rules for Murrumbidgee irrigation (conveyance) licences were changed to better reflect the actual conveyance requirements.
- The carryover limits for general security licences was increased from 15 percent to 30 percent for the end of the 2008/09 water year.