10 Murray–Darling Basin Commission matters

10.1 Best practice pricing

Water and wastewater businesses should earn sufficient revenue to ensure their ongoing commercial viability while avoiding monopoly returns. To this end, governments agreed the following principles should apply:

- The jurisdictional independent pricing body should set or review prices or pricing processes for water storage and delivery and report publicly.
- To be viable, a water business should recover at least the operational, maintenance and administrative costs, externalities (defined as the natural resource management costs attributable and incurred by the water business), taxes or tax equivalents (not including income tax), the interest cost on debt, dividends (if any) and provision for future asset refurbishment/replacement. If a dividend is paid, it should be set at a level that reflects commercial realities and simulates a competitive market outcome. This is defined to be the lower bound of cost recovery.
- To avoid monopoly rents, a water business should not recover more than the operational, maintenance and administrative costs, externalities (all external costs and benefits), taxes or tax equivalent regimes, and provision for the cost of asset consumption and the cost of capital, the latter being calculated using a weighted average cost of capital. This is defined to be the upper bound of cost recovery.
- In determining prices, the independent pricing body should determine the level of revenue for a water business based on efficient resource pricing and business costs. Specific circumstances may justify transition arrangements to that level. Cross-subsidies that are not consistent with efficient and effective service, use and provision should ideally be removed.
- Where service deliverers are required to provide water services to customer classes at less than full cost, the cost of this should be fully disclosed and ideally paid to the service deliverer as a community service obligation (CSO).
- Asset values should be based on a deprival value method unless an alternative approach can be justified, and an annuity approach should be used to determine medium to long term cash requirements for asset replacement/refurbishment.
- Transparency is required in the treatment of CSOs, contributed assets, the opening value of assets, externalities (including resource management costs), tax equivalent regimes and any remaining cross-subsidies.

Future reform: Metropolitan water systems should continue movement toward the upper bound of cost recovery by 2008. Rural and regional water systems should achieve the lower bound of cost recovery, and continue to move towards the upper bound where practicable. Where upper bound pricing is unlikely and a CSO is necessary, it should be publicly reported and the government should consider alternative management arrangements. Jurisdictions' approaches to pricing and attributing the costs of water planning and management should be consistent by 2006. Water prices should be set on a consumption basis, comprising a fixed component and a variable use component, where this is cost effective.

References: 1994 Council of Australian Governments (CoAG) water reform agreement, clauses 3(a)–(d); guidelines for the application of section 3 of the CoAG strategic framework and related recommendations in section 12 of the expert group report (1998 CoAG pricing principles); Intergovernmental Agreement on a National Water Initiative

Cost recovery by Murray River Water

Assessment issue: The Murray–Darling Basin Commission's (MDBC's) bulk water business, River Murray Water, should set water prices based on the principles of full cost recovery and consumption based pricing. Any remaining subsidies should be consistent with efficient and effective service provision and use, and be reported publicly. In 2002 the MDBC conducted an independent review of River Murray Water's pricing arrangements. The review made recommendations aimed at achieving economic and environmental sustainability, and imposing clear pricing signals (that recognise all costs with subsidies and CSOs disclosed) and appropriate institutional role separation. For the 2004 NCP assessment, the Council has looked for the MDBC to have implemented the recommendations of the independent review, including the recommendation to report in the MDBC's annual report each government's annual cost shares for River Murray Water and the corresponding bulk water volumes supplied to water users in each jurisdiction.

Future reform: Governments should apply consumption based pricing, achieve lower bound pricing for all rural systems and continue towards upper bound pricing. Any subsidies must be transparent, and alternative management arrangements aimed at removing the need for a continuing subsidy should be introduced where practicable.

References: 1994 CoAG water reform agreement, clauses 3(a) and (d); 1998 CoAG pricing principles; Intergovernmental Agreement on a National Water Initiative

River Murray Water recovers all of its operating costs, and 75 per cent of its capital costs, of providing water services from New South Wales, Victoria and South Australia. The costs allocated to each state are distributed in proportion to the volume of water each receives from River Murray Water.[1] The remaining 25 per cent of its capital costs are a subsidy to water users that is recovered from the Australian Government.

The MDBC commissioned an independent review of River Murray Water's pricing arrangements, undertaken by Dr John Langford and Chris Scriven in early 2002. The review considered River Murray Water's pricing practices against all areas of the CoAG pricing principles, and made recommendations where it found that practices did not comply with the pricing principles. The Murray–Darling Basin Ministerial Council considered and endorsed the report's recommendations in April 2002.

In relation to the implementation of the recommendations of the independent review of pricing arrangements:

- The Murray–Darling Basin Ministerial Council has approved in principle amendments to the Murray–Darling Basin Agreement to adopt maintenance and renewals annuities as the basis for the future funding of River Murray Water. The amendments are to be adopted by relevant governments in late 2004.

[1] Under the pilot interstate water trading project, the financial contributions from the states to meet River Murray Water's costs are not adjusted for permanent interstate transfers. As a result, when water is traded under the pilot project, the source state (the wholesalers and the remaining retail water users) in effect pays the bulk water charge (see section 10.3).

- A full review of cost sharing arrangements for the Menindee Lakes will be implemented in the 2004-05.
- A review of insurance arrangements has been commissioned and will be completed in 2004-05.
- Improved financial reporting is being implemented from July 2004, which will allow identification of all environmental costs.
- Commencing in its 2001-02 annual report, the MDBC advises the contributions from New South Wales, Victoria and South Australia to the budgeted costs of River Murray Water, and the volumes of the diversions from the River Murray and lower Darling River to those states during the relevant year. The MDBC also advises the contribution from the Australian Government.

Discussion and assessment

Under the 1994 water reform agreement and the National Water Initiative, River Murray Water should at least achieve the lower bound of cost recovery in accord with the CoAG pricing principles, and be moving towards the upper bound of cost recovery. The lower bound of cost recovery should recover at least the operational, maintenance and administrative costs, externalities (defined as the natural resource management costs attributable and incurred by the water business), taxes or tax equivalents (not including income tax), the interest cost of debt, provision for future asset refurbishment/replacement, and dividends (if any).

In previous assessments, the Council found that the independent pricing review of River Murray Water covered all relevant pricing issues. The Council considered that the review recommendations, if implemented, would appropriately address the CoAG water pricing requirements. The Murray–Darling Basin Ministerial Council has endorsed the recommendations of the independent pricing review and set timeframes for implementation. The MDBC has implemented the review recommendation to report the contributions to River Murray Water's costs made by New South Wales, Victoria and South Australia, together with the volumes of water supplied to users in the three states. The remaining review recommendations are being pursued.

10.2 Water planning — providing a better balance in water use

Assessment issue: Governments are to establish water allocation systems that provide a sustainable balance between the environment and other uses of water, including by formally providing water in rivers and groundwater systems for use by the environment.

Under the 1994 CoAG water reform agreement, governments committed to determine environmental water requirements using the best available scientific information, wherever possible, and to have regard to the intertemporal and interspatial environmental water requirements needed to maintain the health and viability of river systems and groundwater basins. For river systems that are overallocated or deemed to be stressed, governments committed to provide a better balance in water use to enhance or restore the health of the river systems. Governments also committed to consider establishing environmental contingency allocations and to review allocations five years after they have been determined. In allocating water to the environment, governments agreed to have regard for the ARMCANZ/Australian and New Zealand Environment and Conservation Council (ANZECC) National Principles for the Provision of Water for Ecosystems (see appendix B).

Arising from the 1994 CoAG water reform agreement, each state and territory established a program in 1999 for implementing water allocations for priority river systems and groundwater resources. Governments committed to substantially complete their 1999 programs by 2005 (including allocations for stressed and overallocated rivers by 2001). Under the National Water Initiative, signatory governments confirmed the importance of water planning as a mechanism for assisting water management and allocation decisions. Signatory governments committed to prepare water plans for surface water and groundwater systems in which entitlements are issued, to assist with water management and allocation decisions to meet productive, environmental and social objectives. They agreed that management and allocation decisions would involve judgments informed by the best available science, socioeconomic analysis and community input. Signatory governments committed to substantially complete allocation arrangements by 2005 for overallocated and overused surface and groundwater systems covered by their 1999 implementation programs, and to prepare water plans by the end of 2007 for other systems that are overallocated, fully allocated or approaching full allocation and by the end of 2009 for other systems that are not approaching full allocation.

The Murray–Darling Basin Ministerial Council is to report on progress with implementing of the cap on water diversions, including jurisdictions' compliance with the cap, progress in improving environmental flows in the River Murray through The Living Murray Initiative, implementation of the 'First Step' decision, and other initiatives aimed at improving the environmental health of the Murray–Darling river system.

References: 1994 CoAG water reform agreement, clauses 4(b)–(f); 1999 tripartite meeting; Intergovernmental Agreement on a National Water Initiative

For the 2004 NCP assessment, the Council requested that the MDBC provide information on:

- implementation of the cap on water diversions, including jurisdictions' compliance with the cap
- progress in improving environmental flows in the River Murray
- any other initiatives aimed at improving the environmental health of the Murray–Darling river system.

Implementation of the cap on water diversions

Caps on diversions are contained in schedule F to the Murray–Darling Basin Agreement. (The Murray–Darling Basin Ministerial Council agreed on the current caps in August 2000.) Schedule F requires that the annual diversion in each valley is to be compared at the end of each water year with the annual diversion target for that year. If the diversions exceed an agreed trigger, an independent audit group is required to conduct a special audit of the valley. If the Independent Audit Group determines that a valley has breached the cap, the relevant state must report to the Ministerial Council on the actions it intends to take in that valley to bring the diversions back in line with the cap.

Basin water use in 2002-03 was 8079 gigalitres — the lowest on record since 1983-84 (MDBC 2004). In terms of compliance with the cap requirements, in 2002-03 the MDBC reported some variation across valleys in each state. (The MDBC does not report on compliance performance for Queensland and the ACT because these jurisdictions have not implemented the cap.) The MDBC identified the Lachlan valley in New South Wales as the only valley to have continually exceeded the cap and to have triggered special audit provisions under schedule F. In its 2002-03 audit report, the MDBC noted that Victoria remains committed to the ongoing development and improvement of cap models and to implementing bulk entitlements to ensure compliance with the cap (MDBC 2004).

Progress on improving environmental flows in the River Murray

The River Murray has a catchment area of approximately one million square kilometres. It comprises approximately 14 per cent of Australia and spans Queensland, New South Wales, the ACT, Victoria and South Australia. The Murray–Darling Basin contains almost three-quarters of the irrigated agriculture in Australia, with agricultural production in excess of $8.5 billion a year.

In 2001 the Murray Darling Basin Ministerial Council commissioned a review of the environmental impacts of flow regulation in the River Murray (Gippel and Blackham 2002). Based on data, reports and other scientific publications, the review reported key changes in the flows of the River Murray as a result of water use, including reduced volume in the lower Murray, reversed seasonal patterns and increased closure of the river mouth. The review concluded that a number of ecological impacts were attributable to these changes in water regime, including reductions in native fish populations, declines in floodplain vegetation and tree health, and decreases in wetland values.

In 2001, the MDBC appointed a multidisciplinary Expert Review Panel to determine the environmental flow requirements of the River Murray. The Expert Review Panel developed the concept of a 'healthy working river',

defined as a river that is managed to provide a sustainable compromise (on which the community agreed), between the condition of the river and the level of human use (CRCFE 2002). The panel considered that there is a substantial risk that a regulated river will not be in a healthy state when key attributes of the flow regime are reduced below two-thirds of its natural level. It determined that the River Murray would need new environmental flow allocations of 4000 gigalitres a year, together with structural and operational improvements, to have a high probability of becoming a healthy working river. Among other findings, the Expert Review Panel considered that: the ecological outcomes of improved river management should be assessed using ecological indicators; holistic methods should be used to determine river health; non-essential weirs and structures should be removed, weir pools lowered or fishways installed; cost–benefit (including ecology) assessments should be undertaken before any proposal to raise weir heights proceeds; and more natural flow patterns should be implemented (covering temperature, daily and seasonal variation).

The Murray–Darling Basin Ministerial Council established The Living Murray Initiative in mid-2002 in response to evidence that the River Murray system is degraded. The initiative applies to the River Murray system as defined by the Murray Darling Basin Agreement — that is, the River Murray from the Hume Dam to the mouth, the Mitta Mitta River from Dartmouth Dam to the Murray, and the lower Darling River from Menindee Lakes to the Murray. The Ministerial Council directed the MDBC to undertake further work to better understand the economic, social and environmental costs and benefits of returning water to the river. It also recommended that the MDBC establish a community engagement process to ensure the MDBC had accounted for community knowledge and values.

Based on the recommendations of the Expert Review Panel, the Ministerial Council selected three environmental flow reference points for analysis: annual average increases of 350 gigalitres, 750 gigalitres and 1500 gigalitres of water for the River Murray system. (The Expert Review Panel had previously considered increasing water in the River Murray by 750 giglitres and concluded that this strategy had a low to moderate probability of achieving a healthy working river.) The Ministerial Council determined that the assessment of costs and benefits should be undertaken on local, regional and system-wide scales. Further, it specified that ecologically significant (icon) sites should be given particular consideration. It selected Barmah–Millewa Forest, the Gunbower Forest, Hattah Lakes, the Chowilla Floodplain, the Coorong and Murray mouth, and the Murray Channel — the Ramsar-listed sites.

The MDBC convened a Scientific Reference Panel made up of some members from the former Expert Review Panel and some additional specialists. The Scientific Reference Panel developed a decision support tool, the Murray Flow Assessment Tool (MFAT), to assess the ecological impact of different flow scenarios both within the channel and on the surrounding floodplain and wetlands of the River Murray. It considered that a flow regime involving 1500 gigalitres a year of additional water to the system, when combined with

improved operational management, would provide the greatest overall benefit. The MDBC considered that this proposal could deliver a healthy working river to the extent that it would redress the balance between human use and ecological sustainability (although it found that the proposal would not provide a substantial benefit to native fish) (CRCFE 2003).

In addition, the MDBC commissioned preliminary analysis of the economic and social impacts of increasing flows to the River Murray. The analysis found that recovery of water for the environment is likely to lead to a range of benefits and costs, to both direct users of water and communities more broadly. Benefits include improved water quality (likely to benefit agriculture, manufacturing, tourism and urban consumers), as well as possible increases in the value of hydro-electric power generated. Any reduced water availability for irrigation would reduce production and returns from these activities unless there is an offsetting increase in efficiency (although the security of water supplies may be higher). Further, the analysis showed that the extent and distribution of the costs and benefits would be affected by how the water is recovered, cost sharing arrangements, access rights to water, and structural adjustment packages. The independent Social and Economic Reference Panel is undertaking ongoing work on these issues.

As part of The Living Murray Initiative, on 14 November 2003, the Murray–Darling Basin Ministerial Council announced its 'First Step' decision. This decision is a targeted initiative focused on maximising environmental benefits for six icon sites in the Murray system. The decision sets out specific ecological objectives and outcomes for each site, including:

- Barmah–Millewa forest: achieve successful breeding of colonial waterbirds in at least three years in ten, and maintain healthy vegetation in at least 55 per cent of the forest area

- Gunbower forest, Koondrook–Perricoota: reinstate at least 80 per cent of permanent and semi-permanent wetlands and maintain at least 30 per cent of total river red gum forest area

- Hattah Lakes: restore the aquatic vegetation zone around at least 50 per cent of the lakes and increase successful breeding events of threatened colonial water birds and native fish

- Chowilla floodplain (including Lindsay–Wallpollas): water the high value wetlands and maintain the health of the current area of river redgums and at least 20 per cent of the original area of black box

- Murray mouth, Coorong and lower lakes: keep the Murray mouth open, provide more frequent conditions for estuarine fish spawning, and enhance the migratory wading bird habitat in the lower lakes

- River Murray channel: enhance native fish recruitment and habitat, and maintain current levels of channel stability.

Governments agreed to the arrangements for the 'First Step' in the CoAG Intergovernmental Agreement on Addressing Water Overallocation and Achieving Environmental Objectives in the Murray–Darling Basin. They agreed to achieve the objectives by recovering water that would be built up to an estimated average 500 gigalitres a year of 'new' water within five years. CoAG agreed that roughly this volume of water should be released to the environment each year, but may be adjusted to take account of droughts or flood events. Funding for this work commenced on 1 July 2004. In October 2004, the Murray–Darling Basin Ministerial Council will consider a program of longer term actions (aimed at addressing system-wide ecological outcomes rather than specific ecological assets) that will build on this first stage.

Discussion

Best available science

Governments commissioned considerable scientific research as part of The Living Murray Initiative. This research included assessments of current ecological condition, as well as investigations of options to address the declining ecological health of the river and associated habitat. The Expert Review Panel and the Scientific Reference Panel were multidisciplinary teams comprised of experts in a wide range of aquatic sciences, all with considerable experience in issues concerning the River Murray. The process considered aspects of the floodplain and wetlands as well as the channel environment. While not separately considered, the scientific assessment included the impacts of flows and actions on groundwater and salinity. The tool developed for the project (MFAT) is a holistic method that considers ecological indicators for fish, waterbirds, macroinvertebrates, floodplain and wetland vegetation, and blue-green algae.

There has been considerable debate about the quality of the analysis underlying The Living Murray Initiative. The Institute of Public Affairs refutes that the River Murray is in such a degraded ecological condition. Marohasy (2003) states that salinity in the River Murray is decreasing, native fish populations (especially the Murray cod) are not declining, the Barmah–Millewa forest has adequate environmental flow conditions, and there is no evidence of deterioration of river red gum communities. Her conclusions are not endorsed by the MDBC, the Cooperative Research Centre for Freshwater Ecology or other aquatic science experts. The main reason for this dispute is that much of the decline in biodiversity and ecological health is related to wetlands and floodplains, which Marohasy did not address.

International limnological experts peer reviewed the Expert Review Panel report (Acreman 2002; King 2002). They endorsed the system-wide assessment and the risk based approach, but considered that the report did not sufficiently detail the concept of a healthy working river or the derivation of the indicator of two-thirds of natural flow. Benson *et al.* (2003) and Benson (2004), on behalf of Murray Irrigation, also reviewed the Expert Review Panel

and Scientific Reference Panel reports. They criticised the expert panel approach, considering that it should not be a substitute for basic data collection and that it is risky to base significant decisions on subjective opinions. In addition, they considered that the MDBC's process placed an inappropriate emphasis on volumetric aspects of flow at the expense of options with a lower social cost, such as water efficiency programs, recycling and pipelining.

The MDBC, in response to these criticisms, reiterated that it never intended the two-thirds natural rule to be an exact science or to apply to the entire flow regime. The Expert Review Panel developed the concept for key, ecologically significant flow attributes, which will vary according to the characteristics of each ecosystem. The MDBC explained that its use of expert panels was an initial mechanism to help improve the health of the River Murray system before the ecosystem further deteriorated. It considered that the Expert Review Panel offers a large body of combined knowledge and experience that should not be undervalued. It noted that systematic, long term data collection is required for the River Murray system and that the Sustainable Rivers Audit (to commence in 2004-05) will provide information on changes in ecological indicators. In addition, The Living Murray Initiative contains both flow and non-flow related management actions, as recommended by the Expert Review Panel and subsequent processes.

Balancing economic, environmental and other interests

In coming to the 'First Step' decision, governments researched the ecological, economic and social costs of addressing the river health problems of the Murray–Darling system. The environmental flow investigations indicated that a significant volume of water is required to restore the health of Murray–Darling system. The evidence presented to date also suggests there are limited opportunities to achieve low cost water savings.

The 'First Step' decision aims to implement the lowest cost water savings available for the Murray–Darling Basin and to target those savings to where they can provide the greatest benefit to ecologically significant sites. It involves a re-allocation of 500 gigalitres a year in a manner that aims to share the burden equitably across the affected jurisdictions. In addition to reallocating water, the MDBC is implementing a range of non-flow restoration projects.

The 'First Step' decision is, however, the first part of a longer process. While the Murray–Darling Basin Ministerial Council is yet to decide on measures to achieve the long term objective (a healthy working river), the MDBC has commissioned work to progress interstate water trade and investigate opportunities for water use efficiencies and water delivery infrastructure changes to provide additional opportunities for water recovery.

Monitoring and adaptive management

The 'First Step' explicitly mentions adaptive management. The MDBC advised that adaptive management will be tied to both short term events monitoring and long term surveillance monitoring. While the MDBC is yet to announce details of the monitoring program, it indicated that monitoring will be directly related to the ecological objectives for each of the six identified icon sites.

Stakeholder consultation and transparent process

Water planning for the Murray–Darling Basin involves work by the MDBC, the Murray–Darling Basin Ministerial Council and the governments that are parties to the intergovernmental agreement. All decisions relating to environmental water releases for the Murray–Darling Basin have involved extensive consultation with all relevant stakeholders.

The CoAG intergovernmental agreement commits signatory governments to implement the 'First Step' decision in a manner consistent with the National Water Initiative, which requires open and transparent consultation with water users and other stakeholders.

Assessment

When implemented, the 'First Step' decision will involve an annual increase of 500 gigalitres for the River Murray to manage the six identified icon sites. In addition, the MDBC is managing implementation of a range of non-flow projects to assist restoration of the Murray–Darling system. The 'First Step' decision will not, however, provide the flow outcomes recommended by the Scientific Reference Panel. Governments acknowledge that the decision is the first stage of a longer process and they have committed to further action based on their experience with implementing the First Step. The Council considers that the governments that are party to The Living Murray Initiative and the 'First Step' decision have satisfactorily addressed CoAG obligations relating to the allocation of water to the environment for this 2004 NCP assessment.

10.3 Interstate trading

Assessment issue: Trading arrangements in water entitlements are to be instituted to maximise water's contribution to national income and welfare, where systems are physically shared or hydrologic connections and water supply considerations permit trading. Under the 1994 CoAG water reform agreement, trading arrangements were to be finalised by 2005. However, the National Water Initiative extends to 2007 the timeframe for establishing institutional and regulatory arrangements that facilitate intra- and interstate trade, and requires the removal of certain barriers to trade.

Under the National Water Initiative, governments are to immediately remove all restrictions on temporary trade. Also, except in the southern Murray–Darling Basin, governments are to immediately remove barriers to permanent trade out of water irrigation areas (up to an annual threshold limit of 4 per cent of the area's total water entitlement), subject to a review by 2009, and move to full open trade by 2014 at the latest. In the southern Murray–Darling Basin, the relevant governments (New South Wales, Victoria and South Australia) are to take all necessary steps to enable exchange rates and/or tagging of water access entitlements by June 2005, and establish an interim annual threshold limit of 4 per cent on permanent trade out of water irrigation areas, with a review in 2009 to consider raising the interim annual limit.

At the time of the 2003 NCP assessment, the MDBC was making progress with several issues relating to interstate trade in water.

For the 2004 NCP assessment, the Council requested that the MDBC report on:

- the pilot project for permanent interstate water trading
- arrangements for extending interstate water trading beyond the pilot project
- its work on reducing barriers to interstate water trade.

References: 1994 CoAG water reform agreement, clause 5; 1999 tripartite meeting; Intergovernmental Agreement on a National Water Initiative

The Murray–Darling Basin represents 14 per cent of Australia's land surface but accounts for around 40 per cent of the gross value of agricultural production. Trading in water entitlements provides a means of maximising returns on the basin's limited water resources.

Water has been traded interstate on a temporary basis in the Murray–Darling Basin since the mid-1990s and on a permanent basis between regions covered by a pilot project since 1998. At the time of the 2003 NCP assessment, the MDBC was progressing with several issues relating to interstate trade in water:

- the pilot project for permanent interstate water trading
- arrangements for the extension of interstate water trading beyond the pilot project
- facilitating interstate water trading by reducing barriers to trade.

Pilot project for permanent interstate water trading

In November 1997 the Murray–Darling Basin Ministerial Council adopted a schedule to the Murray–Darling Basin Agreement (schedule E) to provide the institutional and regulatory framework for the operation of a pilot project for permanent interstate water trade. The schedule establishes agreed trading rules, environmental clearance procedures and salinity requirements for interstate trade. The pilot project is limited to the permanent transfer of high security water entitlements in the Mallee region of South Australia, Victoria and New South Wales (downstream of Nyah).

The total volume of permanent interstate trade under the pilot project, from its commencement in 1998 until the end of May 2004, was around 23 gigalitres, including just under 5 gigalitres in 2003-04. The volume traded is less than 1 per cent of the water applied in the pilot area. Around 75 per cent of permanent interstate trade was from New South Wales and Victoria to South Australia (table 10.1).

Table 10.1: Permanent interstate water transfers under the pilot project, 1998 to 31 May 2004

Interstate water transfers	*Total volume of transfers*	*Net volume of transfers*
	Megalitres	*Megalitres*
From New South Wales to:		
– Victoria	345	–2 695
– South Australia	7 410	7 310
– Total	7 755	4 615
From Victoria to:		
– New South Wales	3 040	2 695
– South Australia	9 946	7 871
– Total	12 986	10 566
From South Australia to:		
– New South Wales	100	–7 310
– Victoria	2 074	–7 871
– Total	2 174	–15 181
Total transfers	22 915	–

Source: MDBC 2004

The pilot project has enabled the establishment and testing of requirements and operational procedures for a cross-jurisdictional market in a limited range of water entitlements. Interstate trade requires transfers between state water entitlement registers and licensing systems. An approval process for interstate trade has been agreed. It covers applications to trade, the notification of all relevant agencies, assessment processes, a common settlement date, licence amendment and registration, as well as the

reconciliation of water accounts and the adjustment of water deliveries, state and valley caps (under the Murray–Darling Basin Ministerial Council cap on diversions), and bulk water charges.

The operation of the pilot project was reviewed in 2000. The Council reported on the review in the 2001 NCP assessment (NCC 2001a). The review identified two key areas requiring improvement:

1. the management of salinity impacts from new irrigation developments resulting from interstate water trade (discussed below under 'environmental controls on trading')
2. the efficiency of administrative procedures between jurisdictions for permanent interstate trades (discussed below under 'processing trades').

Interstate water trading beyond the pilot project

The MDBC has been undertaking work in several areas to enable the extension of interstate water trading beyond the pilot project, including the development of:

- a system of exchange rates to allow trading between regions and between different water entitlements in different states
- adequate environmental controls for trading
- efficient administrative arrangements for processing and approving trades
- a system for accessing state-based registry systems to enable those interested in interstate trading to obtain the information necessary to conduct such trades.

Exchange rates

The MDBC is working on a system of exchange rates for water trade. Exchange rates can be used to allow for the trading of water entitlements in one valley and/or state to entitlements in a different valley and/or state. They can also be used to convert from one entitlement type within a valley or state to another.[2] The application of an exchange rate enables the volume and reliability characteristics of the water entitlement to be converted from those of the seller's location to those of the buyer's location, including accounting for losses incurred in delivering the water. Exchange rates are designed to

[2] The exchange rates are also to be used to calculate the volume of water to be transferred between buying and selling valley water accounts and for adjusting the Murray–Darling Basin Ministerial Council cap between the buying and selling valley and state.

minimise the impacts of water trade on the reliability of access to water for entitlement holders who are not party to the trade, while also ensuring that no additional entitlements are inadvertently created through the trade.

In early 2003 the MDBC finalised background work describing the characteristics (volume, reliability and tenure) of the key water entitlements in the southern Murray–Darling Basin. It subsequently commenced modelling the exchange rates for converting between these entitlements. To assist in this process, the MDBC recruited additional modelling expertise and established a technical group (comprising experts from New South Wales, Victoria, South Australia and the MDBC) to guide the modelling process.

The calculation of exchange rates needs to account for the capacity of the system to deliver the water. It therefore requires the use of computerised hydrological models that represent the physical attributes and operational rules of the river systems on which the trades are undertaken. The MDBC's exchange rate modelling uses existing models of the southern basin (for the Murray, Murrumbidgee, Goulburn and lower Darling rivers). The models are based on 110 years of data, including data on water use, diversions, allocations and demands, by district. The modelling is technically complex and is drawing on expertise in hydrology, river operations and irrigation diversions across the three participating jurisdictions. It involves the adjustment of entitlements and water demand in the selling and buying valleys, transfers between valley water accounts, changes to reserves and the adjustment of entitlement flows to South Australia. Once modelled exchange rates are derived, they are reviewed to ensure they will not result in any breaches of the Murray–Darling Basin Ministerial Council cap. Four different models are to be used in the final determination of the full exchange rate matrix.

A full set of water entitlement reliability criteria has been developed and applied to the modelling. The criteria provide objective measures of water entitlement characteristics that need to be maintained to ensure entitlement holders are not adversely affected by trade.

The MDBC has completed a large number of modelling runs to provide the basis for a first round of potential exchange rates. The modelling results have been extensively reviewed by the technical group and key sensitivity factors have been identified. Further testing of the sensitivity factors is under way, with a view to submitting the results of the modelling to a full commission meeting before the end of 2004.

The MDBC has also considered the potential for developing a system of 'tagged' trading as an alternative to exchange rates in the longer term. Under a regime in which traded water is tagged to the original source of the water ('wholesale tagging'), water would retain the characteristics of its state (and source) of origin. Such a regime would establish entitlements to extract and use water in one state (the state of destination) but with the share of water available for extraction determined by the state of origin.

The MDBC has completed an initial review of the legal and administrative requirements for a possible wholesale tagging system. The review considered several core issues, including granting, enforcing and reviewing entitlements, appeals against decisions, registering entitlement dealings, delivering entitlements and financial matters (such as fees, levies and charges imposed by states and water retailers). In its 2004 NCP annual report, the MDBC advised that the main findings of the review are as follows:

- Because the rights to take water in each state are rights under the relevant Act, almost all parts of each Act are likely to have some bearing on the characteristics of that right (for example, provisions for review and attenuation, enforcement, appeal rights and levels of penalties).

- Existing state legislation is not sufficiently flexible to accommodate the legal and administrative requirements of a tagged system. While the review did not analyse in detail the changes to state legislation that would be required to implement tagged trading, it outlined a preferred model for legislative amendments. The review considered that the least complex approach, from a legal perspective, would be to clearly separate the various elements of the water right and trade only the element that can be physically moved from one state to another — the physical quantity of water to be extracted (or the water share).

- If a tagged trading regime is to be developed, the legislation in each state would need to be complementary and it would be preferable for the required amendments to be made after the states had reached agreement on the operation of the regime. Given that legislative amendments would be needed in three or more jurisdictions, the review indicated that a lengthy lead time would be required. It considered, however, that the achievement of the changes is not an insurmountable hurdle because the substantive elements — primarily the unbundling of entitlements and complementarity between the states — are consistent with recent trends in water policy.

Environmental controls on trading

The framework for considering the environmental impacts of interstate trades under the pilot project is included in schedule E to the Murray–Darling Basin Agreement. The schedule sets out the roles and responsibilities of the participating governments in approving trades. It requires the approval processes for interstate trade (including the environmental approval processes) to be equivalent to those applied to intrastate trades. An attachment to the schedule describes the environmental clearance procedures and requirements that are in place in each jurisdiction for approving trades.

In 2003 the MDBC completed a draft upgrade of the environmental clearance procedures attached to schedule E of the agreement, to account for the legislative and policy changes that have been made by jurisdictions since

2000 (when the procedures were last upgraded). The upgrade process identified additional issues to consider, including:

- the transition to the full separation of land and water, and the resultant emphasis on site-use licensing in some jurisdictions
- the consistency of procedures for assessing and approving the expansion of existing developments and those applied to new developments
- the effect of changes in water use efficiency (when water trades from a lower efficiency use to a higher efficiency use) on the environment and on the amount of water returned to rivers from irrigation diversions via drainage (surface and subsurface)
- measures to manage point of origin environmental impacts that result from the transfer of water away from an area
- the auditing of compliance with licence conditions for new and expanded irrigation developments
- monitoring the cumulative impacts of trade
- the development of best practice guides for specific components of the assessment process.

In its 2004 NCP annual report, the MDBC noted that governments are addressing these issues (see the relevant state chapters). In addition, at the basin scale, the Ministerial Council's Basin Salinity Management Strategy 2001–2015 and other work on the threats to future water resources seek to address the environmental impacts of new development, changes in flow regimes and salinity.

Following further work on the environmental clearance upgrade in a joint session with jurisdictions in July 2004 (which included consideration of the above additional issues), the MDBC expects to submit a final upgrade to the Ministerial Council for approval in late 2004. It anticipates that regular upgrades will be required in response to the ongoing administrative and legislative changes in each state.

The Ministerial Council's Basin Salinity Management Strategy provides the framework for managing salinity in the River Murray. In November 2002 the Ministerial Council adopted a new schedule to the Murray–Darling Basin Agreement (schedule C) to implement the key elements of the strategy. The schedule requires the establishment of salinity registers to record salinity credits and debits for actions taken within each state.

Under schedule C, models for assessing the salinity impact of new irrigation developments must be accredited by the MDBC. Victoria developed the Nyah to Border model, which the MDBC conditionally accredited in 2002. The MDBC funded the development of a rapid assessment tool (known as the Salinity Impact Rapid Assessment Tool or SIMRAT) for the Mallee region.

Development of the assessment tool was overseen by a technical working group (comprising representatives from New South Wales, Victoria, South Australia and the office of the MDBC). The assessment tool can be applied to irrigation developments up to 20 kilometres from the river. It can assess both the short and long term salinity impacts on the river. The MDBC is considering the accreditation of SIMRAT.

Each of the states has established a policy for managing salinity impacts arising from new irrigation developments. Victoria, for example, delineates high and low salinity impact zones under the Nyah to the South Australia Border Salinity Management Plan. Trade is not permitted into the high impact zones. While trade is permitted into the low impact zones, developers are required to purchase salt disposal entitlements and to meet the annual operating costs of those entitlements.

The MDBC advised that South Australia recently audited the salinity impact of new developments on its section of the River Murray. The audit is being independently reviewed. In February 2004 the State Government released a discussion paper for public comment outlining proposals for addressing future salinity impacts. South Australia currently requires developers to agree, before a development proceeds, to deal with the impact when it arises in the future. The discussion paper proposes the establishment of high and low salinity impact zones and a salt interception zone. Development in the zones would be permitted up to the limits of the relevant salinity interception works.

Processing trades

The MDBC coordinates regular joint sessions of approvals and processing staff from each jurisdiction to review and enhance the procedures for interstate trades. Changes to transfer procedures are being trialled to improve the efficiency of the process. In its 2004 NCP annual report, the MDBC noted a range of developments within the states that could enhance the efficiency of the transfer process, including: the separation of water access entitlements from site-use approvals; the establishment of comprehensive, inter-operable registers; and the establishment of advanced electronic systems for the management of approvals, and the recording and transfer of data. It also noted the importance of maintaining adequate resources in state approval and licensing areas to ensure the timely processing of trades.

Licence/entitlement registration and accounting information is held in different forms at individual authority, state and River Murray Water levels. The MDBC is working on the requirements for an interactive, electronic system to manage the transfer of data and provide robust water accounting for interstate and inter-valley trades (see below).

Access to state based registry systems

Interstate water trade requires transfers between entitlement information systems within states and a reconciliation of registration information against interstate water accounts, and bulk water charging and billing systems. It results in the transfer of part of the water shares of one state to another state (and affects Murray–Darling Basin Ministerial Council caps at the state and valley levels). Interstate trade may also have implications for River Murray Water and state water authority operations, as well as for the states' financial contributions to River Murray Water.

The Murray–Darling Basin Agreement (schedule E) requires the MDBC to establish and maintain a register of permanent interstate transfers under the pilot project for interstate water trade. It also establishes the associated procedures for amending state and valley water accounts and caps. The MDBC's existing system is paper based, which has been adequate for the number of permanent interstate trades occurring under the pilot project. The MDBC has established a regular reconciliation of registration information with each participating irrigation authority and licensing agency. It has also implemented a monthly accounting and reconciliation process for the much larger number of interstate and inter-valley temporary trades.

In its 2004 NCP annual report, the MDBC identified the following as key issues for interstate trade with respect to the operation of entitlement registers and water accounts, particularly given the different forms and stages of development of registers in each of the Murray–Darling Basin jurisdictions (see the relevant state chapters):

- Robust and concurrent processes need to be established for transferring entitlements from one register to another, having regard to the different forms and requirements of the registration systems within states and accounting for any relevant exchange rates. A concurrent effective settlement date across registry systems is required for each trade, to ensure trades occur concurrently and are completed satisfactorily, and to maintain accurate transfer information.

- The transfer of registration and water accounting data needs to be accurate and timely. River Murray Water and the state water authorities rely on the accuracy of registration systems and the robustness of transfer and data exchange procedures (to maintain accurate water accounts, preserve operational system integrity, meet the requirements of the Murray–Darling Basin Agreement with regard to water sharing and delivery, and maintain and audit state and valley caps on water diversions).

- Entitlement registers need to be reconciled to maintain the accuracy of water accounting and billing systems, as well as to provide reliable data for the management of operational systems at local, district and regional authority levels.

- Accurate information is required for evaluating and reporting on the outcomes and impacts of interstate trade by individual jurisdictions and the MDBC. The MDBC's reporting obligations are described in schedule E to the Murray–Darling Basin Agreement. In addition, schedule C to the agreement (which covers the management of the salinity impacts of interstate trade) requires accurate information for the allocation of salinity credits and debits and their recording on salinity registers.

The MDBC is working on the requirements for a fully electronic, interactive system for data transfer and water accounting. It indicated that, to be effective, the system will need to capture all relevant water and entitlement movements, within quality assured and reviewed procedures. The MDBC has prepared a comprehensive specification for the system, in consultation with relevant jurisdictions. Box 10.1 briefly describes the requirements for the system. The system is to be capable of staged implementation, building on specific modules. If the commission approves further development, the next phase will be to build and test a prototype. The implementation timetable for the system would depend on the timing of new and revised state registers and the establishment of links between registers (and state and water authority accounting systems). The modular design proposed would enable the system to be used initially to enhance transfers between registries and water accounts for the existing small number of permanent interstate trades, with subsequent extension to cover inter-valley trades and temporary trades (and potentially trade in environmental entitlements).

Box 10.1: Requirements for an electronic data transfer and water accounting system for interstate water trade

Characteristics

- Web based
- Uses accounting software, double entry and transaction based
- Can work with any trading rules, exchange rates or retail tagging systems
- Transfers can occur only if registers and accounts are reconciled
- Each agency has access to 'its' components of the system
- Consistent with existing legislation in each state.

Prior work required in jurisdictions to support system function

- Establish the system to deal with entitlements, allocations, water use, and trading of entitlements and allocations (registers would not contain information on rights to channel capacity or site use approvals, which are a matter for the buyer and the buyer's delivery authority, however, these could be added to the system later)
- Separation of the accounting of annual water allocations from water entitlements to be comprehensive.

(continued)

Box 10.1 continued

Further work required by participating jurisdictions

- Separate the process relating to any approvals associated with channel delivery capacity from entitlements
- Separate the process for site use approvals from entitlements
- Separate annual water allocations from water entitlements — seller keeps water allocations made before the sale of entitlements, while buyer receives water allocations after that date
- Specify individual entitlements well enough to allow them to participate in trade (even if legally they may be a share of a formal irrigation corporation/trust entitlement).

Source: MDBC 2004

Reducing barriers to interstate water trade

The MDBC has undertaken and commissioned work on barriers to interstate water trade, in consultation with governments. Recent work focused on two issues: (1) alternatives to barriers to trade out of irrigation areas and (2) the impact (on interstate trade) of differential financial arrangements for bulk water between the states.

Trade out of irrigation areas

A consultancy undertaken for the MDBC in 2002 found that barriers to water trade out of irrigation areas are typically erected by the boards of irrigation corporations and trusts in response to fears of 'stranded assets' (Hassall and Associates 2002).[3] Stranded assets can arise if water entitlements are traded out of an irrigation area, leaving fewer irrigators to meet the fixed costs of the infrastructure that will be supplying a lower volume of water. The study noted other rationales provided for the restrictions, particularly adverse environmental and community impacts and the preservation of water entitlements for future development. It identified several alternatives to restrictions on trade out of irrigation areas:

- alternative pricing strategies to account for stranded assets, including exit fees (that is, charges levied on irrigators selling their entitlement out of the area to recoup the fixed costs of infrastructure) or long term contracts (under which irrigators would agree to meet the fixed costs even if they sell their entitlement)
- as an interim strategy, adopting a more liberal but gradualist policy in New South Wales and South Australia, similar to that in Victoria (such as encouraging the irrigation corporations and trusts to adopt an annual

[3] The restrictions applying in New South Wales, Victoria and South Australia are discussed in sections 2.4, 3.4 and 6.4 respectively.

2 per cent limit on permanent trade out of an area for a period of five years, with a review after this period).

The MDBC commissioned a further study on barriers to trade out of irrigation districts, which was completed in September 2003. While the study (by Scrivco and Hassall and Associates 2003) is not for public release, the MDBC summarised the main findings in its 2004 NCP annual report:

- Stranded assets should be addressed by implementing access fees (that is, fixed charges for access to the irrigation infrastructure). Irrigators selling their entitlement out of their area should have the option to convert the future (ongoing) access fees to a once-off exit fee. This approach will enable irrigation supply businesses (corporations and trusts) to participate in the permanent water trading market while maintaining their financial viability, and is consistent with CoAG cost recovery principles.

- Access and exit fees should be calculated using a consistent method across the basin. Access fees should be based on the fixed costs of the infrastructure.[4] Exit fees should be calculated using an appropriate discount rate.

- The approach should not be implemented in isolation from other strategies, particularly in irrigation areas where economic and/or environmental conditions are reducing the viability of the irrigation supply businesses. Other strategies include:

  – a structured process involving a formal review once a given volume of water has traded out of a district or area, or after a set period of time

  – giving priority to the preparation of asset development, replacement and retirement strategies for each irrigation area[5]

  – water sales, potentially combined with appropriate structural adjustment support, for areas in which maintenance of the irrigation infrastructure is not financially viable (MDBC 2004).

The MDBC is undertaking further work on access and exit fees during 2004, in consultation with the irrigation supply businesses in New South Wales, Victoria and South Australia. It is aiming to establish basic principles for the

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[4] The MDBC noted that existing fixed charges mostly do not reflect infrastructure costs. While it considers that across-the-board changes to tariff structures are not likely in the near future, it indicated that Victoria's recent proposal to unbundle water entitlements (see sections 3.2 and 3.4) and discussions occurring as a result of the MDBC's work may see further progress on pricing (MDBC 2004).

[5] The MDBC indicated that the conversion of agricultural land to urban uses may require different treatment in areas where encroachment is significant. In these cases, there is no requirement for any review of service capacity in the future, but there is still a need to consider third party impacts on the remaining irrigators. It noted that the option of charging a permanent excision fee has been raised in some irrigation areas.

fair application of access and exit fees (including circumstances in which the fees should not be applied) and to identify detailed implementation requirements.

Differential financial arrangements for bulk water

The MDBC also commissioned a consultancy on bulk water charges, which was completed in 2003 (Scrivco and Hassall and Associates 2003). The consultancy found that the expansion of permanent interstate trade is likely to be impeded by differential charging arrangements for bulk water between the states. South Australia does not pass on to irrigators River Murray Water charges for bulk water (see section 6.1). While New South Wales and Victoria pass on these costs, different charging arrangements apply: charges are part fixed and part variable in New South Wales (see section 2.1) and mostly fixed in Victoria (see section 3.1). In addition, under the pilot interstate trading project, the financial contributions from the states to meet River Murray Water's costs are not adjusted for permanent interstate transfers. As a result, when water is traded under the pilot project into South Australia, for example, the source state (the wholesalers and the remaining retail water users) in effect pays the bulk water charge. The study also identified problems that would arise from the extension of permanent interstate trade to tributary systems not operated by River Murray Water.[6]

Based on an analysis of various options and permanent interstate trading scenarios, and consultations with the states, the study recommended adoption of a set of principles including the following:

- When permanent interstate trades are approved, the financial responsibility for bulk water charges should transfer to the government or wholesaler in the destination state.

- The financial contributions from each state to meet River Murray Water's costs should be adjusted annually to reflect entitlement balances as at 1 July.

- A wholesaler in the source state that has wholesale assets on a tributary system should charge River Murray Water the same price for bulk water for permanent interstate transfers that it charges entitlement holders in the source state. These bulk water charges should include the cost of wholesale assets on the tributary (and state resource management costs where appropriate). River Murray Water should include these charges in the calculation of the costs that it passes onto the states.

[6] Under existing financial arrangements, for a permanent interstate trade from Victoria to South Australia, for example, there would be no payment from South Australia to meet the bulk water costs of the source wholesaler in Victoria.

- Permanent interstate trades should not be approved unless the destination wholesaler accepts financial responsibility for the bulk water charges.

- The wholesalers within each state should pass on the bulk water charges to entitlement holders (although it would be up to each state to decide whether the charges are passed on).

- The seller should pay for the fixed bulk water charges for temporary trades.

- The source wholesaler and the seller should pay for the fixed bulk water charges for permanent trades in the year of trade. In subsequent years, fixed charges should be met by the destination wholesaler and the buyer (assuming these costs are passed on).

- The buyer should pay for the variable bulk water charges for permanent trades.

The study indicated that the proposed principles are unlikely to provide a perfect solution in all circumstances and may require further refinement. The consultants considered, however, that the principles would assist in overcoming the impediment to permanent interstate trade posed by the existing arrangements. The study recommended that the principles not be applied retrospectively. The commission adopted the principles at its meeting in October 2003.

Discussion and assessment

The MDBC's pilot project has enabled permanent interstate water trading among New South Wales, Victoria and South Australia since 1998. It has also enabled the development of trading rules, environmental clearance procedures and salinity requirements to minimise the impacts of interstate trade on the environment and other water entitlement holders. The pilot project is limited, however, to high security water entitlements in the Mallee region downstream of Nyah. While around 23 gigalitres of water have been permanently traded since the pilot project's commencement, this volume is less than 1 per cent of the water applied in the pilot area.

The MDBC has continued to undertake and coordinate, in consultation with governments, significant further work essential to the expansion of permanent interstate water trade in the Murray–Darling Basin, including on: exchange rates to allow for the trading of water entitlements in one valley and/or state to entitlements in a different valley and/or state, as well as an alternative system of trading 'tagged' entitlements; environmental controls (including to minimise salinity impacts); and the administrative arrangements and registry systems for processing, approving and accounting for trades. It has also commissioned studies on barriers to interstate water trade, particularly on barriers to trade out of irrigation areas and the impact

(on interstate trade) of differential financial arrangements for bulk water between the states.

Under the 1994 CoAG water reform agreement, trading arrangements were to be substantially implemented by 2005 for the water sources covered by governments' 1999 implementation programs (see the relevant state chapters). Partly based on the experience with the pilot project and the MDBC's research and technical work (including on barriers to trade). governments made further commitments on interstate trade under the National Water Initiative. This should enable the 1994 CoAG target to be achieved in the southern Murray–Darling Basin. The initiative extends to 2007 the timeframe for establishing institutional and regulatory arrangements that facilitate interstate trade in other areas.

Under the National Water Initiative, signatory governments agreed to remove barriers to temporary trade immediately. In the southern Murray–Darling Basin, the Australian Government and the governments of New South Wales, Victoria and South Australia committed to take all necessary steps to enable the use of exchange rates and/or tagging of water access entitlements by June 2005. In addition, they committed to establish an interim annual threshold limit of 4 per cent (of the area's total water entitlements) on permanent trade out of water irrigation areas, and undertake a review in 2009 to consider raising the interim annual limit. Outside the southern Murray–Darling Basin, signatory governments committed to remove barriers to permanent trade out of water irrigation areas up to an annual threshold of 4 per cent by June 2005, subject to a review by 2009, and move to full open trade by 2014 at the latest.