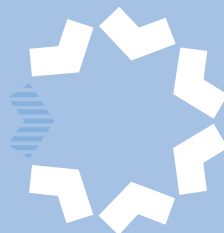


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Assessment of governments' progress
in implementing the
National Competition Policy
and related reforms: 2004



Volume two:
Water

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Inquiries or comments on this report should be directed to:

Media and Communications Manager
National Competition Council
Level 9
128 Exhibition Street
MELBOURNE VIC 3000

Ph: (03) 9285 7474
Fax: (03) 9285 7477
Email: info@ncc.gov.au

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The National Competition Council

The National Competition Council was established on 6 November 1995 by the *Competition Policy Reform Act 1995* following agreement by the Australian Government and state and territory governments.

It is a federal statutory authority which functions as an independent advisory body for all governments on the implementation of the National Competition Policy reforms. The Council's aim is to 'improve the well being of all Australians through growth, innovation and rising productivity, and by promoting competition that is in the public interest'.

Information on the National Competition Council, its publications and its current work program can be found on the internet at www.ncc.gov.au or by contacting NCC Communications on (03) 9285 7474.

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Abbreviations

ACT	Australian Capital Territory
ACTEW	Australian Capital Territory Electricity and Water Corporation
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
CoAG	Council of Australian Governments
CRCFE	Cooperative Research Centre for Freshwater Ecology
CSO	Community service obligation
DEUS	Department of Energy, Utilities and Sustainability
DIPNR	Department of Infrastructure, Planning and Natural Resources
EPA	Environmental Protection Agency
ERA	Economic Regulation Authority (Western Australia)
ESCOSA	Essential Services Commission of South Australia
GL	Gigalitre
GWMA	Groundwater management area (New South Wales)
IFIM	Instream flow incremental method
IPART	Independent Pricing and Regulatory Tribunal (New South Wales)
IQQM	Integrated Quantity Quality Model
LWU	Local government water utility
MDBC	Murray–Darling Basin Commission
MFAT	Murray Flow Assessment Tool

ML	Megalitre
NCC	National Competition Council
NCP	National Competition Policy
NWQMS	National Water Quality Management Strategy
REALM	Resource Allocation Model
SIMRAT	Salinity Impact Rapid Assessment Tool
SWQ6	State Water Quality series document 6
TEDI	Tool for Estimating Dam Impacts
WACC	Weighted average cost of capital
WAMP	Water allocation and management plan
WRC	Water and Rivers Commission (Western Australia)

Findings and recommendations

In 1994, the Council of Australian Governments (CoAG) agreed to a comprehensive water reform strategic framework, with the objective of creating an efficient and sustainable water industry. Key reforms are pricing to achieve efficient water use and service provision, clarifying water property rights, allocating water to the environment, facilitating water trading, rigorously appraising new rural water projects, reforming water industry institutions, and consulting water industry stakeholders and the community.

CoAG incorporated the agreed 1994 framework under the 1995 National Competition Policy (NCP) and asked the National Competition Council to assess governments' implementation progress. Under the Agreement to Implement the National Competition Policy and Related Reforms, satisfactory implementation of the water reform program is a condition for state and territory governments to receive competition payments.

Because CoAG expected water reform to involve extensive change, it considered that implementation should occur over five to seven years, with the program essentially complete by 2001. In 2001, however, CoAG extended to 2005 the time to 'substantially complete' the allocation and trading arrangements in rivers and groundwater resources. CoAG senior officials prioritised the reforms over different NCP assessments, scheduling rural water pricing, interstate water trading and environmental allocations for progress assessment in 2004.

As well as the scheduled 2004 matters, the Council considered two standing items: governments' appraisal of new water infrastructure (for jurisdictions in which there are relevant projects) and their work on public consultation and education. In addition, the Council considered several matters that it had found in the 2003 NCP assessment not to have been sufficiently advanced, including intrastate trading (in all jurisdictions), water legislation review and reform (in Victoria, Western Australia and South Australia), the commencement of the water access licence and registry systems in New South Wales, the conversion of Queensland's existing water licences to water allocations, Western Australia's implementation of the National Water Quality Management Strategy, and action by Western Australia and South Australia to address urban water and wastewater pricing obligations. Arising from the 2003 NCP assessment, the Australian Treasurer suspended 10 per cent of Western Australia's 2003-04 competition payments, pending the state satisfactorily addressing its urban water and wastewater pricing obligations.

In June 2004, the Australian Government and all state and territory governments except Western Australia and Tasmania agreed to the National Water Initiative. Under this initiative signatory governments committed to complete the 1994 water reform program and to implement additional reforms. Regarding the scheduled 2004 assessment matters, signatory governments committed under the National Water Initiative to:

1. facilitate intra- and interstate trade, including action by June 2005 to enable permanent trade out of water irrigation districts in the southern Murray–Darling Basin up to an annual (interim) threshold of 4 per cent of the total water entitlement of the district
2. substantially complete by 2005 the allocation of appropriate water to the environment in rivers and groundwater systems that are overallocated or deemed to be stressed, and that were identified on their 1999 NCP implementation programs.

The Council has found that governments, with two exceptions, have achieved satisfactory progress for 2004 in implementing their NCP water reform obligations. The exceptions are New South Wales and Western Australia. The Council has found that New South Wales has not demonstrated that its water sharing plans allocate appropriate water to the environment in stressed and overallocated systems (while recognising the existing rights of other water users) in accord with its obligations under the 1994 water reform agreement. The Council has found that Western Australia has not completed its program of review and reform of water industry legislation.

The Council's findings on each state and territory government's water reform performance and its recommendations on 2004-05 competition payments are summarised below. Because responsibility for water rests with the states and territories, the water reform performance of the Australian Government is not assessed under the NCP.

New South Wales

- *Rural pricing.* Rural cost recovery performance is improving, although State Water is yet to recover lower bound costs across all its services, particularly those provided from unregulated rivers and groundwater systems. New South Wales intends to apply a new price path from 1 July 2005 that will continue to move State Water services towards the lower bound of cost recovery. Water prices will also recover natural resource management costs incurred by the Department of Infrastructure, Planning and Natural Resources and the Murray–Darling Basin Commission that are attributable to water users in New South Wales. Community service obligations (CSOs) provided to State Water will be defined, costed and transparently reported in published financial statements.

All regulated river systems now apply two-part tariffs. Charges for services in groundwater management areas are also set on a two-part tariff basis where water use is metered. All charges for services in unregulated river water sharing plan areas will be set on a two-part tariff basis within five years. The balance between the charges for access and use in the regulated systems will be considered in developing the new price path.

The Council considers that New South Wales has achieved satisfactory progress for 2004 against its CoAG rural water pricing commitments.

- *Water access entitlements and registry.* New South Wales introduced perpetual water access licences (separate from land title and specified as volumetric shares), and a water access licence register on 1 July 2004. New South Wales' arrangements accord with its commitments under the 1994 water reform agreement and under the National Water Initiative.
- *Allocations to the environment.* The 1994 water reform agreement provided until 2001 for governments to address the obligation to allocate appropriate water to the environment in the stressed and overallocated rivers that governments identified in 1999. It provides until 2005 for governments to substantially complete allocations in all rivers and groundwater systems identified in 1999. The governments that signed the National Water Initiative (including the New South Wales Government) confirmed their commitment to addressing overallocation and overuse in accord with their commitments under the NCP.

New South Wales has gazetted 36 water sharing plans that allocate water for environmental purposes in the state's major rivers and groundwater systems. The Council has looked for New South Wales to show, consistent with its obligation under the 1994 water reform agreement and the National Water Initiative, that it has set extraction limits and environmental allocations that meet the CoAG test of using the best available science, and that departures from the science based environmental allocations to recognise the existing rights of other water users are supported by robust socioeconomic analysis. The Council considers that such departures, if supported by robust socioeconomic evidence, are consistent with obligations under the 1994 CoAG water reform agreement and the National Water Initiative.

Although the Council has raised this matter with New South Wales in each NCP assessment since 2002, New South Wales has not provided the information to show its water sharing plans allocate appropriate water to the environment. New South Wales also has not responded to the Council's invitation to verify the Council's understanding of the effects of the environmental allocation arrangements in a sample of 10 water sharing plans considered in the deferred 2003 NCP water reform assessment. Without robust information to support the environmental allocation arrangements, the Council has noted that some plans permit extractions at levels that may exacerbate existing environmental stresses.

The paucity of (scientific and socioeconomic) evidence on the public record means that the Council cannot conclude that the environmental allocations in the gazetted plans go as far as possible to meeting the water regimes necessary to sustain ecological values while recognising the existing rights of other water users. With New South Wales proposing to review its approach in only a few of its 36 gazetted plans, the Council considers that New South Wales has not demonstrated that it has satisfactorily addressed its obligation to provide appropriate water to the environment in stressed and overallocated rivers and groundwater systems.

The Council regards the obligation to make appropriate allocations to the environment as a significant aspect of the CoAG water reform program, as expressed in both the 1994 water reform agreement and the 2004 National Water Initiative. Acknowledging that New South Wales has deferred some of its plans and that substantial completion of allocations is due in 2005, the Council recommends that 10 per cent of the state's 2004-05 competition payments be suspended. The suspension is recoverable if New South Wales provides (1) robust information to support its current arrangements or (2) environmental allocations that are within a range of outcomes that could reasonably be reached on consideration of the best available science and robust socioeconomic evidence. The 2005 target provides a final opportunity for New South Wales to address this matter.

- *Water trading.* For both intra- and interstate trade, New South Wales committed under the 1994 water reform agreement to facilitate water trading where this is socially, physically and ecologically sustainable. Under the National Water Initiative, New South Wales committed to facilitate trading where water systems are physically shared or hydrologic connections and water supply considerations permit trading. It committed to immediately remove any barriers to temporary trade and barriers to permanent trade out of water irrigation areas (up to an interim limit of 4 per cent per year of the total water entitlement of the water irrigation area), subject to a review by 2009, and to move to full and open trade no later than 2014. In the southern Murray–Darling Basin, New South Wales (with the Australian Government, Victoria and South Australia) committed to enable exchange rates and/or tagging of water access entitlements by June 2005, and to establish an annual 4 per cent interim threshold limit on permanent trade out of water irrigation districts. There is to be a review in 2009, to consider raising the interim limit. New South Wales will also need to ensure the trading rules in its water sharing (and subsequent) plans facilitate trading, consistent with the requirements of the National Water Initiative.

Given the state's commitments under the National Water Initiative, and the extended timeframes applying to the implementation of trading arrangements outside the southern Murray–Darling Basin, the Council considers that New South Wales has made satisfactory progress for 2004 against its CoAG water trading obligations.

-
- *Appraisal of new water infrastructure.* There were no new water infrastructure projects in New South Wales for which the obligations on environmental and economic appraisal were relevant.
 - *Public education and consultation.* There is limited public accountability in New South Wales regarding the allocation of water to the environment. While the government undertook considerable public consultation when preparing its water sharing plans, it has provided little public information on the manner in which those who developed the plans have accounted for environmental and socioeconomic evidence. There is also little information on the environmental outcomes that New South Wales expects the plans to achieve. The state's new Natural Resources Commission will go only part of the way to addressing the gaps in New South Wales' water planning process, given that the commission's role appears to be limited to reviewing already gazetted plans, and then only towards the end of each plan's life.

Victoria

- *Rural pricing.* Victoria's rural water authorities set prices to recover all lower bound costs in accord with the CoAG pricing principles. They report CSOs and pension concessions in their annual reports. Victoria uses normalised revenues based on 10-year averages to set charges, ensuring the ongoing commercial viability of the state's water businesses.

Victoria extended the jurisdiction of the Essential Services Commission to the water industry, including rural water authorities, with effect from 1 January 2004. The government has prescribed full cost recovery principles in the Water Industry Regulatory Order. The prices of regulated services provided by Victoria's rural water authorities reflect the principle of consumption based pricing.

While Victoria sets fees to fully recover the cost of all activities associated with water licensing, the water authorities do not separately report their natural resource management costs. In future, Victoria will require water authorities to contribute to sustainable water management and address adverse impacts on the environment associated with the use of water. This requirement is likely to be an important step towards ensuring water prices transparently reflect appropriate natural resource management costs.

The Council considers that Victoria has achieved satisfactory progress for 2004 against its CoAG rural water pricing obligations.

- *Water access entitlements.* Victoria has established a system of water entitlements separated from land title (although only land owners can hold entitlements) and specified in volumetric terms. It issues bulk entitlements in perpetuity and water licences for 15 years with a

presumption of renewal. The Department of Sustainability and Environment and the rural water authorities maintain publicly accessible registers of bulk entitlements and water licences.

Under the changes announced by Victoria in its 2004 White Paper on water, all water entitlements will be specified as shares of the consumptive pool and granted unlimited tenure. Victoria will also establish a single, publicly accessible, web based register covering all water entitlements in the state and incorporating third party interests. Under the National Water Initiative timetable, Victoria will need to implement its new arrangements by the end of 2006.

Once the White Paper changes are implemented, non-water users (or non-land owners) will be able to hold water licences and entitlements, but only up to a limit of 10 per cent of the entitlements in each supply system. Because the water licences and entitlements are separate from land title, removal of this remaining link with land is arguably not required under the water entitlement provisions of the 1994 CoAG water reform agreement and the National Water Initiative. (The restriction may, however, constrain water trading — see below.)

The Council considers that Victoria has achieved satisfactory progress for 2004 against its CoAG water entitlements obligations.

- *Allocations to the environment.* Victoria has completed the bulk entitlement conversion process for 19 of its 25 water supply systems, and flow rehabilitation plans for five of the 11 stressed and overallocated river systems covered by its 1999 implementation program. It is advanced in developing plans for the other six stressed and overallocated rivers, and management arrangements for the unregulated rivers and creeks and groundwater protection areas covered by its implementation program. In the White Paper, Victoria identified several other stressed or overallocated rivers and set a timetable for developing management arrangements in these systems.

Victoria uses rigorous, systematic and transparent processes for determining the volume of water available to the environment in all its rivers and groundwater systems. Its flow rehabilitation plans for stressed and overallocated systems involve assessment by an independent Technical Audit Panel of the supporting science. There is robust, transparent socioeconomic evidence to support environmental allocation outcomes that depart from those recommended by the science. The technical assessment documents and draft and final plans are all publicly available, and monitoring reports will be publicly released. The advisory committees that develop the management arrangements include representatives of all major stakeholder groups.

The Council considers that Victoria has achieved satisfactory progress for 2004 against its CoAG environmental water allocation obligations.

-
- *Water trading.* In its White Paper, Victoria announced the removal or easing of several constraints on water trading that the Council previously identified as likely to be inconsistent with the CoAG water trading obligations:
 - Non-water users (or non-land owners) will be able to hold up to 10 per cent of the entitlements in each system.
 - When water entitlements are unbundled and delivery access charges are introduced, the annual 2 per cent rule on permanent trade out of irrigation districts will be removed.
 - The differential return on assets incorporated in the price charged for bulk water supplied by rural water authorities to regional urban customers and irrigators will be removed by 1 July 2005.

Other changes announced in the White Paper will also facilitate water trading, including:

- the unbundling of water entitlements into a water share, a share of delivery capacity and a licence to use water on a site
- the introduction of a new lower reliability, tradable water entitlement, replacing sales water
- domestic and stock rights in irrigation districts will become permanently tradable
- the potential stranding of irrigation scheme assets, caused by water trading out of irrigation districts, will be addressed by the introduction (from July 2005) of charges for shares of delivery capacity (tied to land).

While noting Victoria's advice that the 10 per cent limit on water entitlements able to be held by non-land owners is unlikely to be reached in the near future, the Council considers that the remaining link with land conflicts with Victoria's commitment under the National Water Initiative to facilitate the operation of efficient water markets and opportunities for trading within and between states.

For the unregulated rivers, Victoria has maintained the generic trading rules that:

- for systems north of the Great Dividing Range, prohibit trade upstream and impose a 20 per cent reduction on trade downstream (unless under a winter fill licence)
- for systems across the state, limit downstream trade from an unregulated system to a regulated system to the amount of upstream trade.

The Council accepts, for the most part, that the generic rules offer an appropriate means of managing trade in the (less significant) unregulated

systems. The trading rules in the completed stream flow and groundwater management plans are generally designed to safeguard the health of the river or groundwater system, and to minimise any adverse effects of trade on other water users. The generic 20 per cent reduction imposed on entitlements traded downstream north of the Great Dividing Range (unless under a winter fill licence), along with the comparable rules in the stream flow management plans, is similar to the reduction factors that apply to traded entitlements in some regions interstate. Such measures are a less direct influence on water use and are likely to provide a disincentive to trade.

In relation to interstate trade, Victoria announced in the White Paper that it will permit, when water entitlements are unbundled, permanent trade to another state only when water entitlements in that state (including in irrigation districts) can move to Victoria as freely as Victoria's can move there. Victoria also maintains a late season ban on temporary transfers into New South Wales as a means of preventing trade distortions resulting from the divergent carryover policies in the two states.

For both intra- and interstate trade, Victoria committed under the National Water Initiative to facilitate trading where water systems are physically shared or hydrologic connections and water supply considerations permit trading. It committed to immediately remove any barriers to temporary trade. Along with other governments in the southern Murray–Darling Basin, it also committed to enable exchange rates and/or tagging of water access entitlements by June 2005, and to establish an annual 4 per cent interim threshold limit on permanent trade out of water irrigation districts. There is to be a review in 2009, to consider raising the interim limit.

Given the commitments made by Victoria in its White Paper and under the National Water Initiative, the Council considers that Victoria has achieved satisfactory progress for 2004 against its CoAG water trading obligations.

- *Appraisal of new water infrastructure.* There were no new water infrastructure projects in Victoria for which the obligations on environmental and economic appraisal were relevant.
- *Public education and consultation.* Victoria has consulted significantly on water reform matters. The preparation of the White Paper on water involved a comprehensive investigation of the water management issues facing the state. In April 2003, the Victorian Minister for Water delivered a 'Ministerial Statement on Water' setting out the government's vision for improving the management of the state's water resources. Victoria then released a Green Paper for discussion, which outlined over 80 proposals for improving water management. The government conducted an extensive discussion process, holding information sessions across the state and receiving over 670 submissions from water authorities, community organisations, industry groups and individuals. An expert advisory task force analysed the submissions and advised the government. Victoria has

indicated that the public feedback and advice significantly shaped the direction and detail of the water management package outlined in its White Paper.

- *Remaining 2003 matters — legislation review and reform.* Victoria is yet to implement all recommendations from its 2001 water industry legislation review, partly because it aligned this work with its 2004 White Paper review of the water industry. To fully address its NCP obligations, Victoria needs to complete its response to the review recommendations, including enacting any necessary legislation.
- *Remaining 2003 matters — institutional reform.* The Essential Services Commission became the economic regulator of the Victorian water industry on 1 January 2004. Victoria's Water Industry Regulatory Order vests power in the commission to regulate prices, service standards and market conduct of the state's water and wastewater businesses, and to report publicly on these matters. The commission's first price determination will take effect on 1 July 2005. Victoria has thus addressed its CoAG institutional structure obligations.

Queensland

- *Rural pricing.* Queensland's rural water schemes have moved substantially towards achieving the lower bound of cost recovery in recent years as a result of their application of the October 2000 water price path. Whereas Queensland estimated that 53 per cent of SunWater's nominal allocations of rural water in 2000-01 were achieving the lower bound of cost recovery, it estimated that 97 per cent of nominal allocations now achieve, or are on price paths to achieve, lower bound costs. Queensland intends to implement new price paths by July 2005 or shortly thereafter that will recover lower bound costs wherever possible, and consider the potential for achieving a return on assets. Queensland will support schemes that are yet to recover lower bound costs via separately funded and transparent CSOs. All SunWater water supply charges reflect the principle of consumption based pricing.

Queensland's review of the value of water considered the scarcity value of water, externalities and (transparent) water resource management costs for SunWater rural water pricing arrangements. Queensland has undertaken to determine its future approach to water charges — including the transparent treatment of environmental externalities — based on the findings of this review.

Queensland has begun to introduce charging arrangements that more appropriately reflect the costs of licensing and water resource management. It intends to investigate water licensing and resource management costs, and to better reflect these costs in a new water charging policy.

The Council considers that Queensland has achieved satisfactory progress for 2004 against its CoAG rural water pricing obligations.

- *Water access entitlements.* Queensland has legislated for a system of water entitlements separated from land title, specified in volumetric terms for the 10-year life of the relevant water resource plan. It has also established a water entitlements register, which records third party interests.

Water entitlements in each region will not be separated from land titles and will not be defined in terms of available volumes until the relevant resource operations plan is complete. By the end of 2005, Queensland expects to complete 13 of the 19 resource operations plans covered by its 1999 implementation program. Of the six remaining plans, three cover regions that include significant water sources for agricultural and/or urban and industrial uses (specifically, the Logan–Albert, Mary and Moreton plans, which will not be completed until late 2007 or 2008). In addition, Queensland is proposing amendments to several plans after 2005 to include groundwater.

- *Allocations to the environment.* Queensland has completed 11 of the 20 water resource plans and three of the 19 resource operations plans for the river systems covered by its 1999 implementation program. By the end of 2005, it expects to have completed 17 water resource plans and 13 resource operations plans. Three water resource plans and six resource operations plans will not be finished by 2005.

Queensland established an independent scientific review to assess the science underpinning the assessment of the health of the Condamine–Balonne Basin. It committed to provide flow for four ecological assets in the basin (the Narran Lakes, the lower Balonne River, the Culgoa River floodplain and the Darling River) in accord with the review recommendations. Despite this, the water resource plan for the basin includes a wetting regime for the Narran Lakes only, and the flow management rules do not explicitly address the other three ecological assets.

The Council acknowledges, however, the view of the independent scientific review that the dominant consideration should be to ensure the Narran Lakes receive appropriate flows to maintain the vegetation and bird communities. The Council also notes that the independent scientific review considered that the plan for the Condamine and Balonne system provides a reasonable interim solution until further information is available from the research currently underway on the flow requirements of the Narran Lakes and Culgoa floodplain. Queensland has committed to review the water resource plan after five years and incorporate groundwater during the plan’s 10-year life.

The allocation arrangements in the water resource plans for the Fitzroy and Boyne basins are based on robust and transparent assessments of economic and social interests, and the ecological impacts of water use in the basins. Both plans allow for an increase in development and associated

water extraction. While the available information does not establish that allocation limits for the two basins will provide long term sustainability, the *Water Act 2000* provides some safeguards. Under the Act, the Queensland Minister for Natural Resources and the Minister for Mines must report annually on monitoring outcomes for each water resource plan. The Minister must amend a plan and the associated resource operations plan if the monitoring results indicate that the environmental flow objectives are not appropriate or are not being met.

Queensland's water planning processes are transparent. The Department of Natural Resources and Mines publishes (including via the Internet) relevant material, including public notices, media releases, submissions, information and technical papers and draft and final plans. In the case of the Condamine–Balonne, Queensland published a consultation report, which summarises the views expressed at meetings and in submissions. It did not release the submissions on the draft water resource plan, although these are available via requests under the *Freedom of Information Act 1992*.

The Council considers that Queensland has achieved satisfactory progress for 2004 against its CoAG environmental water allocation obligations.

- *Water trading.* Queensland's arrangements to enable permanent intrastate trade in water allocations are in the early stages of implementation. Outside the trading trial in the Mareeba–Dimbulah and Mary River schemes, resource operations plans are required to enable permanent trading. There is, however, no restriction on the number of consecutive periods in which water allocations can be temporarily traded. Permanent interstate trade involving Queensland depends on the state completing the resource operations plans for the cross-border basins and the administrative arrangements with the other Murray–Darling Basin states.

The National Water Initiative extends to 2007 the timeframe for establishing institutional and regulatory arrangements that facilitate intra- and interstate trade. The trading rules in Queensland's completed resource operations plans appear to reflect environmental and physical constraints, in accord with the state's water trading obligations. By the end of 2007, Queensland expects to have completed 17 of the 19 resource operations plans covered by its 1999 implementation program (although groundwater may still need to be included in some cases).

Noting the National Water Initiative commitments on trading, and the state's expected progress with water planning by 2007, the Council considers that Queensland has achieved satisfactory progress for 2004 against its CoAG water trading obligations.

- *Appraisal of new water infrastructure.* In the 2003 NCP assessment, the Council noted evidence from economic studies and ecological assessments that the Burnett Water Infrastructure Project (except for the raising of the Ned Churchward Weir, for which the environmental processes were still to

be completed) is likely to be economically viable and ecologically sustainable. The Council concluded that Queensland had met the CoAG obligation requiring appraisal of the project prior to it proceeding. The environmental impact assessment process for raising the Ned Churchward Weir remains on hold. If Queensland proceeds with the weir raising and/or the privately funded Nathan Dam (on the Dawson River), it will need to demonstrate that each project is ecologically sustainable.

- *Public education and consultation.* Queensland has consulted on significant water reform matters, including the development of water resource plans and resource operations plans and water trading. In December 2003, for example, the Department of Natural Resources and Mines held workshops in Rockhampton and Emerald in the lead-up to the release of the resource operations plan for the Fitzroy Basin. The sessions were targeted at water entitlement holders, lawyers, accountants, solicitors and financial institutions. In mid-2003, the department released a series of information brochures explaining the different types of water entitlement and the trading arrangements that apply to each type, as well as the separation of water from land (including the impacts on land valuations). Queensland expects to soon release an options paper on approaches to managing assets that may become stranded as a result of trading water permanently out of irrigation schemes, before determining a final policy position by late 2004.

Western Australia

- *Rural pricing.* Western Australia has transferred its four government owned irrigation schemes to local cooperatives. The Water Corporation supplies bulk water to these cooperatives through bulk water supply agreements containing charges that comprise fixed and volumetric components and that recover some of the cost recovery components under the CoAG pricing principles. Western Australia subsidises the bulk water charges and the operations of two local cooperatives.

Western Australia has several remaining rural pricing challenges. Most importantly, rural businesses need to continue towards lower bound cost recovery and towards the upper bound where practicable. Western Australia also needs to show that its consumption based charges are set on the basis of efficient resource pricing. In addition, it could improve the transparency of CSO payments to the Water Corporation by publicly reporting the (separate) CSOs attached to each irrigation scheme (as it did for this assessment after a request from the Council).

The foreshadowed Economic Regulation Authority investigation into the cost recovery and pricing principles underpinning the Water Corporation's bulk water charges to rural users will be an important step towards best practice rural pricing. The government is due to provide the authority with

terms of reference in mid-2005. It is not clear, however, how the government will implement the authority's recommendations, given that Western Australia will not review its bulk water pricing arrangements for up to 15 years.

Western Australia does not charge for water licences, although it does impose licence conditions that transfer responsibility for some water resource management activities (and thus some of the associated costs) to licensees. The ad hoc nature of the current arrangements in Western Australia means it is impossible to determine whether users face appropriate direct and indirect costs as intended by CoAG.

Western Australia has argued that the complexities of levying an appropriate water resource management charge warrant taxpayer funding of licensing related activities, and that it has met CoAG requirements by transparently reporting costs. The Council does not accept these arguments. The failure to recover appropriate water resource management costs from water users via licence charges risks undermining achievement of the CoAG objective of an efficient and sustainable water industry. Most other states and territories are advanced in working through these issues and are applying water licence charges that reflect costs consistent with CoAG's intention that charges for water use should cover appropriate natural resource management costs.

The Council considers that it is appropriate for Western Australia to have until 2006 to resolve matters relating to charging for licences and associated water management. This timing accords with commitments by signatories to the National Water Initiative to implement consistent approaches to pricing and attributing the costs of water planning and management.

The Council considers that Western Australia has achieved satisfactory progress for 2004 against its CoAG rural water pricing obligations.

- *Urban pricing.* Arising from the 2003 NCP assessment, the Australian Government suspended 10 per cent of Western Australia's 2003-04 competition payments, pending the state's creation of the Economic Regulation Authority (proposed at the time of the 2003 NCP assessment) with responsibility for the water industry, and its issue of terms of reference for the authority to investigate urban water and wastewater pricing. Western Australia established the Economic Regulation Authority on 1 January 2004. The authority is responsible for water regulation and advising on pricing, while the new Office of Water Policy advises on water policy.

The government released terms of reference on 16 June 2004 for the Economic Regulation Authority to investigate and recommend on water and wastewater pricing by the state's three large urban service providers. The terms of reference ask the authority to consider and recommend on prices that account for the requirements of the 1994 CoAG water reform agreement and the CoAG pricing principles, and to provide a final report

by 12 August 2005. The outcome of the investigation will be available to the government in setting urban water and wastewater prices in 2006-07, and will be reported publicly. Western Australia has also committed to prepare terms of reference for a broader Economic Regulation Authority investigation of water and wastewater pricing that covers, among other matters, local government water pricing issues.

The Council considers that Western Australia has made satisfactory progress against its urban water and wastewater pricing obligations. Accordingly, the Council recommends that the Australian Government lift the 10 per cent suspension of Western Australia's 2003-04 competition payments and reimburse these funds. While the recommendation to lift the payment suspension recognises the state's progress, it does not mean that water and wastewater prices are now set in accord with the CoAG pricing principles. Western Australia will not meet this obligation until the Economic Regulation Authority completes its investigation and the government implements the authority's recommendations.

- *Water access entitlements.* Western Australia has established a comprehensive system of water entitlements that are separated from land title and specified in volumetric terms. Licences may be issued for between five and 10 years (with a presumption of renewal), or for an indefinite period. (Western Australia has not signed the Intergovernmental Agreement on a National Water Initiative, so is not obliged to specify entitlements as a perpetual share of the consumptive pool of the relevant water source.) The state also maintains a publicly accessible register of water licences and entitlements, which includes provision for recording third party interests.

Western Australia retains a restriction on who can hold a water licence — specifically, the holder must own, occupy or have access to the land on which the water occurs, and intend to use the water. Because the water entitlement is separate from land title, removal of this remaining link with land is arguably not required under the water entitlement provisions of the 1994 CoAG water reform agreement. (The restriction may, however, constrain water trading — see below.)

The Department of Environment has the power to issue a direction overriding all other rights recognised by the *Rights in Water and Irrigation Act 1914*. While this provision may reduce the security of water entitlements, Western Australia advised that it is intended to be used only in extreme circumstances (such as to prevent unacceptable environmental impacts). The department does not appear to have used the power in a manner that would significantly influence the value of water entitlements. The state's policy guidelines on the management of unused entitlements could also undermine the security of water entitlements by enabling the department to reclaim unused entitlements. The impact of the policy on water entitlement security is lessened, however, by several factors, including that it does not apply to entitlements that have been purchased (via trading).

While some aspects of Western Australia's water entitlement arrangements could be improved, to increase the security of entitlements, the Council considers that Western Australia has achieved satisfactory progress for 2004 against its 1994 CoAG obligation to establish water entitlements separated from land title.

- *Allocations to the environment.* Western Australia's implementation program covers 41 water planning areas. Western Australia has completed plans for 11 of these areas. It expects to complete around two thirds of its scheduled water plans by 2005, with the remaining plans finalised soon after.

For its most recent water management plan, covering the Carnarvon area, Western Australia did not use a recognised environmental water assessment method or adopt a holistic or multidisciplinary approach to determine the environmental water allocation. Its environmental water assessment identified data gaps and made recommendations for research into the environmental requirements of the ecosystems identified as being highly groundwater dependent and of significant value. The government did not adopt these recommendations or explain why it did not.

The Office of the Auditor General of Western Australia's 2003 review of the state's water planning processes found problems with the former Water and Rivers Commission's record keeping, and compliance monitoring and environmental assessment processes. It considered that a significant increase in the commission's workload, in combination with a decline in its funding, had seriously affected its capacity to manage the state's water resources.

Western Australia has advised that it is addressing these deficiencies. It is progressively reviewing allocation limits to ensure they account for environmental water requirements. It has amalgamated its water resource management and environmental protection functions within the new Department of Environment. It also intends to establish a water resources council to advise on water resources management, including its funding and effectiveness.

Given the recent changes aimed at improving the state's water planning processes, and Western Australia's commitment to completing its 1999 implementation program by 2005 or soon after, the Council considers that the state has made satisfactory progress against its CoAG environmental allocation obligations for this 2004 NCP assessment.

- *Water trading.* Western Australia's arrangements for intrastate water trading include provisions aimed at limiting potential speculation in the water market. These provisions have the potential to reduce the security of entitlements and constrain the movement of water to its most profitable use. Interstate trade involving Western Australia will be possible only if stage 2 of the Ord Irrigation Project proceeds.

A review of the relevant part of the Rights in Water and Irrigation Act required in 2005, along with a proposed review of the effectiveness of the statewide water trading policy, provides Western Australia with an opportunity to further consider its trading arrangements. For the state's trading arrangements to comply with 1994 CoAG obligations (particularly as the demand for water trading increases), Western Australia would need to amend its legislation and related arrangements (including the local trading rules in water management plans) to:

- remove the provision for making local by-laws to prohibit trades, or clarify that such by-laws would be used only in response to the environmental or physical constraints of the water source
- remove the restriction on who can hold a water licence (which constrains the movement of water to its most profitable use), so there is no longer any link to land or the capacity to use the water
- remove the power of the Department of Environment to reclaim unused water entitlements, and enable it to approve trade in such entitlements, in areas where entitlement and trading arrangements have been fully established.

While elements of Western Australia's water trading arrangements are not consistent with 1994 CoAG obligations, the Council accepts that these elements do not constrain trade to a significant extent given the low demand for trading in most areas of the state. The Council considers, therefore, that Western Australia has achieved satisfactory progress for 2004 against its CoAG water trading obligations.

- *Appraisal of new water infrastructure.* There were no new water infrastructure projects in Western Australia for which the obligations on environmental and economic appraisal were relevant.
- *Public education and consultation.* Western Australia has consulted with the community and water industry stakeholders on a range of water reform matters. The former Water and Rivers Commission finalised policy guidelines on the management of unused entitlements in November 2003, following the release of draft policy guidelines in March 2003 for public consultation.

The Department of Environment is engaging in public consultation on the more efficient use of its unused water allocations, including the feasibility of issuing short to medium term licences to permit access to water reserved for future town supply. This work follows the former Water and Rivers Commission's release of a discussion paper in March 2003. In December 2003, the former commission also published a 'situation statement' outlining proposed reservations of water resources for future public drinking water supplies for the state.

Western Australia has indicated that it will review the effectiveness of its statewide policy on transferable water entitlements via a semi-formal

consultation process. (It intends to seek submissions from parties who have encountered difficulties in trading.) In addition, the Economic Regulation Authority is undertaking a public investigation into water and wastewater pricing by the state's three large urban service providers.

- *Remaining 2003 matters — National Water Quality Management Strategy.* Since the 2003 NCP assessment, Western Australia has released State Water Quality series document 6, which sets guidelines for fresh and marine water quality and water quality monitoring and reporting. Western Australia developed the document in consultation with natural resource management agencies, peak bodies, the Conservation Council and the broader community. The document forms the foundation for establishing environmental values and environmental quality objectives and criteria for significant water bodies, although there is a significant task remaining to implement this work. Western Australia has made some progress in implementing the Australian Drinking Water Guidelines but is yet to incorporate the 2002 version of the guidelines.
- *Remaining 2003 matters — water legislation review and reform.* Western Australia reviewed 32 pieces of water industry legislation and endorsed the findings of those reviews, mostly in 1999 and 2000. It is, however, still to fully implement the recommended reforms for 19 water industry regulatory instruments. It expects to introduce a Bill to implement reform of seven instruments late in 2004.

Despite this matter having been raised with Western Australia in a number of NCP assessments, the state has made little progress since 2000. It is still to meet its water industry legislation review and reform obligations, which the Competition Principles Agreement requires to have been addressed by 30 June 2002. The Council thus recommends that Western Australia's water industry legislation should be treated as part of a pool of incomplete legislation review and reform matters attracting a suspension of the state's competition payments in 2004-05 (see volume 1).

- *Remaining 2003 matters — devolution of greater responsibility for the management of the Ord Irrigation Scheme.* Western Australia transferred the management of the Ord Irrigation Scheme to the Ord Irrigation Cooperative in 2002. Transfer of the scheme assets to the cooperative, which Western Australia expected to occur in mid-2004, has been delayed. The Council accepts, nevertheless, that Western Australia is committed to completing the transfer of the scheme assets. Western Australia has implemented measures to devolve management responsibility for the state's other two main irrigation schemes.
- *Remaining 2003 matters — integrated catchment management.* Western Australia has advanced its integrated catchment reforms since it agreed with the Australian Government on implementing the Natural Heritage Trust extension (in December 2002) and the National Action Plan for Salinity and Water Quality (in October 2003). The agreements provide funding to refine the state's six regional natural resource management strategies for community consultation and accreditation under the

national processes. The Council considers, therefore, that Western Australia has achieved satisfactory progress for 2004 against its integrated catchment management obligations.

South Australia

- *Rural pricing.* South Australia has nine government owned irrigation districts within the lower Murray reclaimed irrigation areas, which it intends to transfer to private ownership. It advised that these districts set charges for irrigation and drainage services that recover (at least) lower bound costs, although the information provided was not sufficient to demonstrate this recovery. Charges to irrigators in the lower Murray reclaimed irrigation areas are not volume based, but rather comprise a service charge and a charge based on the area of land serviced. The Council accepts, however, irrigators will be responsible for setting charges once ownership is transferred.

South Australia's licence fees and catchment management board levies represent a reasonable approximation of the administrative costs of undertaking relevant activities in the state. Customers are likely to pay amounts that reflect the cost of services received.

South Australia's current approach of using consolidated revenue to meet all the costs of River Murray Water supplying water to the state's irrigators, and the costs of the Murray–Darling Basin Commission's water resource management, means that irrigators do not face the cost of any of these services. To comply with water reform obligations, South Australia will need to implement, by the end of 2004, a charging arrangement that attributes appropriate water storage and delivery costs to users. Together with New South Wales and Victoria, South Australia will also need to ensure, by 2006, that it has identified all costs associated with water planning and management, and attributed costs appropriately to irrigators.

The Council considers that South Australia has achieved satisfactory progress for 2004 against its CoAG rural water pricing obligations.

- *Urban pricing:* The South Australian Department of Treasury and Finance has prepared South Australia's first publicly available annual transparency statement, covering the price of SA Water's urban water services in 2004-05. The Essential Services Commission of South Australia (ESCOSA) has commented on procedural and data matters, and on whether the state's water pricing complies with the CoAG pricing principles. South Australia is also adopting a pricing transparency report approach for SA Water's wastewater pricing. The Department of Treasury and Finance has prepared the 2004-05 statement and provided it to ESCOSA for comment. The government expects to release the statement by December 2004.

While the water pricing transparency statement demonstrates that SA Water's water prices are achieving the lower bound of cost recovery, ESCOSA has indicated several areas in which the current arrangements do not comply with the CoAG pricing principles or are not best practice for the water industry. The South Australian Government has undertaken to rectify the major water pricing noncompliance matters identified by ESCOSA.

The Council considers that South Australia has achieved satisfactory progress for 2004 against its CoAG urban water and wastewater pricing obligations.

- *Water access entitlements.* South Australia has legislated for a system of water allocations separated from land title and specified in volumetric terms. Water licences are issued in perpetuity. Water allocations have been converted from an area to a volumetric basis in most regions, although over half of the allocations in the South East Catchment will still be area based in 2005. South Australia also has a water licence register, which records third party interests. The National Water Initiative requirement that water access entitlements be specified as shares of water available for consumption will require South Australia to amend its current arrangements by the end of 2006.

The Council considers that South Australia has achieved satisfactory progress for 2004 against its CoAG water entitlements obligations.

- *Allocations to the environment.* At the time of the 2003 NCP assessment, South Australia had completed water allocation plans for all 15 of the prescribed water resource areas covered by its 1999 program. The government is taking further action on environmental allocations. It is close to completing a stressed resources review to improve its approach to identifying water resources at risk of stress and appropriate management responses. It develops new water allocation plans as the need for these is identified, and recently completed a plan for the Tintinara Coonalpyn prescribed wells area. The process used to develop this plan demonstrates that South Australia continues to allocate water to the environment in accord with its obligations under the 1994 CoAG water reform agreement.

The Council considers that South Australia has satisfactorily addressed its CoAG obligation to allocate appropriate water to the environment for the systems identified on its 1999 implementation program.

- *Water trading.* South Australia's arrangements for water trading contain two constraints that are inconsistent with CoAG obligations: (1) the limits on trade out of some irrigation districts (such as the Central Irrigation Trust's 2 per cent cumulative limit on permanent trade out of the trust's districts); and (2) the 20 per cent reduction factor applied to water allocations that are traded (permanently or temporarily) in the Northern Adelaide Plains. The trading provisions in South Australia's most recently completed water allocation plans appear to reflect environmental and

physical constraints, so accord with obligations under the 1994 CoAG water reform agreement.

For both intra- and interstate trade, South Australia committed under the National Water Initiative to facilitate trading where water systems are physically shared or hydrologic connections and water supply considerations permit trading. It committed to immediately remove barriers to temporary trade. Along with other governments in the southern Murray–Darling Basin, it also committed to enable exchange rates and/or tagging of water access entitlements by June 2005, and to establish an annual 4 per cent interim threshold limit on permanent trade out of water irrigation districts. There is to be a review in 2009, to consider raising the interim limit.

Given the commitments made by South Australia under the National Water Initiative, the Council considers that the state has achieved satisfactory progress for 2004 against its CoAG water trading obligations.

- *Appraisal of new water infrastructure.* The Council found in the 2003 NCP assessment that South Australia had complied with the obligation to demonstrate that the Clare Valley Water Supply Scheme is economically viable. During 2003-04, South Australia addressed the matters raised in the ecological study of the project. The Council considers, therefore, that South Australia has also met the CoAG obligation to show that the project is ecologically sustainable.
- *Public education and consultation.* South Australia has consulted with the community and water industry stakeholders in a range of water reform areas. It publicly released the SA Water 2004 pricing transparency statement, together with ESCOSA's comments on the statement. As part of the volumetric conversion process for allocations in the South East Catchment, it implemented a communication strategy to inform the public of the project's requirements and progress. For the Clare Valley Water Supply Scheme, South Australia advised that it is undertaking a community consultation program covering the scheme's benefits, the availability of water to towns and irrigators, and the possible environmental impacts of the water imported into the region.
- *Remaining 2003 matters — water legislation review and reform:* The passage of the Crown Land Management Bill 2004, scheduled for introduction in early 2005, will complete South Australia's water industry legislation review and reform obligations.
- *Remaining 2003 matters — devolution of greater responsibility for the management of the lower Murray reclaimed irrigation areas.* South Australia has continued to progress management devolution of the nine government owned irrigation schemes in the lower Murray reclaimed irrigation areas. Devolution forms part of a program of rehabilitation of the areas. Recent advances include the transfer of responsibility for the operation and maintenance of irrigation infrastructure to a private irrigation company, and the commencement of water trading.

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- *Remaining 2003 matters — integrated catchment management.* The *Natural Resources Management Act 2004* has streamlined administrative arrangements and improved the government's ability to deliver catchment and natural resource management reforms.

Tasmania

- *Rural pricing.* Three government owned irrigation schemes (Cressy–Longford, Winnaleah and South East) together provide about 10 per cent of all irrigation water used in Tasmania. The Cressy–Longford and Winnaleah schemes price at the lower bound of cost recovery and account for transitional CSOs for debt repayment. Although Tasmania does not expect the South East Irrigation Scheme to reach the lower bound of cost recovery until 2010-11, subsidies are transparent and declining. The three schemes set charges using consumption based pricing principles.

Following its review of fees payable under the *Water Management Act 1999*, the Tasmanian Government increased licence fees so they now recover about 13 per cent of water management costs. Taxpayers meet the remaining costs. According to the review, this level of cost recovery reflects the distribution of public and private benefits from the Department of Primary Industries, Water and Environment's natural resource management function. The recommended fees also reflect increased costs of service.

The Council considers that Tasmania has achieved satisfactory progress for 2004 against its 1994 CoAG rural water pricing obligations.

- *Water access entitlements.* Tasmania has established a comprehensive system of water entitlements separated from land title and specified in volumetric terms. Water licences are issued for 10 years, with a presumption of renewal. Tasmania maintains a register of water entitlements, which includes provision for recording financial interests.

Given that it has almost completed the process of converting water allocated under its previous system to licences and allocations under the new system, the Council considers that Tasmania has made satisfactory progress for 2004 against its 1994 CoAG water entitlements obligations. (Tasmania has not signed the National Water Initiative so is not obliged to specify entitlements as a perpetual share of the consumptive pool of the relevant water resource.)

- *Allocations to the environment.* Tasmania has completed environmental water assessments for 43 of the 45 rivers and streams covered by its 1999 implementation program. It implemented its first water management plan — for the Great Forester catchment — in 2003. In light of its experience with the Great Forester plan, Tasmania has amended the *Water Management Act* to streamline and improve its water planning

processes. The changes address aspects of transparency and accountability in water planning. Tasmania expects to implement water management plans for the state's remaining 15 high priority river systems by the end of 2005 or soon after.

Tasmania uses 'community values' that include both environmental and non-environmental objectives to set environmental flows. This approach does not allow a rigorous and transparent assessment of the trade-offs between using water for environmental purposes and using it for consumptive purposes. Over the short to medium term, however, Tasmania's approach is unlikely to result in adverse environmental outcomes because the state has not identified any stressed or overallocated rivers. Tasmania is developing a holistic approach to determining environmental flows which it proposes to apply in all future water planning. This approach should improve the state's capacity to determine environmental flow requirements for its major river systems.

The Council considers that Tasmania has achieved satisfactory progress for 2004 against its CoAG environmental water allocation obligations.

- *Water trading.* Tasmania has removed the two trading restrictions identified by the Council in the 2003 NCP assessment as being likely to be inconsistent with CoAG water trading commitments:
 1. In irrigation districts, to hold irrigation rights, it is no longer necessary to be an owner or occupier of land, or a person who may hold land, in the district.
 2. In unregulated systems, the Minister is no longer able to refuse or modify a proposed transfer if the quantity of water available would exceed the amount that could be used sustainably for the intended purpose.

Tasmania will need to ensure the trading rules in the water management plans that are still to be completed are also consistent with CoAG obligations. This should be the case if the rules reflect the requirements of the Water Management Act (as amended).

The Council considers that Tasmania has achieved satisfactory progress for 2004 against its 1994 CoAG water trading obligations.

- *Appraisal of new water infrastructure.* Tasmania's Meander Dam project cannot proceed until the state has finalised the management plan for the spotted tailed quoll, and the plan has been approved by the Australian Government Minister for the Environment and Heritage. If the Tasmanian Government confirms during 2004-05 that it will proceed with the Meander Dam, then Tasmania's compliance with CoAG obligations on environmental and economic appraisal will need to be considered in the 2005 NCP assessment.

- *Public education and consultation.* Tasmania consults with the community and stakeholders in the key water reform areas. Development of the water management plan for the Great Forester River involved a lengthy consultative process via a local consultative group, and the release of a draft water management plan for public comment. Reflecting the complexity of the Great Forester process, in June 2004 Tasmania established a simpler mechanism for proclaiming groundwater areas, which involves the Department of Primary Industries, Water and Environment working with stakeholders to implement management rules to ensure the equitable and sustainable use of groundwater. Amendments to the Water Management Act during 2004 provide for the Resource Planning and Development Commission to independently review the department's responses to representations on draft water management plans, to provide greater transparency and promote confidence in water planning processes.

In December 2003, as part of the Tasmanian Government's commitments under its bilateral agreement to implement the National Action Plan for Salinity and Water Quality, the Department of Primary Industries, Water and Environment released a policy paper, *Guiding principles for water trading in Tasmania*. The paper, which specifies the guiding principles for assessing applications for water transfers under the Water Management Act, is likely to assist water users to understand the trading and approval process.

- *Remaining 2003 matters — institutional structure.* Tasmania's review of its arrangements for handling complaints about the service standards of local government water businesses (which was occurring as part of a wider review of the *Local Government Act 1993*) has progressed to the release of an exposure draft Bill for community consultation. The Bill specifies that local governments must adopt formal complaint handling policies and procedures (to be prescribed in Regulations), which will include a complaints register to help identify systemic issues. A customer will be able to seek an independent review of a decision through the Local Government Ombudsman. Tasmania intends to introduce the Bill during 2004.
- *Remaining 2003 matters — devolution of greater responsibility for the management of the Winnaleah and South East irrigation schemes.* Tasmania formally handed over management of the Winnaleah Irrigation Scheme to irrigators in December 2003. The Winnaleah irrigators are now responsible for day-to-day scheme operations, administration and management (including price setting), and own the operational assets. While making little progress towards devolution for the South East Irrigation Scheme, Tasmania advised the Council that it is treating devolution as a priority.

Australian Capital Territory

- *Rural pricing.* The ACT has no publicly funded or owned rural water infrastructure. It does not contribute to the operations of River Murray Water.

Although the ACT did not provide detailed information on how it sets its water extraction licence fees, the Council notes that the ACT has sought to ensure its licence fee structure recovers appropriate costs and is consistent with fee structures in New South Wales. The ACT asks the Independent Competition and Regulatory Commission to recommend on the territory's charge for water abstraction.

The Council considers that the ACT has achieved satisfactory progress for 2004 against its CoAG water and wastewater pricing obligations.

- *Water access entitlements.* In the ACT, water entitlements are issued in perpetuity, separated from land title and specified as volumetric shares. The ACT has a register of water entitlements, but the register does not record third party interests and is accessible only in hard copy form. The National Water Initiative requires participating states and territories to ensure they have compatible, publicly accessible and reliable systems for registering entitlements (including any encumbrances) by 2006. This requirement is likely to require further work by the ACT, which has advised that it can readily address any need to record third party interests.

The Council considers that the ACT has achieved satisfactory progress for 2004 against its CoAG obligations on water access entitlements.

- *Allocations to the environment.* The ACT has implemented a water resources management plan that provides environmental water allocations for each of its 32 subcatchments and all groundwater resources. It has also developed a new strategy for water management, which sets directions until 2050.

The Council considers that the ACT has addressed its obligation to allocate appropriate water to the environment for the systems identified on the territory's 1999 implementation program.

- *Water trading.* The ACT permits intra-territory water trading, subject to the approval of the Environment Management Authority to ensure trading occurs within the physical and ecological constraints of catchments. It has removed all other legislative impediments to intra-territory trade.

The ACT is progressing the two main requirements for interstate trading: (1) its Murray–Darling Basin Ministerial Council cap; and (2) agreement with other jurisdictions on the terms and conditions of trade. It expects to complete a memorandum of understanding with the New South Wales and Australian governments (including provision for a cap) by the end of 2005.

The National Water Initiative extends to 2007 the timeframe for establishing institutional and regulatory arrangements that facilitate interstate trade. (While the southern Murray–Darling Basin states have agreed to facilitate interstate trade by June 2005, the ACT is not covered by this element of the National Water Initiative.)

The Council considers that the ACT has achieved satisfactory progress for 2004 against its CoAG water trading obligations.

- *Appraisal of new water infrastructure.* There were no new water infrastructure projects in the ACT for which the obligations on environmental and economic appraisal were relevant.
- *Public education and consultation.* The ACT Government released a strategy for sustainable water resource management, *Think water, act water*, in April 2004. It developed the strategy via a public process involving the release of a draft in November 2003 for three months of public comment.

Northern Territory

- *Rural pricing.* The Northern Territory has no publicly funded or owned rural water infrastructure. It does not charge for private water licences, although it may impose licence conditions that transfer responsibility for some water resource management activities (and thus some of the associated costs) to licensees.

Arising from the 1999 tripartite meeting on water, private withdrawals of groundwater are not subject to the pricing obligations in the 1994 water reform agreement for competition payments purposes. The bulk of water used in the Northern Territory is drawn from groundwater sources. Under the National Water Initiative, however, the Northern Territory will need to adopt by 2006 an appropriate and consistent approach to attributing the costs of water management to licence holders. Appropriate attribution will become more important if water trading between the Northern Territory and the Ord Irrigation Scheme in Western Australia takes place.

The Council considers that the Northern Territory has achieved satisfactory progress for 2004 against its CoAG water and wastewater pricing obligations.

- *Water access entitlements.* Water entitlements in the Northern Territory are separated from land title and specified in volumetric terms. Licences are generally issued for up to 10 years. While its water licence register is not accessible electronically and does not record third party interests, there has been little demand for water trading so the Council considers that the Northern Territory has made satisfactory progress for 2004 against its water entitlements obligations.

Given the National Water Initiative requirement that water access entitlements be specified as perpetual shares of water available for consumption, the Northern Territory will need to amend its arrangements by 2006. The Northern Territory has acknowledged that it may also need to further develop its water entitlements registry.

- *Allocations to the environment.* The Northern Territory listed four water control districts on its 1999 implementation program. It has completed a water management strategy for the Ti-Tree Basin water control district and expects to declare plans for the Katherine–Daly, Darwin and Alice Springs water control districts in 2005.

The Ti-Tree Basin plan provides no public information on the hydrology modelling. The absence of information makes it difficult to determine whether the strategy is based on the best available science and whether associated consultative processes were sufficiently rigorous. For recharge to the Ti-Tree Basin, the estimate that the Northern Territory used in the strategy differs from estimates determined by the CSIRO. The Northern Territory has undertaken to work with the CSIRO to develop a robust estimate of the annual recharge of the Ti-Tree Basin by the time of the 2005 NCP assessment. It has also commenced a research project to determine whether any ecologies depend on groundwater in the arid zones such as the Ti-Tree Basin. The Northern Territory committed to update its water allocation plans on the basis of new information gained.

The Council considers that the Northern Territory has achieved satisfactory progress for 2004 against its CoAG environmental water allocation obligations.

- *Water trading.* At existing levels of development, there is little (if any) demand for water trading in the Northern Territory. In previous NCP assessments, the Council found that the Northern Territory had removed legislative impediments to water trading. The general trading restrictions that the Northern Territory proposes to include in its water allocation plans (and those included in the completed Ti-Tree plan) reflect physical and environmental constraints. The Northern Territory needs to ensure the trading rules in the remaining water allocation plans facilitate trading where water systems are physically shared or hydrologic connections and water supply considerations permit trading.

The Northern Territory has previously advised that it has agreed in principle with Western Australia for that state's water trading arrangements to apply throughout the Northern Territory sector of stage 2 of the Ord Irrigation Project (if it proceeds).

The Council considers that the Northern Territory has achieved satisfactory progress for 2004 against its CoAG water trading obligations.

- *Appraisal of new water infrastructure.* There were no new water infrastructure projects in the Northern Territory for which the obligations on environmental and economic appraisal were relevant.

- *Public education and consultation.* There is limited public accountability in the Northern Territory regarding the allocation of water to the environment. Further, there is virtually no public information on the manner in which those who developed the territory's first water resource strategy (for the Ti-Tree Basin) accounted for environmental and socioeconomic evidence, although the Northern Territory Government stated that relevant information was available to the committee that developed the strategy and to other stakeholders. The strategy provides, however, for regular public reporting on catchment health in newsletters, fact sheets and seminars, and requires the committee to report annually to the government.

Murray–Darling Basin Commission matters

- *Rural pricing.* In previous NCP assessments, the Council concluded that the independent review of River Murray Water's pricing (conducted in 2002) covered all relevant 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 review and set timeframes for their implementation. During 2004-05, the Murray–Darling Basin Commission will adopt maintenance and renewals annuities as the basis for funding River Murray Water, review cost sharing arrangements for the Menindee Lakes and insurance arrangements, and improve financial reporting to enable identification of all environmental costs.

The Murray–Darling Basin Commission reports 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. This reporting assists in addressing the CoAG requirement for pricing transparency.

- *Allocations to the environment.* Under The Living Murray Initiative, governments have agreed to the 'First Step' decision. This targeted initiative will increase environmental flows aimed at maximising environmental benefits for six icon sites in the Murray system. Under the 'First Step' decision, the Australian Government and the governments of New South Wales, Victoria, Queensland and South Australia agreed to increase environmental flows by an average of 500 gegalitres a year built up over five years and to adopt other initiatives to improve river health. While the 'First Step' decision does not take up in full the flow outcomes recommended by the scientific reference panel, the participating governments have acknowledged that the decision is only the first stage in addressing the health of the River Murray system. Governments 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 achieved satisfactory progress for 2004 towards addressing their CoAG obligations on the allocation of water to the environment.

- *Water trading.* The Murray–Darling Basin Commission's pilot project has enabled permanent interstate trade in high security water entitlements in the Mallee region of South Australia, Victoria and New South Wales (downstream of Nyah) since 1998. The commission has continued to undertake and coordinate, in consultation with governments, significant work essential to expanding permanent interstate water trade in the Murray–Darling Basin, including work on exchange rates and an alternative system of trading 'tagged' entitlements, environmental controls, and the administrative arrangements and registry systems for processing, approving and accounting for trades. It has also commissioned studies on how to reduce barriers to interstate water trade (particularly barriers to trade out of irrigation areas) and the impact (on interstate trade) of differential financial arrangements for bulk water across the states.

Partly based on experience with the pilot project and the Murray–Darling Basin Commission's research and technical work, governments have made interstate trade commitments under the National Water Initiative that should enable the 1994 CoAG target — for trading arrangements to be substantially implemented by 2005 — 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.

- *Public education and consultation.* Water planning for the Murray–Darling Basin involves work by the Murray–Darling Basin Commission, the Murray–Darling Basin Ministerial Council and the government parties to the intergovernmental agreement on the 'First Step' decision. (The 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.) All decisions relating to environmental water releases for the Murray–Darling Basin have involved extensive consultation with all relevant stakeholders.

1 Australia's water reform program: scope of the 2004 National Competition Policy assessment

Ten years ago, the Council of Australian Governments (CoAG) agreed to a water resource policy and strategic reform framework (CoAG 1994). It perceived a need to improve the efficiency of Australia's water supply and wastewater industry, address natural resource degradation and improve community understanding of the need to change how Australia had been using water. The National Water Initiative, to which most governments agreed in June 2004, complements and extends the 1994 reform framework (CoAG 2004).

Governments incorporated the 1994 water reform agreement into the 1995 National Competition Policy (NCP) as one of the 'related reforms' and asked the National Competition Council to oversee their progress with reform implementation. The NCP water reforms are broad ranging, covering natural resource management, water and wastewater pricing, more rigorous approaches to future investment, the separation of water access entitlements from land title, trading in entitlements, institutional reform and improved public consultation. Specifically, under the 1994 water reform agreement governments committed to:

- price water and wastewater services so businesses achieve full cost recovery, with prices set on a consumption basis where cost-effective
- create clearly specified water entitlements separate from land title
- recognise the environment as a user of water by allocating water specifically for use by the environment
- encourage intrastate and interstate trading in water entitlements
- implement market based and regulatory measures aimed at improving water quality
- integrate natural resource management and catchment management processes
- implement a range of institutional reforms, including separating the roles of service provision and standards setting and regulation, and ensuring better commercial performance by water businesses
- employ rigorous economic and environmental appraisal processes before new investment in rural water schemes

- conduct public education and consultation programs and ensure stakeholder involvement in significant change issues.

CoAG originally set a timeframe of five to seven years for implementing the 1994 reform program. It set broad compliance milestones: urban water pricing, the institutional reforms and allocations/entitlements (including allocations to the environment and trading of entitlements) were to be completed by 1998, along with rural water pricing by 2001. Following the 1999 tripartite meeting on water,¹ CoAG extended the timetable to 2005. In particular, governments were to substantially implement allocation and water trading arrangements for river systems and groundwater resources by 2005 (with arrangements for stressed and overallocated river systems to be determined by 2001).

CoAG asked the Council to assess governments' performance in implementing the water reform program in 1999 and again in 2001. CoAG subsequently asked the Council to conduct annual assessments, setting priorities for each assessment over the period 2003 to 2005:²

- The 2003 NCP assessment considered urban water pricing and cost recovery, institutional reforms, intrastate water trading, integrated catchment management and water quality arrangements.
- This 2004 NCP assessment has considered rural water pricing and cost recovery, interstate water trading and progress with environmental allocations. It has also considered matters that the Council found in the 2003 NCP assessment not to have been satisfactorily addressed.
- The 2005 NCP assessment is scheduled to consider governments' implementation of the whole 1994 water reform program.
- In each assessment, governments' performances are considered against their commitments to ensure new rural water schemes are economically viable and ecologically sustainable,³ and to undertake appropriate public education and consultation.

¹ The tripartite meeting on water was held in January 1999 by representatives of the National Competition Council, the High Level Steering Group on Water — augmented by representatives from the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) and the Australian and New Zealand Environment and Conservation Council (ANZECC) — and the Committee on Regulatory Reform to consider the implementation of the CoAG water reform framework. CoAG subsequently endorsed the recommendations from the meeting.

² The 2002 NCP water reform assessment considered governments' progress in only the areas that the 2001 NCP water reform assessment found were not satisfactorily advanced.

³ Under the National Water Initiative, signatory governments committed to show that all proposed water infrastructure projects satisfy economic and ecological appraisals before investment in the project occurs.

This 2004 NCP assessment is the Council's fifth water reform compliance assessment. The Council has also conducted supplementary assessments on issues in particular jurisdictions. NCP assessment and supplementary assessment reports are available on the Council's website (www.ncc.gov.au).

CoAG revised clauses of the 1994 agreement to extend the 1994 reform program to incorporate groundwater and storm/wastewater (known as the 1996 framework for the strategic reform of Australia's water industry).⁴ Governments excluded elements of the 1996 framework relating to the pricing of private withdrawals of groundwater and the use of storm/wastewater from NCP compliance assessment and recommendations on competition payments. However, the obligation to establish arrangements for groundwater resources that address CoAG's environmental water allocation and water trading objectives is relevant for NCP compliance and competition payments.

In August 2003, CoAG decided to refresh the 1994 water reform agenda with the aims of increasing the productivity and efficiency of water use, sustaining rural and urban communities, and ensuring the health of river and groundwater systems. It considered that investment in new, more efficient production systems was being hampered by uncertainty about the long term access to water in some areas. It recognised that fully functioning water markets could help to ensure investment is properly targeted and water is used for higher value and more efficient purposes, and noted that current arrangements are preventing water markets from delivering their full potential. CoAG also expressed concern about the pace of securing adequate environmental flows and adaptive management arrangements to ensure ecosystem health in Australia's river systems (CoAG 2003). In addition, the Australian Government and the governments of New South Wales, Victoria, South Australia and the ACT agreed in August 2003 to provide new funding of \$500 million over five years to address water overallocation in the Murray–Darling Basin.

On 25 June 2004, the Australian Government and the governments of New South Wales, Victoria, Queensland, South Australia, the ACT and the Northern Territory agreed to the National Water Initiative (CoAG 2004).⁵ The initiative confirmed the signatory governments' commitment to the 1994 water reform agreement but recognised that post-1994 developments, variation in jurisdictions' reform progress and expansions in knowledge provide an opportunity to enhance the 1994 agenda. The signatory governments expect that full implementation of the National Water Initiative will achieve:

- clear and nationally compatible characteristics for secure water access entitlements

⁴ Letter from the Prime Minister to Heads of Government, 10 February 1997.

⁵ The governments of Western Australia and Tasmania have not signed the Intergovernmental Agreement on a National Water Initiative.

- transparent, statutory-based water planning
- statutory provision for environmental and other public benefit outcomes, and improved environmental management practices
- the return of all currently overallocated or overused systems to environmentally sustainable levels of extraction
- the progressive removal of barriers to trade in water and the meeting of other requirements to facilitate the broadening and deepening of the water market to achieve an open trading market
- a clear assignment of the risk arising from future changes in the availability of water for consumption
- water accounting to meet the information needs of different water systems in terms of planning, monitoring, trading, environmental management and on-farm management
- policy settings that facilitate water use efficiency and innovation in urban and rural areas
- responses to future adjustment issues that may have an impact on water users and communities
- recognition of the connectivity between surface and groundwater resources with connected systems managed as a single resource.

To achieve these objectives, the signatory governments agreed on reform outcomes and committed to specific policy actions. Accordingly, the National Water Initiative outcomes and actions cover:

- water access entitlements and water planning frameworks
- water markets and trading
- best practice water pricing
- the integrated management of water for environmental and other public benefit outcomes
- water resource accounting
- urban water reform
- knowledge and capacity building
- community partnerships and adjustment.

As part of the National Water Initiative, signatory governments agreed to establish a new body — the National Water Commission — to advise CoAG on national water issues and to assist with the effective implementation of

the water reform program. They agreed that the National Water Commission would undertake the scheduled 2005 assessment of states' and territories' implementation of NCP water reform commitments.

The National Water Initiative encompasses all elements of the 1994 water reform agreement. It specifies governments' reform commitments in greater detail and, for aspects of water allocation and trading, extends the timeframe for implementing reforms beyond the 2005 end date for the 1994 program. The Council has considered CoAG's specification of reform obligations in the National Water Initiative as the relevant framework for the elements of the 1994 water reform agreement assessed in 2004, consistent with the approach it has taken throughout the NCP when CoAG has refined or further developed reform benchmarks. For the 1994 water reform matters assessed in 2004, the Council has considered that the National Water Initiative affects compliance benchmarks for the signatory governments as follows.

- Rural and regional surface water and groundwater systems are to price at the lower bound of full cost recovery in accord with governments' commitments under the 1994 water reform agreement, and to achieve upper bound pricing where practicable.
- Allocation arrangements that provide a better balance in water resource use for all stressed and overallocated surface water and groundwater systems covered by governments' NCP (1999) implementation programs are to be substantially completed by 2005. Under the National Water Initiative, signatory governments committed to water planning as a mechanism to assist in making water management and allocation decisions to meet productive, environmental and social objectives. Decisions about competing uses of water should involve judgments informed by the best available science, socioeconomic analysis and community input. Water planning by states and territories is to provide secure ecological outcomes and resource security outcomes.

While it states that NCP timelines are to be met (confirming signatory governments' commitment to completing allocation arrangements for stressed and overallocated systems in accord with their pre-existing NCP commitments), the National Water Initiative does not contain an explicit date for completing arrangements for the rivers and groundwater systems covered by governments' 1999 programs that governments did not identify as stressed or overallocated. In this 2004 NCP assessment, the Council has considered governments' progress toward substantial completion of arrangements for all water systems covered by their 1999 implementation programs. It has considered a government to have not satisfactorily met obligations on water allocations (including to the environment) where finalised arrangements (including water plans) have not been shown to provide appropriate allocations to the environment in accord with CoAG obligations, and the government has not taken or committed to action to address relevant issues.

- Institutional and regulatory arrangements that facilitate intra and interstate trade are to be implemented by 2007, with publicly accessible,

compatible systems for registering water access entitlements and trades in place by the end of 2006. Barriers to temporary trade are to be removed immediately. Except in the southern Murray–Darling Basin, barriers to permanent trade (up to an annual threshold of 4 per cent of an area’s total water entitlement) are also to be removed immediately, subject to a review by 2009 with full open trade by 2014 at the latest.

For the southern Murray–Darling Basin, the Australian Government, and the New South Wales, Victorian and South Australian governments have committed to take all necessary steps to enable exchange rates and/or tagging of water access entitlements, and to facilitate permanent trade out of water irrigation areas (up to an interim threshold limit of 4 per cent by June 2005), with a review in 2009 to consider raising the threshold.

Recognising that two governments did not sign the National Water Initiative, the Council has taken the following approach in this 2004 NCP assessment:

- The Council has regarded the 1994 water reform agreement obligations and 1999 tripartite meeting timeframes with the National Water Initiative commitments to outcomes, actions and timeframes as the framework for reporting on all states’ and territories’ progress with reform implementation.
- The Council has regarded the 1994 water reform agreement obligations and 1999 tripartite meeting timeframes with the National Water Initiative commitments to outcomes, actions and timeframes as the framework for assessing signatory governments’ compliance with reform obligations, for the purpose of recommending on 2004-05 competition payments. For the non-signatory governments (Western Australia and Tasmania), the Council has assessed their water reform compliance (and recommended on 2004-05 competition payments) against the 1994 water reform agreement obligations and 1999 tripartite meeting timeframes.

Two components of the National Water Initiative — (1) the development and implementation of water resource accounting systems and (2) the introduction of urban water efficiency measures — were not part of the 1994 water reform agreement. The Council, therefore, has not reported on governments’ progress in either area in this 2004 NCP assessment. In each case, deadlines for substantive action fall beyond 2004:

- Water resource accounting involves governments establishing standardised reporting formats that allow Australia to produce an annual water balance. The balance is to cover all significant water use and integrate the accounting of surface and groundwater use where there is significant interconnection. Agreed milestones involve governments benchmarking their accounting systems by mid-2005, implementing robust water accounting systems by the end of 2006 (including an environmental water register by mid-2006), developing and implementing metering and measuring actions by the end of 2007 and implementing systems to integrate the accounting of surface and groundwater by the end of 2008.

- Urban water efficiency reform involves governments implementing demand management measures and encouraging innovation in water use. The National Water Initiative specifies a range of actions to be implemented by the end of 2005 and the end of 2006.

1.1 Scope of the assessment

In accord with the 2004 water reform assessment priorities determined by CoAG and accounting for reform progress in previous NCP assessments and the reform benchmarks in the 1994 water reform agreement and the National Water Initiative, the 2004 NCP assessment has considered governments' actions to:

- achieve best practice water pricing by rural water businesses (all states and territories), and urban water and wastewater businesses (with matters remaining from the 2003 NCP assessment for New South Wales, Western Australia and South Australia)
- progress the establishment of systems of water access entitlements (all states and territories). One water entitlement matter remaining from the 2003 NCP assessment was the commencement of the water access licensing and registry systems in New South Wales.
- progress water management, including to allocate appropriate water to the environment, in the aquatic systems covered by jurisdictions' 1999 implementation programs
- encourage the development of water markets and trading in water entitlements (all states and territories). Some intrastate trading matters remained from the 2003 NCP assessment for all states and territories.
- progress appraisals of new water infrastructure where appropriate (Queensland, South Australia and Tasmania)
- conduct public education and consultation programs associated with the above reforms (all states and territories)
- satisfactorily progress other matters remaining from the 2003 NCP assessment
 - institutional reform matters (Victoria, Western Australia, South Australia and Tasmania)
 - aspects of the National Water Quality Management Strategy (Western Australia)
 - integrated catchment management arrangements (Western Australia and South Australia)

- the devolution of a greater degree of management responsibility for irrigation schemes to local constituents (Western Australia, South Australia and Tasmania)
- the adoption of reforms to water industry legislation as recommended by NCP reviews, in line with obligations under the Competition Principles Agreement, in Victoria, Western Australia, South Australia and Tasmania.

Water pricing

In the 1994 water reform agreement, governments committed to ensure their urban and rural water and wastewater businesses (including bulk water suppliers) set prices to achieve full cost recovery. They also committed to ensure businesses relate prices for water and wastewater services to the volume of water consumed, where this would be cost-effective.

In the National Water Initiative, governments confirmed their commitment to full cost recovery and consumption based pricing for water storage and delivery in both metropolitan and rural and regional systems:

- Metropolitan systems should continue to move towards upper bound pricing by 2008 (recognising some small community services may never be commercially viable but must be maintained to meet social and public health obligations).
- Rural and regional systems should achieve lower bound pricing in accord with governments' commitments under the 1994 water reform agreement, with continued movement towards upper bound pricing where practicable. Where full cost recovery is unlikely to be achieved in the long term and a community service obligation (CSO) is deemed necessary, governments are to publicly report the size of the subsidy and, where practicable, consider alternative management arrangements aimed at removing the need for an ongoing CSO.

In line with the decisions of the 1999 tripartite meeting on water, the Council's 2003 NCP assessment considered governments' compliance with urban pricing reform. This 2004 NCP assessment considered governments' implementation of their rural pricing commitments and the urban pricing matters remaining from the 2003 NCP assessment.

Full cost recovery

The Expert Group on Asset Valuations and Cost Recovery Definitions for the Australian Water Industry (1995) and the Standing Committee on Agriculture and Resource Management (1997) on the guidelines for the application of the pricing sections of the 1994 water reform agreement considered the full cost recovery objective should involve recovery of all

efficient resource pricing (including externalities) and business costs. After considering this work, Premiers and Chief Ministers defined full cost recovery revenue for the purpose of the 1994 water reform agreement as falling within a band of cost recovery:

- At a minimum, revenue from charges for water and wastewater services must recover operating and maintenance expenses, administration costs, provision for asset consumption, interest costs on debt, externality costs (defined as the natural resource management costs incurred by, and attributable to, a water business), taxes or tax equivalents, and dividends (if any) — the lower bound of cost recovery.
- At a maximum, revenue from charges for water and wastewater services must recover operating and maintenance expenses, administration costs, depreciation, externality costs (the positive and negative environmental externalities associated with water use), the opportunity cost of the business's investment in assets (calculated using a weighted average cost of capital), and taxes or tax equivalents — the upper bound of cost recovery.

The 1999 tripartite meeting on water decided that, where the following outcomes apply, the Council should consider a government to have complied with rural full cost recovery requirements:

- The business has achieved full cost recovery or has established a price path to achieve full cost recovery after 2001 with transitional community service obligations (CSOs) made transparent.
- For a business that is unlikely to achieve full cost recovery in the long term, the government has made transparent the CSO required to support the scheme.
- The government has made cross-subsidies transparent.

Full cost recovery

Water and wastewater businesses are to set prices to earn sufficient revenue to ensure their ongoing viability but avoid monopoly returns. To this end governments agreed that 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 to and incurred by the water/wastewater business), taxes or tax equivalents (not including income tax), the interest cost on debt, dividends (if any) and provision for future asset refurbishment/replacement. Dividends should be set at a level that reflects commercial realities and simulates a competitive market outcome.

(continued)

- To avoid monopoly rents, a water business should not recover more than the operational, maintenance and administrative costs, externalities (defined as the positive and negative environmental externalities associated with water use), taxes or tax equivalent regimes, provision for the cost of asset consumption and cost of capital (the latter calculated using a weighted average cost of capital).
- Prices should be set on the basis of the level of revenue required by a water business based on efficient resource pricing and business costs. 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 classes of customer 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.
- Asset values should be based on 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.
- The treatment of community service obligations, contributed assets, the opening value of assets, externalities including resource management costs, tax equivalent regimes and any remaining cross-subsidies must be transparent.

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

Consistent with the recommendations of the reports of the expert group and the Standing Committee on Agriculture and Resource Management, the Council has interpreted the metropolitan pricing obligation under the National Water Initiative as requiring businesses, by 2008, to set prices to recover costs at least at a level close to (if not at) the upper bound full cost recovery. Water and wastewater pricing that achieves only lower bound cost recovery by 2008, without significant movement towards upper bound cost recovery, would not satisfactorily address pricing obligations because such pricing would indicate that the water business is failing to recover significant elements of efficient resource and business costs (including the cost of capital). Upper bound costs should be determined, transparently reported, and in cases where water businesses do not recover upper bound costs, under recovery recognised as a subsidy.

Most states and territories now subject their monopoly water businesses to price regulation by the jurisdictional economic regulator, whereby the regulator either determines maximum prices or recommends on a pricing structure for a decision by the relevant government via a public inquiry and reporting process.⁶ South Australia and Tasmania take a different approach from the other jurisdictions.

⁶ Victoria brought the water industry under the jurisdiction of the Essential Services Commission on 1 January 2004, with the first price determination to take effect on 1 July 2005. Western Australia created the Economic Regulation Authority (with jurisdiction for the water industry) on 1 January 2004 and has issued terms of reference for the authority to investigate urban water and wastewater pricing.

- The South Australian Cabinet each year sets the price of water and wastewater services provided by the state's major service provider (SA Water) after considering a pricing transparency statement addressing the CoAG pricing principles prepared by the South Australian Department of Treasury and Finance and reviewed by the Essential Services Commission of South Australia.
- In Tasmania, where business units of local governments provide water and wastewater services, the Government Prices Oversight Commission audits businesses' pricing decisions against the CoAG pricing principles and provides feedback to the Tasmanian Government and local governments on the application of the pricing principles.

One matter relevant to the adoption of (lower bound) cost recovery pricing that the Council considered in this 2004 NCP assessment is that Western Australia and the Northern Territory do not charge for a licence to extract water (surface water or groundwater). Work by the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) (subsequently endorsed by CoAG) indicates that CoAG intended governments to recover direct management costs from users and to consider the appropriate apportionment of indirect costs,⁷ making transparent any remaining subsidies. (CoAG excluded the application of these pricing objectives to private withdrawals of groundwater from NCP compliance assessment purposes.⁸) The National Water Initiative has confirmed CoAG's earlier view on appropriate cost recovery for water planning and management activities. Under the National Water Initiative, signatory governments have committed to identify all the costs of water planning and management and determine the proportion of costs that could be attributed to water access entitlement holders, with a view to determining consistent approaches to pricing and attributing the costs of water planning and management by 2006. Charges are to be linked as closely as possible to the costs of activities or products.

Consumption based pricing

The 1994 CoAG water reform agreement also required governments to ensure urban and rural water and wastewater businesses relate water prices to the volume of water used by introducing consumption based (or volumetric) pricing where this is cost-effective. Relating pricing to use creates a financial incentive to use water efficiently, thus encouraging water conservation, which

⁷ Direct management costs include the cost of operating water allocation regulatory systems (for example, licensing, day-to-day management and administration) and metering and water level monitoring that directly supports management. Indirect management activities include policy, investigation, assessment, monitoring, the maintenance of technical databases and related activities.

⁸ Private withdrawals include private providers and small cooperatives that extract water from bores for private use but exclude large cooperative arrangements (including trusts) that supply water wholesale as a commercial venture and that are subject to government control or direction or receive substantial government funding.

can defer investment in new water infrastructure and lead to potentially substantial financial savings and environmental benefits.

Under the 1994 CoAG water reform agreement, governments may ask service providers to provide services to customer classes at less than the full cost of the service. Where a government does this, to comply with CoAG obligations, it should disclose the cost of providing the services and fund them via a CSO paid to the service provider. Cross-subsidies that are not consistent with efficient and effective service should be eliminated, and those that are retained should be made transparent. (The Council does not assess governments' justifications for CSOs or cross-subsidies, but expects that CSOs and cross-subsidies will not undermine CoAG's overall policy objective of an efficient and sustainable water industry.)

Consumption based pricing

Water businesses are to set prices based on the volume of water supplied to encourage more economical water use. Urban businesses should implement a two-part tariff (comprising a fixed access component and a volumetric cost component) where this is cost-effective. Metropolitan bulk water suppliers should charge on a volumetric basis (or employ a two-part tariff with an emphasis on the volumetric component).

Reference: 1994 CoAG water reform agreement, clauses 3(a)–(c)

Most (metropolitan and regional) urban water providers (including metropolitan bulk water suppliers) now apply a two-part tariff, comprising a fixed access charge and a consumption based use component. The few providers not using a consumption based approach have shown that it is not cost-effective to price on this basis.⁹ In most jurisdictions, government-owned rural water businesses also adopt a consumption based approach. However, it is not clear that rural businesses in all jurisdictions are pricing on this basis.

Wastewater businesses commonly set charges on a volumetric basis for users who discharge a significant amount of waste or waste of high toxicity. They do this by linking charges to the volume of waste and/or pollutant/toxicity load. Because almost all of the cost of providing wastewater services to domestic and small commercial consumers is fixed, businesses generally adopt a fixed (rather than use based) charge for wastewater services for these user categories.

⁹ In previous NCP and supplementary assessments, the Council considered the case of the Townsville City Council, which does not set water prices for residential customers on a consumption basis. The Council found that analysis by the Queensland Competition Authority supported Townsville's approach, although the authority noted the desirability of Townsville keeping the case for consumption based pricing under review (NCC 2003b).

Water access entitlements

Under the 1994 CoAG water reform agreement, governments undertook to better define water entitlements and separate them from land title. Governments agreed to specify the amount of water available for extractive uses (in terms of ownership, volume, reliability, transferability and, if appropriate, quality).

Under the National Water Initiative, governments decided that the system of water access entitlements should, among other things, ensure the security and commercial certainty of the entitlement. Accordingly, for the consumptive use of water, signatory governments committed to implementing a system of statutory water access entitlements, where the entitlement is separate from land and is defined as a perpetual or open-ended share of the consumptive pool of a specified water resource. Water access entitlements must specify the essential characteristics of the water product and be exclusive, tradable or transferable, divisible or able to be amalgamated, mortgagable and enforceable. Entitlements are to be recorded in publicly accessible, reliable water registers. Governments committed to legislative and administrative action (where necessary) to achieve this outcome by the end of 2006.

New systems of water access entitlements

Governments are to establish comprehensive systems of statutory water access entitlements separate from land, being a perpetual or open-ended share of the consumptive pool of a specified water resource by the end of 2006. Water access entitlements must specify the essential characteristics of the water product and be exclusive, tradable or transferable, divisible or able to be amalgamated, mortgagable and enforceable.

References: 1994 COAG water reform agreement, clause 4; 1999 tripartite meeting; Intergovernmental Agreement on a National Water Initiative.

All governments have now legislated to establish systems of water access entitlements separate from land title. In some jurisdictions, water access entitlements are not yet specified as a perpetual share of the water available for consumption, reflecting the fact that the 1994 water reform agreement did not require this specification.

Implementing water access entitlements involves converting existing water allocations to the new entitlements systems, developing operational systems for registering entitlements, and developing and implementing water management plans for river systems and groundwater basins. Water management plans establish the amount of water that is available in a system and set out the arrangements for sharing that water among different users, including the environment.

This 2004 NCP assessment has reported on all governments' progress in implementing their water access entitlements arrangements. It also considered one matter remaining from the 2003 NCP assessment: the new access licensing and registry systems in New South Wales that commenced on 1 July 2004.

Water management

Under the National Water Initiative, signatory governments recognised that decisions about water management involve balancing economic, environmental and other interests. They accepted that they have ‘a responsibility to ensure that water is allocated and used to achieve socially and economically beneficial outcomes in a manner that is environmentally sustainable’. They agreed that water planning is a mechanism that assists them, with the community, to make water management and allocation decisions to meet (often competing) production, environmental and social objectives. CoAG’s broad objectives for water planning are to provide for:

- secure ecological outcomes by describing environmental and other public benefit outcomes for water systems and defining the appropriate water management outcomes to achieve those objectives
- resource security outcomes by determining the shares of the consumptive pool and the rules to allocate water during the life of the plan.

Arising from the 1994 water reform agreement, each government developed an implementation program in 1999. These 1999 programs identify the priority rivers and groundwater systems for which governments undertook to develop arrangements for the allocation and trading of water.¹⁰ Governments committed to substantially complete allocation and trading arrangements for all river systems and groundwater resources covered by their 1999 implementation programs by 2005.

Under the National Water Initiative, signatory governments confirmed their commitment to substantially complete allocation arrangements by 2005 for all river systems and groundwater resources that have been overallocated or are deemed to be stressed in accord with their 1999 implementation programs. The National Water Initiative set 2007 as the deadline for completing water plans for other systems that are overallocated, fully allocated or approaching full allocation, and 2009 as the deadline for completing plans for other systems that are not approaching full allocation. Signatory governments committed to make substantial progress by 2010 towards adjusting all overallocated and/or overused systems.

This 2004 NCP assessment has reported progress by governments towards completing allocation arrangements for the systems covered by their 1999 implementation programs and considered a sample of completed water plans in each jurisdiction. The Council has looked for governments to show that they have based allocations to the environment on the best available science, with any departures from the science based levels justified using robust socioeconomic evidence. The Council has sought to understand that governments have determined the volumes of water allocated to the

¹⁰ Appendix A contains governments’ 1999 programs for implementing allocation and trading arrangements.

environment on the basis of robust evidence, including socioeconomic evidence where the allocations depart from those recommended by the science. It thus considers outcomes that depart from those recommended by the science but are within a range that is reasonable based on robust socioeconomic analysis to be consistent with the 1994 CoAG obligation to allocate appropriate water to the environment. The Council does not conduct its own analyses or reassess the scientific and socioeconomic data.

Achieving secure ecological outcomes

CoAG recognised the environment as a legitimate user of water in the 1994 water reform agreement, acknowledging a need in all jurisdictions to arrest widespread natural resource degradation caused by water use. Governments committed to making an appropriate amount of water available for the environment in surface water and groundwater systems.

Under the 1994 agreement, governments agreed to allocate water to the environment — with the allocated amount determined, wherever possible, using the best scientific information available having regard to the water needs required to maintain the health and viability of river systems and groundwater basins. For rivers that have been overallocated or are deemed to be stressed, governments agreed that arrangements should provide a better balance in water use including appropriate allocations to the environment to enhance or restore the health of aquatic systems.

Governments undertook to have regard to the ARMCANZ/Australian and New Zealand Environment and Conservation Council (ANZECC) National Principles for the Provision of Water for Ecosystems for direction on how water management processes should allocate water for ecosystems. In broad terms, the national principles recognise that an adequate water regime is essential for maintaining natural ecological processes and biodiversity. They state that the provision of water for ecosystems should go as far as possible to meeting the water regime necessary to sustain ecological values, while recognising the existing rights of other water users.¹¹

Provision of water to the environment

Governments are to establish a sustainable balance between the environment and other uses of water, including formal provisions for the environment for surface water and groundwater systems.

In the 1994 CoAG water reform agreement, governments committed to determine environmental requirements using the best available scientific information wherever possible, and to have regard to the intertemporal and interspatial water needs required to maintain the health and viability of river systems and groundwater basins.

(continued)

¹¹ Appendix B discusses the Council's approach to considering how governments have implemented the CoAG obligations on allocating water to the environment, including regard for the ARMCANZ/ANZECC national principles.

For river systems that are overallocated or deemed to be stressed, governments committed to provide a better balance in water resource use, including appropriate allocations to the environment to enhance or restore the health of river systems. In establishing environmental allocations, governments undertook to have regard to the ARMCANZ/ANZECC National Principles for the Provision of Water for Ecosystems.

The 1999 tripartite meeting on water established a timeframe for governments to complete arrangements for environmental allocations.

For the second tranche [1999 NCP assessment], jurisdictions should submit individual implementation programs, outlining a priority list of river systems and/or groundwater resources, including all river systems which have been overallocated, or are deemed to be stressed and detailed implementation actions and dates for allocations and trading to the NCC for agreement, and to [CoAG] Senior Officials for endorsement. This list is to be publicly available.

For the third tranche [2001 NCP assessment], States and Territories will have to demonstrate substantial progress in implementing their agreed and endorsed implementation programs. Progress must include at least allocation to the environment in all river systems which have been overallocated, or are deemed to be stressed.

By 2005, allocations and trading must be substantially completed for all river systems and groundwater resources identified in the [1999] agreed and endorsed individual implementation programs.

The National Water Initiative confirmed signatory governments' commitment to preparing water plans for surface water and groundwater systems in which entitlements are issued. Water plans will be informed by judgments about the best available science, socioeconomic analysis and community input. Signatory governments committed to substantially complete allocation arrangements by 2005 for stressed and overallocated surface and groundwater systems covered by their 1999 implementation programs, and to complete water plans by 2007 for other systems that are overallocated, fully allocated or approaching full allocation and by 2009 for other systems that are not approaching full allocation.

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

Following the January 1999 tripartite meeting on water, CoAG senior officials agreed that each government, to demonstrate compliance with the obligation to allocate water to the environment, should:

- identify relevant surface water and groundwater sources in an implementation program in 1999
- finalise environmental allocations by 2001 for river systems that are overallocated or deemed to be stressed
- substantially complete allocations by 2005 for all river systems and groundwater resources covered by their 1999 implementation programs.

Under the National Water Initiative, signatory governments confirmed their commitment to substantially complete allocation arrangements by 2005 for the rivers and groundwater systems that are overallocated or deemed to be stressed and are identified in their 1999 programs, and to milestones in 2007 and 2009 for developing water plans for other systems.

Achieving resource security

Water users' concern about resource security — particularly the assignment of risk relating to future reductions in the availability of water for consumptive uses — has been evident in several jurisdictions as water planning has proceeded. The National Water Initiative defines the framework for risk management and outlines how the future risk of any reduction in water availability or reliability should be borne.

Under the National Water Initiative, an effective risk assignment framework is as follows:

- The new perpetual or open-ended share based water access entitlements system is established.
- Water plans have been transparently developed to determine the water allocation for the entitlements.
- There is regular reporting of progress with implementing water plans.
- A pathway for dealing with known overallocation and/or overuse is agreed.

The risks of any reduction in water availability or reliability are to be borne as follows:

- Water access entitlement holders are to bear the risk arising from a reduction in the consumptive pool resulting from seasonal or long term changes in climate, and from periodic natural events such as bushfires and drought.
- Water access entitlement holders are to bear the risks up to 2014 arising from bona fide improvements in the knowledge of water systems' capacity to sustain particular extraction levels.
- Risks arising from bona fide improvements in the knowledge of water systems' capacity to sustain particular extraction levels under comprehensive water plans commencing or renewed after 2014 are to be shared over each 10-year period, such that:
 - water access entitlement holders bear the first 3 per cent reduction in water allocations under water access entitlements
 - state/territory governments and the Australian Government share one-third and two-thirds respectively reductions of 3–6 per cent in water allocations under water access entitlements
 - state/territory governments and the Australian Government share equally reductions greater than 6 per cent in water allocations under water access entitlements.

- Governments are to bear the risk of any reduction in water availability or reliability that arises from changes in government policy, where that reduction is not previously provided for. In such cases, governments may recover this water in the most efficient and cost-effective way.

The National Water Initiative permits affected parties (including water access entitlement holders, environmental stakeholders and the relevant government) to adopt a different approach to risk sharing if they can agree to an alternative approach.

Water trading

Both the 1994 CoAG water reform agreement and the National Water Initiative recognise the importance of maximising the contribution of water to national income and welfare through water trading. The 1994 agreement required governments to implement arrangements for water trading once they settle water entitlements and to implement consistent trading arrangements to facilitate cross-border trading. The National Water Initiative reconfirmed the importance that governments are placing on water trading. It commits states and territories to establishing water market and trading arrangements that facilitate opportunities for trading within and between jurisdictions where water systems are physically shared or hydrological connections and water supply considerations permit trading.

Water trading

Governments must establish compatible institutional and regulatory arrangements to facilitate intra- and interstate trade by the end of 2007, including publicly accessible, compatible registry systems by the end of 2006. Governments are to immediately remove barriers to 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 Australian Government and the governments of 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. They are to establish an interim annual threshold limit of 4 per cent on permanent trade out of water irrigation areas, and undertake a review in 2009 to consider raising the interim annual limit.

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

CoAG senior officials asked the Council to assess governments' progress with intra- and interstate water trading in 2003 and 2004 respectively. The 2003 NCP assessment found that water entitlements can be traded temporarily (for an agreed number of seasons, including consecutively) or permanently in most jurisdictions. In some jurisdictions, it is also possible to lease rights with no limit on the duration of the lease.

Temporary trading of entitlements is now widespread in the Murray–Darling Basin jurisdictions. Permanent trading is embryonic, with permanent interstate trade currently operating only as a pilot project within a small area of the basin. There is not much permanent trading (separate from land sales) in Western Australia or Tasmania, and none (temporary or permanent) in the Northern Territory or the ACT. The reason is mostly that current allocations can satisfy demand for irrigation water.

Water entitlements systems and water planning arrangements are both important to the growth of trading. In some states the water entitlements systems require an entitlement holder to own land or be able to use the water that is traded. This may restrict the development of water markets by constraining the activities of third parties such as agents and water brokers. Water plans may contain the rules governing trading and establish the quantum of tradable volumetric allocations. As part of this 2004 NCP assessment, therefore, the Council has examined whether entitlements arrangements and the rules in water plans may unjustifiably constrain trading.

The Council's previous NCP assessments identified water trading restrictions that appear to be focused on outcomes other than environmental health or the physical constraints of water systems. The Council's 2003 NCP assessment noted, in particular, constraints on permanent trade out of irrigation districts in New South Wales, Victoria and South Australia. The Council signaled in that assessment that its 2004 NCP assessment would look for governments to have either removed these constraints or shown that the constraints provide a net benefit to the community.

Under the National Water Initiative, governments acknowledged the need to remove these institutional barriers to trade. The states and territories committed to take immediate legislative and administrative action to remove barriers to permanent trade out of irrigation areas (up to an interim limit of 4 per cent per year of the total water entitlement of the water irrigation area), subject to a review by 2009 and move to full and open trade by 2014 at the latest. 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 exchange rates and/or tagging of water access entitlements by June 2005, and to establish an annual 4 per cent interim threshold limit on permanent trade out of water irrigation areas. They are to undertake a review in 2009 of the impact of trade under the interim threshold, to consider raising the interim limit.

The Council foreshadowed in the 2003 NCP assessment that it would finalise its assessment of all governments' implementation of reforms to intrastate trading arrangements (including the New South Wales, Victorian and South Australian matters) in 2004. Consistent with its approach of accounting for CoAG's further development of water reform benchmarks, the Council has considered the above commitments by the National Water Initiative signatory governments as relevant to the 2004 assessment of those governments' compliance with the 1994 CoAG water reform agreement obligations on intrastate water trading.

Investment in new and refurbished water infrastructure

The 1994 CoAG water reform agreement requires that future investment in new rural water schemes or extensions to existing schemes proceed only if governments show, prior to construction commencing, that the scheme will be economically viable and ecologically sustainable. The National Water Initiative extends these appraisal requirements to investment in all new and refurbished water infrastructure, subject to the recognition that some small community services will never be viable but will need to be maintained to meet social and public health obligations.

Appraisal of new and refurbished water infrastructure

Investments in new and refurbished water infrastructure are to be undertaken only after appraisal indicates that the new or refurbished infrastructure is economically viable and ecologically sustainable.

References: 1994 CoAG water reform agreement, clause 3(d)(iii); Intergovernmental Agreement on a National Water Initiative

In previous NCP assessments, the Council found that state and territory government mechanisms for appraising the economic and ecological aspects of water schemes appear to provide for appropriate independence, public consultation and scrutiny, and have enough flexibility to match the depth of analysis with the size and significance of the project. The Council's assessments therefore involve considering whether governments apply their approval processes appropriately, so robust economic and environmental assessments support any decision to build or refurbish water infrastructure. Evidence of ecological sustainability is relevant for all projects, while evidence of economic viability is relevant only where governments contribute funds to a project.

The economic viability test involves considering whether an infrastructure project will deliver an overall public benefit to Australia — that is, to be economically viable, a scheme must deliver a net benefit that accounts for the private (scheme related) and social (broader than the scheme) benefits and costs. Accordingly, while a project's commercial viability is an important element of the economic viability test, a project that is not commercially viable may still satisfy the economic viability test if there is robust evidence that the project will deliver a net social benefit that outweighs the costs of not being commercially viable. The Council looks for governments to demonstrate economic viability by having analysed all relevant economic and social costs and benefits,¹² including any costs of mitigating adverse environmental effects of the scheme. For large developments, a robust cost–benefit analysis is an effective way of meeting the CoAG obligation to demonstrate economic

¹² Economic viability assessments should discount cash flows using an appropriate discount rate such as a project-specific weighted average cost of capital.

viability. Appraisals should be based on the best information available, with any assumptions and limitations clearly stated.

The ecological sustainability test involves considering whether a project satisfies government ecological assessment processes and legislative requirements, including Australian Government processes under the *Environment Protection and Biodiversity Conservation Act 1999* where relevant. The Council looks for governments to demonstrate ecological sustainability by providing information on the nature of the assessment and decision-making processes as well as on mechanisms to monitor the development's impacts and compliance with environmental standards.

The 2003 NCP assessment considered new rural water projects in Queensland (the Burnett Water Infrastructure Project), South Australia (the Clare Valley Water Supply Scheme) and Tasmania (the Meander Dam). For that assessment, the Council foreshadowed that aspects of these projects might need to be considered further in the 2004 NCP assessment, depending on whether and how the projects proceeded. Of the three projects, the Clare Valley Water Supply Scheme and the Meander Dam had relevant developments.¹³ There was no decision by 30 June 2004 for the Meander Dam project to proceed, however, so the Council did not conclude on Tasmania's compliance with CoAG obligations on the appraisal of new water infrastructure in this 2004 NCP assessment.

Public education and community consultation

CoAG recognises the importance of governments consulting on water reform and involving the community in policy decisions, and implementing educational programs that show the benefits of water reform. The 1994 water reform agreement committed governments to consult on significant reforms and implement public education programs. Consistent with this commitment, governments agreed under the National Water Initiative to conduct open and timely information sharing processes, and to provide accurate and timely information on water planning.

The National Water Initiative also recognises that adjustment issues affecting entitlement holders and communities may arise from reductions in water availability. Under the initiative, governments have committed to address significant adjustment issues. In addition, the National Water Initiative recognises the importance of knowledge and capacity building. Governments have committed to identify the key science priorities to support

¹³ The Council also reported on new infrastructure matters in Queensland: it noted that, since the 2003 NCP assessment, there was no development concerning the matter relevant to the Burnett Water Infrastructure Project (the Ned Churchward Weir raising) and it considered stakeholder submissions to the 2004 NCP assessment concerning a proposed private sector project, the Nathan Dam.

the water reform program and to implement the necessary measures to ensure that research effort is comprehensive, well coordinated and publicised.

Public education and community consultation

Governments have committed to consult with relevant stakeholders on the significant CoAG reforms (especially water pricing and cost recovery for urban and rural services, water planning, and trade in water access entitlements) and to implement education programs on the benefits of water reform. Governments have committed to provide accurate and timely information to relevant stakeholders on the progress of water plan implementation and on other issues relevant to the security of water entitlements.

References: 1994 CoAG water reform agreement, clauses 7(a)–(e); Intergovernmental Agreement on a National Water Initiative

In accord with CoAG senior officials' scheduling of assessment issues, in each NCP assessment the Council considers governments' implementation of public education and consultation obligations, focusing on the reforms scheduled for assessment. Consequently, for this 2004 NCP assessment, the Council has considered governments' public education and consultation on rural water pricing, new infrastructure, water planning and water trading, and governments' provision of information on their progress with water planning and related resource security issues.

Issues identified in the 2003 National Competition Policy assessment

In the 2003 NCP assessment, the Council noted matters in several jurisdictions where progress with implementing elements of the 1994 water reform agreement was slow or required further consideration. These matters are summarised below, by jurisdiction. The Council's 2003 NCP assessment report (volume three) details these reform requirements (NCC 2003a).

Rather than recommending competition payment penalties in the 2003 NCP assessment, the Council undertook to reconsider the relevant government's progress in this 2004 NCP assessment (in addition to the matters that CoAG senior officials scheduled for assessment in 2004). The National Water Initiative has since further developed the reform benchmarks and timelines for some of these matters.

New South Wales

- Demonstrate continued progress by nonmetropolitan urban water and wastewater businesses towards achieving (at least lower bound) cost recovery.
- Commence the state's water access entitlements licence system and register of water entitlements.

- Remove, or demonstrate a net public benefit from, the prohibition on net permanent water trade out of water irrigation areas, and ensure any trading rules in water sharing plans facilitate trading (see also the discussion on water trading, pp. 1.18–19).

Under the National Water Initiative, New South Wales committed to make the necessary legislative changes by June 2005 to effect a Heads of Agreement between the Government and major irrigation corporations to permit permanent trade out of irrigation areas (up to an interim threshold of 4 per cent per year of the total water entitlement of the water irrigation district).

Victoria

- Remove, or demonstrate a net public benefit from, the annual 2 per cent limit on net permanent water trade out of water irrigation areas, and ensure any trading rules in water management plans facilitate trading. Consider and, where appropriate, remove or amend measures that appear to be inconsistent with CoAG water trading obligations, including: the requirement for water entitlements to attach to land; the differential return on assets incorporated in the price charged by rural water authorities for bulk water supplied to regional urban customers and irrigators; and restrictions in unregulated systems north of the Great Dividing Range that prohibit trade upstream and impose a 20 per cent reduction on trade downstream (see also the discussion on water trading, pp. 1.18–19).

Under the National Water Initiative, Victoria committed to effect changes to permit increased trade, including removing barriers to trade out of irrigation areas (up to the interim threshold of 4 per cent per year of the total water entitlement of the water irrigation district). It committed to do this at the same time that New South Wales amends its legislation and no later than June 2005.

- Effect the foreshadowed extension of the jurisdiction of the Essential Services Commission to cover the water industry.
- Develop and publish obligations statements for regional urban and rural water businesses.
- Complete water industry legislation review and reform obligations by implementing remaining key recommendations from the NCP review of water industry legislation.

Queensland

- Progress the implementation of water resource plans and resource operations plans to enable the conversion of existing water licences to water allocations and permanent trading in water allocations (outside the schemes covered by the trading trial) (see also the discussion on water trading, pp. 1.18–19).

Western Australia

- Establish the Economic Regulation Authority and issue terms of reference for an investigation by the authority of urban water pricing. These actions would also address remaining institutional structure obligations (NCC 2003a, pp. xxxvii–viii).
- Remove, or demonstrate a net public benefit from, restrictions on water trading (including provisions in the *Rights in Water and Irrigation Act 1914*), and ensure any trading rules in water management plans facilitate trading (see also the discussion on water trading, pp. 1.18–19).
- Progress the devolution of a greater degree of management responsibility for the Ord Irrigation Scheme to local constituents.
- Ensure administrative arrangements provide for effective integrated management of catchments. Implement the Waterways WA framework for considering and supporting land care practices to protect rivers with high environmental values.
- Progress the implementation of the National Water Quality Management Strategy. Implement guidelines on fresh and marine water quality, and on water quality monitoring and reporting.
- Complete water industry legislation review and reform obligations by implementing reforms to 19 water industry instruments as recommended by Western Australia's NCP reviews of water industry legislation.

South Australia

- Demonstrate that water and wastewater prices charged by SA Water comply with CoAG requirements by preparing the State's first pricing transparency statement showing that 2004-05 prices satisfactorily address the CoAG pricing principles (NCC 2003a, pp. xlvii–viii and pp. 6.2–4). The preparation of annual water and wastewater pricing transparency statements would also address institutional structure obligations.
- Remove, or demonstrate a net public benefit from, restrictions (including the cumulative 2 per cent limit in the Central Irrigation Trust) on water

trade out of water irrigation areas. Ensure any trading rules in water allocation plans facilitate trading. Demonstrate that the reduction factors on some allocations that are traded are consistent with CoAG water trading obligations (see also the discussion on water trading, pp. 1.18–19).

Under the National Water Initiative, South Australia committed to effect changes to permit increased trade including removing barriers to trade out of irrigation areas (up to the interim threshold of 4 per cent per year of the total water entitlement of the water irrigation district). It committed to do this at the same time that New South Wales amends its legislation and no later than June 2005.

- Progress the devolution of a greater degree of management responsibility for the lower Murray reclaimed irrigation areas to local constituents.
- Progress the proposed reform of the legislative and administrative arrangements governing natural resource management to reduce the complexity of current procedures.
- Complete water industry legislation review and reform obligations by repealing the remaining two pieces of legislation from South Australia's NCP water legislation review and reform program.

Tasmania

- Remove arrangements in the *Water Management Act 1999* and *Irrigation Clauses Act 1973* that govern the holding and transfer of water entitlements (which require an entitlement holder to own or occupy land in the irrigation district, and which allow transfers to be refused if the quantity of water involved would exceed the amount that could be used sustainably for the intended purpose) or demonstrate that these measures provide a net public benefit. Ensure trading rules in water management plans facilitate trading (see also the discussion on water trading, pp. 1.18–19).
- Advise on outcomes regarding arrangements for handling customer complaints about the service standards of local governments' water businesses (following the review of the *Local Government Act 1993*).
- Progress the devolution of a greater degree of management responsibility for the South East Irrigation Scheme to local constituents.

Australian Capital Territory

- Progress the development of trading rules and arrangements for interstate trade, and decide the size of the Murray–Darling Basin Ministerial Council cap on diversions and the way that the cap is determined to enable trading in water access entitlements (see also the discussion on water trading, pp. 1.18–19).

Northern Territory

- Continue to develop water allocation plans that ensure the plans' trading rules facilitate trading in water access entitlements where systems are physically shared, or where hydrologic and water supply considerations permit trading (see also the discussion on water trading, pp. 1.18–19).

1.2 The 2004 assessment process

The 2004 NCP assessment framework

As for the previous NCP assessments of governments' progress with water reform, the Council released a framework before this 2004 assessment outlining the scope of the assessment. The Council intended the assessment framework to guide governments and water industry stakeholders on the matters under consideration in the 2004 NCP assessment. The framework aimed to:

- provide a transparent basis for assessing governments' actions to implement the objectives set by CoAG
- identify the type of information that governments need to provide to demonstrate compliance
- outline the scope of the assessment, to guide public submissions
- provide a basis for identifying where reform is proving difficult, as a focus for discussion between the Council and the relevant government.

The Council released the 2004 NCP assessment framework for water reform in December 2003. It publicised the existence of the framework via its Enews facility and placed the framework on its website. The Council also provided the framework to all governments and, on request, to interested parties. As discussed above, the National Water Initiative, agreed by most governments in June 2004, further developed the reform benchmarks for some water reform matters considered in the 2004 NCP assessment.

Governments' 2004 National Competition Policy reports

Governments report annually on their progress with implementing the NCP program. For this 2004 assessment, the Council asked governments to report by 12 April 2004, with a focus on the matters being assessed in 2004.

Governments provided their annual reports on water reform on the dates noted in table 1.1. To assist the Council, some governments provided an advance draft copy. The Murray–Darling Basin Commission also provided information to assist the Council's 2004 NCP assessment of water reform implementation.

Table 1.1: Governments' provision of 2004 NCP annual reports on water reform

<i>Government</i>	<i>Date on which the Council received the 2004 NCP annual report on water reform^a</i>
Australian Government	6 May 2004
New South Wales	25 June 2004
Victoria	8 April 2004
Queensland	15 April 2004
Western Australia	23 April 2004
South Australia	22 June 2004
Tasmania	7 April 2004
The ACT	12 May 2004
The Northern Territory	30 April 2004

^a To assist the Council, some governments made their reports available initially in draft form, before endorsing the draft for public release. The dates reported are the dates on which governments submitted their reports, whether draft or endorsed.

Submissions from stakeholders

The Council invited interested parties to make submissions on governments' water reform activity. The purpose of inviting submissions was to ensure, as far as possible given available resources, that the Council had access to stakeholder views on governments' reform progress. Submissions were provided by a range of stakeholders, including environmental organisations, irrigators and irrigator representatives, reference groups involved in water management, water authorities and interested individuals.

In the 2004 assessment framework released in December 2003, the Council invited interested parties to provide submissions, where possible by 12 April 2004, so it could consider them in conjunction with governments' NCP annual reports. The Council received 16 submissions and placed them on its website.¹⁴ Appendix C lists the individuals and organisations that made a submission.

The Council considered all matters raised that were relevant to 2004 NCP assessment obligations. (It has also considered some matters from 2004 submissions in the deferred 2003 assessments for New South Wales and Victoria.) Where issues relevant to the 2004 NCP assessment of a

¹⁴ The Council also received a range of material from the East End Mine Action Group (Mount Larcom, Queensland) and a letter from the Gwydir Valley Irrigators Association, which it has considered as part of this 2004 NCP assessment.

government's reform performance were raised, the Council sought comment from the relevant government.

1.3 The deferred 2003 assessments: implications for 2004

Under the 1994 CoAG strategic water reform framework, governments were to have made substantial progress by 2001 in implementing arrangements to provide water to the environment, including allocations in all river systems identified as overallocated or stressed. By 2005, governments were to have substantially completed allocation and trading arrangements for all river systems and groundwater resources covered by their 1999 implementation programs. CoAG senior officials asked the Council to consider governments' progress against this objective in the 2004 NCP assessment.

As long ago as the 2001 NCP assessment, the Council noted issues relating to work on environmental allocations by New South Wales and Victoria (the two jurisdictions with stressed and overallocated rivers). In subsequent assessments (most recently the 2003 deferred assessments), the Council considered the two states' compliance with CoAG obligations on environmental allocations in stressed and overallocated rivers.

New South Wales

At the time of the 2003 NCP assessment, New South Wales had gazetted the State Water Management Outcomes Plan and 35 (of 39) first-round water sharing plans, but had deferred commencement of the gazetted plans to 1 January 2004. New South Wales had published summary guides and fact sheets on almost all of the 35 completed plans, but had not provided sufficient information on expected ecological health outcomes for the Council to finalise its assessment of whether that state had satisfactorily addressed CoAG obligations to allocate environmental water in stressed and overallocated rivers. New South Wales was also still to finalise the programs to implement the gazetted water sharing plans and to commit to a satisfactory process and timetable for developing water management arrangements for the stressed or overallocated river systems not covered by a gazetted water sharing plan.

At the time of the deferred 2003 assessment (June 2004), New South Wales had:

- confirmed it would commence 30 of the 35 gazetted water sharing plans on 1 July 2004 (deferred from 1 January 2004)
- confirmed it would commence five gazetted groundwater plans on 1 July 2005 (deferred from 1 January 2004), to review its approach to reducing water access for these plans

- published the guides and fact sheets for the gazetted water sharing plans and provided some additional information on the action taken to allocate water to the environment
- progressed, but not finalised, the four remaining first-round water sharing plans, with the Orara River plan being the only first-round non-groundwater plan still to be completed
- completed the implementation programs for the 35 gazetted plans (which were awaiting Ministerial approval)
- commenced development of 'macro plans' for the unregulated rivers and groundwater sources not covered by the 39 first-round water sharing plans.

While New South Wales had mechanisms for most of its water sources for allocating water among different uses (including to the environment) and enabling trading, the Council was not able to conclude that the State had satisfactorily addressed the CoAG obligations relating to environmental allocations. Despite stating that extraction limits in several plans are set to sustain ecological values, New South Wales provided insufficient information to show this sustainability. The Government also did not indicate the extent of, and rationale for, any trade-offs made for social and economic reasons in setting the extraction limits. In addition, for some water sources, the available evidence (including from the former New South Wales Department of Land and Water Conservation) suggested the gazetted arrangements are unlikely to address existing significant environmental challenges.

While the water sharing plans can be amended during their 10-year life, constraints on permitted amendments leave little prospect of any changes satisfactorily addressing current environmental challenges. The proposed involvement of the Natural Resources Commission is positive but unlikely to satisfactorily address the deficiencies in the plans. New South Wales had, however, deferred the commencement of five groundwater plans by 12 months (to 1 July 2005) to review its approach to reducing water allocations in the five water sources.

While the Council acknowledges the complexity of ensuring appropriate environmental allocation arrangements in overallocated systems, it noted that the need to ensure appropriate environmental allocations had been raised with New South Wales in all assessments since 2001. The Council considered recommending a suspension or reduction in the State's 2003-04 competition payments. However, it completed the deferred 2003 assessment only in June 2004: given this delay, the Council judged that a more appropriate course (noting New South Wales's deferral of five plans to review allocation arrangements) was to wait until the 2004 NCP assessment to reconsider this and remaining water planning matters relating to stressed and overallocated systems (NCC 2004a).

Victoria

Victoria placed 11 stressed and overallocated rivers on its 1999 program for implementing water allocation arrangements, including allocations to the environment. In past NCP assessments, the Council accepted some delay (beyond the 2001 deadline) by Victoria in finalising arrangements to allocate environmental water for stressed and overallocated rivers, recognising that the state was continuing to progress towards achieving its obligations in this area.

At the time of the 2003 NCP assessment, Victoria was still to decide how it would provide environmental flows in three of the state's five priority stressed rivers: the Thomson and Macalister river systems and the Maribyrnong River. The Council deferred Victoria's 2003 NCP assessment for this matter, noting that the (then foreshadowed) National Water Initiative might have implications for Victoria's approach.

The deferred assessment found that Victoria, since the 2003 NCP assessment, had made the following progress regarding the Thomson and Macalister rivers:

- The Thomson and Macalister Task Force had finalised its report on options for flow rehabilitation for the Thomson and Macalister rivers, and the State Government had commenced some river restoration projects pending its decision on the task force report. At the time of the deferred assessment, the task force report was before the government, and the government's response was expected as part of the White Paper on water.
- The Port Phillip and Westernport Catchment Management Authority was developing a draft Port Phillip and Westernport River Health Strategy, which would consider proposed actions for the Maribyrnong River over the short to long term in line with regional priorities being established through the regional river health strategy.
- The Victorian Government had provided funds to the Port Phillip and Westernport Catchment Management Authority to investigate options to manage summer stress in Jacksons Creek and to conduct on-ground habitat works to protect the low flow aquatic habitat in Deep Creek.
- The Victorian Government had allocated \$280 000 from its Stressed River Program to the Goulburn Broken Catchment Management Authority to develop and implement a revised stream flow management plan.
- The Victorian Government had progressed the development of arrangements for allocating environmental water in the remaining six stressed rivers covered by its 1999 implementation program. It had identified another six rivers as being at significant risk of flow stress and had signalled that it would take action to address this stress.

Victoria does not consider the Maribyrnong River to be a priority because it considers the statewide return in terms of environmental outcomes from investing in flow restoration activities is greater for other rivers. Victoria has restored flows in some but not all reaches of the Maribyrnong River. The Port Phillip and Westernport Catchment Management Authority will consider river health aspects as part of implementing its regional river health strategy. The deferred 2003 assessment of Victoria's actions to restore flows in King Parrot Creek (which Victoria advised forms a substitute to further investment to restore flows in the Maribyrnong River) found that Victoria had implemented several interim measures to address summer and winter flow stress and groundwater extraction identified in the draft stream flow management plan for the creek. Victoria was behind schedule, however, for deciding on water management arrangements for the creek, and work remained to address deficiencies in the draft stream flow management plan.

The deferred 2003 assessment found that although Victoria had some way to go to meet stressed river environmental allocation obligations, the state is progressing its bulk entitlements program, the stream flow management plans and other stressed river arrangements. The Council undertook to further consider, in the 2004 NCP assessment, Victoria's implementation of the Thomson/Macalister arrangements, and identified a range of matters that Victoria needed to address by 2005 to meet 1994 CoAG obligations. The Council considered Victoria to have met its CoAG obligations for 2003, and recommended no reduction in Victoria's 2003-04 competition payments for environmental water allocation issues (NCC 2004b).

2 New South Wales

2.1 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 and consumption based pricing by rural water service providers

Assessment issue: New South Wales is to demonstrate that government-owned irrigation schemes and government-owned suppliers of bulk water are setting prices based on the principles of full cost recovery and consumption based pricing. Government-owned water businesses must also show that they are managing any subsidies consistent with efficient and effective service provision and use. For the government-owned bulk water service provider, State Water, prices are regulated by the Independent Pricing and Regulatory Tribunal (IPART) via a three-year price path (to 30 June 2004). The price path aimed to move bulk water supply prices towards the lower bound of cost recovery. (Some State Water bulk water services will not achieve full cost recovery by 2004 under the price path.) Previous National Competition Policy (NCP) assessments found that the New South Wales Government did not transparently report its CSO payments to State Water. IPART also identified variations in the balance between entitlement and use charges in regulated systems, and considered that these variations may not reflect the different costs involved. It encouraged the government to investigate the composition of the tariffs (IPART 2001, p. 73). For the 2004 NCP assessment, the National Competition Council looked for New South Wales to:

- provide information on the implementation of the IPART price paths, indicating the services for which full cost recovery is likely to be achieved by 30 June 2004 and those for which it is not. For bulk water supply services that will not achieve full cost recovery by 30 June 2004, the Council looked for New South Wales to show that State Water is continuing to move towards the lower bound of cost recovery and indicate when this is likely to be achieved. The Council also looked for New South Wales to determine arrangements for price setting for State Water's bulk water services after 30 June 2004, when the price path concluded.
- demonstrate substantial application of consumption based pricing, report on the outcomes of investigations conducted in response to the IPART comments, and outline the basis for State Water's bulk water supply prices for the various customer categories across regulated, unregulated and groundwater systems
- demonstrate that rural sector CSO payments are transparently reported.

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 2004

Cost recovery

State Water is a commercial business unit of the Department of Energy, Utilities and Sustainability, incorporating into a single business all the state's bulk water delivery functions outside the areas of operation of the Sydney Catchment Authority, Sydney Water Corporation, Hunter Water Corporation and a small number of other water supply authorities. It is responsible for the operation and maintenance of 18 major dams and storages and 264 weirs across New South Wales. About 6200 licensed bulk water users are supplied from rivers regulated by State Water dams and weirs. State Water has a further 15 000 groundwater and unregulated river customers (Department of Energy, Utilities and Sustainability 2004).

In December 2001, IPART announced caps on annual price rises for bulk water supplied by State Water, to apply from 1 October 2001 until 30 June 2004. The tribunal capped annual price increases at 15 per cent plus the consumer price index for bulk water from regulated rivers, and 20 per cent plus the consumer price index for water from unregulated rivers and groundwater. The tribunal's objectives in setting the price path included moving towards cost recovery and disclosing State Water's costs. In setting the price path, IPART accounted for the (efficient) costs of operations, maintenance and administration, water resource management activities, capital costs and taxes. Dividends are paid only out of profits.

New South Wales advised that it implemented the IPART three-year price paths in full (NSW 2004). It noted that the estimated share of recovered (lower bound) costs increased from 61 per cent in 2000-01 to 74 per cent in 2003-04 (table 2.1).

Table 2.1: Cost recovery for water services, by New South Wales region/river valley

<i>Region/river valley</i>	<i>2000-01</i>	<i>2003-04</i>
	%	%
Barwon (Border, Gwydir, Namoi, Peel)	66	82
Central West (Lachlan, Macquarie)	81	89
Far West	20	33
Murray	77	96
Murrumbidgee	78	88
North Coast	12	20
Hunter	30	45
South Coast	12	19
Total New South Wales	61	74

Source: IPART 2001

Cost recovery outcomes differed for the various types of water source and the different regions. The regulated river systems, which account for 86 per cent of revenue from bulk water sales, recovered 94 per cent of (lower bound) costs in 2003-04, while unregulated river and groundwater systems each recovered just over 30 per cent of lower bound costs (table 2.2).

New South Wales confirmed that it is committed to full cost recovery in rural bulk water prices. It noted, however, that it will be difficult to achieve cost recovery in the coastal regulated river valleys without significantly increasing prices for the relatively few extractors in the valleys. The level of cost recovery is currently well short of the lower bound benchmark. New South Wales indicated that it may continue to subsidise water users' shares of attributable costs for these regulated systems.

New South Wales has deferred IPART's next determination of State Water prices by 12 months, meaning the new price paths will apply from 2005-06. For the interim year, 2004-05, State Water will increase its prices by the

amount of the consumer price index. New South Wales considered it necessary to delay determination of the next price path because it is introducing new institutional arrangements for rural water services. State Water was corporatised on 1 July 2004, and the State Government was then deciding the functions of State Water and the new Department of Infrastructure, Planning and Natural Resources (DIPNR). IPART will regulate both State Water's delivery costs and DIPNR's water resource management costs.

Table 2.2: Estimated share of allocated costs recovered from tariffs in 2003-04, by New South Wales region/river valley

<i>Region/river valley</i>	<i>Regulated water</i>	<i>Unregulated water</i>	<i>Groundwater</i>
	%	%	%
Border	100	42	
Gwydir	100	89	Barwon region
Namoi	100	43	37
Peel	55	Included in Namoi	–
Lachlan	100	28	Central West
Macquarie	107	71	35
Far West	No regulated rivers	33	34
Murray	100	33	56
Murrumbidgee	100	71	28
North Coast	11	21	22
Hunter	53	31	21
South Coast	35	20	8
Total	94	31	32

Source: IPART 2001

New South Wales advised that State Water will submit a water delivery pricing proposal to IPART by the end of October 2004. This will include a three to four year price path, commencing 1 July 2005, with real annual price increases. State Water will seek to have IPART raise the maximum allowable price increase for regulated rivers to achieve cost recovery for water delivery services by the end of the determination. Water delivery charges account for over 70 per cent of total bulk water revenue.

New South Wales also advised that DIPNR will submit a natural resource management pricing proposal that considers the allocation of the Murray–Darling Basin Commission's (MDBC) natural resource management costs to the Murray–Darling Basin valleys in New South Wales. Costs are to be allocated on an 'impactor pays' basis (see the later section on River Murray Water cost allocation). New South Wales advised that the DIPNR submission will be provided to IPART by the end of October 2004.

Community service obligations and subsidies

IPART (2001) estimated that rural sector CSOs — the shortfall between State Water’s customer revenue and its expenditure — in 2003-04 would total almost \$16 million (measured in 2001-02 prices). Table 2.3 shows the estimated shortfall for 2003-04 in New South Wales regions/river valleys, by water source, as reported in IPART’s 2001 price determination.

New South Wales advised that future State Water CSOs (including shortfall amounts) will be clearly defined, costed and transparently reported in State Water’s annual reports. The State Government will provide additional funding to State Water to meet external requirements such as dam safety.

Table 2.3: CSOs^a for 2003-04 by New South Wales regions/river valleys and water source (\$m, 2001-02 prices)

<i>Region/river valley</i>	<i>Regulated water</i>	<i>Unregulated water</i>	<i>Groundwater</i>	<i>Total</i>
Border	0.0	0.1		
Gwydir	0.0	0.0		
Namoi	0.0	0.3		
Peel	0.4	Included in Namoi	Barwon region 1.4	Barwon region 2.2
Lachlan	0.0	0.3	Central West 1.0	Central West 1.2
Macquarie	-0.2	0.2		
Far West	No regulated rivers	0.9	0.8	1.6
Murray	0	0.2	0.4	0.5
Murrumbidgee	0	0.1	1.1	1.2
North Coast	0.4	2.0	0.4	2.8
Hunter	1.9	0.8	0.4	3.2
South Coast	0.3	2.2	0.8	3.3
Total	2.6	7.0	6.3	15.9

^a Shortfall between revenue raised and the allocated user share of costs.

Source: IPART 2001

Consumption based pricing

New South Wales reported that it prices most bulk water services on a consumption basis using two-part tariffs. The two-part tariffs, comprising a fixed (volume of entitlement) component and a variable (use) component, are being implemented as determined by IPART in 2001:

- A two-part tariff is in place for all regulated river services.

- For unregulated rivers, a two-stage program is underway to move towards consumption based pricing. The first stage involved converting licences based on irrigation area to a volumetric entitlement. New South Wales reported that this stage is now complete, and customers will be charged per megalitre based on their annual entitlement instead of an area-based charge. The second stage will involve defining the volume of water that licence holders extract. This requires monitoring annual water use through metering or some other calibrated, auditable process. Metered customers will face the two-part tariff instead of a single entitlement charge as this stage is implemented across the State. New South Wales expects to implement metering in the unregulated river water sharing plan areas over the next five years.
- Two-part tariffs are also in place in groundwater management areas where metering and monitoring of water use is possible.

New South Wales reported that the cost structure of bulk water delivery will be redefined with the corporatisation of State Water. The government will require State Water to operate commercially. In this context, State Water is investigating differential pricing, premium pricing, the ratio of the fixed and variable cost components of price, and the relativity between the price of high security and general security water. The new board of directors will set the principles for future pricing submissions to IPART, based on State Water's Statement of Corporate Intent.

As discussed above, State Water will make a pricing submission to IPART in September 2004. New South Wales advised that the submission will seek to achieve best practice rural bulk water pricing. Accordingly, the submission will encompass consumption based pricing and recovery of the efficient costs of State Water's bulk water services for regulated rivers, unregulated rivers and groundwater sources.

Submissions

Nature Conservation Council of NSW Incorporated and the Inland Rivers Network

The Nature Conservation Council of NSW and the Inland Rivers Network jointly submitted that rural bulk water prices and urban water prices in New South Wales do not reflect the full cost of the resource so do not accord with the 1994 CoAG water reform agreement. Regarding rural water pricing, the submissions argued that infrastructure assets are undervalued, environmental costs are excluded, prices are maintained at levels below cost recovery to support marginal users, externality costs are determined at a state level (which does not allow for variations among valleys) and delivery costs are averaged across lengthy and disparate river reaches. The submissions argued that the result is significant undervaluing of services and, therefore, underpricing.

The Nature Conservation Council of NSW and the Inland Rivers Network supported the use of independent bodies such as IPART because this use provides for transparent and accountable pricing processes. Regarding national benchmarking, they considered that the appropriate benchmark is the pricing policy rather than the actual price, because variations in the treatment of externality costs will influence the price of water in any given area.

NSW Irrigators' Council

The NSW Irrigators' Council raised several issues regarding the state's application of rural water reform obligations:

- It commended State Water on its involvement of customers in the preparation of the next pricing submission to IPART.
- It acknowledged the significant progress towards institutional separation, with State Water and DIPNR making separate submissions to IPART, and noted the scope for DIPNR (through the work of regulators and the government) to achieve a more commercial focus.
- It raised several concerns regarding the government's approach to full cost recovery, including that:
 - the costs of natural resource management appear as a single figure in financial reporting and are not sufficiently transparent because DIPNR does not report natural resource management costs in the same way that State Water reports costs
 - the focus on recovering costs solely from irrigators is not appropriate because some natural resource management benefits accrue to groups other than irrigators (in which case, the NSW Irrigators' Council considered that part of the cost should be funded by the identified groups or government)
 - current irrigators should not be responsible for sunk costs (which should be paid by the government)
 - the current flat fee charged to water users for externalities is inequitable, overly blunt and not transparent (whereas transparent cost attribution between states, then valleys and then users would be appropriate)
 - The Living Murray Initiative policy costs should not be charged to River Murray Water, so should not flow through to water users
 - the government should not seek to achieve a return on infrastructure assets (because this will increase production costs for water users and contradict other CoAG pricing principles)

- the government has not identified CSOs, despite a strong case based on some water users' incapacity to pay prices that achieve cost recovery,
- River Murray water users and users in other valleys have not been informed of any progress with the determination of a robust and transparent method for allocating the MDBC's water resource management costs to users.
- It argued that some users are experiencing delays in the processing of permanent licence transfers because the government is focusing on cost recovery without necessarily providing an efficient service.
- It supported the accurate and efficient measurement of all water use, proposing that State Water use real-time technology and an auditing approach to improve compliance, and that the government identify associated costs as a CSO where they are prohibitive for users.

Discussion and assessment

Cost recovery

Under the 1994 water reform agreement (confirmed by the National Water Initiative), New South Wales needs to show that all rural systems at least achieve lower bound cost recovery in accord with the CoAG pricing principles, and it needs to move towards the upper bound where practicable. 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).

IPART's approach to setting maximum prices for bulk water delivery services accounts for the CoAG pricing principles. The IPART 2001 price determination established, as a first step, the efficient costs of bulk water supply operations, water resource management and capital costs. Further progress towards the lower bound of full cost recovery is expected to be achieved through the next IPART pricing determination, to apply from 2005-06.

New South Wales made significant changes to its institutional arrangements following the 2003 NCP assessment. It advised that it will require the corporatised State Water to operate in a commercial manner, consistent with the *State Owned Corporations Act 1989*. The corporatisation of State Water more clearly defines the role of rural water service provision in the state. This change, while not a direct pricing matter, should nevertheless provide a strong framework for applying best practice pricing principles. The other change is IPART's separate regulation of State Water costs and charges and

DIPNR's natural resource management costs — a distinction that is likely to provide greater transparency in water pricing.

The state's rural systems are yet to achieve lower bound cost recovery, although cost recovery performance is improving. Through the IPART bulk water pricing process, New South Wales has established price paths that moved cost recovery by State Water services from 61 per cent of lower bound costs in 2000-01 to 74 per cent in 2003-04. Moreover, it has indicated that it will establish a further price path to continue to move State Water services and DIPNR water resource management towards the lower bound of cost recovery. New South Wales confirmed that State Water's submission to IPART for the forthcoming price determination will aim to move the corporation to full cost recovery (presumably the lower bound of cost recovery) for most regulated systems. The government's postponement of the price determination by 12 months is not inconsistent with implementing its CoAG pricing commitments.

Asset valuation methods and cost of capital related issues were raised by the two submissions that addressed rural pricing in New South Wales. IPART has determined that all water assets in place before 1 July 1997 should not be part of the asset base for pricing purposes. This means that depreciation or a rate of return on pre-1997 expenditure is not a cost to be recovered in price setting. All post-1997 expenditure that is attributed to users, including renewal and compliance expenditure, attracts a discount rate set at State Water's cost of capital. The Council has previously commented on the state's approach to treating infrastructure assets in price setting, taking the view that it accords with the requirements of the CoAG pricing principles' lower bound of cost recovery.

The two submissions presented different arguments regarding treatment of infrastructure assets for pricing purposes. The Nature Conservation Council of NSW and the Inland Rivers Network argued that State Water infrastructure assets are undervalued and hence the corporation's services are underpriced. The NSW Irrigators' Council argued that a zero rate of return on assets is appropriate, and to seek a positive return would only increase production costs for water users. New South Wales, in response to the submissions, indicated that it does not agree that it should refrain from earning a return on infrastructure capital investments. The Council notes that earning a return on infrastructure assets is consistent with the commitments on full cost recovery in both the 1994 CoAG water reform agreement and the National Water Initiative, and is necessary if State Water is to move towards the upper bound of cost recovery.

The two submissions also raised issues regarding the state's treatment of natural resource management costs and compliance with CoAG pricing requirements relating to the treatment of externalities. The CoAG pricing principles define externalities (for the purpose of the lower bound of cost recovery) as the environmental and natural resource management costs attributable to and incurred by the water business, and require the treatment of externalities to be transparent. New South Wales recently reviewed its approach to natural resource management and its treatment of relevant

costs, and established new institutional frameworks and processes. DIPNR will be required to submit a natural resource management pricing proposal that considers the allocation of MDBC natural resource management costs, and IPART, as part of its next price determination, will regulate these costs separately from water delivery costs. The Council considers that this approach is likely to improve the treatment and transparency of natural resource management costs. New South Wales explained that variances in financial reporting between DIPNR and State Water, an issue raised in submission, arise because of the different requirements for reporting by government agencies and government businesses. (The section on River Murray Water cost allocation provides further information on the treatment of environmental and natural resource management costs in New South Wales.) New South Wales noted that the area of attributable environmental costs is an evolving one, as signatory governments have recognised under the National Water Initiative. It explained that IPART, DIPNR and other natural resource management agencies will continue to work collaboratively on this issue.

Acknowledging that the government intends to establish a new price path for State Water to move closer to full cost recovery, and that IPART undertakes the price setting process independently, the Council considers that New South Wales has made sufficient progress with rural water pricing for the 2004 NCP assessment. New South Wales will not have complied with the CoAG pricing obligations, however, until it has achieved the lower bound of cost recovery or established the proposed price path that achieves the lower bound of cost recovery (with transitional CSOs made transparent).

Transparent reporting of subsidies

The 1994 CoAG water reform agreement requires the removal of subsidies that are inconsistent with efficient service provision or, at a minimum, the transparent reporting of the objective and quantum of remaining subsidies. Where services are provided to classes of customer at less than full cost, the cost must be fully disclosed and ideally paid to the service providers as a CSO. Where full cost recovery is unlikely to be achieved in the long term, governments should report publicly and, where practicable, consider alternative management arrangements aimed at removing the need for an ongoing CSO.

New South Wales does not publicly report the actual CSO payments that it makes to State Water to address revenue shortfalls relating to bulk water supply services. The IPART rural bulk water price determination indicated, however, the level of forecast cost recovery benchmarked against efficient lower bound costs, and the level of subsidy (revenue shortfall) on a valley-by-valley basis (IPART 2001). The IPART work shows that the level of subsidisation fell between 2001 and 2004, and will fall further over the period of the next price path (expected to commence on 1 July 2005).

The New South Wales Government's commitment to continue moving towards the lower bound of cost recovery means these subsidies will be phased out in

accord with IPART's price determinations. However, the government has asked IPART, in determining rural water price paths, to balance the achievement of full cost recovery against the capacity of bulk water users to absorb the price rises required to achieve full cost recovery. New South Wales advised that the lower bound of cost recovery may not be feasible to achieve in some coastal regulated systems regions and, as a result, that it may continue subsidising water users' share of attributable costs. It also advised that future State Water CSOs will be clearly defined, costed and transparently reported in the corporation's annual reports. The government intends to also separately report any additional funding that it provides to State Water to meet external requirements such as dam safety requirements.

The Council considers that New South Wales has made sufficient progress against its CoAG rural water pricing obligations for the 2004 NCP assessment.

Consumption based pricing

Under the 1994 CoAG water reform agreement (confirmed by the National Water Initiative), governments need to adopt pricing regimes based on the principle of consumption based pricing. New South Wales reported that it applies or is implementing consumption based pricing for most bulk water services. All regulated service charges are two-part tariffs, all services in unregulated river water sharing plan areas will be charged on a two-part tariff basis within five years and services in groundwater management areas are charged on a two-part tariff basis where water use is metered. New South Wales did not provide information on groundwater metered use.

In 2001, IPART identified wide variations in the balance between entitlement and use charges in regulated systems, and considered that these variations may not reflect the different costs involved. It encouraged the government to investigate the composition of the tariffs with reference to implications for revenues, impacts on customers and the potential signalling effects on water use (IPART 2001). The Council understands that these issues will be addressed in State Water's work on pricing practices, which is to be provided to IPART by the end of October 2004.

While New South Wales is yet to apply consumption based charging in the State's unregulated systems (and noting IPART's questions about the basis of the two-part tariffs in regulated systems), the Council is satisfied that New South Wales is committed to the broad application of consumption based pricing. The Council considers that New South Wales has addressed its obligations in this area for the 2004 NCP assessment.

Cost recovery in issuing licences for water extraction

Assessment issue: New South Wales is to demonstrate that its approach to charging for water licences, renewals and transfers will achieve cost recovery in accord with the CoAG pricing principles. IPART considered the level of fees in 2001, but recommended no change until it makes a specific determination or until it reviews the level of the fees associated with the state's system of access licences (which commenced on 1 July 2004). For the 2004 NCP assessment, the Council has looked for New South Wales to provide information on the extent to which current water licence fees reflect costs.

Future reform: Signatories to the National Water Initiative are to bring into effect by 2006 consistent approaches to pricing and attributing the costs of water planning and management. This should involve identifying all costs associated with water planning and management, including the proportion of those costs that can be attributed to water access entitlement holders, consistent with the principle of linking charges as closely as possible to the costs of activities or products. These approaches should be consistent across sectors and jurisdictions in which water entitlements can be traded.

Reference: 1994 CoAG water reform agreement, clauses 3(a), (d) and (e); 1996 Agriculture and Resources Management Council of Australia and New Zealand (ARMCANZ) paper; 1998 CoAG pricing principles; 1999 tripartite meeting; Intergovernmental Agreement on a National Water Initiative

New South Wales advised that since the licensing provisions under the *Water Management Act 2000* commenced in July 2004 it has applied the existing fee structure to new water access licences and approvals in areas covered by water sharing plans. This is an interim approach pending the relevant Minister's approval of a new fee structure. In areas where water plans do not apply, the current *Water Act 1912* licensing fees are continuing.

In its new determination IPART has set maximum licence fees that will apply from 2005-06. New South Wales advised that DIPNR will make a submission to IPART on natural resource management pricing. This submission will propose full cost recovery for water access licences. New South Wales stated that arrangements being introduced under the Water Management Act, with sufficient costing data being available, will result in a robust cost-reflective fees structure. It considers that the extent of change brought about by its new water management initiatives and other changes under the National Water Initiative meant it was impractical to develop a comprehensive fee structure in advance of the new arrangements commencing on 1 July 2004.

Discussion and assessment

The National Water Initiative commits governments to bring into effect by 2006 consistent approaches to pricing and attributing costs of water planning and management. This should involve the identification of all costs associated with water planning and management, and the identification of the proportion of costs that can be attributed to water access entitlement holders consistent with the principle of linking charges as closely as possible to the costs of activities or products. The National Water Initiative requires consistency in pricing policies across sectors and jurisdictions where

entitlements can be traded. The measures that New South Wales is proposing are likely to lead to compliance by 2006 with the best practice pricing objectives regarding water access licence fees. The Council considers that New South Wales has made sufficient progress against its CoAG obligations in this area for the 2004 NCP assessment.

Murray–Darling Basin Commission costs — River Murray Water and water resource management cost allocation

Assessment issue: The River Murray Basin states have different policies on passing on River Murray Water costs to water users. IPART (2001) noted that much information has been gathered on the MDBC's costs and the allocation of the state's share of these costs to users. Given the availability of this information, IPART requested that the Department of Land and Water Conservation (now incorporated in DIPNR) develop a robust and transparent method for allocating the MDBC's water delivery and water resource management costs to users for the next price determination. For the 2004 NCP assessment, the Council has looked for New South Wales to show that it allocates MDBC costs robustly and transparently among users.

Future reform: Signatories to the National Water Initiative are to bring into effect by 2006 consistent approaches to pricing and attributing costs of water planning and management. This should involve (i) the identification of all costs associated with water planning and management and (ii) the identification of the proportion of costs that can be attributed to water access entitlement holders consistent with the principle of linking charges as closely as possible to the costs of activities or products.

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

In previous assessments, the Council found that the Murray–Darling Basin states have different policies on passing on River Murray Water costs and water resource management costs to water users. New South Wales and Victoria pass on to irrigators the River Murray Water charges for bulk water, but apply different charging arrangements.¹ Charges are part fixed and part variable in New South Wales and mostly fixed in Victoria. South Australia does not pass on River Murray Water costs to irrigators. A consultancy study undertaken for the MBDC found that these differential charging arrangements for bulk water are likely to impede the expansion of permanent interstate trade (Scrivco & Hassall and Associates 2003).

The MDBC's independent audit of cost sharing arrangements considered that the following actions are necessary to provide clear price signals to water users:

¹ River Murray Water recovers the full cost of constructing, operating, maintaining and renewing assets from the MDBC's member governments. River Murray Water recovers 75 per cent of the cost of asset refurbishment and replacement from the states, with the Australian Government paying the remaining 25 per cent. The states meet the full cost of asset operation and maintenance.

- All River Murray Water costs need to be recognised and all subsidies and CSOs need to be disclosed.
- Financial and pricing information for River Murray Water should be publicly available.
- States should disclose the level of subsidy and/or CSO per megalitre provided to each water business that receives bulk water from River Murray Water. Disclosure of the level of subsidy is particularly important because the Murray–Darling Basin states have different policies on passing on River Murray Water costs to water users.

IPART's 2001 bulk water price determination provides information on the approach in New South Wales. In the price determination, IPART allocated:

- all costs of water delivery to the Murray Valley
- half of the MDBC's water resource management costs to the Murray Valley (93 per cent), the Murrumbidgee Valley (5 per cent) and other inland valleys
- the other half of the MDBC's water resource management costs to the Murray and Murrumbidgee valleys based on estimates of long term extraction costs.

For each year of the current price determination, IPART determined the shares of River Murray Water costs that should be recovered from users and from the New South Wales Government. IPART recognises that the costs incurred are not related exclusively to bulk water delivery. Some of these costs, for example, are incurred to meet other needs, such as environmental protection, flood mitigation and navigation. Some current and future costs also relate to past practices and activities.

During the 2001 price review, IPART noted that much information had been gathered on the nature of the MDBC's costs and the allocation of the state's share of these costs among users. IPART asked the former Department of Land and Water Conservation (now DIPNR) to use this information to review and develop a robust and transparent method for allocating the MDBC's costs to users for the next price path (expected to commence on 1 July 2005).

New South Wales has indicated it will ask IPART to account for the State's share of River Murray Water costs and the MDBC's natural resource management costs in determining prices for bulk water delivery. New South Wales has submitted that IPART should examine both natural resource management and water delivery costs in the next pricing review, because at least some of the cost of the MDBC's natural resource management activities will be attributable to New South Wales licence holders, in addition to River Murray Water's water delivery activities. New South Wales proposed the following process for passing on the MDBC's water management and River Murray Water delivery costs to users:

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- The Murray–Darling Basin Ministerial Council should determine the share of funds that New South Wales should provide to the MDBC for water delivery and resource management under the Murray–Darling Basin Agreement.
 - The state’s funding share should be applied to total MDBC expenditure for each bulk water activity to determine the expenditure attributable to each of these activities in New South Wales. These expenditures, together with other non-MDBC bulk water expenditures incurred by New South Wales, should be allocated to water users and the government according to cost sharing ratios set by IPART. The resultant aggregate expenditure to water users can then be recovered through bulk water charges.
 - The state’s share of River Murray Water’s water delivery costs for the operation and maintenance of Murray River bulk water infrastructure should be allocated to users in the Murray valley.
 - The MDBC’s natural resource management costs comprise the costs of activities aimed at ensuring basin sustainability plus a small proportion of River Murray Water’s non-water delivery costs. Currently, most of these costs are allocated to users in the Murray River valley. The forthcoming DIPNR pricing submission to IPART will propose that the state’s share of the MDBC’s natural resource management costs be allocated to the New South Wales Murray–Darling Basin valleys on an ‘impactor pays’ basis. Costs would be allocated to users based on the volume of water they extract. This approach would reduce the natural resource management costs allocated to users in the Murray River valley and increase costs allocated to users in other river basin valleys. New South Wales considers that this would be a robust, logical and transparent method of allocating the costs to the users who cause the costs to be incurred. This cost allocation method is consistent with that for the Murray–Darling Basin salinity and drainage strategy.

Discussion and assessment

The National Water Initiative commits signatory governments to implementing by 2006 consistent approaches to pricing and attributing costs of water planning and management. This should involve the identification of all costs associated with planning and management (including the costs of underpinning water markets), and the identification of the proportion of costs that can be attributed to water access entitlement holders consistent with the principle of linking charges as closely as possible to the costs of activities and products. This information should be publicly reported. Pricing arrangements should facilitate the efficient functioning of water markets, including interjurisdictional water markets.

New South Wales has reviewed the allocation of MDBC costs relating to River Murray Water and natural resource management. It intends to continue passing on all River Murray Water delivery costs and MDBC natural resource

management costs on an ‘impactor pays’ basis, and to allocate costs between users and the government. New South Wales did not provide any information on the review, so the Council cannot comment on the robustness of the allocation. The Council considers, however, that IPART regulation of water delivery and natural resource management costs would add rigour and transparency to the process of cost allocation.

The New South Wales Government’s proposed approach to allocating costs will attribute appropriate costs to water users such that all costs are fully recovered. This will address obligations under the 1994 water reform agreement and components of the state’s best practice pricing commitments under the National Water Initiative. New South Wales should ensure, however, that its policies for attributing MDBC costs to users and the government do not create inefficient functioning of water markets.

Cost recovery and consumption based pricing by nonmetropolitan urban water and wastewater services

Assessment issue: New South Wales is to demonstrate that all larger providers of nonmetropolitan urban water and wastewater services (those providers with more than 1000 connections) are achieving full cost recovery and applying consumption based pricing. In the 2003 NCP assessment, the Council found that some local government water and wastewater service providers with more than 1000 connections were unlikely to be achieving full cost recovery, and some were not applying consumption based pricing. For the 2004 NCP assessment, the Council has looked for New South Wales to provide data to demonstrate that all remaining local water and wastewater utilities have substantially complied with full cost recovery and consumption based pricing obligations.

Future reform: Metropolitan businesses should price, on a consumption basis, at least at the lower bound of cost recovery, and continue moving towards upper bound pricing by 2008. Metropolitan water systems are to develop pricing policies for recycled water, stormwater and tradewaste by 2006.

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

At 1 April 2004, 15 local government water utility (LWU) water services and 22 LWU wastewater services were not achieving the lower bound of cost recovery. New South Wales advised that all underrecovering LWUs have agreed to move to cost recovery within three years (and the full three years where an increase in charges of more than 10 per cent is required).²

Also at 1 April 2004, 24 LWU water services were yet to introduce consumption based pricing. New South Wales advised that 12 of these services will implement consumption based pricing, two will merge with other LWUs in 2004-05, and eight will implement consumption-based pricing in

² The information provided by New South Wales does not specify whether the state’s cost recovery goal accords with the CoAG pricing principles upper bound or lower bound.

2005-06. While the remaining two LWUs have not confirmed when they will introduce consumption based pricing, the New South Wales Government expects them to do so by 2005-06.

New South Wales reported that it is continuing to actively support and encourage best practice pricing by all LWUs. In this regard, the Department of Energy, Utilities and Sustainability (DEUS) has produced pricing guidelines that explain the benefits of best practice pricing for water utilities, their customers and the environment, and that provide utilities with the tools to move towards the upper bound of cost recovery and consumption based pricing. The aim of the guidelines is to ensure all providers of LWU services that are not best practice pricing achieve cost recovery and set water service prices on a consumption basis. The DEUS has issued the guidelines and associated pricing software to all LWUs, conducted pricing workshops, and provided a performance coordinator to facilitate the implementation of best practice pricing. IPART and DEUS monitor adherence to the guidelines.

Under the *Local Government Amendment (National Competition Policy Review) Act 2003*, LWUs need to demonstrate substantial compliance with best practice management guidelines by:

- preparing a strategic plan and a minimum 20-year financial plan to establish an appropriate level of annual income required from each of water supply and sewerage
- complying with best practice water supply, sewerage and trade waste pricing, commercial developer charges and liquid trade waste approvals
- complying with criteria for demand management, drought management, performance reporting and integrated water cycle management.

New South Wales confirmed that LWUs must comply with the best practice management guidelines and best practice pricing to perform certain functions. Compliance with the best practice management guidelines is necessary, for example, before an LWU may pay a dividend from the surplus earned by its water supply or sewerage business to general local government revenue. Compliance with the best practice management guidelines is a prerequisite to eligibility for financial assistance towards the capital cost of backlog infrastructure (under the New South Wales Government's country towns water supply and sewerage program). LWU best practice pricing is a condition also for local governments applying for special variations to general income or for loan approvals.

Discussion and assessment

LWUs with more than 1000 connections have improved their compliance with best practice pricing obligations. At the time of the 2003 NCP assessment, 23 LWU water and wastewater services were not achieving the lower bound

of cost recovery, whereas now 15 are not achieving the lower bound. While the number of LWU water services applying consumption based pricing has increased only slightly since the 2003 NCP assessment, New South Wales anticipates significant adoption of consumption based pricing during 2004-05. Overall, only a relatively small proportion of the state's property connections (less than 3 per cent) is not facing cost-reflective consumption based prices.

New South Wales continues to encourage and support the adoption of best practice pricing by LWUs. In most cases where LWUs are yet to adopt best practice pricing, they have committed to do so within a short time frame. The state's best practice pricing guidelines and best practice management guidelines are likely to provide incentives and assistance to the remaining LWUs to move to at least the lower bound of cost recovery and adopt consumption based pricing. LWUs that pay a dividend to their local government owner will move towards the upper bound of cost recovery.

The Council considers that New South Wales has satisfactorily progressed its 1994 water reform agreement cost recovery and consumption based pricing obligations for the 2004 NCP assessment. New South Wales will need to ensure its regional water businesses (up to 50 000 connections) continue to move toward the upper bound of cost recovery in accord with the state's commitments under the National Water Initiative. Any water businesses with more than 50 000 connections will need to move towards upper bound pricing by 2008.

2.2 Water access entitlements

Assessment issue: Governments are to institute a statutory water access entitlement system and support systems for the consumptive use of water, separate from land. The water access entitlement system should be specified as a perpetual or open-ended share of the consumptive pool of a water source. These arrangements should be in place by 2006.

At the time of the 2003 NCP assessment, New South Wales was converting its system of five-year water licences to a new system of water access entitlements and 15-year access licences under the Water Management Act. The reliability of water access entitlements was to be further determined by water sharing plans, which seek to provide security of access for all water users (including the environment) during their 10-year term. New South Wales was also working on a system for registering water access entitlements. While the new systems were to be in place by January 2003, New South Wales deferred their commencement — initially to January 2004 and subsequently to July 2004 — to accommodate the then foreshadowed National Water Initiative. Given that the outstanding obligation was for New South Wales to implement its new access licensing and registry systems, the Council deferred this element of the 2003 assessment, initially to a deferred 2003 assessment and subsequently to the 2004 NCP assessment.

For the 2004 NCP assessment, the Council has looked for New South Wales to establish its new water access licensing and registry systems, and to introduce perpetual water access entitlements consistent with the state's commitments under the National Water Initiative.

References: 1994 CoAG water reform agreement, clause 4; 1999 tripartite meeting; Intergovernmental Agreement on a National Water Initiative

At the time of the 2003 NCP assessment, New South Wales was converting its system of five-year licences under the *Water Act 1912* to a new system of 15-year access licences under the Water Management Act. It was also working on a system for registering water access entitlements. New South Wales was to have established its new water access licensing and registry systems in January 2003. It deferred these measures — along with the commencement of its water sharing plans — initially to 1 January 2004 and later to 1 July 2004 to accommodate the then foreshadowed National Water Initiative.

The access licensing and registry systems proposed by New South Wales at the time of the 2003 NCP assessment included the following arrangements:

- Most water extractions are required to be licensed.³ Licences are separate from land title, transferable, divisible and enforceable. It is not necessary to own or occupy land to hold an access licence. Licences include a share component (specifying shares in the available volume of water from the relevant water source) and an extraction component (specifying the times, rates, circumstances and locations of extractions). Licences are categorised according to the priority of access — for example, in regulated rivers, there are both high security and general security access licences. Reliability is further determined by water sharing plans, which seek to provide security of access for all water users (including the environment) during their 10-year term (see section 2.3). Water access licence holders can claim compensation for access reductions made during the term of a water sharing plan that are inconsistent with the provisions of the plan.
- The water access licence register records all water access entitlements, their ownership, third party interests and transfers. The register is to be administered by Land and Property Information NSW, which is also responsible for the Land Titles Register. It is to be publicly available, including on the Internet.

Given that the outstanding obligation was for New South Wales to implement its new access licensing system and registry, the Council deferred this element of the 2003 assessment, initially to a deferred 2003 assessment and subsequently to the 2004 NCP assessment.

Reform progress

New South Wales implemented its new water access licensing and registry systems on 1 July 2004, following the commencement of the relevant sections of the Water Management Act, the Water Management (Access Licences and Approvals) Regulation 2004 and the Water Management (Access Licences and

³ Licences are not required for the landholders' basic right to use water for domestic and stock purposes, harvestable rights (a percentage of rainfall run-off captured in a farm dam) and native title rights and interests.

Approvals) Savings and Transitional Regulation 2004. The new arrangements initially apply to the areas covered by the 31 water sharing plans that also commenced on that date (see section 2.3). Application of the new arrangements to these areas involved the conversion of approximately 7000 licences to new access licences and 'works and use' approvals (covering the construction of works to take water and the use of water on land).

In late June 2004, before the new arrangements commenced, New South Wales amended the Water Management Act, including changes to accommodate elements of the National Water Initiative. Some amendments related to the new access licensing and registry systems. In particular, New South Wales made most water access entitlements perpetual (replacing the previously proposed 15-year duration).⁴ In addition, it made provision for term transfers of water access licences (similar to a lease of land). Other amendments gave effect to and/or clarified elements of the water access licence register (for example, to ensure parties with a mortgage or other interest in a water access entitlement can exercise the same powers that they can exercise in relation to land under the *Real Property Act 1900*). New South Wales also simplified the process for administering works and use approvals.

New South Wales advised that the water access licence register has not been fully validated, because ownership details are being verified and financial institutions need time to record their interests. It indicated that it will use its best endeavours to introduce indefeasibility of title within three years, with progress to be reviewed in 2006.

Submissions

The Murrumbidgee Horticulture Council considered that the integrity of high security water entitlements must be protected (that is, 100 per cent delivered in all but the worst drought years) to continue the significant levels of investment in horticulture. It stated that 'permanent plantings with living infrastructure cannot survive fluctuations in annual allocations' (Murrumbidgee Horticulture Council submission, p. 3).

The NSW Irrigators' Council emphasised the importance of providing long term security for water entitlements. It considered that water entitlements (including supplementary entitlements) should be issued in perpetuity. In addition, it argued that governments should take responsibility for compensating entitlement holders for reduced access when new rules are introduced to meet environmental objectives.

⁴ The entitlements are for access to a perpetual share of the available water (not a guaranteed volume of water). Some categories of access entitlements that are for specific purposes at specific locations (such as water utility, domestic and stock access entitlements) will not be perpetual but will not have a fixed term. Supplementary water access (previously known as off-allocation water) also will not be perpetual.

Discussion and assessment

The Council concluded in previous NCP assessments that the new access licensing and registry systems proposed by New South Wales were consistent with 1994 CoAG obligations on water entitlements. The arrangements include a comprehensive system of water entitlements separated from land title and specified as volumetric shares. The water access licence register is similar to the state's land titles register and includes third party interests.

At the time of the 2003 NCP assessment, the state's outstanding obligation was to implement the access licensing and registry systems. Subsequently, the National Water Initiative required participating states and territories to introduce perpetual water access entitlements (with similar status to freehold land) and to have compatible, publicly accessible and reliable systems for registering entitlements (including any encumbrances) and (permanent and temporary) trades.

New South Wales adopted perpetual water access entitlements as a result of the amendments to the Water Management Act in June 2004. The state's water access licence register is operational and the government is working to verify details, including ownership interests, within three years.

The Council considers that New South Wales has met its CoAG obligations relating to water access entitlements for the 2004 NCP assessment.

2.3 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.

(continued)

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.

At the time of the 2003 NCP assessment, New South Wales had gazetted its State Water Management Outcomes Plan and 35 (of 39) first-round water sharing plans. It had not, however, provided information on the supporting science or expected ecological health outcomes that it used to develop its plans or on any productive or social objectives that affected the water allocations in the plans. The Council needed this information to finalise its assessment of whether New South Wales had satisfactorily addressed 1994 CoAG obligations, including whether the state had shown regard for ARMCANZ/ANZECC national principles 4, 5 and 7. Given that New South Wales deferred commencement of its water sharing plans to accommodate the (then foreshadowed) National Water Initiative, the Council deferred this element of the 2003 NCP assessment for New South Wales.

The Council conducted the deferred 2003 NCP assessment in June 2004, concluding that New South Wales had not shown that it has met the obligation to provide appropriate allocations of water to the environment in stressed and/or overallocated rivers. It stated that it would consider recommending in the 2004 NCP assessment a substantial suspension or reduction in competition payments to New South Wales (to apply from 2004-05), unless the state either:

- provides evidence to show its water sharing arrangements go as far as possible towards meeting the water regimes necessary to sustain the ecological values of aquatic ecosystems while recognising the existing rights of other users, or
- commits (as part of the 2004 NCP assessment) to further develop its arrangements by 1 July 2005 so they are more likely to achieve the above objective within a reasonable timeframe.

References: 1994 CoAG water reform agreement, clause 4; 1999 tripartite meeting; Intergovernmental Agreement on a National Water Initiative

The Council considered New South Wales's progress against the environmental allocation obligation in the 2001 and 2002 NCP assessments, a supplementary 2002 assessment and the 2003 NCP assessment. In the supplementary 2002 assessment, the Council considered a sample of 10 New South Wales water sharing plans then due to become operational on 1 July 2003. While acknowledging that the plans would improve environmental outcomes in most cases, the Council could not determine from the limited information provided by New South Wales whether the plans satisfy the CoAG obligation to provide appropriate allocations of water to the environment. In particular, New South Wales provided insufficient information on the basis of water allocations for consumptive and environmental uses, and on the nature and extent of socioeconomic trade-offs from recommended environmental flows (ARMCANZ/ANZECC national principles 4, 5 and 7).

At the time of the 2003 NCP assessment, New South Wales had gazetted 35 (of 39) first-round water sharing plans covering about 80–90 per cent of the state's water, but had deferred commencement of the plans to 1 January 2004. Given that the deferral was to accommodate CoAG work on the then

foreshadowed National Water Initiative, the Council deferred this element of the 2003 NCP assessment for New South Wales.

By the time of the deferred 2003 assessment in June 2004, New South Wales had:

- confirmed it would commence 30 of the 35 gazetted water sharing plans on 1 July 2004 (deferred from 1 January 2004), and advised that it would not alter the essential content of each of the 30 plans
- confirmed it would commence the remaining five gazetted groundwater plans (for the Lower Gwydir, Upper and Lower Namoi, Lower Macquarie, Lower Lachlan and Lower Murrumbidgee groundwater sources) on 1 July 2005 (deferred from 1 January 2004), and indicated that it is reviewing its approach to reducing water access in these plans
- published the guides and fact sheets for all of the gazetted water sharing plans and provided some additional information to the Council on the action it has taken to allocate water to the environment
- progressed, but not finalised, the four remaining first-round water sharing plans (for the regulated Hunter River, the Orara River, the Lower Murray groundwater and the Great Artesian Basin), with the Orara River plan the only first-round non-groundwater plan still to be completed
- completed the implementation programs for the 35 gazetted plans
- commenced a process to develop ‘macro plans’, within a ‘reasonable timeframe’, for the rivers and groundwater sources not covered by the 39 first-round water sharing plans.

The Council’s main findings from the deferred 2003 NCP assessment are as follows:⁵

- New South Wales now has mechanisms — the water sharing plans and implementation programs — for allocating water (including to the environment) and facilitating trading in place and ready to commence for almost all water resources. New South Wales has not shown, however, that it has not gone as far as possible to provide water to sustain ecological values (including by re-allocating water), while recognising the existing rights of water users (in line with ARMCANZ/ANZECC national principles 4 and 5).
 - For only two water sources covered by the 10 water sharing plans examined by the Council (the plans for the Lower Lachlan groundwater and Stuarts Point groundwater), New South Wales stated that extraction limits are set at levels that will sustain ecological values. However, despite several opportunities, New South Wales provided insufficient information to support these statements.

⁵ The Council’s findings are detailed in the deferred 2003 NCP assessment report (NCC 2004a, pp. 23–6 and appendix B).

- For the remaining eight water sources covered by the 10 water sharing plans examined by the Council, New South Wales made no statement that the planned allocations will sustain ecological values. Neither did New South Wales provide any publicly available information to demonstrate that (1) the planned allocations were based on the best available science and (2) that any trade-offs in setting extraction limits were made on the basis of a rigorous assessment of social and economic interests.⁶ For four of the eight water sources (the regulated Gwydir River, the regulated Namoi River, the Kangaroo River, and the Upper and Lower Namoi Groundwater Sources), the Council noted evidence (primarily from the former Department of Land and Water Conservation) indicating significant environmental challenges that the gazetted water sharing arrangements are unlikely to satisfactorily address (although for the Upper and Lower Namoi Groundwater plan, New South Wales is reviewing its approach to reducing water access before the plan commences on 1 July 2005).
- Information on ecological sustainability and the socioeconomic trade-offs made in developing the water sharing plans may become publicly available through the new role of the Natural Resources Commission in reviewing the water sharing plans. It could be 10 years, however, before the existing water sharing plans are subject to scrutiny by that commission.
- Accepting that governments sometimes cannot introduce arrangements that immediately achieve a sustainable balance, particularly in systems where the volume of water already allocated for consumptive use is significant, the Council took account of possible changes in water allocation arrangements that might enable a sustainable balance to be achieved during the 10-year life of the New South Wales plans. The Council considered, however, that the constraints on permitted amendments to allocation arrangements mean there is little, if any, prospect that New South Wales can change its plans during their 10-year life to satisfactorily address current environmental challenges. While the proposed role for catchment management authorities in managing environmental water (and trust funds) offers scope for improved environmental outcomes during the life of the water sharing plans, New South Wales did not provide any information on the expected extent of potential improvements.
- The Council questions the regard shown by New South Wales for ARMCANZ/ANZECC national principle 7. Under this principle, accountabilities in all aspects of the management of environmental water provisions should be transparent and clearly defined. While New South Wales undertook considerable public consultation when preparing the

⁶ In relation to socioeconomic trade-offs, the Council noted that the independent assessment of the economic impacts of the draft water sharing plans (undertaken by ACIL Consulting for the New South Wales Government) considered the economic consequences to be minor in regional and statewide terms.

water sharing plans, there is little public information on the manner in which it considered environmental science in developing the plans. New South Wales also provided little information on the extent to which it expects the plans' rules and limits to achieve environmental outcomes. The recently announced involvement of the Natural Resources Commission goes only part of the way to addressing the gap in the process, given that the commission's role appears to be limited to reviewing already gazetted plans, and then only towards the end of each plan's life.

The Council considered that New South Wales had not shown that it has met its CoAG obligation to provide appropriate allocations of water to the environment in stressed and/or overallocated rivers. Acknowledging CoAG's 1994 statement that action needs to be taken to address widespread natural resource degradation occasioned in part by water use, along with CoAG's considerable concern (expressed in August 2003) about the pace of securing adequate environmental flows and adaptive management arrangements to ensure ecosystem health in Australia's river systems, the Council attached a great deal of importance to this matter.

To give New South Wales full opportunity to provide information to support the allocation arrangements in its water sharing plans, the Council delayed finalising the deferred 2003 NCP assessment beyond the original timeframe for this work. The Council sought to provide scope for the New South Wales Government either to provide (scientific and socioeconomic) evidence that its gazetted water plans will deliver appropriate environmental allocations (in line with the 1994 CoAG water reform agreement) for its stressed and overallocated surface water and groundwater systems, or to commit to further developing its water planning arrangements so they provide appropriate environmental allocations. New South Wales did not provide the information sought by the Council. It also did not respond to the Council's invitation to verify the Council's understanding of the effects of the environmental allocation arrangements in the sample of 10 water sharing plans (which the Council provided to New South Wales in draft form in April 2004).

Given the delay in finalising the deferred 2003 NCP assessment, the Council decided to defer to the 2004 NCP assessment any recommendation on competition payments to New South Wales for compliance with CoAG environmental allocation obligations. The Council stated in the deferred 2003 NCP assessment that it would consider recommending in the 2004 NCP assessment a substantial suspension or reduction in competition payments to New South Wales (to apply from 2004-05) unless the state either:

- provided (scientific and socioeconomic) evidence to demonstrate that its water sharing arrangements go as far as possible to meeting the water regimes necessary to sustain the ecological values of aquatic ecosystems while recognising the existing rights of other users, or
- committed (as part of the 2004 NCP assessment) to further developing its arrangements by 1 July 2005 to improve the likelihood that they will achieve the above objective within a reasonable timeframe.

Developments since the deferred 2003 assessment

New South Wales commenced 31 water sharing plans (including the recently gazetted plan for the regulated Hunter River) on 1 July 2004. It deferred the remaining five gazetted plans, including three of the 10 that the Council considered in previous assessments, to 1 July 2005.

Immediately before their commencement, New South Wales amended eight (of the 10) plans that the Council considered in the deferred 2003 NCP assessment. For the regulated Gwydir River water sharing plan, the state's latest modelling (noted in the amendments) indicated that the plan will provide 66 per cent of average annual flows to the environment rather than the 56 per cent previously estimated.⁷ The amendments relating to environmental allocations in the other plans appear to be relatively minor.⁸

In late June 2004, the New South Wales Parliament passed the Water Management Act amendments introduced by the government in May 2004. As noted in the deferred 2003 NCP assessment, several of the amendments are relevant to the provision of water to the environment (NCC 2004a):

- Catchment management authorities have been given the capacity to administer environmental water as an integral part of overall catchment management. They can hold access licences for environmental water and establish trust funds for acquiring and managing the environmental water.
- The independent Natural Resources Commission is required to review the water sharing plans before the end of their 10-year life. It will advise the Minister on whether the provisions in the water sharing plans are materially affecting the achievement of the targets and standards in the catchment action plans.
- A Water Innovation Council will be established to advise the Minister and the catchment management authorities in identifying and pursuing

⁷ The estimated total annual flow increased from 875 400 megalitres to 1 141 000 megalitres. The estimated long term annual extraction also increased, from 388 000 megalitres to 392 000 megalitres.

⁸ The changes to the water sharing plan for the regulated Namoi River provide marginally less water for the environment; the maintenance of minimum flows at Walgett was made contingent on a specified minimum aggregate volume of water being held in Keepit and Split Rock dams, and the trigger for taking supplementary water in part of the system was reduced. The amended plans for the two unregulated rivers (the upper Brunswick and Kangaroo rivers) allow minor additional extractions from very low flows to comply with legislation on food safety and the prevention of cruelty to animals, but reduce the maximum carry-over of water by licence holders from one year to the next. The amended plan for the Stuarts Point groundwater targets two high priority groundwater dependent ecosystems, whereas the original plan stated that groundwater dependent ecosystems should be identified and the plan should manage water for them.

opportunities for water conservation and environmental protection (including opportunities for recovering water for the environment, water re-use and water use efficiency).

Submissions

For the 2004 NCP assessment, the Council received two submissions that raised issues relevant to the state's compliance with CoAG obligations relating to the provision of water to the environment. The Council received the submissions from the NSW Irrigators' Council and the Nature Conservation Council of NSW/Inland Rivers Network while conducting the deferred 2003 assessment, so it considered and reported on the relevant elements in that assessment.

In addition to the two submissions, in late September 2004 the Gwydir Valley Irrigators Association wrote to the Council in response to the deferred 2003 NCP assessment. The association was concerned, in particular, with the Council's comparison of data on the indicative long term average extraction limit in the water sharing plan for the regulated Gwydir River (388 000 megalitres a year, since revised to 392 000 megalitres a year) with data on historical extractions in a 1998 report by the former Department of Land and Water Conservation (which estimated that licensed and off-allocation extractions averaged 220 000 megalitres a year between 1990 and 1998). The association indicated that average extractions over the longer term have been much closer to the Murray–Darling Basin Ministerial Council cap of 415 000 megalitres a year, stating that the difference between this and the figure in the department's 1998 report is attributable to supplementary water extractions and floodplain harvesting.

The association considers that the water sharing plan for the regulated Gwydir River will reduce average extractions rather than increase them. In addition, in response to the Council's use of a quote from the department's 1998 report — indicating that there is clear evidence of increasing environmental stress within the river and its wetland areas — the association stated that there is insufficient information to draw conclusions about the health of the wetlands. It indicated that the wetlands regularly receive substantial flows of up to 300 000 megalitres a year (in line with the volumes required to flood the wetlands recommended in a study in 1996).

Discussion and assessment

In the deferred 2003 NCP assessment, the Council stated that it would look in the 2004 NCP assessment for New South Wales to:

- provide (scientific and socioeconomic) information to support the environmental allocations in its water sharing arrangements, showing these go as far as possible to meeting the water regimes necessary to

sustain the ecological values of aquatic ecosystems while recognising the existing rights of other users, or

- commit (as part of the 2004 NCP assessment) to further develop its water sharing arrangements by 1 July 2005 to improve the likelihood that they will achieve the above objective within a reasonable timeframe.

New South Wales did not respond to the deferred 2003 NCP assessment. It also is still to respond to the Council's invitation (in April 2004) to verify the Council's understanding of the effects of environmental allocation arrangements in the sample of 10 water sharing plans considered in the deferred 2003 NCP assessment.

While New South Wales amended the allocation arrangements in some water sharing plans (including for some overallocated and stressed systems), these changes do not appear to address the environmental challenges evident in those systems. The latest modelling of environmental flows reflected in the amended plan for the regulated Gwydir River indicate that the plan will provide 66 per cent of average annual flows to the environment (rather than the 56 per cent previously estimated). In the absence of additional information (including historical data on supplementary water extractions and floodplain harvesting), the Council is not in a position to verify the information on historic extraction levels provided by the Gwydir Valley Irrigators Association. The Council notes, however, that there is further information (to that reported in the deferred 2003 NCP assessment) indicating a decline in the condition of the region's Ramsar listed wetlands.⁹ It is also aware of data that indicate the water flows to the wetlands may be less than suggested by the association.¹⁰ New South Wales provided no new evidence to support the sustainability of the long term extraction limit and other rules established under the Gwydir River plan, including to show that

⁹ The Murray Darling Basin Ministerial Council (1995) in an audit of water use in the basin found that the Lower Gwydir water couch wetlands have been reduced by 90 per cent as a result of water resource development and use in the Gwydir Valley. Murdoch University (2001) conducted a study on the water requirements of the Gwydir wetlands, using a method endorsed by Environment Australia. The study stated that a reduction in the frequency of small to medium floods (as a result of diversion for irrigation) is considered responsible for the displacement of aquatic vegetation with terrestrial vegetation and weeds. This finding is supported by an investigation by Earl (2003) on the distribution of the noxious weed lippia (*Phyla canescens*) that covers large areas of the Gwydir wetlands as a result of the decrease in water inflows and increased terrestrial conditions. The Murdoch University study concluded that the overriding threat to the Gwydir wetlands is a reduction in the frequency and magnitude of flooding resulting in a reduction in the quantity of water reaching the wetlands. It found that there has been a 70 per cent reduction in the occurrence of flows large enough to flood the Lower Gwydir watercourse.

¹⁰ Data from the MDBC (1999, 2000, 2001, 2002, 2003 and 2004) indicate that the flow of water to the Gwydir wetlands over the period 1997-98 to 2002-03 has averaged 103 000 megalitres a year, ranging from 74 000 megalitres in 1997-98 to 157 000 megalitres in 1999-2000.

the 66 per cent of mean annual flow provided to the environment will translate to two-thirds of natural flow for seasonal ecologically-significant flow events.

The amendments relating to environmental allocations in the other plans that the Council considered in the deferred 2003 NCP assessment do not appear to have any implications for the Council's conclusions in that assessment. New South Wales has provided no new information to support the sustainability of the extraction limits and rules established by the other water sharing plans. It has also not provided new socioeconomic evidence to support any trade-offs that it made for social and economic reasons in setting the water sharing rules in the plans. The Council considers, therefore, that there is insufficient evidence to enable it to conclude that New South Wales has met its CoAG obligation to provide appropriate allocations of water to the environment in stressed and/or overallocated rivers and groundwater systems.

For the rivers and groundwater sources covered by the state's 1999 implementation program but not covered by the 39 first-round water sharing plans (see appendix A), New South Wales has advised that it intends to develop 'macro plans' within a 'reasonable timeframe'. At the time of the 2003 NCP assessment, New South Wales indicated that two pilot plans would be ready for public consultation in June 2004. Although New South Wales provided only limited information on its proposed approach, the macro plans appear to offer a cost-effective and timely means for implementing water management arrangements for the state's lower priority rivers and groundwater sources.

Since the 2003 NCP assessment, New South Wales has provided no information on its progress with the proposed macro plans. Accordingly, the Council could not consider in this 2004 NCP assessment whether and how New South Wales is addressing water allocation obligations beyond the systems covered by the 39 water sharing plans. Accepting advice from New South Wales that the 39 plans cover 80–90 per cent of the state's water, the Council has not accounted for the remaining systems in formulating its conclusions in this 2004 NCP assessment on the state's progress toward compliance with the CoAG obligations on the provision of water to the environment.

2.4 Water 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.

(continued)

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 (including New South Wales) 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.

In the 2003 NCP assessment, which considered intrastate trading arrangements, the Council found that New South Wales had developed an effective framework for water trading under the Water Management Act. The new trading arrangements were still to commence, however, with the water sharing plans and the registry system to be implemented. In addition, the Council identified constraints on trading that are inconsistent with CoAG obligations, including: limits on trade out of some irrigation districts; and, in some water sharing plans, restrictions on trading that do not appear to be required to protect the environment or ensure the practical management of trading. Permanent interstate trade is permitted only in high security water entitlements in the area covered by the MDBC's pilot interstate trading project.

New South Wales needs to:

- make substantive progress towards removing constraints on trade out of irrigation districts
- ensure the trading rules in water sharing plans facilitate trading where systems are physically shared or hydrologic connections and water supply considerations permit trading
- develop arrangements for interstate water trade beyond the MDBC's pilot interstate trading project.

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

In New South Wales, the Water Management Act includes the following main provisions related to water trading:¹¹

- Water access licences are separated from land, are divisible and can be transferred permanently or temporarily.¹² In irrigation schemes, the irrigation corporations hold bulk access licences. The corporations provide a share of the water to each of the landholders within the irrigation district. Only the corporations can legally trade entitlements into or out of their districts. Some corporations limit trade out of their irrigation districts.

¹¹ Previously, the Water Act provided for the temporary or unlimited transfer of water allocations where the allocations were specified volumetrically. Only landholders could purchase water allocations.

¹² Basic landholder rights to water, including stock and domestic rights, are tied to land and are not transferable. Towns can buy and sell water entitlements, although sales are restricted to temporary trades of one-year duration.

- The ‘share’ (or volumetric) component of a water access licence is separated from the ‘extraction’ component (which specifies the sections of the water source from which water may be taken). These components may be independently transferred. By separating the share component from the extraction component, water can be traded without requiring complex environmental assessments for approving extraction and use.
- The register of access licences allows third party interests to be registered. The consent of third parties is required before a transaction may proceed.
- An application to trade must comply with the provisions of the Act and any transfer rules established in the water sharing plans for the relevant water sources.

At the time of the 2003 NCP assessment, New South Wales had deferred the commencement of its gazetted water sharing plans and new access licensing and registry systems — initially to 1 January 2004 and later to 1 July 2004 — to accommodate the then foreshadowed National Water Initiative (see section 2.2). As a result, the state’s new water trading arrangements were also still to commence.

In the 2003 NCP assessment, the Council found that New South Wales had developed an effective framework for water trading. It identified, however, constraints on trading that are inconsistent with CoAG obligations, including: limits on trade out of some irrigation districts; and, in some water sharing plans, restrictions on trading that do not appear to be required to protect the environment or ensure the practical management of trading.

New South Wales participates in the MDBC’s pilot project for permanent interstate water trading (see chapter 10). 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). Formal arrangements for interstate trade between New South Wales and Queensland, and New South Wales and the ACT are still to be developed.

Trading rules in the water sharing plans

To provide a basis for the trading rules in water sharing plans, New South Wales gazetted statewide ‘access licence dealing principles’ under the Water Management Act in 2002. Access licence dealings include:

- a change to the ownership of an access licence (referred to as a ‘transfer’)
- a change in the category of an access licence (a ‘conversion’, such as from general security to high security)
- the separation (‘subdivision’) or amalgamation (‘consolidation’) of access licences

- the movement of the share component or extraction component from one access licence to another (an ‘assignment’)
- the movement of water allocations from the account of one access licence to another
- a change in the location at which water allocations credited to the access licence may be extracted.

Under the access licence dealing principles, the objective of access licence dealings is to:

... help to facilitate maximising social and economic benefits to the community of access licences as required under the objects of the Act. Dealings do this by:

- (a) allowing water to move from lower to higher value uses, and*
- (b) allowing the establishment of water markets that value the access licences, thereby encouraging investment in water efficient infrastructure, and*
- (c) allowing greater flexibility to access licence holders.*

Box 2.1 summarises the general principles applying to access licence dealings in New South Wales.

Box 2.1: General principles for access licence dealings in New South Wales

Dealings should:

- not adversely affect environmental water and water dependent ecosystems
- be consistent with strategies to maintain or enhance water quality
- in unregulated rivers, not increase commitments to take water from areas of high conservation value
- in unregulated river and groundwater sources, not increase commitments to take water above sustainable levels
- in regulated rivers, not increase daily demand at locations and times where demand exceeds delivery capacity
- in regulated rivers, not increase commitments to take water in lower river or effluent systems where this would result in flow for water delivery exceeding 80 per cent of channel capacity for more than 10 per cent of days
- not adversely affect geographic and other features of Indigenous significance or of major cultural, heritage or spiritual significance
- not adversely affect the exercise of basic landholder rights and have no more than a minimal effect on the taking of water from an approved water supply work.

Source: Access Licence Dealing Principles Order 2002

Apart from the general principles, the following principles also apply for specific types of access licence dealing:

- Most access licence dealings are prohibited if there is an outstanding debt under the Act in respect of the licence or if the licence has been suspended.
- Access licence dealing rules in a water sharing plan are not permitted to regulate or prohibit intrastate transfers of access licences (that is, the transfer of the licence from one person to another), or the subdivision or consolidation of access licences.
- Access licence dealing rules in a water sharing plan may regulate or prohibit other access licence dealings (that is, apart from intrastate transfers, or subdivisions or consolidations) if doing so in a manner consistent with the general principles.
- Dealings involving a change of water source are prohibited where the movement is from an unregulated to a regulated water source (but not vice versa), or from a groundwater source to a regulated river or unregulated river (or vice versa), and no water allocations remaining in the water allocation account of the cancelled licence may be credited to the new licence.
- Interstate dealings must be consistent with the relevant interstate agreement.

In developing the trading rules that apply to each water source, water management committees tailored the statewide access licence dealing principles to account for the level of stress on the water source and operational constraints. Many of the water sharing plans nominate zones in which water dealings are restricted. For the 2003 NCP assessment, New South Wales advised that these restrictions are for environmental reasons or because there is limited supply capacity. It also advised, however, that water management committees were required when developing the water sharing plans to assess the socioeconomic impacts, including the impacts of retaining or removing trading restrictions. New South Wales stated:

A key objective ... has been to remove as many restrictions on trade as possible, and the final plans reflect a freeing up of the trading environment. In the Murrumbidgee plan, for example, many of the previous restrictions and penalties on trading, such as the loss of carry-over water, have been removed. (Government of New South Wales 2003, p. 10)

Box 2.2 contains examples of restrictions on trading in three of the gazetted water sharing plans (one regulated river plan, one unregulated river plan and one groundwater plan).

Box 2.2: Examples of trading restrictions in gazetted water sharing plans in New South Wales

Lachlan River regulated water source

- Any dealing that would increase the total volume of share components of access licences allowed to take water from the Lachlan River downstream of Booligal is prohibited.
- The trading of access licences or share components between upstream of Lake Cargelligo and downstream of Lake Cargelligo is limited until a full review is completed.
- The trading of access licences from the Lachlan River regulated water source to the Lachlan River effluent creeks or Willandra Creek downstream of Willandra Homestead is prohibited.
- The assignment of water allocations from a Lachlan River regulated water access licence to an access licence in another water source (such as the tributaries) is prohibited.
- Access licences in the Lachlan River regulated water source may not be transferred to another state.

Kangaroo River unregulated water source

- Individual daily extraction limits of unregulated river access licences can be traded only within the Kangaroo River water source.
- In the escarpment zone, there is to be no net increase in the share component or extraction component to more than specified levels.

Upper and Lower Namoi groundwater sources

There are prohibitions on dealings:

- to or from water sources outside the plan area if the total share component or water allocated would exceed 600 megalitres per year per square kilometre
- if adverse local impacts would result
- of water allocations from the Quirindi local water utility
- of supplementary water access licences or allocations
- of aquifer access licences and water allocations into or out of the Lower Namoi groundwater source
- of aquifer access licences and water allocations into any Upper Namoi groundwater source, with the exception of zone 10
- if the total share component of all access licences and the total water allocations in zone 10 would exceed 70 per cent of its recharge.

In the 2003 NCP assessment, the Council found that the water sharing plans generally facilitate water trading, but that some contain restrictions on trading that appear unrelated to a need to protect the environment or to ensure the practical management of trading. Some constraints (for example, the restriction on dealings involving a change of water source where the movement is from an unregulated to a regulated river) appear to be a response to socioeconomic concerns.

Trade out of irrigation districts

Irrigation corporations and trusts in New South Wales impose a range of restrictions on (permanent and/or temporary) water trade out of irrigation districts (see box 2.3). The restrictions were typically erected in response to fears of 'stranded assets' (Hassall and Associates 2002). If water entitlements are sold out of the irrigation district, then fewer users are left to meet the ongoing costs of water supply, including the costs of maintaining supply infrastructure. In previous NCP assessments, the Council identified the prohibition on trade out of some irrigation districts as a significant impediment to the expansion of water trading both within New South Wales and interstate.

Box 2.3: Examples of New South Wales irrigation company rules for water trading out of irrigation districts

Coleambally Irrigation Co-operative Limited

- Permanent transfers out of the area are prohibited if the irrigation area's entitlements would fall below 632 ggalitres (the level of entitlements in 2002).
- A minimum of 4 megalitres per hectare must be retained on each property.

Jemalong Irrigation

- An exit fee may be applied to temporary transfers out of the area but has not been implemented.

Macquarie Valley (six small irrigation schemes established as trusts)

- No permanent transfers out of each trust's scheme are permitted.
- No permanent transfers out of the area are permitted.

Murray Irrigation Limited

- Permanent transfers out of the area must not exceed the sum of permanent transfers into the area.
- A minimum 60 per cent of 1995 entitlements must remain on each property.

Murrumbidgee Irrigation

- For high security licences, total permanent transfers out of the area were limited to 1 per cent of high security entitlements in 2001-02.
- For general security licences, no permanent transfers out of the area were permitted in 2001-02.
- A minimum 25 per cent of entitlements must remain on each property.

West Corugan Irrigation Trust

- No temporary transfers out of the area are permitted unless the water to be traded out was previously traded into the area.
- No permanent transfers out of the area are permitted.

Western Murray Irrigation

- No permanent transfers out of the area are permitted.

Source: Hassall and Associates 2002

Recent trading activity

Significant volumes of water are traded in New South Wales each year. In the 2003 NCP assessment, the Council reported that around 710 gigalitres of water were traded in the state's regulated river systems in 2001-02 (NCC 2003a). Temporary trade accounted for more than 95 per cent of the total volume of water traded. New South Wales did not provide more recent information.

Trading is concentrated in the irrigation areas in southern New South Wales. In 2001-02, the Murray and Murrumbidgee river systems accounted for almost 60 per cent of total trade, with the Darling and Lachlan systems accounting for a further 15 per cent. Pending the commencement of the water sharing plans, the Council understands that only limited trading in unregulated river and groundwater systems has occurred.

Since the establishment of the MDBC's pilot project for permanent interstate water trading in 1998, net trade out of New South Wales has amounted to around 4.6 gigalitres. Net transfers from New South Wales to South Australia of 7.3 gigalitres have been partly offset by net transfers from Victoria to New South Wales of 2.7 gigalitres (see chapter 10). Temporary interstate transfers are significantly higher. Net temporary transfers from South Australia to New South Wales in 2002-03 alone, for example, amounted to 6.1 gigalitres (see chapter 6).

Reform progress

As discussed in sections 2.2–3, New South Wales commenced 31 water sharing plans, along with its new water access licensing and registry systems, on 1 July 2004. The state's new water trading arrangements also commenced on that date for the areas covered by the water sharing plans. A further eight plans are scheduled to commence on 1 July 2005. For the unregulated rivers and groundwater sources not covered by the 39 water sharing plans, New South Wales intends to develop 'macro plans' within a 'reasonable timeframe'.

In late June 2004, New South Wales amended the Water Management Act, including changes to refine its trading arrangements. Apart from the move to perpetual water access entitlements and other amendments discussed in section 2.2, the changes included:

- the provision that entitlements may be leased, for a specified period of not less than six months
- the provision that entitlement holders who are tenants in common can transfer their access entitlements
- the provision that information on water dealings (such as volumes of water traded and prices paid) may be made public

- the removal of the requirement for the Minister's consent to a change in ownership of a licence that does not involve a change in the location at which the water is extracted (given that environmental issues are unlikely to arise in such cases)
- the simplification of procedures for interstate trading, by allowing water access entitlements from one state to be used to supply water in another state (removing the need for the entitlement to be converted).

In a Ministerial statement on the New South Wales water reforms in June 2004, the Minister for Natural Resources indicated that the government will consider ways of establishing a transparent process for setting exchange rates for water trades (Knowles 2004). In particular, the Minister intends to request that the new Water Innovation Council advise on appropriate exchange rates and methods for determining such rates. The Minister also indicated that he would seek the Water Innovation Council's advice on whether brokers who arrange water trades should be registered (like brokers involved in land-related dealings).

In its 2004 NCP annual report, New South Wales reiterated its view that the ability to vary trading rules that constrain trade out of irrigation districts rests with the irrigation corporations' boards and shareholder customers (Government of New South Wales 2004). It indicated, however, that the Australian Competition and Consumer Commission is investigating the issue at the request of the Murray–Darling Basin Ministerial Council. In addition, New South Wales stated that it is continuing to investigate ways to resolve these concerns through discussions with the Australian Government and the irrigation corporations. In his June 2004 Ministerial statement, the Minister for Natural Resources indicated that he will request that the Water Innovation Council advise possible methods for facilitating trade into and out of irrigation areas, including annual limits on trading out, access fees and exit fees.

Submissions

The Murrumbidgee Horticulture Council, which represents 1000 high security horticultural irrigators, raised concerns with the trading arrangements in the water sharing plan for the regulated Murrumbidgee River. In particular, it highlighted the plan's prohibition on the transfer of water allocations from a regulated river (high security) access licence water allocation account for applications received after 1 September in any water year. It stated:

We are particularly concerned with ongoing restrictions to high security irrigators' ability to enter a free and competitive market (both temporary and permanent) in the Murrumbidgee valley. This restriction has significant negative impacts on both buyers and sellers in the valley, including the environment as a potential purchaser in the market place.

... we have significant concerns over the inclusion of restrictions to temporary trade ... which reduce competition and severely undermine the property right of high security entitlement holders. (Murrumbidgee Horticulture Council submission, p. 1)

It indicated that the effect of the trading rule is to prevent high security access licence holders from using all of their entitlements via trading. If the water is not used by high security licence holders (on farm or via trade), it reverts to the resource pool available to general security licence holders in the following year (and not to the environment). The Murrumbidgee Horticulture Council was concerned that the rule may promote a 'use it or lose it' attitude among high security irrigators. It also considered that the restriction reduces competition (potentially increasing prices) for water traded by general security licence holders, who are not constrained by the 1 September cut-off.

The Murrumbidgee Horticulture Council unsuccessfully challenged in the Land and Environment Court the Minister's inclusion of the rule in the water sharing plan. It considers that the rule is contrary to CoAG water reform requirements, despite the Minister being found to have the legal right to apply the restriction under the Water Management Act. It argues that the evidence presented by New South Wales during the court hearing established that the restriction is not for any public or environmental benefit or for the practical management of trading. Rather, the rule is aimed at providing relief to lower priority water users from reductions in their announced water allocations.

The NSW Irrigators' Council noted the following considerations:

- The water trading rules agreed by members of irrigation corporations, in accord with the corporations' memoranda and articles of association, should not be regarded as 'barriers' to trade. Some of the rules are aimed at operational constraints.
- The fact that trade is demand driven explains why there have not been permanent trades out of some corporation areas, regardless of the rules. Trade within regions and districts needs to be recognised as a major portion of water trade.
- Consistent with the objectives of CoAG's trading reforms, significant adjustments are occurring (including changes of ownership and the development of properties) despite the lack of permanent trade.
- Clearly defined property rights, based on water users' requirements for security, will enhance trade out of irrigation corporation areas.
- Several contentious issues relating to water trade are yet to be resolved, including the tagging of entitlements versus exchange rates, the meaning of 'best use' and 'public interest', the need for socioeconomic restrictions (in

response to the social circumstances of rural communities), and the required operational and physical constraints.¹³

- Government agencies need to be able to process trades in a commercial timeframe. Some water users have experienced unacceptable delays in DIPNR's processing of permanent water transfers (for example, up to 18 months in the Macquarie Valley).

Discussion and assessment

In previous NCP assessments, the Council found that the Water Management Act provided an effective framework for water trading in New South Wales, although it identified constraints on trading that are inconsistent with CoAG obligations. New South Wales is also still to develop interstate trade arrangements beyond the MDBC's pilot project, including arrangements for trade with Queensland and the ACT.

Following the commencement of the new water access licensing and registry systems and 31 water sharing plans on 1 July 2004, the water trading arrangements cover a substantial proportion of the state's water. With a further eight water sharing plans scheduled to commence on 1 July 2005, the trading arrangements will apply to 80–90 per cent of the state's water. The water sources accounting for the remaining 10–20 per cent will continue to be administered under the more restrictive Water Act until New South Wales finalises its macro plans (or other arrangements) for these areas.

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. The National Water Initiative extends to 2007 the timeframe for the establishment of institutional and regulatory arrangements that facilitate intra- and interstate trade (although barriers to temporary trade must be removed immediately). In the southern Murray–Darling Basin, the relevant governments (including New South Wales) committed to take all steps (including legislative and administrative changes) to enable exchange rates and/or tagging of water access entitlements traded from interstate sources to buyers in their jurisdictions by June 2005. The recent legislative amendments by New South Wales to simplify procedures for interstate trading represent the first step in this process.

¹³ The NSW Irrigators' Council indicated that trading restrictions may be required in some cases because different arrangements apply in regulated and unregulated rivers. Enabling trade from regulated to unregulated parts of the Gwydir system, for example — such as from the regulated Mehi River to the unregulated Barwon River — may trigger commence-to-pump conditions in the Barwon, because these conditions are often based on river height. Given that the trade may create an artificial flow and an access event in the unregulated system, the buyer might have difficulty accessing the water purchased.

In the areas covered by the water sharing plans, water access licences are separated from land title, are divisible and can be transferred permanently or temporarily (including by lease). It is not necessary to own or occupy land to hold an access licence. The water access licence register is similar to the state's land titles register. It includes third party interests, whose consent is required before transfers may proceed. The government is working to verify details on the register (including ownership interests) within three years to provide indefeasibility of title. While the time taken to process trades has been a problem in the past, New South Wales expects significant improvements under the new arrangements.

Trading mechanisms are well developed in New South Wales, with trade occurring through formal water exchanges, brokers and private sales. While some market information is available (for example, through the water exchanges), the availability and comprehensiveness of information should improve as a result of the recent legislative changes. The water access licence register is open to the public, and the water sharing plans (including the rules for trading to and from a particular water source) are available on the Internet.

The new arrangements also include measures to ensure water trades do not adversely affect the environment or the rights of other water users. All water transfers that involve a change to the location at which water may be extracted must be approved by the government and must be consistent with the Water Management Act, the access licence dealing principles and the trading rules in the relevant water sharing plans.

The water sharing plans and the statewide access licence dealing principles provide greater scope for trading than previously possible — for example, trade is permitted in unregulated river systems where previously it was generally not possible. Some constraints remain, however. The access licence dealing principles prohibit dealings involving, for example, a change of water source where the movement is from an unregulated to a regulated water source. In addition, the water sharing plans often nominate zones in which dealings are restricted and, in some cases, impose wider restrictions. The guides to the water sharing plans published by New South Wales indicate that the rules regulating dealings are required generally for practical management reasons and to protect the environment and the interests of other access licence holders.

Nevertheless, other rationales also underpin the restrictions on trading in some plans:

- In the 2003 NCP assessment, New South Wales advised that the restriction on dealings involving a change of water source from an unregulated to a regulated water source is in place to protect an immature water market (on the unregulated rivers) from a well-developed market (on the regulated rivers). This restriction appears likely to constrain the extent to which water is put to its most profitable use and, therefore, is likely to work against the achievement of CoAG water reform objectives.

- The Murrumbidgee Horticulture Council highlighted the regulated Murrumbidgee River plan's prohibition on the transfer of water allocations from high security water allocation accounts after 1 September each year. The rule restricts trade and appears to advantage lower security licence holders, but does not seem to be required for environmental reasons or the practical management of trade. New South Wales did not respond to the issues raised in the Murrumbidgee Horticulture Council's submission.
- New South Wales previously indicated that it required water management committees to assess socioeconomic impacts when developing the water sharing plans, including the impacts of retaining or removing trading restrictions. As an example, the guide for the Lachlan River regulated water source states that the dealing rules may be required to protect social infrastructure.

In its 2004 NCP annual report, New South Wales stated that it:

... continues to support the removal of barriers to trade except for those protecting the environment or protecting the interests of third party water users directly affected in an adverse way by proposed dealings.
(Government of New South Wales 2004, p. 13)

Under the extended timetable in the National Water Initiative, New South Wales will need to ensure the trading rules in its water sharing and subsequent plans facilitate trading by 2007 where water systems are physically shared or hydrologic connections and water supply considerations permit water trading.

The limits on trade out of irrigation districts, particularly the prohibition that applies in some districts, appear to be a response to community concern that trade out of a district may result in adverse outcomes, including: the diminution of local production and regional economies; a reduction in the rate base for local governments; the loss of economies of scale; and potential 'stranding' of irrigation infrastructure. In addition, directors of irrigation corporations have responsibility for the ongoing value of the corporation and, therefore, want to ensure no adverse impacts for their shareholder customers. The restrictions impede water trading, however, both within New South Wales and interstate, limiting the capacity of New South Wales to achieve CoAG trading objectives. While the ability to vary trading rules rests with the corporations' boards and shareholder customers, the CoAG water agreements place responsibility on the New South Wales Government to facilitate trading in water, subject to protecting the environment and third party interests.

In his June 2004 Ministerial statement, the Minister for Natural Resources stated:

The government is committed to facilitating water trading into and out of irrigation corporations and cooperatives. It will work closely with the corporations and cooperatives to assist them in removing unjustified barriers to trade and in implementing measures, such as 'retail tagging', to mitigate any potential adverse consequences flowing

from the removal of trading restrictions, including the residual costs of managing water supply infrastructure.

The Water Innovation Council will be asked to advise the government on this and other possible methods for facilitating trading into and out of irrigation areas, consistent with arrangements agreed under the National Water Initiative. These measures include annual limits on trading out, access fees and exit fees. (Knowles 2004, p. 16)

Subsequently, under the National Water Initiative, New South Wales and other signatory governments committed to remove by June 2005 the barriers to permanent trade out of water irrigation areas (up to an annual threshold of 4 per cent of the area's total water entitlements), subject to a review by 2009, and to move to full open trade by 2014 at the latest (except for the southern Murray–Darling Basin). The governments agreed to remove barriers to temporary trade immediately. For the southern Murray–Darling Basin, New South Wales and the other relevant governments committed to take all necessary steps by June 2005 to facilitate permanent trade out of water irrigation areas (up to an interim annual threshold limit of 4 per cent), with a review in 2009 to consider raising the threshold. New South Wales specifically committed to make the necessary legislative changes by June 2005 to effect a Heads of Agreement between the government and major irrigation corporations to permit permanent trade up to the interim threshold of 4 per cent per year.

Given the commitments made by New South Wales under the National Water Initiative, and the extended timeframes applying to the implementation of trading arrangements outside the southern Murray–Darling Basin, the Council considers that New South Wales has made satisfactory progress against its CoAG water trading obligations for the 2004 NCP assessment.

3 Victoria

3.1 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 and consumption based pricing by rural water service providers

Assessment issue: Victoria is to demonstrate that government-owned irrigation schemes and government-owned suppliers of bulk water are setting prices based on the principles of full cost recovery and consumption based pricing. Government-owned water businesses must also show that they are managing any subsidies consistent with efficient and effective service provision and use. In the 2003 National Competition Policy (NCP) assessment, Victoria reported that some of its rural water authorities were not operating on a commercially viable basis (as defined by the CoAG pricing principles), but it did not transparently report subsidies to these rural water authorities. Victoria indicated that prices for regulated rural water services reflected consumption based pricing principles, but that it was restructuring Goulburn–Murray charges. For the 2004 NCP assessment, the National Competition Council has looked for Victoria to demonstrate that its five rural water authorities have substantially achieved lower bound full cost recovery (consistent with all elements of the CoAG pricing principles). Where an authority would not achieve full cost recovery by 30 June 2004, the Council has looked for Victoria to show that the authority has made substantial progress towards lower bound cost recovery and to advise when lower bound cost recovery is likely to be achieved. Victoria has also needed to demonstrate that any CSOs supporting these schemes are transparent. In addition, the Council has looked for Victoria to report on the outcome of Goulburn–Murray Water's restructure of charges, including showing how the restructured charges reflect consumption based pricing principles.

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 must 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

Cost recovery

Rural water services are delivered by five rural water authorities: Goulburn–Murray, Gippsland and Southern, Sunraysia,¹ First Mildura, and Wimmera–Mallee.² These authorities manage irrigation systems and services, manage stock and domestic systems, manage headworks such as large dams, licence private diversions from waterways and the extraction of groundwater, and conduct environmental management activities. Water use in Victoria is dominated by irrigation, which uses 77 per cent (or about 3.7 million megalitres) of the total volume of water extracted each year. Goulburn–Murray Water is by far the largest authority, accounting for 90 per cent of all entitlements used for irrigation and supplying bulk water services to two other rural water authorities and several regional urban water areas.

¹ Sunraysia Rural Water merged with Lower Murray Water to form the Lower Murray Urban and Rural Water Authority on 1 July 2004.

² Wimmera–Mallee Water and Grampians Water merged to form the Grampians Wimmera Mallee Water Authority on 1 July 2004.

Victoria advised that all water authorities set revenue targets that aim to recover lower bound costs in accord with the CoAG pricing principles. Authorities use normalised revenues based on 10-year rolling averages of sales. While they can experience minor fluctuations between profit and loss from year to year (where there are unforeseen or seasonal variations in expenses and/or revenues) this method aims to ensure they achieve financial self sufficiency without earning monopoly rents over the long term.

Victoria reported that most of the state's rural water authorities recovered operating, maintenance and administration costs, finance charges and a renewals annuity in 2002-03. Where externalities are directly attributable to water users, and rural water authorities have incurred costs to undertake remedial works to address them, these costs are also recovered from rural water users. Natural resource management costs are generally not separately identified in the authorities' corporate plans or reported in rural water authority annual reports. Rural water authorities have been operating under the national tax equivalent regime since 1 July 2002. Table 3.1 indicates the 2002-03 revenue and cost recovery outcomes for the five rural water authorities.

Table 3.1: Cost recovery by rural water authorities, 2002-03

	<i>First Mildura Irrigation Trust</i>	<i>Gippsland and Southern</i>	<i>Goulburn– Murray</i>	<i>Sunraysia^a</i>	<i>Wimmera– Mallee^b</i>
	\$'000	\$'000	\$'000	\$'000	\$'000
Revenue					
Bulk, service and use	4 782	16 720	63 467	12 140	12 258
Other	878	1 768	32 619	1 641	7 333
<i>Total revenue</i>	<i>5 660</i>	<i>18 488</i>	<i>96 086</i>	<i>13 781</i>	<i>19 591</i>
Expenses					
Operations, maintenance and administration	4 349	16 480	85 438	9 311	9 857
Finance charges	0	0	200	0	0
Renewals annuity	987	2 145	14 569	2 471	3 455
Other	131	905	3 569	556	3 343
<i>Total Expenses</i>	<i>5 467</i>	<i>19 530</i>	<i>103 776</i>	<i>12 338</i>	<i>16 655</i>
Surplus/deficit	193	-1 042	-7 690	1 443	2 936

^a Sunraysia Rural Water merged with Lower Murray Water to form the Lower Murray Urban and Rural Water Authority on 1 July 2004. ^b Wimmera–Mallee Water and Grampians Water merged to form the Grampians Wimmera Mallee Water Authority on 1 July 2004.

Source: Government of Victoria 2004

Victoria explained that Goulburn–Murray Water's poor financial result for 2002-03 reflected the impact of the sixth consecutive year of drought. Low water availability due to the drought had restricted allocations on the Murray

and Goulburn systems. This had reduced sales revenue while also increasing operations costs. Gippsland and Southern Water also recorded a deficit in 2002-03.

During 2004 Victoria confirmed its commitment to rural lower bound cost recovery (DSE 2004). In the Water Industry Regulatory Order 2003, the government prescribed cost recovery principles that all water authorities must comply with. The principles require water authorities to set prices to recover operating, maintenance and administration costs, capital expenditure to renew and rehabilitate assets, and finance costs associated with new investments (including the cost of debt or equity). The government has decided to exempt rural authorities from generating a return on past investments (those made before 1 July 2004). In line with this policy the government will phase out by 1 July 2005 the requirement to earn a 4 per cent return on assets providing bulk water services to regional urban authorities. The government considers this approach appropriately recognises that much of the existing rural infrastructure is sunk (and the costs are either already recovered or not expected to be recovered).

The Essential Services Commission assumed responsibility for water industry economic regulation on 1 January 2004. The *Water Industry Act 1994* as amended by the *Water Industry (Essential Services Commission and other Amendments) Act 2003* establishes the broad framework for the commission's regulation of the water industry pricing. The commission must make pricing decisions in accord with the Water Industry Regulatory Order 2003, which prescribes the principles of full cost recovery. It must also monitor and report publicly on the performance of the regulated water industry.

The government has also confirmed that it will introduce arrangements for the water authorities to make an environmental contribution (separate from establishing the base cost of delivering water services). This contribution will add to funding for sustainable water management to help address any adverse environmental impacts from the use of water. From 1 July 2005 to 30 June 2008, rural water authorities will be required to pay an amount equivalent to 2 per cent of their existing revenues as an environmental contribution. The government considers that the lower rural contribution (urban water providers will contribute 5 per cent) recognises irrigators' role in working towards better environmental outcomes, and will assist them to make the necessary adjustments. Goulburn–Murray Water, however, will not be required to contribute funding to environmental initiatives until 1 July 2007 in recognition of the reforms to the sales water allocation framework and the drought. Each rural water authority will be able to pass on its environmental contribution by increasing the tariffs and charges for its services.

Victoria considers that its environmental contribution approach appropriately recognises the difficulty in quantifying some of the environmental impacts of water use and, in turn, estimating the costs associated with those impacts. It considers that the approach also reflects the difficulty of determining the extent to which those using and paying for services are responsible for adverse environmental impacts.

Victoria anticipates that environmental contributions will generate approximately \$225 million by June 2008, but has not indicated the proportion that would come from rural water authorities. Before 1 July 2008 and every four years thereafter, Victoria will review the amount of funds raised through environmental contributions and each rural water authority's environmental contribution.

Transparent reporting of subsidies

Under the *Financial Management Act 1994*, regional urban and rural water authorities must report CSOs in their annual reports. All authorities do this. Several rural water authorities provide price concessions for pensioners, reporting these concessions in their annual reports — for example, Goulburn–Murray Water and Sunraysia Rural Water.

Consumption based pricing

All rural water authorities apply consumption based pricing principles. The fixed component of the charge reflects costs that do not vary with use (such as access fees), while the variable component is linked to the volume of water used. Table 3.2 outlines rural water authorities' fixed and variable charges in 2003-03 and the proportions of revenue raised by each element of the charge.

Goulburn–Murray Water restructured its irrigation service charge in 2004. The restructured tariffs comprise a fixed service charge and entitlement storage fee and a variable infrastructure use charge. The service charge is designed to recover the costs of water resource administration — including billing, debt collection and metering — and is levied on each customer according to the number of service points on the customer's property. The entitlement storage fee recovers from customers the bulk water cost attributable to their water entitlement. The infrastructure use fee recovers the costs that the rural water authority incurs in operating the infrastructure that delivers the service, and is charged on the basis of the volume of water delivered. The infrastructure access fee recovers the costs of items such as infrastructure maintenance and renewals.

Table 3.2: Fixed and variable charges by rural water authorities, 2002-03

<i>Rural water authority</i>	<i>Tariff component</i>	<i>Nature of component</i>	<i>Proportion of revenue (%)</i>
Goulburn–Murray ^a	Service fee	Fixed	3.9
	Entitlement storage fee	Fixed	20.0
	Infrastructure access fee	Fixed	48.8
	Infrastructure use fee	Variable	26.3
	Additional service point fee	Variable	1.0

(continued)

Table 3.2 continued

<i>Rural water authority</i>	<i>Tariff component</i>	<i>Nature of component</i>	<i>Proportion of revenue (%)</i>
Sunraysia ^b	Access fee	Fixed	67.0
	Bulk water charge	Fixed	5.2
	Drainage and salinity fee	Variable	27.8
Wimmera–Mallee	Domestic and stock access charge	Fixed	82.0
	Usage fee	Variable	18.0
First Mildura	Access fee	Fixed	26.7
	Bulk water diversion charge	Fixed	10.3
	Salinity levy	Variable	1.7
	Delivery fee	Variable	61.2
Gippsland and Southern	Drainage fee	Variable	0.02
	Irrigation services charge	Variable	100.0

^a The tariff components reported for Goulburn–Murray Water are for 2003–04. ^b Now the Lower Murray Urban and Rural Water Authority.

Source: Government of Victoria 2004

Discussion and assessment

Cost recovery

Under the 1994 CoAG water reform agreement and the National Water Initiative, Victoria needs to show its rural water services are setting prices that achieve at least the lower bound of cost recovery in accord with the CoAG pricing principles. 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 on debt, provision for future asset refurbishment/replacement, and dividends (if any).

Victoria uses normalised 10-year averages to provide an appropriate basis for ensuring the ongoing commercial viability of water businesses. Its rural water authorities set prices to recover all lower bound costs. This is now overseen by the Essential Services Commission, which adds rigour and transparency to the way Victoria determines efficient water service prices.

The requirement that water authorities pay an environmental contribution to the government, which they are permitted to pass on through price increases, is a step towards ensuring that appropriate natural resource management costs are (transparently) reflected in water prices. This reform is consistent with the direction of the externality cost element of the CoAG pricing principles. The transparency of the price setting process would be further improved, however, by requiring rural authorities to separately report all natural resource management costs.

Victoria's treatment of assets accords with the lower bound cost recovery requirements of the CoAG pricing principles. The lower bound does not require water businesses to account for the opportunity cost of capital, so does not require them to earn a return on the value of infrastructure assets. Victoria's approach also accords with its commitment under the National Water Initiative to move towards upper bound pricing for all rural systems where practicable.

Transparent reporting of subsidies

Acknowledging that rural water authorities report CSOs and pension concessions in their annual reports, the Council considers that Victoria has met its water reform commitments relating to transparent reporting of subsidies.

Consumption based pricing

In the 2001 NCP assessment, the Council was satisfied that pricing of regulated services by Victoria's rural water authorities appropriately reflects the principle of consumption based pricing. Goulburn–Murray Water's refinement of its irrigation service charges better reflects the costs of service provision and the way in which these costs are incurred, and accords with consumption based pricing obligations.

Murray–Darling Basin Commission costs — River Murray Water and water resource management cost allocation

Assessment issue: The River Murray Basin states have different policies on passing on River Murray Water costs and water resource costs to water users. In the 2003 NCP assessment, Victoria indicated that it allocates its share of River Murray Water costs among irrigators, who bear the cost of irrigator services, and taxpayers, who bear the cost of providing services that deliver broad community benefits. Victoria indicated that it will refine its approach after the future commercial reform of River Murray Water. For the 2004 NCP assessment, the Council has looked for Victoria to demonstrate that River Murray Water and MDBC water resource management costs are transparently reported, and to advise on any development since the 2003 NCP assessment in its approach to allocating its share of River Murray Water costs.

Future reform: Signatories to the National Water Initiative are to achieve lower bound pricing for all rural systems in line with existing NCP commitments, and bring into effect by 2006 consistent approaches to pricing and attributing costs of water planning and management. This should involve the identification of all costs associated with water planning and management, and the identification of the proportion of costs that can be attributed to water access entitlement holders, consistent with the principle of linking charges as closely as possible to the costs of activities or products.

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

Victoria contributed approximately \$21 million to the Murray–Darling Basin Commission (MDBC) in 2002-03. Of this amount, \$14.2 million was the contribution towards River Murray Water’s annual costs. These costs are met by the government (about \$5.7 million) and Goulburn–Murray Water (\$8.4 million).

Victoria has not developed its approach to allocating its share of River Murray Water costs since the 2003 NCP assessment. In that assessment, Victoria advised that it distinguishes between costs relating to services that deliver broad community benefits and those relating to services that benefit primarily irrigators. Under this approach, the Victorian Government bears the costs relating to broad community benefits, while Goulburn–Murray Water’s customers bear the cost of irrigator services.

Victoria indicated that it supports transparency in reporting contributions to the costs of operating the MDBC and River Murray Water. It has reported, however, only its contribution to the total cost of operating the MDBC, rather than disaggregating this amount to show separately its contributions to River Murray Water and MDBC costs, and the respective state and Goulburn–Murray Water shares of the contribution to River Murray Water costs. Given that River Murray Water is an internal water business of the MDBC, Victoria considers that the primary responsibility for reporting participating jurisdictions’ contributions to that business should fall to the MDBC through its annual report.

Goulburn–Murray Water reports the value of its share to the relevant irrigators, who ultimately bear this cost through their service charges. The MDBC reports contributions by contracting governments in its annual reports.

Discussion and assessment

Under the 1994 CoAG water reform agreement and the National Water Initiative, Victoria committed to implement best practice water pricing and institutional arrangements. These are arrangements that, among other things:

- promote the economically efficient and sustainable use of water resources and water infrastructure, and government resources devoted to water management
- facilitate the efficient functioning of water markets (including interjurisdictional markets) in both rural and urban settings
- apply user pays principles and achieve pricing transparency for water storage and delivery in irrigation systems
- achieve cost recovery for water planning and management, with consistent approaches to attributing planning and management costs by 2006.

In 2002-03, the Victorian Government allocated all MDBC costs relating to resource management and approximately 40 per cent of River Murray Water costs to taxpayers. Goulburn–Murray Water paid approximately 60 per cent of River Murray Water costs.

The MDBC's independent audit of cost sharing arrangements (Langford and Scriven 2002) argued that the following actions are necessary to provide clear price signals to water users:

- All River Murray Water costs need to be recognised and all subsidies and CSOs need to be disclosed.
- Financial and pricing information for River Murray Water should be publicly available.
- State governments should disclose (on a megalitre basis) the level of subsidy and/or the CSO provided to each water business that receives bulk water from River Murray Water.

The Council accepts that some disclosure is a state responsibility and some is the responsibility of the MDBC. Full disclosure of MDBC and River Murray Water costs is important because the states have different policies on passing on River Murray Water costs to water users. All governments need to ensure River Murray Water and any relevant MDBC costs are appropriately (and consistently) allocated to users.

While Victoria has satisfactorily addressed its rural pricing obligations for this assessment, it has committed under the National Water Initiative to implement (Murray Darling Basin state) consistent approaches to pricing by 2006 and to attribute (also by 2006) the costs of water planning and management. This work should involve the identification of all costs associated with planning and management (including the costs of underpinning water markets) and the identification of the proportion of costs that is attributable to water access entitlement holders, consistent with the principle of linking charges as closely as possible to the costs of activities and products. This information should be publicly reported. Victoria will need to address these matters to comply with rural water pricing obligations.

Cost recovery in issuing licences for water extraction

Assessment issue: Victoria is to demonstrate that it recovers appropriate costs in setting fees for water licences, in accord with the CoAG pricing principles. In the 2001 NCP assessment, Victoria provided the Council with a copy of Goulburn–Murray Water's licence fee schedule for unregulated catchments but did not report more broadly on its water licence fee arrangements and cost recovery outcomes. For the 2004 NCP assessment, the Council looked for Victoria to provide information on water licence fees for applications, renewals, amendments, and permanent and temporary transfers, and show how the user fees reflect costs.

(continued)

Future reform: Signatories to the National Water Initiative are to bring into effect consistent approaches to pricing and attributing costs of water planning and management by 2006. This should involve (i) the identification of all costs associated with water planning and management and (ii) the identification of the proportion of costs that can be attributed to water access entitlement holders consistent with the principle that charges are linked as closely as possible to the costs of activities or products.

References: 1994 CoAG water reform agreement, clauses 3(a) and (b); 1996 ARMCANZ paper; 1998 CoAG pricing guidelines; 1999 tripartite meeting; Intergovernmental Agreement on a National Water Initiative

Victoria reported that four rural water authorities have a delegated licensing function under the *Water Act 1989*. Rural water authorities are required to maintain registers of all holders of water right entitlements in irrigation districts and all individuals who are licensed to divert from rivers and streams. Rural water authorities must also maintain registers of use for irrigation or commercial purposes from farm dams. Victoria advised that it sets all fees to fully recover the cost of all activities associated with the licensing function.

Discussion and assessment

The 1994 CoAG water reform agreement commits governments to ensuring that charges for rural water supply recover at least the lower bound costs of supplying water to users. It commits governments to progressively reviewing charges so that they comply with the principle of full cost recovery with any subsidies made transparent. The Council considers that Victoria has met obligations relating to recovering the costs of issuing licences for water extraction.

3.2 Water access entitlements

Assessment issue: Victoria is to institute a statutory water access entitlement system and support systems for the consumptive use of water, separate from land. The water access entitlement system should be specified as a perpetual or open-ended share of the consumptive pool of a water source. These arrangements should be in place by 2006.

At the time of the 2003 NCP assessment, Victoria was implementing a system of bulk entitlements defining the volume of water that its rural and urban water authorities may take from a river or storage, the rate at which water may be taken and the reliability of the entitlement. (Individual water entitlements in the irrigation districts are listed in a schedule to the bulk entitlement.) In unregulated river systems, water entitlements are provided through licences that allow the holder to divert water. Licences are also required to extract groundwater. Water licences and entitlements are specified in volumetric terms. Only land owners may hold water licences and individual water entitlements (with a transfer detaching the licence or entitlement from the seller's landholding and re-attaching it to that of the buyer). While bulk entitlements are held in perpetuity, water licences are issued for 15 years with a presumption of renewal. (Sunraysia Rural Water reduced the tenure of private diverters' licences to five years but had agreed to review its decision.) The bulk entitlements and the stream flow and groundwater management plans specify the reliability of supply. The Department of Sustainability and Environment maintains a public

(continued)

register of bulk entitlements. Rural water authorities maintain registers of water entitlements in irrigation districts and of licences for diversions from unregulated rivers.

For the 2004 NCP assessment, the Council has looked for Victoria to ensure its water access entitlements system and supporting arrangements are consistent with the state's commitments under the National Water Initiative. Victoria will need to:

- specify its water access entitlements as perpetual shares of water available for consumption
- remove the restriction on who can hold water licences and entitlements or demonstrate that the restriction is in the public interest and consistent with CoAG water reform obligations
- finalise the bulk entitlement conversion process and the stream flow and groundwater management plans to determine the reliability of supply.

References: 1994 CoAG water reform agreement, clause 4; 1999 tripartite meeting; Intergovernmental Agreement on a National Water Initiative

Under the Water Act, Victoria issues bulk entitlements to rural and urban water authorities. A bulk entitlement is a legal entitlement to water. It defines the volume of water that an authority is entitled to take from a river or storage, and may include the rate at which water may be taken and the reliability of the entitlement. Bulk entitlements are granted to rural water authorities for the regulated river systems and to urban authorities irrespective of whether they are supplied by regulated or unregulated rivers. When fully implemented, bulk entitlements will cover almost 80 per cent of water allocated for consumptive use in Victoria.

The majority of water entitlements in Victoria are within regulated irrigation districts. In these districts, bulk entitlements are issued to the rural water authorities as the basis for providing water to irrigators. Individual water entitlements in the irrigation districts are listed in a schedule to the bulk entitlement.

In the unregulated river systems, water entitlements are provided via bulk entitlements to urban water authorities and by licences that allow irrigators to divert water.³ Unregulated rivers provide less than 10 per cent of the water for consumptive use in Victoria. Stressed unregulated rivers that have high environmental value are managed via stream flow management plans, which Victoria is developing on a priority needs basis (see section 3.3). Stream flow management plans include rules for allocating new water licences and flows (including environmental flows). Lower priority rivers will be subject to statewide management rules rather than a formal plan. Victoria is in the process of developing the rules.

Irrigators, mostly in northern Victoria, are also generally entitled to additional water (termed 'sales' water) when there is sufficient water to meet basic entitlements in the current and subsequent years. Sales water is usually offered as a proportion of the basic entitlement, subject to a maximum

³ Licences are not required for water extraction for basic domestic and stock rights.

allocation (typically 100 per cent of the basic entitlement). Licences for industrial, domestic and stock purposes do not attract sales water. In addition, licensed private diverters in most of northern Victoria do not receive the first 30 per cent allocation of sales water made to district irrigators.⁴

Licences are also required to extract groundwater. Groundwater provides around 11 per cent of the water for consumptive use in Victoria. Where an aquifer is highly allocated or stressed, the government establishes a water supply protection area and develops a groundwater management plan (see section 3.3).

Water licences and entitlements are specified in volumetric terms. Only land owners may hold water licences and individual water entitlements (with a transfer detaching the licence or entitlement from the seller's landholding and re-attaching it to that of the buyer). While bulk entitlements are issued in perpetuity, water licences are generally issued for 15 years with a presumption of renewal. In 2001 Sunraysia Rural Water (now the Lower Murray Urban and Rural Water Authority) reduced the tenure of private diverters' licences to five years, to provide greater flexibility in managing environmental issues (particularly drainage and salinity), but undertook to review its decision. The Minister for Water has reserve powers under the Water Act to amend water entitlements in the event of a water shortage. The Act provides for compensation in certain circumstances.⁵

In accord with the Water Act, the Department of Sustainability and Environment maintains a public register of bulk entitlements. Rural water authorities are required to maintain registers of water entitlements in irrigation districts and of licences for diversions from unregulated rivers and use from farm dams. The bulk entitlements and stream flow and groundwater management plans specify the reliability of supply. Third party interests can be noted on the registers.

⁴ Irrigators on regulated rivers may also be allowed to take 'off-quota water' in times of 'surplus' flow (that is, water that flushes down a river and cannot be harvested in public storages). Off-quota water is not permitted to be traded. Victoria intends to abolish off-quota water, which is no longer available on the River Murray and soon will not be available on the Goulburn River.

⁵ A water management plan can specify compensation payments for losses or expenses incurred as a result of an authority directing works to be carried out or works (other than a private dam) to be removed. If the enforcement of a plan confers a benefit on one person to the detriment of another, then the person suffering the loss is entitled to seek compensation from the other party.

Reform progress

In its White Paper released in June 2004 (DSE 2004), the Victorian Government announced the following changes to water entitlement arrangements:

- The state's water allocation system will be extended to provide for secure, tradable entitlements to recycled water and stormwater. By managing all water within the same framework, Victoria is aiming to encourage integrated management by, for example, allowing trading and substitution of water from different sources.
- Water entitlements will be:
 - granted unlimited tenure, given that they are shares of the consumptive pool and that there is an ability to review the pool⁶
 - simplified, with just two types of water share in each supply system (high reliability and lower reliability water entitlements)
 - unbundled into a water share, a share of delivery capacity and a licence to use water on a site
 - able to be held by non-water users, up to a limit of 10 per cent of entitlements in each supply system (such as the Goulburn system).
- A new lower reliability water entitlement will be created, initially by converting the current sales water allocations in northern Victoria into a legally recognised, tradable entitlement. It will be specified as a share of the resource available for consumption, retain the lower reliability of the original sales water and have ongoing tenure. The government will allocate 20 per cent of the new entitlement (an estimated 120 gigalitres) to the environment. Once implemented, the benefits of introducing similar arrangements in the south of the state will be discussed with water authorities and users.
- Domestic and stock rights in irrigation districts (which account for about 5 per cent of water entitlements in the districts) will be merged with other water entitlements and made tradable (via permanent trades). This change is aimed at giving farmers greater choice about the minimum volume of water to hold and to facilitate the rationalisation of distribution channels.

⁶ While its water entitlements are specified as a volume, Victoria considers that they are already effectively shares of the water available for consumption. In the Goulburn system, for example, irrigators were allocated only 57 per cent of their entitlements in 2003. An entitlement of 300 megalitres, for example, thus means 0.025 per cent of the available water, given that the total Goulburn entitlement is 1200 gigalitres. Victoria considers that the introduction of the term 'share' will not require a significant recasting of existing entitlements (DSE 2004).

- In the limited number of catchments and aquifers in which additional water is available for consumption, entitlements will be allocated by market mechanisms wherever possible (that is, by an auction or tender process, which includes public advertisement of the sale and the setting of a reserve price).
- An environmental water reserve will be established to set aside a share of water in rivers and aquifers across the state for the environment (see section 3.3). The reserve will be legally recognised. In establishing the initial reserve, the government will recognise the rights of existing entitlement holders. Bulk entitlements for the environment will be established in systems where water is to be recovered for the reserve.
- An expert assessment of the state's water resources will be made at 15-year intervals to determine whether the resource base has declined (and if the decline has fallen disproportionately on the environment or water users) and if river health is deteriorating for flow-related reasons. If either outcome is the case, the Minister for Water will establish an open, consultative review of the balance between the water available for consumption and the environmental water reserve, and of necessary corrective action (including the last resort option of the Minister adjusting entitlements using the reserve powers).
- The reserve powers in the Water Act will be clarified to ensure the government can effectively qualify entitlements in times of water shortage (including where river or aquifer health is not sustainable) but must establish a clear process for doing so. The government indicated that the powers will always be available to address emergencies or temporary shortages. It will consider making permanent adjustments to entitlements, however, only in response to long term changes to inflows or river health, and following a recommendation from an expert water resource assessment and an open consultative review (see previous point). Such adjustments would be made no more frequently than once in 15 years. Where there has been a long term change to inflows as a result of natural events such as climate change, the government will restore the relative shares held by the environment and water users, without any payment.
- All significant water use will be metered, including all new licences for commercial and irrigation use. While new licensees will be responsible for the full cost of metering, the government will subsidise the installation of meters for existing unmetered users (up to \$400 a meter). To ensure users comply with their licensed entitlements, the government will require water authorities to enforce licence conditions (by requiring users to purchase additional entitlements or adjust their business operations). It will also provide additional funds for monitoring water resources.
- A publicly accessible, web based register will be established, covering all water entitlements in Victoria. It will include water rights, licences and bulk entitlements, and cover regulated and unregulated rivers, groundwater, farm dams, recycled water and stormwater. The register will

record information on the ownership, location and quantity of entitlements (as well as metered use), third party interests (such as mortgages) and water trades. It will also keep track of the links among the new unbundled entitlements. The government will contribute up to \$7 million over four years to establish the register.

- Through the new register of entitlements and the metering initiatives, a robust water accounting system will be developed. A publicly accessible, web based water accounts database will be established. It will be used to report annually on compliance with water entitlements at the bulk supply level, as well as with caps at the catchment and aquifer levels. The initial set of accounts will be prepared manually by early 2005. The web based system is scheduled for completion by early 2006 and will be linked electronically to the register of entitlements.

During 2003-04 Victoria continued the conversion of existing water rights to bulk entitlements. By June 2004 Victoria had completed the bulk entitlements for the Wimmera–Mallee system and moved closer to finalising the conversion arrangements for the remaining six water supply systems in its program (table 3.3). In its White Paper, Victoria stated that it expects to complete the implementation of the bulk entitlement system across the state within two years (that is, by mid-2006).

Table 3.3: Status of bulk entitlements in Victoria, as at August 2004

<i>Water supply system</i>	<i>Status of bulk entitlement</i>
Avoca ^a	Environmental requirements met under current management practices
Barwon	Finalised 2002
Broken ^a	Negotiation complete. Awaiting applications from relevant water authorities. (Expected completion: September 2004)
Campaspe	Finalised 1999–2000
Central Gippsland rivers – urban	Finalised 1997–98
Central Highlands – major urbans	Finalised 2002
Central Highlands region – urban (part)	Finalised 1998
East Gippsland rivers –urban	Finalised 1997
Glenelg region ^a – urban supplies	Finalised 1997
Goulburn	Finalised 1995
Grampians – urbans	Part of Wimmera-Mallee process.
Kiewa/Rubicon (Southern Hydro)	Finalised 1997
Latrobe	Finalised 1996
Lerderderg ^a	Managed under the stressed rivers program
Loddon ^a	Work progressing.
Maribyrnong ^a	Finalised 2000–01

(continued)

Table 3.3 continued

<i>Water supply system</i>	<i>Status of bulk entitlement</i>
Melbourne	Process complete. Awaiting Government resolution of a policy matter.
Moorabool	Finalised 1995
Murray	Finalised 1999
North East region – urban	Finalised 1995–99
Otway rivers – urban	Finalised 1997–98
Ovens	Negotiation complete. Awaiting applications from relevant water authorities.
Snowy ^a	Managed under Snowy Rescue Plan.
South Gippsland rivers – urban	Finalised 1997
Tarago System	Dependent on Melbourne system.
Thomson/Macalister ^a	Finalised 2001. The bulk entitlement will be modified as part of the implementation of the flow rehabilitation plan for the Thomson and Macalister river systems.
Werribee	Finalised 1997
Wimmera-Mallee ^a	Finalised 2004

^a Priority rivers identified on the 1999 implementation program.

Sources: Government of Victoria 2004

For unregulated rivers, Victoria committed in the White Paper to:

- ban the issuing of new licences that allow the diversion of water from November to June (inclusive)
- only issue new licences for the July to October period where there is spare water under the sustainable diversion limit for the catchment
- introduce statewide management rules for licensees who take water in summer, to protect the environmental water reserve (with detailed rules to be released by December 2004).

Victoria also committed in the White Paper to manage the use of groundwater through its licensing regime and, where necessary, to restrict use to maintain groundwater levels to meet the requirements of the environmental water reserve. It will establish water supply protection areas and prepare groundwater management plans in aquifers that are highly allocated or stressed, or that have strong interconnections with stressed surface water systems. Other water planning developments, including Victoria's progress in developing stream flow and groundwater management plans, are reported in section 3.3.

Discussion and assessment

In previous NCP assessments, the Council found that Victoria's Water Act establishes a comprehensive system of water entitlements that are separated from land title (although able to be held only by land owners), specified in volumetric terms and tradable. Bulk entitlements are issued in perpetuity and water licences are issued for 15 years with a presumption of renewal. The Department of Sustainability and Environment and the rural water authorities maintain publicly accessible registers of bulk entitlements and water licences, which include provision for recording third party interests.

The National Water Initiative commits participating states and territories to introduce perpetual water access entitlements, with similar status to freehold land, and to have compatible, publicly accessible and reliable systems for registering entitlements (including any encumbrances) and (permanent and temporary) trades.

Under the changes announced by Victoria in its White Paper, all water entitlements will be specified as shares of the consumptive pool — which Victoria considers will not require a significant recasting of existing entitlements — and granted unlimited tenure. The move to perpetual entitlements will address the short tenure of Sunraysia Rural Water's (now the Lower Murray Urban and Rural Water Authority's) licences for private diverters.⁷ The conversion of sales water to a new lower reliability entitlement and the clarification of the Minister's reserve powers to amend water entitlements should further improve the security of entitlements. The establishment of an environmental water reserve will also enhance the security of water allocated to the environment. (The benefits of Victoria's unbundling of water entitlements are discussed in section 3.4.) In addition, Victoria will establish a single, publicly accessible, web based register covering all water entitlements in the state and incorporating third party interests. Under the National Water Initiative timetable, Victoria will need to implement its new arrangements by the end of 2006.

Victoria limits the ownership of water licences and individual water entitlements to land owners (with a transfer detaching the licence or entitlement from one landholding and re-attaching it to another). Under the White Paper changes, non-water users (or non-land owners) will be able to hold water licences and entitlements, but only up to a limit of 10 per cent of

⁷ One of the sample of groundwater plans provided by Victoria — for the Katunga groundwater — also limits licences to five years. Victoria advised that the limit aligns with the review of the plan after five years. The short planning horizon reflects the limited information on groundwater that was available when the plan was developed (for example, metering commenced only with the planning process). An additional reason for the five-year tenure is the plan's requirement for sleeper licences (licences held but not used) to be retired at renewal. Metering and monitoring programs under the initial plan will enable the sustainable yield of the resource to be determined with greater certainty before the next plan (which will need to provide for perpetual licences) is developed.

entitlements in each supply system. Because the water licences and entitlements are separate from land title, it is arguable that the water entitlement provisions of the 1994 CoAG water reform agreement and the National Water Initiative do not require the removal of this remaining link with land. The restriction may, however, constrain water trading; it is discussed further in section 3.4.

At the time of the 2003 NCP assessment, Victoria expected to complete the bulk entitlement conversion process for all major systems (with the exception of the Loddon and possibly Melbourne systems) by the end of 2003 and to grant all bulk entitlements by the end of 2004. While its progress has been slower than expected, Victoria expects to complete all remaining bulk entitlements by mid-2006, with the process to be completed by mid-2005 for all systems covered by its 1999 implementation program. The reliability of entitlements under licences for private diverters and groundwater users will be affected by the development of stream flow and groundwater management plans. Progress with these plans has also been slower than Victoria expected (see section 3.3).

For the 2004 NCP assessment, the Council considers that Victoria has made satisfactory progress against its CoAG obligations on water access entitlements.

3.3 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

(continued)

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.

At the time of the 2003 NCP assessment, Victoria was still to determine its approaches to providing environmental flows in three of the state's five priority stressed rivers — the Thomson and Macalister river systems and the Maribyrnong River. Given that Victoria was continuing to make progress and noting the work foreshadowed by CoAG on the National Water Initiative may have implications for Victoria's approach, the Council deferred this element of the 2003 NCP assessment.

The Council conducted the deferred 2003 NCP assessment in May 2004, concluding that while Victoria was yet to make a decision on implementation of the recommended environmental flows for the Thomson and Macalister river systems it had made sufficient progress to demonstrate that it had addressed its obligations for the 2003 NCP assessment.

For the 2004 NCP assessment, the Council looked for Victoria to progress its bulk entitlements program, stream flow and groundwater management plans and demonstrate that its arrangements address the obligations in the CoAG water reform agreement and the ARMCANZ/ANZECC National Principles for Provision of Water to Environment. The Council also looked for Victoria to have completed its flow rehabilitation plans (and related arrangements) for the Avoca, Broken, Glenelg, Loddon, Snowy and Wimmera rivers. It also looked for progress with the plan for the Loddon River. Victoria identified additional rivers that are likely to be stressed or overallocated in its White Paper on water.

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

Victoria allocates water to consumptive uses and the environment through the bulk entitlements regime for regulated rivers (section 3.2). For unregulated rivers, environmental flows are governed by stream flow management plans or, in lower priority rivers, by statewide management rules. For stressed rivers, Victoria develops flow rehabilitation plans. For groundwater sources where allocations exceed 70 per cent of the sustainable yield, Victoria establishes a groundwater supply protection area and develops groundwater management plans.

Victoria identified 11 stressed and overallocated river systems in its 1999 implementation program. It had not fully addressed its obligation to allocate water to the environment in the state's stressed and overallocated river systems by the time of the 2001 NCP assessment. The Victorian Government committed, however, to a three-year Stressed Rivers Program for improving the health of its stressed rivers. Under this program, Victoria was to have completed flow rehabilitation plans for:

- five stressed river systems — the Thomson, Macalister, Maribyrnong and Lerderderg rivers and Badgers Creek — for the 2003 NCP assessment
- five stressed river systems — the Avoca, Glenelg, Broken, Wimmera and Snowy rivers — for the 2004 NCP assessment
- one stressed river system — the Loddon River — for the 2005 NCP assessment.

In addition to progressing its Stressed Rivers Program, to meet its CoAG obligations Victoria needs to complete its bulk entitlements program, the

stream flow management plans for the 42 systems covered by its 1999 implementation program and the groundwater management plans for the groundwater resources covered by its 1999 implementation program.

At the time of the 2003 NCP assessment, Victoria was still to determine its approaches to providing environmental flows in three of the state's five priority stressed rivers (the Thomson and Macalister river systems and the Maribyrnong River). While Victoria had not completed water management arrangements for the Maribyrnong River, it had made improvements to the environmental flows in most reaches of the Maryibynong River. It no longer regarded the Maribyrnong River as a priority because it considers the statewide return in terms of environmental outcomes from further investing in flow restoration activities would be greater for other rivers. Given that Victoria was continuing to make progress, and noting that the work foreshadowed by CoAG on the National Water Initiative may have implications for Victoria's approach, the Council deferred this element of the 2003 NCP assessment.

The Council conducted the deferred 2003 NCP assessment in May 2004. By that time, Victoria had made the following progress.

- The Thomson and Macalister Environmental Flows Task Force had reported its environmental flow recommendations to the government. The government had commenced some river restoration projects pending its decision on the task force report as part of the Victorian White Paper on water.
- The Port Phillip and Westernport Catchment Management Authority had started developing a draft regional river health strategy for the Port Phillip and Westernport region, containing proposed actions for the Maribyrnong River over the short and medium to long term, in line with regional priorities being established through the regional strategy.
- The Victorian Government had provided funds to the Port Phillip and Westernport Catchment Management Authority to investigate options for managing summer stress in Jacksons Creek and to conduct on-ground habitat works to protect the low flow aquatic habitat in Deep Creek.
- The Victorian Government had allocated \$280 000 from its Stressed Rivers Program to the Goulburn Broken Catchment Management Authority to: assess the impact of implementing a minimum environmental flow of 12 megalitres a day rule on domestic and stock users; identify options for protecting water supplies should the rule be implemented; develop a revised stream flow management plan to establish the environmental flow; develop a compliance and education program; and implement the agreed environmental flow package. Since the release of the draft stream flow management plan Goulburn–Murray Water has been managing the creek through a minimum flow of 20 megalitres a day over the winter fill months. Victoria intends to formalise this rule in the final stream flow management plan. Additionally, Victoria has established a groundwater management area for the region around Kinglake, which

includes the King Parrot revised stream flow management plan area. It intends to develop a groundwater management plan for the area in 2006-07. In the meantime Goulburn–Murray Water has placed an embargo on issuing further groundwater licences.

- The government was progressing its environmental water planning processes for the remaining six stressed rivers covered by its 1999 implementation program. It had identified another six rivers as being at significant risk of flow stress, and had signalled that it would take action to address this stress.

In the deferred 2003 NCP assessment for Victoria the Council noted that its 2004 NCP assessment would consider Victoria's progress in implementing water management arrangements for river and groundwater sources against the 2005 CoAG deadline for substantial completion of allocations on governments' 1999 implementation programs. The Council thus intended to consider:

- Victoria's progress with its bulk entitlements program and in finalising stream flow and groundwater management plans, to ascertain that the state is on track to achieve substantial completion of all plans and implementation arrangements by 2005
- a sample of completed stream flow management plans (and related arrangements), to determine the extent to which they address the obligations in the 1994 CoAG water reform agreement
- flow rehabilitation plans (and related arrangements) for the Avoca, Broken, Glenelg, Loddon, Snowy and Wimmera rivers to ascertain that the plans address the obligations in the 1994 CoAG water reform agreement.

In addition, the Council considered that Victoria should finalise its water management arrangements — including the state's proposal for development and implementation of a comprehensive regional river strategy for the Port Phillip and Westernport region (containing actions for the Maribyrnong River) by 2005. The strategy should address the deficiencies in the existing flow rehabilitation plan, including consultation on the appropriate trade-offs between consumptive and environmental uses, and the implementation of an effective monitoring and review process. By the 2005 NCP assessment, the Council expected Victoria also to have finalised a stream flow management plan for King Parrot Creek that addresses all data gaps identified in the draft plan, clearly explains the effect of trade-offs between the environment and the rights of existing users, and determines appropriate environmental flows for the creek.

Developments since the deferred 2003 assessment

Victoria's White Paper on water proposed a new sustainable water allocation framework for the state. The extension of Victoria's Crown rights to include stormwater and recycled water brings all water (regardless of its source) within a single management framework. The government committed to invest an extra \$100 million over the next four years to protect and repair the health of the state's rivers and aquifers. This funding will be used to accelerate the water management planning process, improve the water management system, and recover water for the environment primarily by investing in water savings.

As discussed in section 3.2, Victoria proposes to establish a new environmental water reserve, which will be a legally recognised share of water to be set aside to maintain the environmental values of a water system. This will formalise the approach being taken in Victoria's River Health Strategy. In the White Paper, however, the government made clear that the initial reserve may not be sufficient to maintain a healthy river or aquifer in some overallocated systems. Future decisions about enhancing the environmental water reserve will be made within Sustainable Water Strategies. Victoria proposes to use these strategies as the framework for deciding large-scale long-term changes in water use. In addition, the government will amend legislation to institute a requirement for an expert assessment of the state's water resources every 15 years to determine whether the resource base has declined or if river health is deteriorating for flow related reasons. If either is the case, the Minister will establish an open and consultative review of the balance between consumptive use and the environmental water reserve including any necessary corrective measures. This would be complemented by an improved compliance and accountability system. Actions to achieve this include, for example, requiring all significant water uses to be metered, requiring water authorities to enforce licence conditions and by preparing annual water accounts.

The White Paper provides a timetable for implementing water plans for the rivers and streams identified as stressed and/or overallocated. The timetable includes some rivers and groundwater systems covered by Victoria's 1999 implementation program, as well other rivers that the government has only recently identified as stressed and/or overallocated. Victoria's progress in completing its water plans is discussed below.

Victoria's Stressed Rivers Program

Under its Stressed Rivers Program, Victoria committed to completing flow rehabilitation plans for the Avoca, Glenelg, Broken, Wimmera and Snowy rivers for this 2004 NCP assessment, and for the Loddon River for the 2005 NCP assessment. Victoria reported that it has made the following progress.

Avoca River

SKM completed an environmental flows assessment of the Avoca River in 2002. It found the river to be in good condition and that the recommended environmental flows were already being met (SKM 2002). In light of this Victoria has decided not to prepare a stream flow management plan for the Avoca River. Instead, it has decided to provide an additional 1500 megalitres a year of the water savings from the Wimmera–Mallee pipeline and use statewide/regional management rules to implement the environmental flows.

Victoria is also investigating options for improving the watering regime of the terminal lakes of the Avoca system in line with the recommendations in the environmental flows assessment. The watering regimes of these wetlands have been affected by a range of factors, including groundwater extraction and the construction of levee banks. Victoria has established the hydrology of the system and is assessing vegetation and groundwater links. The North Central Catchment Management Authority expects to complete and commence implementation of the Avoca wetlands salinity and water management plan covering possible management options (including management of the levee banks) in 2005 (NCCMA 2004).

Victoria has completed a draft river health strategy for the Avoca River, which it is integrating into a set of regional priorities for river protection and restoration. It is also implementing the water quality plan for the Avoca River. The North Central Catchment Management Authority released its draft regional river health strategy in August 2004. The strategy identifies the Avoca River as a high value waterway. Its health downstream of Charlton is at high risk because of problems related to poor water quality and stock access. The strategy sets management actions and targets over the next five years to address these threats.

Broken River

The Cooperative Research Centre for Freshwater Ecology (CRCFE) completed an environmental flow assessment for the Broken River in 2001. Victoria advised that via the bulk entitlement process it will use some of the water savings from decommissioning Lake Mokoan to provide the recommended environmental flows for the Broken River. This is expected to significantly improve the ecological health of the Broken River and enhance native fisheries by restoring a more natural flow regime and through improved water quality. Victoria planned to complete the bulk entitlement process by September 2004.

In addition, Victoria has supplied additional funding from the Victorian Water Trust to accelerate progress towards improving the ecological health of the Broken River. This effort focuses on benchmarking river health, improving water quality; protecting and enhancing riparian and floodplain vegetation and associated values, ensuring the ongoing protection of frontages and riparian lands, creating significantly enhanced aquatic refuges; managing recreational fishing; increasing the length of stream accessible by

native fish species and flagship species, and building community capacity. It has also provided for fish passage at the following weirs on the Broken Creek: Rice's, Kennedy's and Shier's and at Lake Benalla on the Broken River. Victoria is investigating whether to provide for fish passage or remove the Gowangardie and Holland's weirs.

Loddon River

Victoria completed the environmental flows investigation for the Loddon River in June 2002. Using the holistic FLOWS method the assessment found that priority should be given to reviewing the minimum flows and provisions for fresher flows.

Victoria is modelling the impact on security of supply of meeting the recommended environmental flows as part of finalising the bulk entitlement conversion process. It advised that it anticipates the bulk entitlement will provide substantial improvements in the environmental condition of the Loddon River and the lakes, and that several of the environmental flow recommendations should be able to be met through the bulk entitlement process. Victoria initially considered that a stream flow management plan may be required to protect stream flows in the upper catchment and provide adequate environmental flows, but now considers that the same outcomes can likely be achieved through statewide/regional management rules.

Victoria has completed a draft river health strategy for the Loddon River. It has provided additional funds from the Stressed Rivers Program to implement this strategy, which aims to maximise the environmental benefits of the anticipated flow improvements provided through the bulk entitlement process. The strategy also seeks to address the river health issues associated with the lower Loddon River, issues that could constrain the river health benefits of any flow improvements.

In addition, Victoria has constructed a fishway on Kerang Weir to provide fish passage through the river up to the Loddon Weir. Using risk analysis and assessment the government has identified about 36 priority wetlands (of 105 studied) in the Loddon–Murray region for which it plans to develop management options with a focus on community involvement.

Snowy River

In a joint initiative the Victorian, New South Wales and the Australian governments are implementing the Snowy River rescue plan, which aims to return 21 per cent of the flow (212 000 megalitres) to the Snowy River over 10 years. Consistent with the expert panel of scientist's recommendations, the governments plan to restore 28 per cent of original flow levels to the Snowy River eventually. The governments have established a joint government enterprise to invest in water savings projects to meet the plan's objectives.

The Snowy River rescue plan is complemented by the lower Snowy River rehabilitation plan, which aims to return crucial instream and riparian habitat features to the lower Snowy River over 10 years. The government is developing a physical model to test the likely impact of introducing large woody debris structures to the river.

Thomson and Macalister river systems

Victoria is aiming to progressively restore the health of the Thomson and Macalister rivers by providing an average environmental water reserve of 18 000 megalitres a year to the Thomson River and 7 000 megalitres a year to the Macalister River over the next 10 years. The government proposes to implement the environmental flows in the Thomson and Macalister river systems using a staged approach. Three months after it lifts Melbourne water restrictions and introduces permanent water saving measures it will establish a bulk entitlement of 10 000 megalitres a year in the Thomson River. Within 10 years the government will supply the additional 8 000 megalitres a year for the Thomson River obtained from water efficiency and system savings.

By 2006 Victoria will provide an additional 5000 megalitres a year to the Macalister River via a \$5 million program of infrastructure improvement. It has committed another \$3 million to improve and modernise the water supply system of the Macalister Irrigation District to recover another 2000 megalitres a year within the next 10 years. To maintain a reliable water supply for irrigators and urban users, the environmental flows to be provided in the Macalister River will be subject to climate-based trigger rules. In drier years (about 15 per cent of years) the environmental flow provisions will not be fully implemented. Sufficient water will be provided, however, to at least maintain base flows and pool environments. The Department of Sustainability and Environment is advised that the trigger rules do not pose a threat to the environmental objectives for the system. It has also modified the bulk entitlement to reduce the existing environmental base flow (from 60 to 30 megalitres a day) to provide a water bank to be used to provide freshes during the dry years when environmental flows are reduced.

The process and schedule for achieving and implementing water efficiency and system savings over the 10 year period will be identified in the 2005 Central Region Sustainable Water Strategy. The West Gippsland Catchment Management Authority has responsibility for preparing the operating strategy for managing the environmental water reserve for the Thomson and Macalister river systems. The West Gippsland Catchment Management Authority must develop the operating strategy in consultation with Melbourne Water, Southern Water, the Gippsland Coastal Board and the Department of Sustainability and Environment. It must submit the strategy to the Minister for Environment and the Minister for Water by March 2005 for endorsement. The West Gippsland Catchment Management Authority also has responsibility for managing, monitoring and assessing the adequacy of the improved environmental flow arrangements.

Victoria's approach represents a reduction in the volume of environmental flows provided to the Thomson and Macalister rivers (by about 3 per cent over the medium term) and some extension in the period of implementation compared to the approach recommended by the Thomson Macalister Environmental Flows Task Force. Victoria will use an adaptive approach to maximise the ecological benefits of the environmental flows and undertake a 10 year monitoring program to inform effective management of the environmental water reserve. Within 10 years the government will review the health of the Thomson and Macalister rivers against the task force objectives and, if necessary, will consider additional action.

Wimmera and Glenelg rivers

Victoria commissioned consultants SKM to determine environmental flow recommendations for the Wimmera (SKM 2002) and Glenelg rivers (SKM 2003). SKM used Victoria's holistic FLOWS method.

The Government has implemented the MDBC Cap to prevent further extraction and degradation of the Wimmera River. It has committed 34 690 megalitres of water savings a year from the Northern Mallee pipeline for environmental flows, to be shared between the Wimmera and Glenelg rivers. In addition, Victoria is seeking a partnership approach with the Australian Government on a second Wimmera–Mallee pipeline, which could provide an additional 65 000 to 85 000 megalitres of water a year to the environment. The two pipeline projects should provide sufficient water savings to meet most of the environmental flows recommended for each river.

Victoria completed the bulk entitlement process for the two rivers in June 2004 providing a specific entitlement for the environment. It has provided additional funding from the Stressed Rivers Program to the Glenelg–Hopkins Catchment Management Authority to plan for the increase in environmental provisions that are expected to result from the Wimmera–Mallee pipeline and to maximise the effectiveness of the improved flow provisions. Victoria will develop an integrated Wimmera–Glenelg operating strategy for the environmental bulk entitlement, as well as a specific Glenelg environmental flow plan. The Wimmera Catchment Management Authority will also consider complementary issues, such as assessing whether Huddleston's Weir can physically pass environmental flows.

Other stressed systems

The White Paper identified the Moorabool, Goulburn, Campaspe, Yarra, Barwon and Latrobe rivers as very likely to be stressed or at some risk of being stressed (DSE 2004). The Barwon and Moorabool rivers are covered by Victoria's 1999 implementation program, but were not identified as stressed at that time. The other rivers are not part of Victoria's 1999 implementation program. In signing the National Water Initiative, Victoria committed to prepare water plans by the end of 2007 for other systems that it identifies as being overallocated, fully allocated or approaching full allocation.

Stream flow management plans

For unregulated rivers, including unregulated portions of regulated systems, Victoria manages environmental flows and water allocations for consumptive purposes using stream flow management plans. Victoria's 1999 implementation program indicated that the government would develop 42 stream flow management plans. Victoria has completed two stream flow management plans — for Diamond and Hoddles creeks (these plans are discussed below). Both plans adopt a standard approach using the new procedures and guidelines Victoria developed to improve its rate of progress. Victoria is reviewing a further 10 plans to ensure they are consistent with its new standards and plans to release the revised plans in 2004.

In light of the 2004 White Paper, Victoria reviewed its arrangements, determining 21 priority catchments where the government will provide ecologically sustainable environmental water reserves by:

- developing stream flow management plans that will provide a water regime that sustains agreed ecological objectives within 10 years
- co-investing in implementing stream flow management plans that seek to provide the enhanced environmental water reserve in a shorter timeframe
- moving diverters from summer to winter diversions when this will reduce ecological damage
- co-investing with farmers to assist them to implement measures to apply the stream flow management plan, including the building of off-stream winter fill dams.

Diamond Creek stream flow management plan

Victoria implemented the Diamond Creek Water Supply Protection Area Stream Flow Management Plan 2003 in November 2003 (Melbourne Water 2003a). The plan applies to the surface water of the 311 square kilometre Diamond Creek catchment. It encompasses Diamond Creek (which rises on the Kinglake Plateau and flows into the Yarra River in suburban Melbourne) and the tributaries of Running Creek, Arthur's Creek and Watery Gully. The aim of the Diamond Creek plan is to manage the water resources of the catchment in an equitable manner, so as to ensure the long term sustainability of those resources.

Melbourne Water established an advisory committee — comprising representatives of the EPA Victoria, the Department of Sustainability and Environment, the Port Phillip and Westernport Catchment Management Authority, Environment Victoria, Melbourne Water, local government, and licensed water users — to assist in preparing the Diamond Creek plan. The committee based its recommendations on an environmental flows assessment for Diamond Creek (Zampatti and Lieschke 1999) and a study on the impact

of farm dams in the catchment (SKM 2000a). It published a draft plan and sought submissions from interested parties.

Consultants Zampatti and Lieschke, from the (then) Department of Natural Resources and Environment, conducted the environmental flow assessment for the Diamond Creek catchment using the instream flow incremental method (IFIM). IFIM is a habitat model that does not explicitly consider other aspects of the ecology or geomorphology. The consultants based their assessment on the requirements of two native fish species: river blackfish (*Gadopsis marmoratus*) and mountain galaxias (*Galaxias olidus*) (Zampatti and Lieschke 1999). These species are ubiquitous to many creeks in the area, but are considered threatened in Victoria. Although the consultants did not consider lateral connectivity (that is, movement of water across the floodplain), they included aspects of longitudinal connectivity (along the stream channels) for fish migration in their assessment. The environmental flows assessment recommended the following provisions to maintain the ecological health of Diamond Creek:

- minimum (cease to pump) flows at six sites ranging from 0.3 megalitres a day at the mid to upper reaches to 1.5 megalitres a day further down the catchment at the Diamond Creek gauging station
- a limit on winter fill diversions to flows exceeding the 80th percentile, to protect winter flows
- a review of the winter fill diversions during May and possibly June, to protect ecologically significant first high flows following the summer low flow period.

Zampatti and Lieschke considered that these recommendations would maintain habitat for the river blackfish and mountain galaxias, as well as other fish species, invertebrates and aquatic vegetation in the catchment.

SKM assessed the impact of farm dams on the Diamond Creek catchment using the TEDI (Tool for Estimating Dam Impacts) model. The model uses data on the current hydrological conditions, projections of natural conditions, and inputs from aerial photographs of the size, nature and distribution of dams in the catchment to assess the impact of farm dams on water flows. SKM (2000a) estimated that unlicensed diversions from the Diamond Creek catchment — mostly rainfall run-off into farm dams for domestic and stock use — account for around 740 megalitres a year. Its results indicated that current diversions reduce low and medium flows by approximately 15 per cent and high flows by 4 per cent. The report concluded that the capture of run-off into dams had a larger impact on stream flow than did licensed diversions.

The water allocation provisions of the Diamond Creek plan:

- set the permissible annual volume of all licensed diversions at 790 megalitres a year

-
- prohibit pumping during the first flush after low flow periods and extraction of water between July and October when flows are less than 13 megalitres a day
 - prohibit extraction when flows are less than 1.5 megalitres a day.

These provisions do not allow any increase in the all-year licences or the current allocation (393 megalitres a year), but incorporate an additional allowance for registered and licensed farm dams. The plan provides for an increase in winter fill licences, from 250 megalitres a year to 397 megalitres a year. These provisions accommodate existing users and aim to encourage users to take water for storage in winter, when availability is higher, for use over the summer.

In addition, the committee recommended banning the construction of dams on waterways and limiting the volume of water that may be taken from or collected in farm dams, to reduce the impact of catchment dams on stream flows. To the extent possible, the plan also implements the recommendations in the technical studies. It obliges Melbourne Water to use rosters, restrictions and bans on water extraction to equitably achieve the water allocation limitations.

In the plan, the committee noted that upper Diamond Creek relies on groundwater springs to maintain base flows, and that excessive extraction of groundwater could reduce these flows. It states that ‘if extraction approaches “sustainable limits”, a groundwater management plan is usually developed ...’ (Melbourne Water 2003a, p. 11).

The committee proposed that the Diamond Creek plan be reviewed at least every five years. It nominated Melbourne Water to develop and implement a monitoring program to measure the plans effects on the reliability of supply and the maintenance of environmental flows. It considered that the program should include instream environmental indicators and indicators for assessing Melbourne Water’s performance in implementing the plan. (The plan requires Melbourne Water to report annually on the implementation of the plan and its effectiveness.)

Hoddles Creek stream flow management plan

The Minister for Water approved the Hoddles Creek Water Supply Protection Area Stream Flow Management Plan 2003 in November 2003 (Melbourne Water 2003b). The plan applies to the surface water of the 34 square kilometre Hoddles Creek catchment, encompassing Hoddles Creek (a tributary of the Yarra River located to the east of Melbourne) and the tributaries of Wombat Creek, Black Leather Creek and Wet Lead Creek. The aim of the Hoddles Creek plan is to manage the water resources of the catchment in an equitable manner, so as to ensure the long term sustainability of those resources.

In 1999 Melbourne Water established an advisory committee to assist with the development of the Hoddles Creek plan. The committee comprised representatives of Melbourne Water, the EPA Victoria, the Department Sustainability and Environment, the Department of Primary Industry, the Port Phillip and Westernport Catchment Management Authority, Environment Victoria, local government and licensed water users. In making its recommendations, the committee took account of environmental flows assessments and a number of hydrological investigations of Hoddles Creek. It published a draft plan and sought submissions from interested parties.

Zampatti and Raadik (1997) conducted the environmental flow assessments for Hoddles Creek using IFIM and, like the Diamond Creek assessment, they based their assessment on the requirements of river blackfish and mountain galaxias. The authors also took account of other fauna and flora in their study through field surveys. The investigations recommended minimum summer flows of 6.9 megalitres a day to maintain sufficient habitat for juvenile and adult blackfish. The authors considered that the minimum flows would also maintain habitat for the other fish species, invertebrates and aquatic vegetation.

In a follow-up study, Zampatti and Koster (2001) confirmed the conclusions of the 1997 study. They noted, however, that flows of less than 6.9 megalitres a day occur naturally, but are suboptimal. They considered that irrigation diversions that artificially prolong low flow periods could lead to poor recruitment of fish in the river. (At that time, restrictions on water use were applied when flows fell to 4 megalitres a day.) The authors recommended that the frequency and duration of low flow periods not be extended beyond what would naturally occur (Zampatti and Koster 2001).

On behalf of the committee Melbourne Water employed and SKM (2000a, 2000b, 2001) to conduct hydrological investigations to assess flow scenarios, assess the impact of farm dams on the Hoddles Creek catchment and compare the frequency and duration of low flow periods under natural and current conditions. For its investigations SKM used the Resource Allocation Model (REALM), TEDI model and Spell analyses, respectively. (These tools, which the Technical Audit Panel has endorsed, are widely used in Victorian water resource planning.) The results of hydrological modelling indicated that current water extraction has reduced the frequency and duration of low flow events by 11.5 per cent, medium flows by 1.5 per cent and high flows by 2 per cent.

The Hoddles Creek plan contains the following provisions aimed at balancing environmental flows:

- a permissible annual volume of all licensed diversions of 1207 megalitres plus the volume for certain registered or licensed farm dams
- summer (December to May) flow rules restricting extraction when flows are less than 4 megalitres a day until 31 July 2004, but then 5 megalitres a day thereafter

- winter (June to November) flow rules restricting extraction when flows are less than 10 megalitres a day, except during the transition month of November, when the trigger value is 6.9 megalitres a day.

These provisions do not allow any increase in the all-year licences or the current allocation (457 megalitres a year). They increase substantially, however, the winter fill licence allocation (from 68 megalitres a year to 750 megalitres a year). The provisions accommodate existing users, but aim to encourage users to take water for storage in winter to prevent ecological stress from direct pumping during summer. The advisory committee anticipated that maintaining the summer flow trigger (4 megalitres a day) for the first year of the plan would also allow users time to improve on-farm water use efficiency improvements or implement other offset measures.

The advisory committee considered that the summer flows restriction should occur at the 6.9 megalitres a day limit recommended by the scientific investigations. However, this limit would significantly reduce reliability of supply. The advisory committee thus considered that implementation of this recommendation should be contingent on the government funding water users to make on-farm changes. In its White Paper, Victoria committed to ensure scientifically determined environmental water provisions will be implemented in the Hoddles Creek catchment within five years. The government announced that it will co-invest with farmers to assist implementation of offset measures, such as off-stream winter fill dams.

The plan provides for review every five years. It nominates Melbourne Water to develop and implement a monitoring program to measure the effects of the plan on the reliability of supply and the maintenance of environmental flows. The program must include instream environmental indicators, as well as indicators for assessing Melbourne Water's performance in implementing the plan. Melbourne Water must report annually on the implementation of the plan and its effectiveness.

Discussion

Best available science

The IFIM method used to determine environmental water requirements for Diamond and Hoddles creeks was the accepted environmental flows method in Victoria at the time, but no longer reflects best practice in this evolving scientific field. The approach focused primarily on the requirements of only two species of fish. Further the recommendations were predominantly for minimum summer flows and reflected the needs of inchannel fauna rather than the entire ecosystem. Nevertheless, the environmental assessments considered aspects of the water regime, such as the timing, duration and magnitude of flows. In addition, the stream flow management plans provide for the development of environmental benchmarks and a review that aims to ensure the needs of instream ecosystems are being delivered.

The Technical Audit Panel independently reviewed the Hoddles Creek plan and the environmental flows and the other technical investigations on which it is based. The panel concluded that the methods used were appropriate and adequately applied. The panel considered that data inadequacy in the hydrological modelling impaired the accuracy of outputs and recommended that the monitoring program address data needs. The Diamond Creek and associated technical reports have not been peer reviewed. There are, however, many similarities between the Hoddles Creek and Diamond Creek plans and associated technical investigations.

Balancing economic, environmental and other interests

In setting the water allocations in the stream flow management plans, the advisory committee considered environmental and economic impacts. The plans maintain existing allocations but, through the prohibition on increasing all year licences, include a gradual adjustment process to reduce the summer flow stress by encouraging greater reliance on extraction of water in winter.

A key issue in relation to Diamond Creek is the capture of runoff into the smaller catchment dams (less than 1 megalitre). While the plan addresses this issue as far as possible, the inability to fully regulate dams through the planning process may hinder the achievement of the plan's environmental objectives.

In the case of the Hoddles Creek, the plan proposes implementation of the environmental flows recommended in the scientific assessment, subject to the government funding being available to assist with adjustment. The government announced that it will provide some funding, so the Hoddles Creek plan is likely to fully achieve its stated long term ecological objectives.

Monitoring and adaptive management

The plans for Diamond and Hoddles creeks provide for monitoring and adaptive management. They make Melbourne Water responsible for developing and implementing stream flow monitoring and it appears that the monitoring results will be used in subsequent reviews of the plans.

Stakeholder consultation and transparent processes

Victoria adopted a comprehensive, robust and open consultative process in developing the water management arrangements for the Diamond and Hoddles creeks catchments. The advisory committees overseeing the development of the plans included representatives of all major stakeholders in the catchments, including representatives of environmental, government and irrigator interests. The technical assessment documents and draft and final plans are readily available to the public, and monitoring reports will be publicly released.

Groundwater

Victoria determines permissible annual volumes (the estimated volume of groundwater that can be extracted on a sustainable basis over the long term) for its groundwater management areas. When groundwater allocations reach 70 per cent of the permissible annual volume, it triggers the mechanism for establishing a water supply protection area for which a water management plan must be developed. (A number of the groundwater supply protection areas identified on Victoria's 1999 implementation program, such as Denison, Katunga, Murrayville and Yangery, have licensed allocations that exceed the estimated sustainable yield of the groundwater area.) A consultative committee, comprised mainly of farmers but representing all relevant interests, is responsible for developing the management plan. The plan must address issues such as metering and monitoring, allocation arrangements including transferable water entitlements, environmental allowances for groundwater dependent ecosystems and costs associated with implementing the plan.

Victoria has established 29 water supply protection areas for groundwater resources it has identified as highly allocated or stressed (appendix A, table A.9). Ten of these water supply protection areas were included on Victoria's 1999 implementation program. Others were identified on the program for future development as a water supply protection area. Victoria has groundwater management plans in place for nine of the 29 areas. A further nine draft plans have been completed, five of which are awaiting ministerial approval. Victoria expects to complete all 11 of its outstanding groundwater management plans by 2005.

Most of the groundwater management plans implemented in Victoria to date contain only preliminary analysis that identifies groundwater dependent ecosystems, interconnectivity with surface water systems and sustainable yields. Recommendations in the plans centre on improving data collection and information (through installation of metres and monitoring bores, for example) so that permissible annual volumes and extraction rates can be accurately determined. Where necessary some reallocation or rationing of water entitlements has occurred to ensure extraction is within estimated sustainable limits. Groundwater management plans must be reviewed after five years and take account of any new information available.

Submissions

Environment Victoria provided a submission to the 2004 NCP assessment, commenting on Victoria's approach to providing water to the environment. Some of Environment Victoria's comments focus on the arrangements for the Thomson and Macalister rivers, so the Council took account of these comments in the deferred 2003 NCP assessment of Victoria. In summary, Environment Victoria noted deficiencies in the process for preparing the flow

rehabilitation plan for the Thomson and Macalister rivers. It was concerned that:

- important information was lost in the progression through to the final report
- the task force did not receive important information until very late in the process
- the task force did not consider all possible information and, as a result, was looking at problems rather than solutions.

Environment Victoria also expressed concerns about the decision making process that Victoria adopts for developing stream flow management plans. (The Council did not account for these issues in the deferred 2003 NCP assessment.) Environment Victoria noted that the Water Act (s29(2)(b)) requires that at least one half of the membership of the stream flow management plan consultative committees (body that makes recommendations on the water allocations in a stream flow management plan) must consist of persons who are owners or occupiers of land in the area concerned. Additionally, s29(2)(a)(i) of the Act also requires the Minister to make sure, as far as possible, that all relevant interests are fairly represented on the committee.

Environment Victoria pointed to the representation of landholders on stream flow management plan consultative committees. It noted that the Minister for Water has recently declared stream flow management plan consultative committees that give landholders more than double (and sometimes triple) the representation required under the Water Act. Examples include the committees for Olinda Creek catchment, Steels, Pauls, Dixons and Stringybark Creek catchments. The environment is represented on these committees by a single Environment Victoria volunteer. Environment Victoria considers that the imbalance in stakeholder representation means that committees are unlikely to allocate sufficient water to meet the needs of the environment.

While landholder representation has been substantially strengthened, the role of government employees with skills in natural resource management has been weakened. Environment Victoria posed the following questions:

- Why are the Flora and Fauna Division staff of the Department of Sustainability and Environment not members of the stream flow management plan consultative committees?
- Why have all agencies except Melbourne Water been relegated to the role of observer/advisor and have not retained their membership of the stream flow management plan consultative committees?
- Why does the Minister for Water continue to appoint chairs of the stream flow management plan consultative committees from the already

disproportionately advantaged landholder representatives, rather than more neutral committee members?

Assessment

Victoria has completed the bulk entitlement conversion process for 19 of its 25 water supply systems. It has completed flow rehabilitation plans for five of the 11 stressed and overallocated river systems covered by its 1999 implementation program and is progressing management arrangements for the remaining six river systems. Victoria has implemented two of 42 stream flow management plans for systems covered by its 1999 implementation program. Following the White Paper, Victoria has reviewed its approach, determining 21 priority catchments where it has undertaken to provide ecologically sustainable environmental water reserves.

Victoria has implemented nine groundwater management plans and expects to complete plans for its other 13 water supply protection areas by 2005. Most of the groundwater management plans implemented in Victoria to date contain only preliminary analysis, but must be reviewed within five years taking account of any new information available.

The key environmental water obligation for Victoria for this 2004 NCP assessment was to determine flow rehabilitation strategies that provide appropriate environmental provisions for the five priority stressed river systems (the Avoca, Glenelg, Broken, Wimmera and Snowy rivers) and to implement the environmental flow recommendations for the Thomson and Macalister rivers. While Victoria has adopted robust processes and has made significant progress it has not yet completed the water planning and allocation process for any of these five priority river systems.

Victoria announced its decision on the Thomson and Macalister river systems as part of the White Paper. It has undertaken to implement the recommendations of the Thomson and Macalister Environmental Flows Task Force with some modification. It has decided to reduce by approximately 15 per cent during drier years the volume of water that the task force recommended be provided to the environment in the Macalister River, and delay implementation of the environmental provisions. Along with proposed adjustments to the bulk entitlement for the system, Victoria expects this regime will at least meet the short to medium term river health objectives for the rivers.

The West Gippsland Catchment Management Authority (in consultation with key stakeholders) is developing an operating strategy for managing the environmental water reserve for the Thomson and Macalister river systems. It will provide the strategy to the Victorian Government in March 2005 for endorsement. Within 10 years the government will review the health of the Thomson and Macalister river systems against the task force objectives and, if necessary, consider whether further action is required to maintain or improve the health of the rivers.

In relation to unregulated surface water systems, Victoria is adopting rigorous, consistent and systematic processes for determining the volume of water to be provided to the environment. The stream flow management plans for Diamond and Hoddles creeks demonstrate due regard for the ARMCANZ/ANZECC national principles. While Environment Victoria is concerned about imbalances in stakeholder representation on some stream flow management plan consultative committees, the Council found no evidence from the completed plans for Diamond and Hoddles creeks that the volume of water proposed for the environment is not supported by a rigorous assessment of available scientific, economic and social information. The Council has not, however, considered any of the plans that concern Environment Victoria because these plans are not finalised.

The Council considers that Victoria has achieved satisfactory progress in implementing its CoAG water management objectives for the 2004 NCP assessment. The 2005 NCP assessment will need to consider Victoria's progress in implementing the environmental flows for the Thomson and Macalister river systems and finalising arrangements for the stressed rivers and for all other systems covered by its 1999 implementation program.

3.4 Water 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, in the southern Murray–Darling Basin, the relevant governments (including Victoria) 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.

In the 2003 NCP assessment, which considered intrastate trading arrangements, the Council found that Victoria had developed an effective framework for water trading. It identified, however, constraints on trading that are inconsistent with CoAG obligations, including:

- restricting the holding of water licences and individual water entitlements to land owners (with a transfer detaching the licence or entitlement from the seller's landholding and re-attaching it to that of the buyer)
- in regulated systems, the possibility that a transfer may be refused if it would result in more than 2 per cent (net) of the total water entitlement being transferred out of selected irrigation districts in any given year
- in unregulated systems, the restrictions applying north of the Great Dividing Range that prohibit trade upstream and impose a 20 per cent reduction on trade downstream (unless under a winter fill licence), and the statewide restrictions that limit downstream trade from an unregulated system to a regulated system to the amount of upstream trade

(continued)

- water trading market distortions that arise from the differential return on assets incorporated in the price charged for bulk water supplied by rural water authorities to regional urban customers and irrigators (which results in the charge for supply to country towns being higher than the charge to irrigators for water from the same system).

Victoria was considering several of these constraints in developing a White Paper on the water industry. It was also developing stream flow management plans for unregulated rivers and groundwater management plans, which may include trading rules. Permanent interstate trade is permitted only in high security water entitlements in the area covered by the MDBC's pilot interstate trading project. Victoria bans late-season temporary transfers into New South Wales.

Victoria needs to:

- make substantive progress towards removing constraints on trade, including out of irrigation districts, consistent with its National Water Initiative commitments
- ensure the trading rules in stream flow and groundwater management plans facilitate trading where water systems are physically shared or hydrologic connections and water supply considerations permit trading
- develop arrangements for interstate water trade beyond the MDBC's pilot interstate trading project.

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

Victoria has a well-established trading market for high security water. The Water Act and associated Regulations provide the basis for water trading within the state, with different arrangements applying to regulated, unregulated and groundwater systems. Permanent interstate trade is permitted only in high security water entitlements in the area covered by the MDBC's pilot interstate trading project.

Regulated systems

The water entitlements of irrigators in the regulated irrigation districts are aggregated under the bulk entitlements held by the rural water authorities. The entitlements are transferable, but only among land owners.⁸ A transfer detaches the entitlement from the seller's landholding and re-attaches it to that of the buyer.

Water may be transferred into or out of an irrigation district, although a transfer may be refused if it would result in more than 2 per cent (net) of the total water entitlement being transferred out of selected irrigation districts in a given year. Irrigation districts that may employ the 2 per cent rule are: Torrumbarry; the Murray valley; Shepparton; Central Goulburn; Rochester; Pyramid and Boort; Campaspe; Nyah and Tresco; Woorinen; Merbein, Red Cliffs and Robinvale; and the First Mildura Irrigation Trust. Victoria regards the 2 per cent rule as a loose rein on the pace of change, noting there has been three times the amount of permanent trade in the Goulburn–Murray district

⁸ The Act also permits the permanent or temporary trading of bulk entitlements.

than in New South Wales. Before 2003-04, the rule had been invoked twice in recent years — in the Torrumbarry system in 1998-99 and the Nyah district in 2000-01 — with the effect of only delaying trade for several weeks.

Trade generally requires the approval of the rural water authorities (and/or the Minister) and is subject to a range of rules and guidelines. The rules typically aim to minimise any adverse effects of trade on other water users (for example, through the physical constraints of the system) and the environment.⁹ Apart from the 2 per cent rule, Victoria advised of two exceptions where trading out is not permitted for financial reasons: the Coliban channel system in the Campaspe catchment and the Wimmera irrigation system. The systems are minor (accounting for only 0.5–1 per cent of irrigator entitlements) and dispersed, making them hard to keep viable. Victoria intends to review the rules for the two systems and to consider exit fees and reconfiguration plans.

Water entitlements cannot be permanently transferred without the approval of third parties with an interest in the entitlements. The seller is also required to advertise its intention to sell four weeks before applying for a permanent transfer.

The trading of ‘sales’ water (water available only once there is sufficient to meet basic entitlements in the current and subsequent year) by private diverters is not permitted. The trading of more than 30 per cent of sales water by gravity irrigators is also not permitted. In addition, private diverters are not permitted to use any sales water if they temporarily transfer any of their entitlements. Gravity irrigators lose access to all sales water above 30 per cent if they temporarily transfer any of their water entitlements or any of the first 30 per cent of sales water.¹⁰ Victoria considers that permitting trading of larger allocations of sales water would create windfall gains for irrigators who do not take up offers of sales water and do not have to pay for it. It would also require lower sales allocations to ensure use remains within the Murray–Darling Basin Ministerial Council cap on diversions. Victoria noted that sales water has not been an issue in the pilot interstate trading project, because there is virtually no sales water downstream of Nyah.

Apart from the above constraints on water trading in regulated systems, Victoria’s pricing arrangements for bulk water supply may distort the water trading market. The rural water authorities (Goulburn–Murray Water, Southern Rural Water and Wimmera–Mallee Water) have been required to incorporate a 4 per cent return on assets in the price charged for bulk water supplied to regional urban customers, but not for water supplied to irrigators.

⁹ The rules are set out in Victoria’s guide to water trading (DNRE 2001, pp. 48–50).

¹⁰ Trading of ‘off-quota water’ (water able to be taken in excess of an irrigator’s allocation in times of surplus flow) is also not permitted. Victoria advised that off-quota water, as with sales water, has been an offer to irrigators rather than a proper legal entitlement. As noted in section 3.2, Victoria intends to abolish off-quota water.

As a result, the charge for supply to country towns is higher than the charge to irrigators for water from the same system. Victoria's review of water industry legislation (Marsden Jacob Associates 2001) concluded that this differential in returns distorts the temporary market for water trading.

Unregulated systems

Victoria permits water trade in unregulated river systems on a similar basis to trade in regulated systems. Water licences are transferable, but only among land owners.

Generic trading rules are in place for unregulated systems. North of the Great Dividing Range, there is a prohibition on trade upstream and a 20 per cent reduction in trade downstream (unless under a winter fill licence). In addition, across the state, downstream trade from an unregulated system to a regulated system is limited to the amount of upstream trade. The stream flow management plans that Victoria is developing for priority unregulated rivers (see section 3.3) may set alternative trading rules for these rivers, following detailed investigation of the requirements of each catchment. The generic rules will continue to apply to other unregulated rivers.

For the stream flow management plans completed to date, Victoria has advised that the trading rules are generally designed to safeguard the health of the river and to protect water availability to downstream users. It has indicated that the plans tend to confirm the generic trading rules but may include additional constraints, given they are for stressed streams. It noted that the trading rules are intended to support the environmental flow objectives of the plans, which mostly require the environmental flows to be improved over the planning period, including via reductions in entitlements over time. Victoria provided the Council with copies of two stream flow management plans (the plans for Diamond and Hoddles creeks) that it considered to be representative of such plans. Box 3.1 summarises a selection of the trading rules in these plans, along with Victoria's rationale for the rules.

Box 3.1: Examples of trading rules in stream flow management plans in Victoria

Diamond Creek

- **Rule.** A licence cannot be transferred upstream into the catchment of the upper Diamond Creek (above the confluence with Arthurs Creek).
- **Rationale.** The Yarra basin is an unregulated stream. After reviewing environmental requirements, the hydrology, the level of existing commitments and the potential for new development, the plan's advisory committee recommended that there be no trading into upper Diamond Creek, to protect environmental flows and existing users' security of supply. The upper Diamond Creek is highly ephemeral and highly unreliable compared with Arthurs Creek. The potential for new development in upper Diamond Creek is limited due to topography and the extent of vegetative cover. Licences may be traded between Diamond Creek and the Yarra River subject to assessment and the requirement that any new licence issued is winter fill only.

(continued)

Box 3.1 continued

Hoddles Creek

- **Rules.** Water licences may be transferred out of the plan's area but not into it until the target environmental flow has been achieved. Licences above Yellow Gum Road may be transferred only downstream.
- **Rationale.** The transfer rules and restrictions in the plan primarily apply to 'all year' licences (typically pumped from a stream directly to crops during the low flow summer months). The advisory committee recommended the rules in recognition of the overallocation of all year licences and the need to improve environmental flows and the security of supply for existing all year licences.

Sources: Melbourne Water 2003a, 2003b

Groundwater systems

Trade in groundwater within an aquifer is legally possible. In the 2003 NCP assessment, however, Victoria advised that it is exercising considerable caution before permitting widespread trading in groundwater because the resource is harder to assess and has been built up over decades rather than being annually renewed.

In general, Victoria requires that a groundwater management plan (see section 3.3) be developed before it allows trade. It advised that the completed plans include controls on transfers to ensure water use is managed within the sustainable limit of the resource and to minimise any adverse effects of trade on other water users. Groundwater protection areas are typically divided into zones, reflecting the extent of drawdown that might occur if bores in each zone were to pump their licensed volume. The controls may include:

- restrictions on temporary trade, to prevent sleeper licences being activated by trading or where a water shortage is declared under the Water Act
- restrictions on permanent transfers into particular zones that may be overallocated or overused, or into the groundwater management area if it is allocated above the sustainable limit.

Victoria provided the Council with copies of two groundwater management plans (the plans for the Murrayville and Katunga water supply protection areas) that it considered to be representative of such plans. Box 3.2 summarises a selection of the trading rules in these plans, along with Victoria's rationale for the rules.

Box 3.2: Examples of trading rules in groundwater management plans in Victoria**Katunga groundwater**

- **Rule.** Permanent licence transfers for irrigation are restricted to transfers accompanying land sales or to persons confirmed to have used groundwater without a licence before August 1998. As a condition for approving a licence transfer, the annual capacity of a bore listed on the transferor's licence must be equal to or greater than the entitlement to be transferred.
- **Rationale.** The plan committee recommended both measures to limit the activation of sleeper allocations, to maintain the security of existing active irrigators' entitlements. In view of the urgent need to have the plan in place before the 2003-04 irrigation season, to protect the sustainability of the resource, the plan was approved in August 2003, subject to the condition that it be reviewed within two years with a view to freeing up permanent trade.

Murrayville groundwater

- **Rule.** Groundwater extraction licences are issued only on the establishment of a bore and project infrastructure, to prevent trading of licences that have not been used.
- **Rationale.** Under the provision, existing and future licence holders may not transfer any of their entitlement if it has not been used. The provision is a development clause for new licences. It prevents Wimmera–Mallee Water from granting a licence to a new developer unless the proposed project (that is, the bore, pumping equipment etc.) is established. Since the plan commenced, approximately 7000 megalitres of entitlements have been granted, with approximately 670 megalitres of the total cap on extractions yet to be allocated.

Sources: KWSPACC 2003, MGSPACC 2001

Interstate trade

Victoria participates in the MDBC's pilot project for permanent interstate water trading (see chapter 10). 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).

Victoria permits temporary interstate trade anywhere in the Murray, Goulburn and Campaspe systems, but not into New South Wales after February each year. It has advised that the late-season ban on temporary transfers into New South Wales is a means of preventing trade distortions resulting from the divergent carryover policies in the two states.¹¹ Victoria considers that if water is not permitted to be carried over in the state of origin, the state of destination should not allow it to be carried over there.

¹¹ In Victoria, an individual farmer's unused water goes back into the pool for re-allocation the following year, whereas New South Wales generally permits some carryover.

Recent trading activity

Most water trade in Victoria occurs among irrigators in regulated systems. These systems account for the vast majority of water entitlements. Almost 90 per cent of all permanent trade occurs in the large regulated systems in northern Victoria. Unregulated rivers account for less than 10 per cent of total water entitlements, and trade is correspondingly smaller. Temporary transfers (which average 3–8 per cent of total water entitlements) significantly exceed permanent transfers (generally less than 1 per cent). Trade within Victoria substantially outweighs interstate trade.

Victoria has advised that the nature of water trade in 2003-04 was similar to that in previous years, except for a surge in trade out of irrigation districts to new horticultural developments between Swan Hill and Robinvale. It attributed the surge to the cumulative effects of the drought and the reduced profitability of the dairy industry. The 2 per cent annual limit on permanent water trading out of certain districts was reached, or was close to being reached, in four out of Goulburn–Murray Water's six areas in 2003-04 (DSE 2004). It was reached in Pyramid–Boort (in 2003-04 and 2004-05) and in Rochester (in 2003-04). In recent drought years, temporary trade has represented as much as 15 per cent of total water use. Temporary intrastate trade was over 300 gegalitres in 2002-03.

Since the establishment of the MDBC's pilot project for interstate water trading in 1998, net permanent trade out of Victoria has amounted to around 10.6 gegalitres (in total over the period). This is, however, less than 0.5 per cent of the total entitlements held in northern Victoria. Most permanent trade has been to South Australia (a net 7.9 gegalitres) (see chapter 10).

Temporary interstate trade has significantly exceeded permanent transfers (table 3.4). The overall direction of temporary interstate trade was into Victoria from 1997-98 until two years ago, when it reversed.

Table 3.4: Net temporary trade into Victoria, 1997-98 to 2003-04

<i>Trading period</i>	<i>New South Wales to Victoria</i>	<i>South Australia to Victoria</i>
	<i>Megalitres</i>	<i>Megalitres</i>
1997-98	9 199	5 020
1998-99	11 098	4 445
1999-2000	-4 571	-348
2000-01	-633	50
2001-02	231	-990
2002-03	-12 804	2 852
2003-04 (to 31 January)	-390	-2 979
1997-98 to 2003-04	2 130	8 050

Source: DSE 2004, p. 80

Victoria has advised that the price of permanent trades increased by about 50 per cent to around \$1200 a megalitre in 2003-04. On the temporary market, the price in the Goulburn system rose to an unprecedented \$500 a megalitre at the height of the drought in 2002-03, but had dropped to around \$60 a megalitre by March 2004.

Reform progress

Victoria's White Paper announced the following changes to water trading arrangements (DSE 2004). (Further details on some of the changes are provided in section 3.2.)

- The new entitlements covering recycled water and stormwater will be tradable. They will allow trading of water from different sources (including surface water, groundwater, recycled water and stormwater).
- Water entitlements will be:
 - granted unlimited tenure
 - unbundled into a water share, a share of delivery capacity and a licence to use water on a site
 - able to be held by non-water users, up to a limit of 10 per cent of entitlements in each supply system (to be able to hold more water shares than they would normally need for their land, irrigators will be able to hold twice the volume permitted to be used under their water use licences).
- The new lower reliability water entitlement, initially applying in northern Victoria to replace sales water, will be tradable.
- Domestic and stock rights in irrigation districts will be merged with other water entitlements and made tradable (via permanent trades).
- Stranded assets will be addressed by the introduction from 1 July 2005 of annual charges for shares of delivery capacity that are tied to land. The government stipulated, however, that delivery access charges must not become a barrier to trade.
 - Delivery access charges must be based on costs, with irrigators given the option to pay the charges as a lump-sum exit fee. The Essential Services Commission will scrutinise annual charges and exit fees.
 - In locations where the authority has formally decided to phase out irrigation, it must not apply delivery access charges if a farmer has stopped irrigating and does not wish to retain a right to be supplied.
 - Delivery access charges must not be applied if a landowner or the water authority finds a new customer to take over the delivery capacity share, or if terminating the delivery capacity share would relieve over-commitment of the infrastructure. While delivery capacity shares

will be tied to a property, they will be able to be untied and moved to other properties.

- If charges have been applied to non-irrigated properties for 10 years and the owners do not wish to retain the right to be supplied, the authority should consider whether remaining irrigators should take on responsibility for paying for the service or whether the service should be closed down.
- The government will establish a formal process for water authorities to rationalise or reconfigure their distribution systems, including ceasing to provide a service. The process will involve agreement with all affected customers or the development of a reconfiguration plan by an expert panel in consultation with the affected community.
- When water entitlements are unbundled and delivery access charges are introduced, the annual 2 per cent rule on permanent trade out of irrigation districts will be removed. Victoria expects this removal to occur in around two years time.
- When water entitlements are unbundled, the government will permit permanent trade to another state only when water entitlements in that state (including in irrigation districts) can move to Victoria as freely as Victoria's can move there. The government indicated that it is looking for the National Water Initiative to overcome interstate barriers to trade, including those barriers imposed by irrigation corporations and trusts in other states.
- Rules covering trading between surface water and groundwater will be developed where there is a high degree of connectivity.
- The new publicly accessible, web based register of entitlements will record trades and register third party interests (such as mortgages). It will facilitate trading by covering all water entitlements in Victoria (irrespective of the type of entitlement or the nature of the water source).
- If a bulk entitlement for the environment is held in storage, all or part of it will be able to be traded on the temporary water market, provided the trade will not affect the achievement of the objectives of the environmental water reserve. Trades will be subject to approval by the Department of Sustainability and Environment, following an annual assessment of the environmental condition of the ecosystems targeted by the bulk entitlement. Funds from temporary trading will be used for specific purposes, including the temporary purchase of water for the environmental water reserve when necessary.
- The 4 per cent rate of return required on assets providing bulk water services to regional urban authorities will be phased out by 1 July 2005, to align with the government's policy of exempting rural authorities from generating a return on past investments. The government will forgo the dividend paid by rural authorities that is attributable to the 4 per cent return in 2005-06, and will implement alternative arrangements by 1 July 2005 for activities previously funded by the return.

Discussion and assessment

In previous NCP assessments, the Council found that Victoria's legislation and related arrangements provided an effective framework for water trading, although it identified constraints on trading that are inconsistent with CoAG obligations. Victoria is also still to develop arrangements for interstate trade beyond the MDBC's pilot project.

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. The National Water Initiative extends to 2007 the timeframe for establishing institutional and regulatory arrangements that facilitate intra- and interstate trade (although barriers to temporary trade are to be removed immediately). In the southern Murray–Darling Basin, the relevant governments (including Victoria) committed to take all steps (including legislative and administrative changes) to enable by June 2005 exchange rates and/or tagging of water access entitlements traded from interstate sources to buyers in their jurisdictions.

In the 2003 NCP assessment, the Council indicated it was satisfied that water entitlements in Victoria are sufficiently specified to enable efficient trade. Bulk entitlements are issued in perpetuity, and water licences are issued for 15 years with a presumption of renewal. Under the changes announced by Victoria in its White Paper, all water entitlements will be granted unlimited tenure. While Victoria's registry arrangements do not provide indefeasibility or surety of title, trades may not be approved without the agreement of third parties with an interest in the water entitlement. Victoria's decision to establish a single, publicly accessible, web based register covering all water entitlements in the state (including third party interests) will further facilitate trade.

Victoria's trading arrangements contain measures to protect the water entitlements of other users and the environment. In approving trades, the water authorities and/or the Minister are required to account for any likely adverse impacts on existing water uses, waterways or aquifers, and the environment. Within the Goulburn–Murray system, for example, transfers can be approved only on the basis of supply feasibility, channel capacity, and salinity and drainage criteria. While Victoria has not provided information on the time taken to process trades, the Council is not aware of any problems with the timeliness of approvals.

Permanent and temporary water trading in Victoria are undertaken through a variety of mechanisms, including private trades, brokers and water exchanges. The Watermove exchange, for example, caters for permanent and temporary transfers throughout the state and to and from southern New South Wales. Information on the water market and trading rules is available in Victoria's guide to water trading (DNRE 2001) and through Watermove (which reports the trading rules and information on prices and volumes). Market information and trading mechanisms, therefore, do not constrain water trade in Victoria.

Restrictions on trading

The CoAG water agreement places responsibility on the Victorian Government to facilitate trading in water, subject to protecting the environment and third party interests. The government acknowledged this responsibility in the National Water Initiative, committing to remove barriers to temporary trade immediately and to take all necessary steps to facilitate by June 2005 permanent trade out of water irrigation areas (up to an interim annual threshold limit of 4 per cent). A review in 2009 is to consider raising the threshold.

Several of the changes announced by Victoria in the White Paper will facilitate water trading:

- The unbundling of water entitlements into a water share, a share of delivery capacity and a licence to use water on a site will facilitate trade by separating tradable elements from other elements. Victoria also expects the unbundling to:
 - reduce borrowing costs, by enabling mortgages directly over water
 - assist leasing, by recording the shares of delivery capacity of both users leasing out and users leasing in
 - enable brokers to tailor products to irrigator demand
 - make it easier for irrigators to adjust the reliability of water supplies or the timeliness of deliveries by, for example, arranging more timely delivery without having to buy additional water
 - enable better management of delivery system congestion, by allowing well specified shares of delivery capacity to be traded (DSE 2004).
- The introduction of the new lower reliability water entitlement, replacing sales water, will provide irrigators in northern Victoria with a more secure title to this water and with the additional flexibility to trade it.
- Domestic and stock rights in irrigation districts will become tradable (via permanent trades).
- The potential stranding of irrigation scheme assets, caused by water trading out of irrigation districts, will be addressed by the introduction (from July 2005) of annual charges for shares of delivery capacity that are tied to land. Irrigators will have the option of paying the charges as a lump-sum exit fee. Conditions (including scrutiny by the Essential Services Commission) will apply to ensure the charges do not become a barrier to trade. In addition, new arrangements will enhance the ability of water authorities to rationalise or reconfigure their distribution systems.
- Rules covering trading between surface water and groundwater will be developed where there is a high degree of connectivity.

- Bulk entitlements held in storage for the environment will be able to be traded temporarily, provided the achievement of environmental objectives is not compromised.

The announced changes also include the removal or easing of several constraints on trading that the Council previously identified as likely to be inconsistent with CoAG water trading obligations:

- The requirement for water entitlements to attach to land will be eased. Non-water users (or non-land owners) will be able to hold up to 10 per cent of the entitlements in each system. Irrigators will be able to hold twice the water shares that they are permitted to use under their water use licences.
- When water entitlements are unbundled and delivery access charges are introduced (to address the potential stranding of irrigation scheme assets), the annual 2 per cent rule on permanent trade out of irrigation districts will be removed.
- The differential return on assets incorporated in the price charged for bulk water supplied by rural water authorities to regional urban customers and irrigators will be removed by 1 July 2005. This removal will be achieved via the removal of the 4 per cent return required on assets providing bulk water to regional urban authorities.

While two of the above changes will fully address the relevant trading constraint, 90 per cent of water entitlements will effectively remain attached to land (with a transfer detaching the water entitlement from the seller's landholding and re-attaching it to that of the buyer). In addition, irrigators will be limited to holding twice the water shares that they would normally need to use on their land. Victoria adopted these limits in response to irrigator concerns that non-irrigators could otherwise buy up much of the water and drive up its price. The government noted in the White Paper, however, that:

... this risk is more imagined than real. No water will be available to buy unless irrigators choose to sell. In the long-term, the price of water will be based on the value people generate from actually using it. (DSE 2004, p. 69)

As the Council indicated in previous NCP assessments, the requirement for water entitlements to be attached to land is likely to affect the entry and activities of agents, brokers and other potential participants in the water trading market, and the ability of financial institutions to obtain ownership of a water entitlement in the case of default. As a result, the restriction may reduce the returns available to holders of water entitlements, and may constrain the extent to which water is put to its most profitable use.

Victoria advised that the 10 per cent limit is unlikely to be reached in the near future. Over the 12 years since it commenced, permanent trade in total has not reached 10 per cent of entitlements. In addition, much permanent

trade will continue to be among irrigators. The Council accepts that the 10 per cent limit is unlikely to hinder water trade to a significant extent in the short term. Victoria has indicated that the restriction can be reviewed and modified (for example, to allow a higher limit in a small supply system or to treat leases to an irrigator with an option to buy as water being held by the irrigator) (DSE 2004). Such changes would further mitigate the extent to which the restriction hinders water trade and conflicts with CoAG obligations. Nevertheless, the remaining link between water entitlements and land conflicts with Victoria's commitments under the National Water Initiative. In particular, Victoria has committed to facilitate the operation of efficient water markets and opportunities for trading within and between states where water systems are physically shared or hydrologic connections and water supply considerations permit trading.

For the unregulated rivers, Victoria maintained its generic trading rules that:

- for systems north of the Great Dividing Range, prohibit trade upstream and impose a 20 per cent reduction on trade downstream (unless under a winter fill licence)
- for systems across the state, limit downstream trade from an unregulated system to a regulated system to the amount of upstream trade.

Victoria considers these rules are essential to ensure trading does not cause the ecology of unregulated rivers, and the reliability of existing users' entitlements, to deteriorate. It has advised that the rules recognise the overallocation of 'all year' licences — typically pumped from a stream directly to crops during the low flow summer months — and associated river health risks in many unregulated rivers. The rules allow some trade but bias it to downstream or winter fill outcomes to place less strain on summer flows. For the priority unregulated rivers, Victoria may set alternative trading rules in the stream flow management plans that it is developing, following detailed investigation of the requirements of each catchment.

The Council notes that the unregulated rivers account for less than 10 per cent of water entitlements in Victoria and that the systems in which trading is more likely to be significant will be covered by the trading rules in the stream flow management plans. For the remaining unregulated systems, Victoria's generic rules represent a pragmatic compromise between permitting trading and protecting the environment and the reliability of other water users' entitlements. The Council considers that the generic rules offer an appropriate means of managing trade in the (less significant) unregulated systems, subject to the qualification discussed below regarding the 20 per cent reduction applying to some downstream trades.

For the stream flow and groundwater management plans completed to date, Victoria has advised that the trading rules are generally designed to safeguard the health of the river or groundwater, and to minimise any adverse effects of trade on other water users. It noted that the stream flow management plans tend to confirm the existing generic trading rules but may include additional constraints. The Council's investigation of the trading rules

in a sample of four plans supported Victoria's observations. Some of these plans also include trading rules that appear to be transitional measures targeting various objectives, such as ensuring new licences are used in accord with licence conditions, rather than being traded, and preventing the activation of sleeper licences (via trading) in overallocated systems.

To some extent, the generic 20 per cent reduction imposed on entitlements traded downstream north of the Great Dividing Range (unless under a winter fill licence), along with comparable rules included in the stream flow management plans, is similar to the reduction factors that apply to traded entitlements in some regions interstate. Such measures provide a disincentive to trade and are a less direct influence on water use. The Council considers, therefore, that such measures are likely to be inconsistent with CoAG water trading obligations. Alternative ways of limiting water use that are less likely to adversely affect trade include the government reducing entitlements for all water licence holders in an area by a uniform percentage and/or buying entitlements in the market. Under the National Water Initiative, Victoria will need to ensure the generic trading rules for unregulated rivers and the trading rules in subsequent stream flow and groundwater management plans facilitate trading where water systems are physically shared or hydrologic connections and water supply considerations permit water trading.

Interstate trade

Victoria is still to develop arrangements for permanent interstate trade beyond the MDBC's pilot project. Under the National Water Initiative, the relevant governments in the southern Murray–Darling Basin (including Victoria) have committed to take all necessary steps to enable by June 2005 exchange rates and/or tagging of water access entitlements. The governments have also committed to 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.

As noted, Victoria announced in the White Paper that it would remove its annual 2 per cent limit on permanent trade out of irrigation districts once water entitlements are unbundled and delivery access charges are introduced. It also announced, however, that when water entitlements are unbundled, it will permit permanent trade to another state only when water entitlements in that state (including in irrigation districts) can move to Victoria as freely as Victoria's can move there. The government indicated that it is looking for the National Water Initiative to overcome interstate barriers to trade, including those barriers imposed by irrigation corporations and trusts in other states.

Victoria also maintains a late-season ban on temporary transfers into New South Wales as a means of preventing trade distortions resulting from the divergent carryover policies in the two states. Under the National Water

Initiative, Victoria has committed to remove barriers to temporary trade immediately.

Given the commitments made by Victoria in its White Paper and under the National Water Initiative, the Council considers that Victoria has made satisfactory progress against its CoAG obligations on interstate and intrastate water trading for the 2004 NCP assessment.

3.5 Other matters from the 2003 National Competition Policy assessment

Water legislation review and reform

Governments agreed to review and, where appropriate, reform by 30 June 2002 all existing legislation that restricts competition. Reform is appropriate where competition restrictions do not provide a net benefit to the whole community and are not necessary to achieve the objective of the legislation. Any new legislation that restricts competition must also meet this test.

Victoria completed a review of the *Water Act*, the *Water Industry Act 1994*, the *Melbourne and Metropolitan Board of Works Act 1958* and the *Melbourne Water Corporation Act 1992* in 2001. This review made nine recommendations, including one (accepted by the government) that required no legislative action. The Council found in the 2003 NCP assessment that Victoria was still to implement several recommendations.

Victoria has since progressed some of the recommended reforms, as follows:

- Victoria accepted the recommendation to retain exclusive licences for the provision of water and sewerage services, subject to the implementation of independent price regulation, contracting out to achieve efficiency benefits and vetted competition for cross-border developments (see below). It considers that its establishment of the Essential Services Commission as the economic regulator of the water industry from January 2004 addresses price regulation issues. Victoria also announced measures to encourage competition for future infrastructure under its Partnerships Victoria policy.
- Victoria accepted aspects of the recommendation on alternative approaches to service delivery.¹² It considers that its new regulatory

¹² Following cost-benefit considerations, Victoria rejected some recommendations in this area.

framework for drinking water (to take effect in July 2004) provides appropriate underpinnings for implementation.

Victoria considered future arrangements in respect of the following recommendations when finalising its White Paper, which was released in June 2004:

- to introduce vetted competition (on the basis of cost efficiency) for the right to supply major new developments on the border of existing businesses
- to develop a single regulatory and legislative framework for Victoria's water businesses
- to review the costs and benefits of establishing third party access rights to essential water infrastructure.¹³

The White Paper review found it would be necessary to refine the government's approach to vetted competition. It stated that vetted competition for the right to supply new subdivisions can provide incentives for individual businesses to develop innovative solutions, but can also inhibit collaboration among authorities. Victoria found that collaboration may be critical to the development of integrated solutions that assess impacts beyond the immediate area, and thus ensure systems and resources are used efficiently (Government of Victoria 2004).

In relation to the legislative framework for Victoria's water businesses and catchment management authorities, the White Paper found a need for reform. Currently, these bodies are subject to multiple Acts, which results in a complex and, at times, unclear picture of respective accountabilities. Victoria considers that new legislation is needed to improve coherence. In particular, it proposes to:

- consolidate governance arrangements for catchment management authorities under one Act, while still allowing the authorities to exercise powers under several pieces of legislation
- apply a new legislative framework to water businesses that recognises the diversity of the sector and clarifies roles and responsibilities. (Government of Victoria 2004)

Victoria has advised that it will address the remaining recommendations from the 2001 review concerning compulsory sewerage connections and by-law making powers through legislation to be introduced in the Spring 2005 Parliamentary sittings. The legislation will establish the new legislative

¹³ Action on a fourth recommendation – on impediments to water trading, including the adverse effects on water markets arising from differential rates of return on bulk water supplies to regional urban and rural users – also depended on the outcomes of the White Paper — see the assessment of water trading.

framework for water businesses referred to above. The remaining recommendations specifically relate to:

- the imposition of statutory obligations on property owners to connect to a reticulated sewerage system
- the responsibility of the Minister for making by-laws.

Because the legislative proposal relating to sewerage connection involves a restriction on competition, the Council requested a summary of the legislation's principal features. Victoria provided this information, but requested that it remain confidential to allow further stakeholder consultation on the government's proposal.

Discussion and assessment

While Victoria is implementing its remaining water legislation reform program, it has not yet completed all elements. To some extent this is understandable, given that Victoria sought to align the reforms with a comprehensive public review of the state's water industry policy, which it only recently finalised. Nonetheless, to comply with NCP legislation review and reform obligations relating to the water industry, Victoria needs to finalise its approach and enact any necessary legislation.

Institutional role separation

At the time of the 2003 NCP assessment, Victoria was still to complete the CoAG water reform agreement obligation to separate the roles of water standards setting and regulation from service delivery (see section 3.1). The separation of responsibilities is intended to prevent conflicts of interest that might arise if a monopoly water business (or its Minister) has responsibility for both providing water and setting its price and quality. Economic regulation should be independent, given water and wastewater businesses are public monopolies.¹⁴

The Essential Services Commission became the economic regulator of the Victorian water industry on 1 January 2004. It regulates the prices, service standards and market conduct of the state's 24 businesses that supply water, sewerage and related services. The commission's role was previously limited to monitoring and enforcing service standards and other non-price issues for metropolitan water authorities. (The Department of Sustainability and the Environment was previously responsible for price regulation, and will

¹⁴ Independent economic regulation also addresses CoAG obligations in relation to water pricing, provided that the regulator takes account of CoAG pricing principles and that their recommendations are made available in a public report.

continue in this role until the commission's first price determination, which Victoria advised will take effect on 1 July 2005.)

The Water Industry Act as amended by the *Water Industry (Essential Services Commission and other Amendments) Act 2003* established the framework for the commission to regulate the water industry. The framework includes the Water Industry Regulatory Order and the issue of obligations statements to water businesses.

Water Industry Regulatory Order

The Water Industry Regulatory Order prescribes the services over which the Essential Services Commission has the power to regulate prices and service quality.¹⁵ It specifies that for those services, the commission must:

- approve or specify price arrangements from 1 July 2005
- specify standards and conditions of service
- monitor and report publicly on the performance of water businesses
- audit businesses' compliance with service standards, conditions of service, regulatory information and asset management obligations
- facilitate dispute resolution.

Statements of obligations

Victoria reported in 2003 that it intended to develop statements for its regional urban and rural water businesses to formally articulate their business obligations. The statements were not finalised at the time of the 2003 NCP assessment, so the Council undertook to consider progress in 2004.

In December 2003, Victoria published a generic statement covering the services provided by the state's water businesses. It issued customised statements for its 17 urban water businesses in July 2004. It has advised that it will issue statements for the three rural and two rural urban businesses (the newly formed Lower Murray Urban and Rural Water Authority and the Grampians Wimmera Mallee Water Authority) in November 2004. This delay reflects the need to work through a number of outstanding issues.

¹⁵ The services include retail water, retail recycled water, retail sewerage, storage operator and bulk water, bulk sewerage, bulk recycled water, metropolitan drainage, irrigation drainage, connection, and diversion services, as well as services that attract developer charges.

The statements clarify that the Essential Services Commission — rather than water businesses — sets and monitors service standards.¹⁶ In particular, each business must submit a water plan to the commission, setting out its proposed pricing of services and an explanation of how it proposes to meet its obligations under the statement, legislation and regulation. A business must make any price variation required by the commission and any other variation requested by the Minister¹⁷ or relevant regulatory body.¹⁸

Drinking Water Quality Regulator

Victoria introduced a new regulatory framework for drinking water quality on 1 July 2004. The Office of the Drinking Water Quality Regulator (within the Department of Human Services) will set quality standards. The framework requires urban water authorities that supply drinking water to the public to:

- adopt an integrated risk management framework for drinking water quality
- comply with water quality standards
- communicate effectively with stakeholders
- publicly disclose water quality information.

Discussion and assessment

The *Water Industry Act 1994* as amended by the *Water Industry (Essential Services Commission and other Amendments) Act 2003* provides a statutory framework to separate responsibility for water service provision from standard setting and regulation. In particular, the Act establishes a framework for the Essential Services Commission to regulate the water industry. As part of this framework, the Water Industry Regulatory Order vests regulatory powers in the commission to specify prices and service standards and to report publicly on these matters. The obligations statements further clarify that water business must comply with regulatory requirements, including price determinations by the commission. The new regulatory framework for drinking water quality (which commenced in July 2004) establishes an additional layer of separation between responsibilities for service provision and regulation in the water industry.

¹⁶ The Essential Services Commission will work in conjunction with customer input, particularly for rural service standards. Drinking water quality is subject to a separate regulatory framework.

¹⁷ Before issuing or amending a statement, the Minister must consult with the Essential Services Commission.

¹⁸ For example, EPA Victoria.

The Council considers that Victoria has met its NCP obligations on institutional role separation.

4 Queensland

4.1 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 and consumption based pricing of rural water services

Assessment issue: Queensland is to demonstrate that government-owned irrigation schemes and government-owned suppliers of bulk water are setting prices based on the principles of full cost recovery and consumption based pricing. Government-owned water businesses must also show that they are managing any subsidies consistent with efficient and effective service provision and use. In October 2000, Queensland established five-year price paths aimed at ensuring most SunWater schemes achieve the lower bound of cost recovery by 2005-06. Queensland also asked SunWater to reduce its costs by 15 per cent by 2004. In the 2001 NCP assessment, the Council found that SunWater charges for rural water services used a consumption based approach consistent with CoAG commitments. The Council indicated that it would seek in the 2004 NCP assessment for Queensland to provide information on improvements in cost recovery achieved via the rural price paths, SunWater's cost reduction measures, and any changes to its consumption based charging arrangements. For the schemes that will not achieve full cost recovery via the 2000 price path, the Council asked Queensland to provide timeframes for full cost recovery (where full cost recovery is achievable). The Council also asked Queensland to report on the development of new prices to apply from 2005.

Future reform: Governments should 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

SunWater, a government-owned corporation, is the state's largest water service provider. It supplies nearly half of all the water consumed in Queensland. This is mostly bulk water supplied to 27 irrigation schemes, which provide 40 per cent of all water used for irrigation.

In October 2000, Queensland implemented a plan designed to gradually move SunWater to full cost recovery. It asked SunWater to reduce costs by 15 per cent by 2004 and instituted a five- to seven-year price path (developed in consultation with scheme participants) to better align revenues and costs in 25 of SunWater's 27 schemes (Government of Queensland 2001). Queensland intends these measures to ensure water prices are set to at least recover efficient lower bound costs by 2005-06.

Queensland has advised that water prices for the 25 schemes reflect the October 2000 price path. It advised that:

- most schemes (which account for 97 per cent of SunWater's nominal allocations of rural water) recover at least the efficient lower bound costs, or have price paths set to recover efficient costs by 2005-06
- six schemes (Dawson Channel, the Central Lockyer and Mortonvale pipeline, the lower Lockyer, Pie Creek, Three Moon Creek and Maranoa River) have price paths set to recover at least 50 per cent of efficient lower bound costs by 2004-05 (reflecting the lower capacity of these schemes to absorb price increases).

The two SunWater rural water schemes for which price paths are not yet set are the Callide and the Eden Bann Weir schemes. Queensland proposes to determine price paths for both schemes over the next 12 months.

Each scheme that is not achieving the lower bound of cost recovery is supported by a separately identified and transparently funded CSO. These CSO payments are publicly reported in SunWater annual reports. Queensland has reduced the value of the CSO payments over the period of the price path, based on a model of benchmarked efficient lower bound costs.

SunWater reported that the total cost of its irrigation scheme services has fallen each year since it was corporatised in 2000-01. By 2002-03, for example, its scheme costs were 13 per cent lower than in 2000-01 (SunWater 2004). Queensland has commenced a public process and is aiming to determine and implement new SunWater price paths by July 2005 or shortly thereafter (Government of Queensland 2004). It has advised that published information will itemise the costs used to determine the price paths and will demonstrate that prices comply with the CoAG pricing principles. Queensland released a discussion paper on future SunWater rural water pricing arrangements in November 2003.

In 2002-03, SunWater paid a dividend of \$3.58 million to the Queensland Government. This dividend represented a pay-out ratio of 22.4 per cent of after-tax profits (excluding gains from revaluing noncurrent assets). The board of SunWater recommends the dividend in consultation with 'shareholding Ministers' (the Treasurer of Queensland and the Minister for Natural Resources and Mines) in accord with s159 of the *Government Owned Corporations Act 1993*. The board considers the group after-tax profit position (excluding any unrealised impacts from revaluing noncurrent assets), consolidated group year-end cash position, projected cashflows (including capital investment and long term infrastructure asset replacement and refurbishment) and working capital requirements.

Queensland advised in previous NCP assessments that prices include the natural resource management costs incurred by water businesses, but did not show how prices reflect these costs. Subsequently, in the Review of the Value of Water, Queensland explored issues such as the scarcity value of water, externalities and the costs incurred by the state in undertaking water resource management activities. This review examined the extent to which costs/values are currently reflected in the prices paid for water and the issues associated with further recovering these costs through water charges. Queensland is developing a discussion paper that will seek stakeholder and community comment on the findings of the Review of the Value of Water. It indicated that it will finalise its approach to future water charges before implementing the next price path (July 2005).

Queensland explained that it did not consider asset valuations and a return on assets in the current price path because the price path incorporates only lower bound costs. Rather, it is taking account of asset valuation methods and a return on assets in establishing the rural water price paths that will apply from July 2005.

All SunWater water supply schemes use a two-part tariff water charging model, which includes a volumetric component. Under the current price paths, users are charged a 'fixed' tariff based on the nominal allocation and a 'variable' tariff per megalitre of metered water deliveries. The fixed component represents about 70 per cent of revenue and is designed to meet the fixed costs of operating and maintaining water supply infrastructure and service regardless of water availability. The variable component, which represents 30 per cent of SunWater's revenue, is designed to cover all variable costs of water delivery.

Discussion and assessment

Cost recovery

Under the 1994 CoAG water reform agreement Queensland needs to show its rural water services are achieving at least the lower bound of cost recovery and applying the CoAG pricing principles, or have established a price path to achieve this lower bound. 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 on debt, provision for future asset refurbishment/replacement, and dividends (if any).

Queensland's rural water schemes have moved substantially towards achieving the lower bound of cost recovery in recent years as a result of the October 2000 price path. Whereas Queensland estimated that 53 per cent of SunWater's nominal allocations of rural water in 2000-01 were achieving the lower bound of cost recovery, it estimated that 97 per cent of nominal allocations now achieve, or are on price paths to achieve, lower bound costs. While some schemes will not achieve the lower bound of cost recovery under the current price path, and two have no price path in place, Queensland intends to implement new price paths for all Sunwater schemes by July 2005 or shortly thereafter that will recover lower bound costs wherever possible, and consider the potential for achieving a return on assets. Queensland indicated, however, that some schemes may never recover lower bound costs. It supports these schemes via separately funded and transparent CSOs. This approach is consistent with the CoAG pricing principles.

Queensland's Review of the Value of Water considered the scarcity value of water, externalities and (transparent) water resource management costs for SunWater rural water pricing arrangements. Based on the findings of this review, Queensland will determine its future approach to water charges, including the transparent treatment of environmental externalities. The review (and Queensland's undertaking to consider the use of pricing to manage externalities) accords with its commitments under the National Water Initiative to report publicly on cost recovery for water planning and

management, and to implement pricing that incorporates externalities where feasible.

The National Water Initiative best practice pricing obligations require governments to continue to move their rural systems towards the upper bound of cost recovery in accord with the CoAG pricing principles where practicable. By implementing asset valuation methods and a return on assets that accord with the CoAG pricing principles as part of the next rural water price paths, Queensland will move SunWater prices closer to the upper bound of CoAG cost recovery.

Transparent reporting of subsidies

As noted, some SunWater schemes are still to recover lower bound costs in accord with the CoAG pricing principles. For all of these schemes, the government makes a CSO payment to SunWater that is equivalent to the difference between the estimated efficient lower bound cost of providing the services and the revenue that SunWater raises from the water charge to irrigation schemes. These CSO payments, which are transparently reported, have fallen over the period of the price path. Queensland's approach to providing CSO payments for rural water systems appears to accord with the National Water Initiative objective that CSO payments be transitional and transparent.

Consumption-based pricing

Under the 1994 CoAG water reform agreement (confirmed by the National Water Initiative), governments need to adopt pricing regimes based on the principle of consumption based pricing. In previous NCP assessments, Queensland has advised that all SunWater water supply charges comprise a fixed component and a volumetric component. Queensland also explained which components are fixed and which can vary depending on volume, and why. The Council found that SunWater's water charges satisfy CoAG requirements for consumption based pricing.

Cost recovery in issuing licences for water extraction

Assessment issues: Queensland is to demonstrate that fees charged for water licences achieve full cost recovery, in accord with the CoAG pricing principles. In the 2001 NCP assessment, Queensland indicated that it imposed fees for licences to harvest water, but it did not provide detailed information on the extent of cost recovery because these charges were then under review.

(continued)

For the 2004 NCP assessment, the Council has looked for Queensland to provide information on the rural water charges levied by the Department of Natural Resources and Mines¹, and on the extent to which the charges appropriately reflect the cost of resource management and licensing of the various licensed water activities.

Future reform: Signatories to the National Water Initiative are to bring into effect by 2006 consistent approaches to pricing and attributing the costs of water planning and management. This should involve identifying all costs associated with water planning and management, including the proportion of those costs that can be attributed to water access entitlement holders, consistent with the principle of linking charges as closely as possible to the costs of activities or products. These approaches should be consistent across sectors and jurisdictions in which water entitlements can be traded.

References: 1994 CoAG water reform agreement, clauses 3(a) and (b); 1996 Agriculture and Resources Management Council of Australia and New Zealand (ARMCANZ) paper; 1998 CoAG pricing guidelines; 1999 tripartite meeting; Intergovernmental Agreement on a National Water Initiative

Queensland sets charges for water use for two categories of water: supplemented and unsupplemented. Irrigators supplied by SunWater (supplemented water) pay a water charge that aims to reflect the lower bound cost of providing the service, including SunWater's water management and licensing costs.

Irrigators using unsupplemented water (pumped straight out of rivers or aquifers) historically paid a one-off water harvesting licence application fee of \$77 (sometimes also ad hoc local charges). Some water harvesters (about 1200 of Queensland's 2500 unsupplemented users) also paid a charge for the first 500 megalitres used. Charges for water harvesting (the taking of unsupplemented water) covered about 2 per cent of the estimated cost of Queensland's water management services (Government of Queensland 2003).

On 7 April 2003 Queensland introduced a new pricing structure for water harvesters. It introduced an annual licence fee of \$50 for all water licences issued under the *Water Act 2000*, and replaced the existing water harvesting charge (under which water harvesters were charged for only the first 500 megalitres used) with a flat charge of \$3 a megalitre for all water used.

The annual \$50 licence fee applies to Queensland's 53 000 water licence holders, including the holders of water harvesting licences, groundwater licences and other irrigation licences, but not to landholders who take unsupplemented water for stock or domestic purposes but who do not have a licence, or to authorities (interim water allocations) held by SunWater. The annual fee is payable for new licences and renewals, reinstatements and replacements, amalgamations and subdivisions, and extensions of the licence period.

The charge of \$3 a megalitre applies to only those unsupplemented water harvesting licence holders who were already being charged (some 1200 water

¹ Between 13 February–25 August 2004 the department was the Department of Natural Resources, Mines and Energy. Prior to 22 February 2001 it was the Department of Natural Resources.

harvesters). It does not apply if no water is taken (for example, if no water is available during drought). Under this charging arrangement (the \$50 licence fee and the \$3 a megalitre charge) unsupplemented water licence holders will contribute about 5 per cent of the estimated cost of water management services. The interim \$3 a megalitre fee does not affect existing groundwater management charges.

The charge of \$3 a megalitre is an interim measure pending the outcome of Queensland's Review of the Value of Water. As discussed in the previous section, the review investigated the scarcity value of water, externalities, and water resource management costs (including licensing, monitoring and enforcement costs). It examined the extent to which the prices paid for water reflect these costs/values, and determined what proportion of these costs should be met by users and how they should be recovered.

In addition to the above review, the Queensland Department of Natural Resources, Mines and Energy, in consultation with key stakeholders, developed a discussion paper on water charging. The discussion paper discusses the broader policy issues associated with setting and implementing water charges (such as tariff structures and phasing-in charges). It will undergo a public consultation period extending to the end of September 2004. The department anticipates providing a submission on water charges policy and price setting to the Queensland Cabinet in late 2004.

Discussion and assessment

The 1994 CoAG water reform agreement envisages that governments ensure charges for rural water supply fully cover the cost of supplying water to users. It commits governments to set charges for water storage and delivery that are based on the principle of full cost recovery, with any subsidies made transparent. The National Water Initiative extends this pricing commitment to bring into effect by 2006 consistent approaches to pricing and attributing costs of water planning and management. This work should involve the identification of all water planning and management costs, and the identification of the proportion of costs that can be attributed to water access entitlement holders consistent with the principle of linking charges as closely as possible to the costs of activities or products.

Queensland has begun to introduce charging arrangements that better reflect the costs of licensing and water resource management. Through the review of the value of water process, it clarified its intention to investigate water licensing and resource management costs, and to implement a new water charging policy and price setting process. While Queensland has not been able to discuss the likely price impact for the 2004 NCP assessment, the Council considers that Queensland's processes appear to be robust and are likely to lead to licence fees that better reflect the private benefits derived from licensing and associated water management within the timeframe envisaged under the National Water Initiative.

For this 2004 NCP assessment, the Council considers that Queensland has satisfactorily addressed obligations relating to cost recovery for water licensing and associated planning and management.

4.2 Water access entitlements

Assessment issue: Queensland is to institute a statutory water access entitlement system and support systems for the consumptive use of water, separate from land. The water access entitlement system should be specified as a perpetual or open-ended share of the consumptive pool of a water source. These arrangements should be in place by 2006.

At the time of the 2003 NCP assessment, Queensland was converting water licences and/or interim water allocations to new water access entitlements (termed 'allocations' in Queensland). Water allocations are separate from land title, specified in volumetric terms (subject to an annually announced allocation percentage) and guaranteed for the 10-year life of the relevant water resource plan. Existing entitlements are not converted to the new system until the relevant resource operations plan is completed. Also at the time of the 2003 NCP assessment, Queensland had established a water allocations register that is similar to its land titles register and that records third party interests.

For the 2004 NCP assessment, the Council has looked for Queensland to ensure its water access entitlements system and supporting arrangements are consistent with the state's commitments under the National Water Initiative. Queensland will need to substantially complete its water resource and resource operations plans.

References: 1994 CoAG water reform agreement, clause 4; 1999 tripartite meeting; Intergovernmental Agreement on a National Water Initiative

Under the Water Act, Queensland is converting water licences and/or interim water allocations under the *Water Resources Act 1989* to water access entitlements (termed 'allocations' in Queensland). Water allocations are separate from land title, tradable and clearly specified in terms of their ownership, location and nominal volume (which is subject to an annually announced allocation percentage).

Water resource plans specify the rules for water allocation, water entitlement security objectives and environmental flow provisions, and may also include the management of overland flows. They have effect for 10 years. While water allocations provide an ongoing entitlement to access water, the terms and conditions of allocations may change. The government is liable to pay compensation under the Water Act if the terms and conditions are changed during the life of a water resource plan in a way that reduces the allocations' market value.

Resource operations plans give practical effect to the objectives of the water resource plans. They generally contain details on the conversion of existing entitlements to the new system, the granting of new entitlements, the operation of water infrastructure, the rules for trading, and the requirements for water and ecosystem monitoring and reporting. In systems where water is delivered from a dam and/or other infrastructure (termed 'supplemented systems'), system operators (such as SunWater and local governments) must

hold a resource operations licence and comply with the relevant resource operations plan.

Under the Water Act, existing entitlements are not converted to the new system and permanent trading (see section 4.4) is generally not possible in a region until the relevant resource operations plan is completed. Water resource plans and resource operations plans are also required to determine environmental allocations (see section 4.3).

Queensland intends to develop water resource plans and resource operations plans for all of its major water resources. The plans will cover the 20 water sources covered by the state's 1999 water planning implementation program. Until the plans are finalised, two types of water entitlement apply: (1) interim water allocations for the supply of water in supplemented systems;² and (2) water licences to take water from systems not supplemented by infrastructure (known as unsupplemented systems). These water entitlements are generally attached to land titles and cannot be permanently traded separately from the land. The water licences and/or interim water allocations under the previous system are converted to water allocations once a resource operations plan commences.

In areas that will not be covered by a water resource plan and resource operations plan, or where a resource operations plan does not provide for the establishment of water allocations, water licences similar to those under the previous Act continue. Queensland intends to amend the licences over time to describe the water entitlement in volumetric terms (rather than the previous approach of describing the area that may be irrigated and the works that may be used to take water). Under a water licence, water remains tied to the land title. Water licences are usually found in areas of limited demand (for example, much of Cape York Peninsula and small coastal streams). Once it implements the water resource plans under its 1999 implementation program, Queensland expects water licences to account for no more than 20 per cent of water use.

Queensland has established its water allocations register, which is operated by the Queensland Resource Registry (which is also responsible for the state's land titles register). The water allocations register records details of the ownership of all water allocations, the nominal volume and any conditions that apply. It also allows for the registration of interests in the allocations (such as mortgages and caveats). When water allocations are created under a resource operations plan (from the conversion of an existing entitlement), parties with an interest in the converting entitlement have the opportunity to register their interest before the allocation is created. All dealings in water allocations are handled in the same manner as land dealings and are subject to the same quality assurance procedures. The public may search the register.

² Interim water allocations are usually held by the customers of the scheme but can be held by the scheme operator.

Reform progress

Queensland has completed 11 of the 20 water resource plans and three of the 19 resource operations plans under its 1999 implementation program (table 4.1). During 2003-04, it finalised three water resource plans (the Border Rivers, Moonie and Warrego/Paroo/Bulloo/Nebine plans) and two resource operations plans (for the Boyne and Fitzroy basins). It completed a further two water resource plans in August 2004 (the Condamine–Balonne and Georgina–Diamantina plans).

By June 2005 Queensland expects to complete water resource plans for most of its major river systems, covering 91 per cent of the state's land area. Four water resource plans will not be completed by the end of 2005. Queensland has provided the following information on these plans:

- *The Logan–Albert plan (expected completion in March 2006)* covers a relatively small area of the state but includes significant water sources for agricultural and urban/industrial uses. It is linked to the Moreton plan (through the South East Queensland Regional Water Supply Strategy), which requires the most extensive consultation process in the state.
- *The Moreton plan (expected completion in October 2006)* covers the Brisbane and Pine river systems, which include the water supply storages for Brisbane and surrounding cities. Given the significance of the Moreton catchments and the high level of water development that has already occurred, Queensland is proposing to undertake an 'unparalleled level of consultation, investigation and analysis'.
- *The Wet Tropics plan (expected completion in January 2007)* will cover the major north Queensland coastal rivers, from the Daintree River south to the Herbert River. The river systems are highly significant in terms of their environmental values and as sources of water for urban and agricultural uses. There is a significant water storage in the region, but Queensland has given the plan a lower priority because water in the region is relatively abundant compared with demand.
- *The Whitsunday plan (expected completion in February 2006)* will cover the Proserpine and O'Connell river systems. There is a significant water storage in the region. The planning process is at the stage of data collection and hydrology modelling.

Table 4.1: Status and timetable for water resource and resource operations plans in Queensland, as at March 2004

<i>Water system</i>	<i>Draft water resource plan released</i>	<i>Final water resource plan approved</i>	<i>Draft resource operations plan released</i>	<i>Final resource operations plan approved</i>
Atherton Basalts Groundwater	Incorporated into the Barron catchment planning process			
Barron ^a	December 2001	December 2002	August 2004	December 2004
Border Rivers ^b	July 2002	December 2003	March 2005	June 2005
Boyne	May 2000	December 2000	December 2001	June 2003
Brisbane	Incorporated into the Moreton catchment planning process			
Bundaberg Groundwater	Incorporated into the Burnett catchment planning process			
Burdekin ^b	June 2004 ^f	December 2004	June 2005	December 2005
Burnett ^{b,c}	June 2000	December 2000	December 2002	May 2003
Calliope	Jan 2005	July 2005	May 2006	November 2006
Condamine–Balonne ^b	December 2003	August 2004	March 2005	June 2005
Cooper	December 1999	February 2000	–	–
Fitzroy ^{b,d}	September 1998	December 1999	December 2002	January 2004
Flinders	Incorporated into the Gulf catchment planning process			
Georgina–Diamantina	November 2003	August 2004	December 2004	July 2005
Gulf	October 2004	April 2005	June 2005	December 2005
Herbert	Incorporated into the Wet tropics catchment planning process			
Logan–Albert	March 2005	March 2006	October 2006	September 2007
Marchy	September 2004	June 2005	June 2006	September 2007
Mitchell	October 2004	April 2005	June 2005	December 2005
Moonie	July 2002	December 2003	June 2004 ^f	December 2004
Moreton ^b	March 2006	October 2006	September 2007	May 2008
Pioneer ^e	December 2001	December 2002	August 2004	December 2004
Warrego/Paroo/Bulloo/Nebine	July 2002	December 2003	June 2004 ^f	December 2004
Wet tropics	July 2006	January 2007	2008	2008
Whitsunday	August 2005	February 2006	July 2006	January 2007

^a The Barron water resource plan includes relevant aquifers. ^b Queensland expects to amend the Border Rivers, Burdekin, Burnett, Condamine–Balonne, Fitzroy and Moreton water resource plans in future to include groundwater. ^c The Burnett water resource plan was amended in 2001-02. ^d The Fitzroy water resource plan was amended in 2003-04. ^e The Pioneer water resource plan is being amended to include groundwater. ^f Not completed by June 2004.

Note: Queensland periodically updates the information on its progress with water planning, maintaining a summary on the Department of Natural Resources and Mines website (www.nrm.qld.gov.au).

Source: Government of Queensland 2004

By June 2005 Queensland expects to complete nine resource operations plans, covering 23 per cent of the state's land area. By the end of 2005, it expects to complete a further four plans, leaving six to be completed by that time. For

the Logan–Albert, Moreton, Wet Tropics and Whitsunday regions (discussed above), the resource operations plans are due to be completed in 2007 and 2008. Queensland has provided the following information on the other two plans that will not be completed by the end of 2005:

- *The Calliope plan (expected completion in November 2006)* covers a catchment that supports little consumptive water use. The resource operations plan will largely define processes for dealing with unallocated water identified as being available in the water resource plan.
- *The Mary plan (expected completion in September 2007)* covers a region that includes significant water sources for agricultural and urban/industrial uses.

Queensland has advised that it undertakes a risk assessment of each aquifer system every two years. The assessments consider the condition of the resource, existing and projected water use, and other relevant information. Based on this approach, Queensland included groundwater in the Barron water resource plan and is amending the Pioneer plan to include groundwater. It expects to include groundwater also in the Border Rivers, Burdekin, Burnett, Condamine–Balonne, Fitzroy and Moreton water resource plans. While Queensland anticipates commencing a water resource plan for the Great Artesian Basin in 2007-08, the basin is not covered by the state's 1999 implementation program. Based on available information, Queensland considers that these plans will cover all of the significant groundwater resources in the state.

Submissions

The Pioneer Valley Water Board requested the Council's support for the National Water Initiative to provide for irrigation water supply businesses to hold bulk entitlements for their schemes, rather than individual irrigators holding entitlements. The board's submission is considered further in section 4.4.

Discussion and assessment

Queensland's Water Act establishes a comprehensive system of water entitlements that are separated from land title and specified in volumetric terms. Queensland's arrangements provide ongoing access to the entitlement to use water, although the terms and conditions of allocations may change. Queensland has also established a water entitlements register similar to its land titles register, which includes the registration of third party interests. Both the system of water entitlements and the register are consistent with 1994 CoAG water reform obligations.

Queensland expects to complete nine of the 19 resource operations plans under its 1999 implementation program by June 2005. By the end of 2005, it

expects to complete a further four resource operations plans, leaving six plans to be completed. The government considers that it would be detrimental to accelerate the water planning process, stating in its 2004 NCP annual report that:

While a reasonable body of work will remain outstanding as of June 2005, it is not practicable to accelerate the process without compromising the quality of the science and/or community confidence in the process. (Government of Queensland 2004, pp. 69–70)

Of the six resource operations plans that will not be completed by the end of 2005, three cover regions that include significant water sources for agricultural and/or urban and industrial uses (specifically, the Logan–Albert, Mary and Moreton plans, which will not be completed until late 2007 or 2008). In addition, Queensland is proposing amendments to several water resource and resource operations plans after 2005 to include groundwater. Queensland’s water entitlements will not be separated from land titles and will not be defined in terms of available volumes until the water resource and resource operations plans are complete, although the previous system of licences and interim water allocations will apply in the meantime.

4.3 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

(continued)

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.

At the time of the 2003 NCP assessment Queensland had completed six water resource plans and almost finalised a further three. It had also completed one resource operations plan (for the Burnett Basin). Following an independent scientific study in 2003 Queensland is developing water planning arrangements for the Condamine–Balonne Basin, the state's only potentially overallocated river system. It has proposed to finalise the Condamine–Balonne Basin water resource plan (including appropriate environmental outcomes) and the resource operations plan. For the 2004 NCP assessment Queensland should show that it has:

finalised plans for the implementation of the event based environmental flow rules recommended by the scientific review panel

provided appropriate flow for the ecological assets (including the Narran Lakes and Culgoa national parks), in consultation with the local community and stakeholders provided an opportunity for the Murray–Darling Basin Commission Independent Audit Group to comment on the water resource plan and considered the audit group's comments in finalising the plan

explained, in line with the requirements of the Water Act how the final water resource plan addresses issues raised during public consultations, and adopted monitoring arrangements to evaluate the performance of the plan

committed to the further research recommended by the scientific review, particularly to refine the environmental flow requirements.

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

In the 2001 NCP assessment, the Council concluded that the draft water resource plan for the Condamine–Balonne Basin did not adequately address identified environmental problems. Given that the draft plan contained evidence that the basin may be stressed, the Council expected Queensland to complete a water resource plan that delivered appropriate environmental flows reasonably quickly. Queensland's approach to water management planning is complicated, and there has been debate about the health of the lower Balonne River. This delayed the completion of the final water resource plan and the development of the associated resource operations plan. Queensland's progress with the water management arrangements for the Condamine–Balonne Basin is discussed below.

Queensland has completed three resource operations plans — for the Burnett, Fitzroy and Boyne basins (table 4.1). In the 2003 NCP assessment, the Council concluded that the Burnett Basin resource operations plan met CoAG environmental flow requirements. This 2004 NCP assessment considers the Fitzroy Basin and Boyne Basin plans against the CoAG obligation to allocate appropriate water to the environment.

The Condamine–Balonne Basin

The Condamine–Balonne catchment in southern Queensland represents approximately 12 per cent of the Murray–Darling Basin (approximately half

of the Queensland portion of the basin). The Condamine has its headwaters near Warwick and flows through the Darling Downs, where it becomes the Balonne River. The Balonne River flows into the Barwon River and ultimately the Darling and Murray rivers. The lower Balonne River also contains two nationally significant wetlands — the lower Balonne River floodplain and the Culgoa River floodplain — and is connected to the Narran River, which terminates in the internationally recognised (Ramsar listed) Narran Lakes in New South Wales.

Historically, grazing activities have been the dominant land use in the catchment. Since the early 1990s, however, cotton cropping has become the dominant industry in the Queensland portion of the lower Balonne. Cubbie Station, Australia's largest private irrigation development, lies between the Culgoa River floodplain and the Narran River.

In June 2000, the former Department of Natural Resources released a draft water allocation and management plan (WAMP) for the Condamine–Balonne catchment. Environment groups, the Murray–Darling Basin Commission (MDBC) and New South Wales regulators criticised the plan because they considered it was unlikely to meet its ecological sustainability objectives. The irrigation sector, on the other hand, considered that the science did not show the system was stressed, and it criticised the draft WAMP for placing an unsustainable economic burden on agriculture in the region (Smartrivers 2002).

On 20 September 2000, Queensland imposed a moratorium on the starting of new works in the Condamine–Balonne catchment that would result in an increase in water taking, either from watercourses or overland flows. The moratorium includes a hold on new works associated with (1) developing overland flows and (2) existing water entitlements, and the issue of new allocations.

In 2002, in response to the criticisms of the draft WAMP, Queensland commissioned an independent scientific review of the science underpinning the assessment of ecological condition of the lower Balonne River system. The independent scientific review identified four key ecological assets within the Condamine–Balonne system — the channels of the lower Balonne River, the Culgoa River floodplain, the Narran Lakes and the lower Darling River. The review report, released in January 2003, found that the system's rivers and wetlands were in reasonable ecological condition, but would deteriorate if the existing infrastructure for extracting water were used to capacity. The review report also noted that a significant lag between exercising diversions and ecological impacts is likely and, as such, the lower Balonne has probably not yet experienced the full impact of current diversions.

The independent scientific review recommended close community consultation to achieve a target of wetting on average every 3.5 years for the Narran Lakes and at an appropriate frequency for the Culgoa national parks. It also recommended that the Queensland Government undertake further research to refine the environmental flow requirements of these assets, and that the government use an events based management system, focused on the

ecologically important flow events, for the Balonne. The Queensland Government committed to implement in full the recommendations of the review in a new water resource plan for the Condamine–Balonne system, to be developed by the middle of 2004. In the 2003 NCP assessment, the Council accepted that these commitments satisfactorily addressed Queensland’s NCP obligations for 2003 regarding the allocation of water to the environment.

In August 2004, the Queensland Government released the final water resource plan (subordinate legislation 2004 no. 151). While the plan applies to the surface waters of the Queensland portion of the Condamine–Balonne catchment only, it includes some provisions for taking account of interstate interests and views and extends the environmental flow rules to the part of the lower Balonne floodplain that is located downstream of the Queensland border.

The plan will be implemented via a resource operations plan. Queensland announced its intention to commence preparation of a draft resource operations plan on 3 December 2003, advising that it will finalise the plan by June 2005. The resource operations plan will include details of water licensing and volumetric allocations. This information will also be used in determining Queensland’s Murray–Darling Basin Ministerial Council cap.

The water resource plan covers water in watercourses, lakes and springs, and overland flows in the catchment. It converts existing water licences to tradable water allocations and introduces licences to collect water from overland flows. The plan does not include groundwater, but the government envisages incorporating groundwater management during the 10-year life of the first water resource plan. As an interim measure, Queensland has declared groundwater management areas in the upper Condamine area to prevent the expansion of groundwater use and to regulate extraction from existing bores.

When preparing the water resource plan, Queensland accounted for the report of the independent scientific review and work by the Lower Balonne Community Reference Group (2003). The community reference group comprises local representatives of irrigators and graziers from Queensland and New South Wales, local government, the Indigenous community and environmental interests. Queensland also considered representations from community groups located in the upper and middle catchments. The water resource plan proposes the establishment of advisory councils as a means of providing ongoing consultation. It includes provision to establish a Lower Balonne Council to increase community awareness and involvement in water resource management, and provision for establishing other councils to help develop the resource operations plan.

Queensland has advised that it was necessary to establish the Lower Balonne Council as a priority because the Lower Balonne Community Reference Group was dissolved when the final water resource plan was completed. While the Upper and Middle Condamine Ministerial advisory committees do not have statutory recognition, these bodies can continue to contribute to the development of the resource operation plan.

The water resource plan proposes that the volume of water authorised for diversion, on average, should not increase over that supported by current infrastructure. It continues the September 2000 moratorium on water resource development in the Condamine–Balonne catchment, but provides exemptions for diversions for stock and domestic users, licence renewals, water permits for short term activities such as mineral exploration, and town water supplies.

As recommended by the scientific review, the water resource plan adopts an events based approach to managing environmental water provisions. It sets flow objectives for five flow events: low flow, summer flow, beneficial flooding flow, a one in two year flood and one in 10 year flood. To manage these events, extractions in the lower Balonne must be reduced by up to 10 per cent for a specified maximum number of days (usually 5 or 10 days) so changes in flow are restricted to 66–133 per cent of the natural flow (as measured at specified nodes or reaches).

The plan includes measures to improve the security of water allocations. Security will be improved by the establishment of a water bank so farmers can extract additional water during less-critical flow events. The plan sets performance indicators for determining when and how much of the water bank users may take. This approach aims to ensure a minimal impact on the environment and equitable sharing of any additional water among the entitlement holders.

There has been further research to refine the system's environmental flow requirements, as recommended by the scientific review. The Cooperative Research Centre for Freshwater Ecology conducted a scoping study on the Narran Lakes and released a preliminary report on the hydrology of these wetlands (CRCFE 2003). There is no indication as yet, however, on the volume of water needed to achieve adequate wetting and drying regimes for the lakes. Queensland has advised that it is undertaking a 12 month investigation to identify priority areas for detailed research in the Culgoa floodplain. In addition, Queensland and New South Wales agencies have submitted a joint proposal for funding under the National Heritage Trust program to build on the findings of the Narran Lakes scoping study.

The plan proposes arrangements for monitoring water quality, hydrology and extraction, as well as the ecosystem health indicators of the inchannel, floodplain and wetland habitats. Responsibility for monitoring is invested in water infrastructure operators, who must provide annual written reports to their chief executives. Five years after the commencement of the plan, the Minister must prepare a report on the accuracy of hydrology, community views, the appropriateness of performance indicators, progress in research on the environmental requirements of the Culgoa floodplain and Narran Lakes, and the effectiveness of flow event management. Based on this report, the Minister can decide to initiate a formal review of the water resource plan.

Best available science

The environmental water requirements for the Condamine–Balonne river system were developed using a holistic method and involved an expert multidisciplinary technical advisory panel (DNR 1999). The technical advisory panel considered the floodplain and receiving wetlands as well as inchannel habitats, and accounted for the water requirements for physical and biological processes and a range of different species. It used IQQM (Integrated Quantity Quality Model) for hydrological modelling and AusRiVAS for analysing outcomes for macroinvertebrate communities. The Cooperative Research Centre for Freshwater Ecology (Whittington 2000) endorsed the use of the IQQM model and the ecological health assessments used in the environmental flows assessment. Similarly, the independent scientific panel stated that the IQQM model was appropriate for determining the river's environmental water requirements.

The final water resource plan implements the independent scientific review's recommendation that water use in the Condamine–Balonne system be managed using an events based water management system. The Murray–Darling Basin Commission Independent Audit Group's analysis of the draft plan indicates that the impacts of development under (September 2000) moratorium conditions may be significant compared with the impacts under predevelopment conditions (IAG 2004). In commenting on the draft plan the Independent Audit Group stated that the plan 'endeavours to maintain current economic and social outcomes without adequately addressing environmental outcomes ...and downstream flows. ... [T]he precautionary principle has been applied only in terms of minimising impacts on irrigators' (IAG 2004, pp. 13–14).

The final water resource plan contains some significant changes from the draft. These changes are documented in the consultation report published by Queensland in August 2004. In summary, the final plan:

- tightens the criteria for establishing the licensing controls designed to limit overland flow extractions in the lower Balonne
- includes new provisions to clarify that the plan is not promoting further leveeing on the lower Balonne floodplain
- both strengthens and simplifies the conditions for triggering reductions in water users' access during environmentally-important medium flow events
- broadens the provisions for taking account of interstate interests and representations in processes relating to the implementation and review of the plan.

The final plan contains flow rules estimated to provide 73 per cent of the predevelopment events sufficient to fill the Ramsar-listed portion of the Narran Lakes (Clear lake and Black Lake) only. Because of a paucity of data, the flow management rules do not explicitly address the other three ecological

assets identified by the independent scientific review (the Culgoa River floodplain, the channels of the lower Balonne River and the lower Darling River), although Queensland advised that application of the Narran rule will benefit other tributary streams. (The independent scientific review was not asked to recommend an appropriate water regime for the significant ecological features of the lower Balonne River.) The final water resource plan provides for further research to determine the flows required to maintain the ecological health of the Narran Lakes and Culgoa floodplain in accord with the recommendations of the independent scientific review. Queensland advised that this work has commenced.

The environmental flows assessment that supports the plan made only generalised references to the influences of groundwater (DNR 2000). The technical advisory panel considered the effect of groundwater extraction on the health of the system to be beyond the framework of the WAMP process. However, in its 2002 submission to the independent scientific review, the Department of Natural Resources and Mines indicated that it was developing a groundwater flow system map for the Queensland Murray–Darling Basin and an integrated groundwater and surface water modelling technique to help manage water resources.

Balancing economic, environmental and other interests

The water resource plan provides rules for managing low and medium flows and Narran Lakes filling events, and provides for the regulation of the taking of overland flows. Under the Queensland legislation, the resource operations plan, to be prepared by the chief executive, must comply with the objectives and requirements of the water resource plan approved by the Governor-in-Council. Although Queensland announced that it would commence drafting the resource operation plan in December 2003, it has not indicated the content or extent of the flow management rules.

Queensland committed to implement the recommendations of the independent scientific review. These recommendations centred on the four key ecological assets and included a wetting regime of one in 3.5 years (60 per cent of predevelopment events) for the Narran Lakes. The independent scientific review also recommended that Queensland work with the lower Balonne community to find a sustainable balance.

As discussed above, the flow management rules for the lower Balonne are estimated to provide 73 per cent of predevelopment events sufficient to fill the Ramsar listed portion of the Narran Lakes only. The rules do not, however, explicitly address the other three ecological assets identified by the independent scientific review, given the paucity of the data. The independent review panel considered that the dominant consideration in the lower Balonne system is to ensure the Narran Lakes receive an appropriate flow regime to maintain the vegetation and bird communities. If this is achieved, the flow regime in the Narran River will be sufficient to maintain the river

and distributary channels in good condition. The independent review panel, when asked to comment on the flow management rules, concluded that the wetting regime for the Narran Lakes is appropriate until further information is available (Cullen *et al.* 2003b).

Total water storage (at September 2000 capacity) on the Balonne floodplain is about 1160 megalitres, which is equivalent to the mean annual flow in the Balonne River at St George (Whittington *et al.* 2002). Cullen *et al.* (2003a) projected median annual flows in the Culgoa River and Narran River at the New South Wales border to be 24 per cent and 32 per cent of simulated natural flow respectively. The Cooperative Research Centre for Freshwater Ecology predicted the following ecological responses to full use of current (2000) infrastructure (Whittington *et al.* 2002):

- a contraction of floodplain woody vegetation to a riparian fringe
- changes in the composition and distribution of other floodplain and wetland vegetation
- a decrease in floodplain productivity
- a reduction in permanent pool habitat (that is, refuges for obligate aquatic species such as fish)
- reduced water quality in remaining pools (including fluctuations in temperature and dissolved oxygen)
- effects on longitudinal connectivity between the Condamine–Balonne and Murray–Darling systems.

The independent review panel considered that the health of the lower Balonne system and the interests of irrigators would be better served if Queensland were to use a more appropriate measure of the required wetting regime than mean annual flow. It recommended adopting event-based targets for water and environmental management in the lower Balonne. The final water resource plan incorporates an event based management approach.

Queensland has advised that it analysed a small–medium flow event that occurred in the lower Balonne during January–February 2004 to compare the difference between the volume of water that could be taken before the final water resource plan was in place and the volume that could be taken under the plan. Queensland reported the following findings:

- If the full extractive capacity of all water infrastructure in the lower Balonne had been exercised, then the water that could have been potentially extracted during the recent flow event was estimated to be around 480 gigalitres.
- The volume of water actually extracted by river and floodplain harvesters during the January–February 2004 flow event was 430 gigalitres.

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- If extractions had been in accord with the limitations and rules in the water resource plan (not then in place), then total allowable extractions would have been an estimated 380 gigalitres, some 100 gigalitres (20 per cent) less than the potential total extraction before the plan.

Queensland has advised that it will review the water resource plan after five years, and this review would consider the results of monitoring the ecological health of the significant assets. The Lower Balonne Community Reference Group proposal states that if monitoring indicates a downward trend in river health attributable to water development, then the event management rules may require adjustment.

Monitoring and adaptive management

While a detailed monitoring program is yet to be developed, the water resource plan contains provisions that provide the foundation for a robust system for assessing the effectiveness of the plan. The monitoring includes aspects of hydrology and ecosystem health, and is linked to the objectives of the plan. The Minister must report annually on monitoring outcomes, and the plan provides for a more comprehensive report after five years. The plan adopts the adaptive management approach contained in the Water Act, and Queensland confirmed that it will review the plan after five years, accounting for the results of ecological monitoring. Queensland water resource plans have a maximum life of 10 years and must be reviewed before renewal.

Stakeholder consultation and transparent processes

The Queensland Government prepared the water resource plan with the assistance of the Lower Balonne Community Reference Group, comprising local representatives of irrigators and graziers from Queensland and New South Wales, local government, the Indigenous community and environmental interests. Queensland also considered representations from community groups located in the upper and middle catchments and sought input from the Upper and Middle Condamine Ministerial advisory committees and the Condamine–Balonne WAMP Indigenous Working Party.

In general, Queensland's water planning processes are transparent. The Department of Natural Resources and Mines publishes (including via the Internet) relevant material, including public notices, media releases, submissions, information and technical papers and draft and final plans. In the case of the Condamine–Balonne, Queensland has published a consultation report, which summarises the views expressed at meetings and in submissions. In line with Queensland's policy approach on privacy matters relating to public submissions on water resource and resource operations plans, it did not release the submissions responding to the draft water resource plan. These submissions can be sought from the department via requests under the *Freedom of Information Act 1992*.

The Fitzroy Basin

The Fitzroy Basin is a large catchment of 142 600 square kilometres incorporating the Callide, Dawson, Comet, Nogoa–Mackenzie, Isaac and lower Fitzroy subcatchments. It is a coastal river system draining into an estuarine zone and, ultimately, a marine environment that includes the Great Barrier Reef.

Queensland developed the Fitzroy Basin water resource plan in 1999³ to manage the intensive water use areas areas of the Fitzroy Basin. The plan initially covered surface water contained in stream and waterways only, but Queensland has released for public consultation a draft amendment to the plan to incorporate overland flows. The water resource plan and resource operations plan do not cover groundwater. The Queensland Government has advised, however, that the most recent biennial assessment of groundwater capacity and extraction indicated that the plans will soon need to incorporate groundwater. It intends to extend the plans to cover the remainder of the basin in 2005.

The 2003 Fitzroy Basin resource operations plan is the means by which Queensland implements the water sharing arrangements to meet the water security and environmental objectives in the water resource plan. It seeks to ensure the water in the plan area is managed in an integrated and sustainable way, providing for both the needs of the community and the natural environment. The resource operations plan contains arrangements for:

- converting existing water entitlements to tradable water allocations
- making new entitlements available
- the operation of infrastructure and management of water;
- trading water allocations
- water and ecosystem monitoring.

The resource operations plan adopts the water resource plan measures for each of the managed river systems in the Fitzroy Basin. At this stage the resource operations plan largely maintains the water allocations that were in place immediately before the release of the water resource plan in 1999. Only the allocation for consumptive use appears to have increased, by 62 802 megalitres a year in the Fitzroy Barrages.

Queensland has advised that the resource operations plan implements all the environmental water provisions in the water resource plan. The water sharing rules and environmental water allocations in the plans were based on ecological and economic assessments conducted by the former Department of

³ Water resource plans were then known as water allocation management plans.

Natural Resources (DNR 1998a–l). That department used a technical audit panel to determine the basin’s environmental flow requirements, develop and model flow management strategies, and determine the environmental implications of those strategies. The panel comprised eight experts in fish ecology, floodplain and wetland ecology, hydrology, geomorphology and estuarine processes. The Fitzroy Basin WAMP Community Advisory Panel, which comprised representatives from industries and community interests across the basin, provided advice on community values.

The technical audit panel adopted a ‘whole of catchment’ approach encompassing the surface water system from the headwaters to the estuarine mouth. It considered both flow and non-flow environmental requirements and management strategies for maintaining river health. It proposed three flow management options.

1. Base flows — implement flows to maintain a riffle habitat to facilitate the transport of nutrients and carbon and allow biota to travel between pools during low flow.
2. Trigger flows — allow the first post-winter flows to pass through the system (October–April) for a minimum of three weeks to support the spawning activities of native fish.
3. Waterhole management — maintain pools as refuges for aquatic life during times of low flow and drought.

The technical audit panel recommended base and trigger flows at 15 nodes across the basin. It recommended that waterholes be managed on a reach-by-reach basis, to adjust for specific local conditions (such as the shape, size and depth of pools and water use). The water resource plan adopts the recommended environmental flow objectives and the performance indicators or standards for meeting those objectives. The timing and duration of trigger flows are as recommended by the panel, although flow magnitude is expressed in height rather than volume. For waterholes, the water resource plan adopts the maximum drawdown of 0.5 metres recommended by the technical audit panel. In aggregate, roughly 75 per cent of the water flow in the Fitzroy Basin is provided to the environment.

The resource operations plan contains operational rules governing the management of base flows, first post-winter trigger flows and waterholes. First post-winter flow management strategies are provided for the Dawson Valley and Nogoia–McKenzie water supply schemes, but not for the lower Fitzroy or Fitzroy Barrage water supply schemes. Queensland has advised that it will meet the post-winter flow objectives for the two Fitzroy systems through passive management (that is, flows will be delivered without the need for intervention).

In addition to setting environmental flow objectives, the water resource plan allocates water for future development. The plan includes rules for determining the actual volume of water to be delivered under the resource operations plan, by setting priorities for water sharing, seasonal assignments

and associated water allocation security objectives. The provisions for new development increase annual consumptive water allocations by 247 800 megalitres — a 50 per cent increase on the existing (pre-plan) entitlements. The future development related allocations are:

- 190 000 megalitres in the Dawson River from installation of the Nathan Dam
- 3000 megalitres in the McKenzie from the raising of Bingeang Weir
- 300 megalitres in the Dawson from the raising of Moura Weir
- up to 300 000 megalitres (estimated) in Isaac/Connors and lower Fitzroy Rivers
- up to 40 000 megalitres (estimated) from the Comet/Nogoa–Mackenzie River system
- up to 11 500 megalitres (estimated) from the upper Dawson River.

Modelling by the department showed that anticipated development would have a negligible or minor impact on the ecological health of most of the river systems in the basin. The exceptions to this are the Dawson, upper McKenzie and Comet rivers. The development scenario in the water resource plan exceeds environmental flow limits in the Dawson and upper McKenzie rivers for a number of flow indicators and in the lower Fitzroy for mean annual flow and upper riparian zone impacts.

While implementation of the proposed developments in the Fitzroy Basin risks some ecological degradation of the system, the department estimates that increased development will provide significant economic and social benefits. The department found that there would be a small adverse impact on commercial and recreational fishing, but estimated that increasing regulated development on the Dawson and Comet rivers would almost double returns (gross margins) to agriculture in the area (DNR 1998i, 1998k). The department estimated that implementation of the environmental management strategies in the water resource plan would lower annual returns by about 5 to 6 per cent only. This resulted from some reduction in water supply reliability. The department also presented figures indicating that direct benefits from increased irrigation and farming activity from major development, such as the proposed Nathan Dam on the Dawson River, could be of the order of \$210–244 million (in net present value terms) and generate over 700 permanent jobs (DNR1998a). Adopting environmental management strategies was estimated to reduce these benefits by around 30 to 40 per cent. While these figures are not directly comparable to those above, they do provide an indication of the possible magnitude of benefits and costs. The department did not, however, estimate the economic costs associated with the ecological degradation arising from further development of the Fitzroy Basin, apart from the costs to the commercial and recreational fishing industries.

Under the water resource plan, there is monitoring of flow, water quality, macroinvertebrates, geomorphology, habitat condition and biological trigger

processes. Responsibility for monitoring natural ecosystems rests with Queensland Government agencies. Holders of Resource Operations Licences must monitor flow and water quality, including environmental water provisions and fishway operations. Licence holders must report results to the Chief Executive of the Department of Natural Resources and Mines. The monitoring that government agencies and holders of Resource Operation Licences must undertake is detailed in the resource operations plan.

There are provisions for reporting on the outcomes of the water resource and resource operations plans each financial year. The Water Act requires the Minister for Natural Resources and Mines to amend a water resource plan and associated resource operations plan if the results of monitoring indicate that the environmental flow objectives are not appropriate or are not being met. Any amendments to the plans must result in equivalent or improved outcomes for the environment without adversely affecting water security allocation objectives.

Best available science

Queensland used a holistic method — IQQM and hydrological modelling based on daily flows — and an expert multidisciplinary technical audit panel to conduct the environmental flow assessment. In its work on the lower Balonne system, the independent scientific review endorsed this approach as a water management tool suitable for variable river systems (Cullen *et al.* 2003a).

The flow analysis considered the floodplain and receiving estuary as well as inchannel habitats and included the water requirements for physical and biological processes and a range of different species. While the benchmarking using a river within the Fitzroy Basin (the McKenzie River) added value, the water resource plan used the McKenzie benchmark to set the ‘environmental flow limit’ for the whole system. This appears to be inconsistent with the technical audit panel’s advice that benchmarks be used only as a guide to risks within a system.

Queensland has advised that its Water Assessment Group has a quality assurance program for its hydrological modelling, involving internal and external peer review of the modelling framework, flow analysis and the associated technical reports. The Fitzroy Basin analysis does not, however, present margins of error and confidence limits on data, and the supporting technical reports do not cover data quality or validation. The independent scientific review found, for example, that for floods, inaccuracies in stream gauging data in variable systems, such as the Fitzroy Basin, could be 10 per cent to as high as 25 per cent (Cullen *et al.* 2003a). In addition, the water resource plan does not source the reference trigger flow or explain how the flow conditions for unsupplemented water are determined.

Queensland informed the Council that it set the flow conditions for allocating unsupplemented water (using IQQM modelling) with the aim of achieving the

environmental flow objectives determined by the technical audit panel. It has advised that the technical audit panel had reviewed the environmental provisions in the water resource plan. Queensland stated that the panel considered the environmental water provisions to be broadly consistent with the overarching objective of the water resource plan and that the plan accurately estimates the likely environmental implications of the provisions.

Balancing economic, environmental and other interests

The water resource plan applies the environmental management recommendations from the scientific assessment. The resource operations plan provides for active management to achieve base flows that mimic the natural seasonal patterns within a band of plus or minus 20 per cent. A similar approach is adopted to ensure critical trigger events occur with reasonable frequency and for achieving medium flows that should be sufficient to maintain river health. Because Queensland is meeting all other environmental objectives through passive management, there is no need for specific strategies.

The water resource and resource operations plans maintain existing (pre-plan) water entitlements and broadly similar levels of water security. Implementation of the environmental management strategies may, however, reduce the reliability of the water supply for some groups of water users compared to historical usage. The outcome will depend on future rainfall levels and distribution patterns.

The plans provide for an increase in current and future water allocations for consumptive use accommodating a degree of future development. Queensland scaled back some planned future developments, however, because the scientific assessment indicated that these may impose an unacceptable risk of harm to the river ecology in parts of the basin. The government proposes to conduct further detailed studies before proceeding with proposed developments for the area.

Overall, the environmental objectives for the Fitzroy Basin appear to have been achieved while largely maintaining existing entitlements for consumptive uses. The water resource and resource operations plans are clear about the likely outcomes for the environment, and supported by an assessment of the likely impact on agricultural, commercial and recreational fishing interests.

Monitoring and adaptive management

Monitoring covers aspects of the natural environment as well as water resource use. It involves reporting on environmental flows and fishway operations as well as aspects of catchment health. There are programs for each subcatchment detailing site locations, required parameters, frequency,

timing, data validation and the methods to be used. The programs are designed to be repeatable and to provide results that are comparable over time and between subcatchments.

Arrangements for monitoring programs are comprehensive and well considered. The detailed design of the monitoring programs includes aspects of quality control and data standards and should enable meaningful interpretation over time and between subcatchments. The resource operations plan states that the results of monitoring are to be used in compiling the annual report. The Water Act requires the Minister for Natural Resources and Mines to amend a water resource plan and associated resource operations plan if the results of monitoring indicate that the environmental flow objectives are not appropriate or are not being met. Any amendments to the plans must result in equivalent or improved outcomes for the environment and water users. As such an adaptive management framework is in place.

Stakeholder consultation and transparent processes

Queensland developed the water allocation provisions in the water resource and resource operations plans through extensive consultation, using open and transparent processes. The advisory committee included a broad representation of the major stakeholders in the catchment. The consultation process was supported by rigorous economic and scientific assessments. While the water resource and resource operations plans are complicated, they are supported by published technical reports that are comprehensive, easy to understand and readily accessible to the public. The draft resource operations plan also provides for ongoing consultation, and economic and scientific assessment.

The Boyne Basin

The Boyne River catchment includes the unregulated streams and creeks above Awoonga Dam and the regulated Boyne River downstream of the dam. The water from the catchment eventually drains into an estuarine zone at Port Curtis before entering the waters of the Great Barrier Reef Marine Park.

The Gladstone Area Water Board is the main water user in the Boyne Basin. It operates Awoonga Dam and supplies town water for the City of Gladstone. In response to the board's application to raise the Awoonga Dam wall from 30 metres Australian Height Datum (AHD) to 45 metres AHD and increase its existing water entitlement by 34 000 megalitres a year, Queensland prepared the Boyne River Basin water resource plan (DNR 2001). (At the same time the Gladstone Area Water Board prepared an environmental impact statement for the proposed dam construction works.) The plan covers only the surface water. Extraction of overland flows and groundwater from the catchment is not significant.

The water resource plan restricts the maximum water available to the Gladstone Area Water Board to 63 000 megalitres a year at a dam height of 30 metres AHD and 113 600 megalitres a year at dam height of 45 metres AHD. For other users the plan limits water extraction above the dam to 3000 megalitres a year and sets out rules for replacing the area-based licences with volumetric water licences. The plan makes provision for the release of base flows below the dam when the dam level is above 30 metres AHD and for trigger flows whenever the stream flow into the dam is at least 3210 megalitres a day for four consecutive days. It also specifies water security and environmental objectives.

Queensland has implemented the water resource plan arrangements via the 2003 Boyne River Basin resource operations plan (DNRM 2003). The resource operations plan seeks to ensure the water in the Boyne Basin is managed in an integrated and sustainable way that provides for the needs of the community and the natural environment. Under the resource operations plan the annual allocation for the Gladstone Area Water Board is set at 63 000 megalitres. This provides the board with an additional water allocation of 15 000 megalitres a year to accommodate the raising the dam wall from 30 to 40 metres AHD. It also allows for a further allocation of 19 000 megalitres a year once the dam wall is raised to 45 AHD. (After the dam wall is raised any water entitlements attached to the flooded land that have been purchased by the Gladstone Area Water Board will be cancelled.)

The Gladstone Area Water Board and the former Department of Natural Resources undertook ecological and economic assessments that were used to determine the water sharing rules and environmental water allocations in the plans. That department used a technical audit panel to determine the basin's environmental flow requirements, develop and model flow management strategies, and determine the environmental implications of those strategies. The panel comprised experts in fish ecology, aquatic ecology, river morphology and botany. A community liaison group comprising 18 representatives from local stakeholder groups provided feedback and assistance during the development of the water resource plan. The Peak Reference Group comprising representatives of local authorities, government agencies and a conservation group helped with the planning processes for both the water resource plan and the environmental impact statement for Awoonga Dam.

The technical audit panel considered the ecological condition of the river downstream of Awoonga Dam to be in degraded condition based on existing information and a brief site visit. The panel assessed flow scenarios using the IQQM model and developed a rating system based on river morphology, aquatic biology, riparian vegetation and fish. The technical audit panel recommended that downstream of Awoonga Dam:

- base flows should be increased by reinstating low flows and reducing duration and frequency of dry spells.

- trigger flows should be provided by reinstating some measure of variability into the system to encourage fish breeding and allow fish passage.

The water resource plan adopts the recommended environmental flow objectives and the performance indicators or standards for meeting those objectives. It slightly improves the timing and duration of trigger flows compared to those recommended by the panel. Key flows will be maintained at between 41–61 per cent of predevelopment flow patterns. (This, however, provides less variability of flow in the river than before the raising of the dam wall.) Upstream of the dam, the plan provides for flows to be maintained at between 85 and 99 per cent of predevelopment levels. The resource operations plan contains operational rules governing the management of base flows, and trigger flows as defined by the water resource plan. In addition, the resource operations plan requires all water users with a volumetric licence to install water meters.

The environmental assessments for the water resource plan and the Awoonga Dam Environmental Impact Statement noted that raising the dam wall would reduce freshwater flows and associated nutrient input to the estuary. This was predicted to have an adverse impact on species composition and diversity.

The Queensland EPA concluded that the water flow provisions contained in the water resource plan are unlikely to meet the conditions for ecological sustainability because of the adverse impacts on downstream habitats, including the estuary. It also considered that implementation of the plan would be likely to further degrade the condition of downstream habitats (EPA 2000). Queensland considered the economic and regional prosperity provided by the plan, however, justified accepting a higher use of the Boyne Basin's water resources than in some other Queensland catchments (DNR 2001).

Under the water resource plan, there are provisions for monitoring flow, water quality, macroinvertebrates, phytoplankton, geomorphology, habitat condition and biological trigger processes. Queensland Government agencies and holders of resource operations licences are responsible for this monitoring. Licence holders must report their monitoring results on flow and water quality to the Chief Executive of the Department of Natural Resources and Mines. The details of the monitoring requirements are included in the resource operations plan. Queensland advised that its monitoring of the effects of releases from Awoonga Dam in 2004 (the first releases since 1996) showed that these triggered the movement of fish, which was the objective of the management strategy.

There are provisions for reporting on the outcomes of the water resource and resource operations plans each financial year. The Water Act requires the Minister to amend a water plan and associated resource operations plan if the results of monitoring indicate that the environmental flow objectives are not appropriate or are not being met. Any amendments to the plans must result in equivalent or improved outcomes for the environment and water users.

Best available science

Queensland used a holistic method (IQQM and hydrological modelling based on daily flows) and an expert multidisciplinary technical audit panel to conduct the environmental flow assessment. The EPA audit, however, criticised the former Department of Natural Resources' selection of technical audit panel because none of the members had expertise in estuarine and marine systems or experience in assessing flow impacts (EPA 2000).

The EPA was also critical of the technical audit panel's methods for assessing catchment condition. It noted that the technical audit panel's analysis lacked detail on data sources and did not describe available data, particularly for the upper catchment. It considered that the technical audit panel's methods for comparing the predicted impacts of flow scenarios were too subjective. The EPA considered that the technical audit panel should have estimated environmental flow limits. Without using such an approach the EPA considered that it was not possible to determine whether water allocations for consumptive use would remain within sustainable limits. It thus recommended that future water resource plans use benchmarking techniques for assessing and comparing the projected impacts of different water use scenarios. (Queensland adopted this approach in the Fitzroy Basin water resource plan.)

Balancing economic, environmental and other interests

The water resource plan applies the environmental management recommendations from the scientific assessment. The resource operations plan applies an active management approach to achieving the recommended base and trigger flows. In addition, the resource operations plan contains provisions to ensure downstream releases are from the off-take that has the least impact on downstream users and the aquatic environment.

The water resource and resource operations plans provide for an increase in current and future water allocations for consumptive use to accommodate future development. The Gladstone Area Water Board's allocation will increase from 63 000 megalitres a year to 78 000 megalitres a year once construction on the dam wall is complete. There will be a further increase to 97 000 megalitres if the dam wall is raised to 45 metres. This is expected to meet the specified economic and social outcomes, but degrade the downstream aquatic environment.

The EPA criticised the environmental provisions in the draft water resource plan (which are also reflected in the final plan) because it considered that these place a higher emphasis on economic and social values than the ecological health of the catchment and receiving estuary. As such, the EPA recommended that the stated objectives in the final plan be recast to more

accurately reflect the economic, social and environmental outcomes being sought. This recommendation was not adopted for the final plan.

Monitoring and adaptive management

The monitoring programs for the river and creeks cover all important aspects of the freshwater environment as well as water use. They set out site locations, required parameters, and the frequency and timing of monitoring. They define responsibilities for each monitoring task. Licence holders must measure and report on flow and water quality. State agencies are responsible for monitoring and reporting on catchment health, which requires specialist ecology skills.

The program for the receiving estuary monitors fish populations only. The EPA identified this habitat to be at greatest risk from reduced flows in the Boyne River and considered that Boyne plans should have placed greater emphasis on monitoring this ecosystem. It recommended that the Port Curtis bay be included in the monitoring program in addition to the estuary and that the monitoring program should aim to measure the influence of reduced freshwater inflows on the structure of the entire ecological community.

The resource operations plan states that the results of monitoring are to be used in compiling the annual report on the performance of the plans. The Water Act requires the Minister to amend a water plan and associated resource operations plan if the results of monitoring indicate that the environmental flow objectives are not appropriate or are not being met. Any amendments to the plans must result in equivalent or improved outcomes for the environment and water users. As such an adaptive management framework is in place.

Stakeholder consultation and transparent processes

Queensland developed the water allocation provisions in the water resource and resource operations plans through extensive consultation, using open and transparent processes. The advisory committee included a broad representation of the major stakeholders in the catchment. The consultation process was supported by publicly available economic and scientific assessments, and interested stakeholders had an opportunity to make submissions during the development of the draft and final water resource plan. The published technical reports, which provide much of the evidence to support the provisions in the water resource and resource operations plans, are comprehensive, easy to understand and readily accessible. The resource operations plan also provides for ongoing consultation, and economic and scientific assessment.

Stakeholder comments

In early 2003 the East End Mine Action Group provided the Council with information that suggests the activities at the QCL-Holcim East End Mine have depleted the aquifer in the Mt Larcom area with consequent adverse effects on the availability of water to some users, including the environment. The East End Mine Action Group is in dispute with QCL and the Queensland Government about the extent and cause of water depletion from the aquifer.

The Department of Natural Resources and Mines is developing a draft water resource plan for the Calliope River catchment, which incorporates the Mt Larcom groundwater sources. Its Proposal to Prepare Draft Water Management Plans for the Calliope and Boyne River Catchments Notice (no. 1) 1999⁴ states that in developing the draft plan the Minister must have regard for underground water levels and that it is intended the plan will apply to underground water in subartesian aquifers. However, in an amending moratorium notice (Draft Water Resource (Calliope River) plan, *Water Act 2000*, Amending Moratorium Notice and Public Notice) published in February 2004, Queensland changed the scope of the proposal for the draft plan. It is now Queensland's intention that the Calliope River plan apply to all surface water within watercourses and to overland flow water in the catchment, but not to subartesian groundwater (DNRME 2004). Following the release of the amended moratorium notice, the East End Mine Action Group wrote to the Queensland Government and to the Council to express its concerns about the exclusion of groundwater.

The circumstances described by the East End Mine Action Group (depleted aquifer levels and reduced availability of water for users) indicate that the groundwater source may be overused, and therefore appropriate for inclusion in Queensland's water resource planning process. Accordingly, in March 2003 the Council wrote to the Department of Natural Resources and Mines seeking advice as to why it proposed to exclude groundwater from the Calliope River water resource plan.

In response the Queensland Treasury explained that while originally the Calliope plan was not to cover groundwater, the new process for water resource planning in Queensland (specified in the *Water Act*) means there is scope for the Minister for Natural Resources and Mines to include groundwater in the Calliope plan. The Treasury indicated that the Minister would seek public comment on this matter before announcing a decision on the scope of the plan.

As noted above, the Minister decided against inclusion of groundwater in the Calliope plan. The department's information paper indicates that knowledge of groundwater in the catchment is limited and that groundwater in the Calliope catchment is not regulated or controlled and licences are not required for installing or using bores (DNRME 2004). The report does not

⁴ The department released the proposal under the *Water Resources Act 1989*. Queensland has replaced this Act with the *Water Act 2000*.

assess interconnection between surface and groundwater in the catchment, water levels in the aquifer, recharge rates or water use. Queensland advised, however, that it conducts such assessments during its biennial aquifer risk assessments. It noted that the most recent assessment concluded that the risks associated with groundwater use in the Calliope Basin are low.

Under the National Water Initiative, signatory governments including Queensland committed to recognise connectivity between surface water and groundwater and to manage connected systems as a single resource. To meet with this commitment Queensland needs to incorporate groundwater management into its water planning (including in the Calliope catchment) or, alternatively, demonstrate that connectivity between surface water and groundwater is not sufficient to warrant the inclusion of groundwater.

Assessment

Queensland has completed 11 of the 20 water resource plans and three of the 19 resource operations plans for the water systems covered by its 1999 implementation program. Queensland is operating broadly in line with its agreed timetable, although it will not complete several resource operations plans until after 2005. The completed plans mostly cover surface water. Further amendments will be required to some of these plans to cover overland flows, less intensive water uses and groundwater. Material provided to the Council by the East End Mine Action Group raised issues related to the allocation of groundwater.

The Council indicated in the 2003 NCP assessment that it would look as part of the 2004 NCP assessment for Queensland to have finalised the Condamine–Balonne water resource plan (including providing an opportunity for the Murray–Darling Basin Commission Independent Audit Group to comment on the draft plan) and the resource operations plan in line with the government's undertakings. The Council noted the finding of the independent scientific review that the rivers and wetlands of the lower Balonne system were in reasonable ecological condition, but that the system would deteriorate if the existing infrastructure for extracting water is used to capacity. In this regard, the Council noted the review finding that there is likely to be a significant lag between exercising diversions and ecological impacts and the probability that the lower Balonne has not yet experienced the full impact of current diversions.

Queensland finalised the water resource plan for the Condamine–Balonne system in August 2004. It is still developing the resource operations plan, which must comply with the objectives and rules in the finalised water resource plan. Queensland provided information to show that, under the plan, the volume of water used could be as much as 20 per cent less than the volume that could have been taken under pre-existing arrangements. Nevertheless, there are some questions about the extent to which the water resource plan addresses the CoAG obligation to provide appropriate allocations to the environment. Although Queensland had committed to

implement the recommendations of the independent scientific review (which covered the four key ecological assets, including a wetting regime for the Narran Lakes), the water resource plan provides a wetting regime for a portion of the Narran Lakes only. The independent scientific panel considered, however, that the plan provides a reasonable interim solution until further information is available from the research currently underway on the flow requirements of the Narran Lakes and Culgoa floodplain. Moreover, the flow management rules in the water resource plan do not explicitly address the other three ecological assets — the lower Balonne River, the Culgoa River floodplain and the Darling River. The Council notes, however, the view of the independent scientific review that the dominant consideration in the lower Balonne system should be to ensure the Narran Lakes receive appropriate flows to maintain the vegetation and bird communities.

The (then) Department of Natural Resources, Mines and Energy sought input to the draft water resource plan from a range of stakeholders, including interests from New South Wales. In line with its policy approach on privacy matters relating to water planning, Queensland did not to publicly release the submissions in response to the draft plan although it did release a consultation report that outlines how it addressed the issues raised in submissions on the draft plan. Queensland has committed to review the water resource plan after five years and incorporate groundwater during the plan's 10-year life. It has also committed to monitor the impacts of water use, in accord with the requirements specified in the water resource plan, and is developing the monitoring program as part of developing the resource operations plan.

In addition to the Condamine and Balonne water resource plan the Council has considered all completed resource operations plans. In the 2003 NCP assessment the Council looked at the resource operations plan for the Burnett Basin and concluded that it satisfactorily addressed CoAG obligations on the provision of water to the environment. This year the Council considered the water resource and resource operations plans for the Fitzroy and Boyne basins. Queensland revised its future development plans for the Fitzroy Basin in light of the evidence that the developments proposed could have unacceptable adverse consequences for river health. In the final water resource plan for the basin, Queensland presented modelling evidence to demonstrate that its revised approach would largely be ecologically sustainable, although it recognised there could be further degradation in certain areas. Queensland advised that its revised approach was assessed by the independent technical advisory panel (which assessed the results of the modelling).

The plans for the Boyne Basin permit a significant increase in consumptive water use linked to extension of the Awoonga Dam. Queensland estimated this would deliver significant benefits to the local economy, although at some cost to the aquatic environment below the dam, including the estuary. The Queensland evidence raises a question as to whether the ecological sustainability objectives outlined in the Boyne Basin plans will be achieved.

Further Queensland's monitoring program for the Boyne River estuary covers fish only and does not extend to Port Curtis bay area. These constraints on monitoring may make it difficult for Queensland to identify environmental problems and implement appropriate responses.

All plans considered in this 2004 NCP assessment focus on the economic and social interests of water users, while accepting the potential for some decline in environmental health. At this stage, however, it is too early to determine the environmental outcomes because the plans have not been in place long enough for monitoring information and reporting on outcomes to be available. Given Queensland's commitments on monitoring and the Water Act requirement that the Minister for Natural Resources and Mines to amend plans if monitoring results show environmental flow objectives are not being met, the Council considers that Queensland has satisfactorily addressed its obligations for this 2004 NCP assessment.

For the 2005 NCP assessment Queensland should demonstrate that it has substantially implemented plans for the systems covered by its 1999 implementation program. This should include completing the resource operations plan for the Condamine–Balonne River (in accord with the undertaking given by Queensland in 2003 to finalise the water resource plan during the first half of 2004). Noting the advice of the independent scientific review, Queensland should be expected to have significantly advanced the research on the system's flow requirements currently under way. Consistent with its approach under other water plans, Queensland should also be expected to have implemented a program against which the outcomes of using water in accord with plans for the Condamine–Balonne system can be monitored, and commit to appropriate adaptive management should monitoring information indicate action is needed.

4.4 Water trading

Assessment issue: Trading arrangements in water allocations or 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. 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 (including the immediate removal of all restrictions on temporary trade).

In the 2003 NCP assessment, which considered intrastate trading arrangements, the Council found that Queensland had developed an effective framework for water trading but was in the early stages of implementation. Permanent trading generally depends on the finalisation of a resource operations plan for each basin. At the time of the 2003 NCP assessment, Queensland had finalised only one resource operations plan. Pending development of the trading provisions in the resource operations plans, Queensland implemented interim permanent trading arrangements through a water trading trial in several water supply schemes.

(continued)

Queensland needs to finalise its resource operations plans and ensure the trading rules in the plans facilitate trading where systems are physically shared or hydrologic connections and water supply considerations permit trading. It also needs to develop arrangements for interstate water trade with New South Wales.

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

Under the Water Act, Queensland is implementing arrangements for the permanent trading and leasing of water allocations through the preparation of resource operations plans. Permanent intrastate trade generally depends on the finalisation of a resource operations plan for each basin. Interstate trade depends on the completion of resource operations plans for the cross-border basins and of administrative arrangements with the other Murray–Darling Basin states.

Pending development of the trading provisions in the resource operations plans, Queensland implemented permanent intrastate trading arrangements for ‘interim water allocations’ through a water trading trial in the Mareeba–Dimbulah and some other water supply schemes.

Water may be traded temporarily via ‘seasonal assignments’ of part or all of the water available under a water entitlement for a water year. Seasonal assignments are permitted in supplemented systems subject to the approval of the scheme operator. In unsupplemented systems, seasonal water assignments require the approval of the Department of Natural Resources and Mines and are allowed only in areas where water entitlements are adequately specified (including in terms of volume) and the environmental risks are understood. Seasonal assignments in unsupplemented systems are limited to areas where a water resource plan, resource operations plan or regulation permits.⁵

Trading of allocations under resource operations plans

In areas covered by a water resource plan and resource operations plan, water allocations generally are separated from land title and may be traded permanently or leased. Resource operations plans provide for several types of dealing in water allocations:

- The ‘transfer’ of a water allocation involves a change in the ownership of the allocation. A transfer is lodged with the registrar (the Queensland Resource Registry) for recording the new ownership and does not require the approval of the resource manager (the Department of Natural Resources and Mines). If the allocation is in a supplemented system (that

⁵ Before irrigating land under a seasonal assignment for two (or two out of three) consecutive water years, the purchaser must have a land and water management plan approved by the department.

is, a system where water is delivered from a dam and/or other infrastructure), the registrar will not register the transfer without evidence of a supply contract between the water allocation holder and the resource operations licence holder (for example, SunWater). Parties with a registered interest must be notified of proposed transfers, and their consent is required before a transfer can be registered.

- A ‘change’ to a water allocation involves a change in the nature of the allocation (such as the location from which water may be taken, the purpose for which the water may be used or the priority of the allocation) rather than a transfer of ownership. To change a water allocation, the holder must apply to the department for a water allocation dealing certificate. The department assesses the change against the rules in the resource operations plan. A certificate must be lodged with the registrar to record the change on the water allocation register. If the allocation is in a supplemented system, the registrar will not register the change without evidence of a supply contract between the water allocation holder and the resource operations licence holder.
 - To sell a water allocation to a downstream buyer, for example, the seller (or, after the event, the buyer) may need to apply to change the location of the water allocation to reflect the new downstream location. (Sales within the same zone generally do not require a location change.) A dealing certificate and a transfer document (to transfer the allocation to the new owner) must then be lodged with the registrar to record the change and transfer.
- Water allocations can also be ‘subdivided’ or ‘amalgamated’.

Trading rules — referred to as ‘water allocation change rules’ — are usually specified in the resource operations plan for each basin. Typically, the rules specify permitted changes and prohibited changes. For physical reasons, trading is limited to the catchment covered by the resource operations plan. The plan area may be disaggregated into zones, based on hydrological considerations. Generally, a water allocation will allow the holder to take water from anywhere within the zone. The resource operations plan will usually include pre-tested volumes of water that may be traded between zones without affecting the reliability of supply and the achievement of environmental flow objectives. If the change can be made within these limits, it will be approved. If the change would cause the limits to be exceeded, the application must be advertised and assessed by the Department of Natural Resources and Mines. Refusal of the application may be appealed to the Land Court. Purchasers of water allocations require department approval of a land and water management plan before using the water for irrigation.

Trading of interim water allocations under the trading trial

A trial of permanent water trading commenced in the Mareeba–Dimbulah water supply scheme in 1999. With the new water trading framework in the Water Act, the trial continued under interim trading arrangements established by a Regulation under the Act. Following an evaluation in 2002, Queensland continued the trial in the Mareeba–Dimbulah scheme and extended it to parts of the Nogoa–McKenzie and Mary River schemes. It extended the scheme in response to the demand for water trading in these areas and because it expects that trading will not adversely affect environmental values.

The trial involves the trading of interim water allocations. Trade is restricted to landholders whom the relevant water supply scheme can supply — because the interim water allocations must re-attach to land — and to interim water allocations used for stock, domestic or primary production purposes. Transfers require the approval of the Department of Natural Resources and Mines, which may set conditions to avoid adverse environmental impacts. Applicants must provide evidence of a supply contract between the purchaser and the scheme operator, as well as the written consent of parties with a financial or other interest in the seller's land. Purchasers need to have a land and water management plan approved by the department before using the water for irrigation.

Recent trading activity

Before the commencement of the Water Act, there was limited scope for water trading in Queensland. Trade was effectively limited to temporary transfers via seasonal assignments (mostly in regulated systems) and, since 1999, to the pilot for permanent transfers, initially in the Mareeba–Dimbulah scheme. Trading is likely to remain relatively constrained pending the finalisation of water resource plans and resource operations plans.

Queensland advised that data on interstate trading are not available.

Seasonal assignments

In 2002-03 seasonal assignments or temporary transfers in water supply schemes managed by SunWater amounted to over 250 000 megalitres (table 4.2). This volume was more than twice that traded in the previous year and almost four times that traded in 2000-01. The number of temporary transfers almost trebled over this period. In 2002-03, around 40 per cent of transfers (by volume) were in the Burdekin–Haughton scheme.

Table 4.2: Temporary transfers in SunWater schemes

<i>Water supply scheme</i>	<i>2000-01</i>		<i>2001-02</i>		<i>2002-03</i>	
	<i>no.</i>	<i>ML</i>	<i>no.</i>	<i>ML</i>	<i>no.</i>	<i>ML</i>
Awoonga–Callide pipeline	–	–	–	–	–	–
Barker–Barambah	39	2 370	50	3 100	104	5 691
Bowen–Broken rivers	1	40	1	675	22	922
Boyne River and Tarong	54	2 342	6	1 010	32	1 935
Bundaberg	237	4 761	460	6 842	269	16 101
Burdekin–Haughton	23	7 222	118	29 905	327	103 858
Callide Valley	19	453	12	258	13	345
Central Lockyer Valley	9	230	–	–	–	–
Chinchilla Weir	19	490	16	399	2	30
Cunnamulla Weir	2	52	2	70	5	421
Dawson Valley	79	7 407	84	5 256	88	2 788
Julius Dam	–	–	–	–	–	–
Logan River	16	901	29	1 777	81	4 594
Lower Fitzroy	–	–	–	–	1	1
Lower Lockyer Valley	22	471	35	437	12	125
Macintyre Brook	41	2 907	68	7 618	53	3 571
Maranoa River	–	–	–	–	–	–
Mareeba–Dimbulah	54	2 917	149	10 236	292	27 041
Mary River	17	1 132	53	2 246	175	3 463
Nogoa–Mackenzie	45	20 957	90	28 424	230	42 904
Pioneer River	–	–	5	472	11	2 064
Proserpine River	–	–	2	1 020	120	9 331
St George	45	5 608	90	11 235	71	8 301
Three Moon Creek	13	448	17	553	8	649
Upper Burnett	36	787	50	1 379	43	1 800
Upper Condamine	62	4 800	65	2 181	4	2 845
Warrill Valley	35	1 130	59	433	5	2 971
Total	872	67 651	1 490	118 776	2 462	253 184

ML Megalitres.

Source: Government of Queensland 2004

Trading trial

Since commencement of the trading trial in the Mareeba–Dimbulah scheme in 1999, there have been over 80 permanent transfers in the scheme, amounting to almost 2800 megalitres (table 4.3). A similar volume was permanently transferred in the Nogoa–Mackenzie scheme between the extension of the trial in 2002 and its cessation in January 2004 (on commencement of the resource operations plan for the Fitzroy Basin, which includes the scheme).

Before amendments to the transfer process in May 2003, the Department of Natural Resources and Mines used to take from one to 12 months to process applications for transfers under the trial. Queensland has advised that the new requirement for applications to include evidence of a supply contract with the scheme operator has significantly improved processing times.

While it does not collect official data on prices, Queensland has indicated that the price range for permanent transfers of interim water allocations has been \$300–1000 a megalitre in the Mareeba–Dimbulah scheme, and the price has exceeded \$1000 a megalitre in the Nogoa–Mackenzie scheme.

Table 4.3: Permanent transfers in the Mareeba–Dimbulah and Nogoa–Mackenzie water supply schemes

<i>Water year</i>	<i>Mareeba–Dimbulah</i>		<i>Nogoa–MacKenzie</i>	
	<i>Applications</i>	<i>Transfers</i>	<i>Applications</i>	<i>Transfers</i>
	<i>no.</i>	<i>ML</i>	<i>no.</i>	<i>ML</i>
1999-2000	4	164	na	na
2000-01	9	275	na	na
2001-02	25	912	3	637
2002-03	35	1 001	8	1 147
2003-04 ^a	12	434	14	1 159
Total	85	2 786	25	2 943

^a From 1 July 2003 to 14 January 2004. **na** Not applicable. The trading trial was extended to the Nogoa–MacKenzie scheme in 2001-02.

Source: Government of Queensland 2004

Trading under resource operations plans

Permanent trading in the Burnett Basin has been possible since May 2003, following the completion of the resource operations plan for the basin. From 1 July 2003 to 13 October 2004, there were 46 permanent water allocation transfers totalling over 2600 megalitres. The typical price paid for permanent transfers in the Burnett Basin is \$1000 a megalitre.

Permanent trading in the Fitzroy Basin has been possible since January 2004, following the completion of the resource operations plan for the basin. From 12 January 2004 to 13 October 2004, there were 21 permanent water allocation transfers totalling almost 3000 megalitres. The typical price paid for permanent transfers in the Fitzroy Basin is \$1700 a megalitre.

Queensland advised that permanent transfers involving a change to the water allocation have generally been approved (and a dealing certificate issued) within 14 business days.

Reform progress

Following Queensland's completion of the resource operations plan for the Fitzroy Basin in January 2004, permanent trading in water allocations is now permitted in the Fitzroy and Burnett basins.⁶ As with the Burnett plan, the resource operations plan for the Fitzroy Basin includes trading rules that specify permitted and prohibited changes, including the location from which water may be taken, the purpose for which the water may be used and the priority of the allocation. The plan also includes pre-tested volumes of water that may be traded between zones without affecting the reliability of supply and the achievement of environmental flow objectives. Changes outside these limits require public advertisement and individual assessment by the Department of Natural Resources and Mines.

The trading trial ceased in the Nogoa–Mackenzie scheme once the resource operations plan for the Fitzroy Basin commenced. It will continue in the Mareeba–Dimbulah and Mary River schemes until the relevant resource operations plans are completed. The plan for the Barron Basin (which includes the Mareeba–Dimbulah scheme) is expected to commence in early 2005.

In areas for which resource operations plans will be completed or extended after 2005 (the deadline under the 1994 CoAG agreement for substantial completion of trading arrangements), Queensland has provided the following information on the expected level of demand for trading. Where plans are to include overland flows and groundwater, it has noted that physical constraints may limit the possibility of trading, irrespective of demand.

- *The Calliope plan (expected completion in November 2006)*. There is no immediate need for water trading because less than 10 per cent of the available water is being used.
- *The Logan (expected completion in September 2007), Mary (expected completion in September 2007) and Moreton (expected completion in May 2008) plans*. Preliminary analysis indicates that future demand for trading will be low to moderate, given reasonable opportunities for improvements in intra-sector water use efficiency.

⁶ The resource operations plan for the Boyne Basin (completed in July 2003) does not provide for permanent trading (separate from land sales). Most of the water entitlements in the basin are held by the Gladstone Area Water Board and have been converted to water allocations. There are around 30 other existing water licences, which Queensland has decided not to convert to tradable water allocations (but which will be converted from an area basis to a volumetric basis). Some of the water licences upstream of the Awoonga Dam will be cancelled when the dam is raised. As there is additional water to be made available via new water licences, Queensland advised that 'there is no immediate need for water trading' in the Boyne Basin (Government of Queensland 2004).

- *The Wet Tropics (expected completion in 2008) and Whitsunday (expected completion in January 2007) plans.* The expected demand for water trading is low, particularly in the Wet Tropics where water is abundant relative to demand.
- *The Burnett plan.* The existing resource operations plan covers those areas with the highest demand for trading in surface water. The Barker Barambah and Boyne and Tarong water supply schemes are likely to be included in 2005. The resource operations plan will be amended in 2005 to establish significant allocations for the Burnett River Dam and Eidsvold Weir. In the Three Moon catchment (which is to be included in the plan in 2006), the demand for trading is expected to be low. The plan is also to be amended after 2005 to include groundwater. Queensland monitors overland flow development impacts annually to determine if the plan's objectives are being achieved. Moderate demand for trading in groundwater is expected in some areas (such as the Bundaberg subartesian area). Outside of these areas, little demand for trading in groundwater is expected. There is limited demand for trading in water from overland flows.
- *The Fitzroy plan.* The existing resource operations plan covers those areas with the highest demand for trading in surface water. Outside these areas, demand for trading in surface water is likely to be relatively low. The plan is to be amended after 2005 to include overland flows and groundwater (a draft was released for consultation in October 2004). Moderate demand for trading in water from overland flows is expected in some areas (such as the Comet and Nogoia–Mackenzie subcatchments). Moderate to high demand for trading in groundwater is also expected in some areas (such as the Callide Valley subartesian area). Outside of these areas, little demand for trading in overland flows or groundwater is expected.

In June 2004 the Department of Natural Resources and Mines released for public consultation an options paper on approaches to dealing with the 'stranded assets' problem that may arise from trading out of water supply schemes. The paper indicates that the department is further investigating exit fees and/or the development of separate markets in reticulation infrastructure capacity. The department expects a final policy position to be determined by late 2004. Queensland has advised that it has not implemented caps on trade out of irrigation schemes. However, in one case (Avondale Water Board in the Burnett Basin), tradable allocations were not granted to end users, pending finalisation of the policy on trading out of schemes.

In mid-2003, the Department of Natural Resources and Mines released a series of information brochures as part of a water trading information kit. The brochures explain the different types of water entitlement and the trading arrangements that apply to each type, as well as the separation of water from land (including the impacts on land valuations). In December 2003 the department held workshops in Rockhampton and Emerald in the lead-up to the release of the resource operations plan for the Fitzroy Basin.

The sessions were targeted at water entitlement holders, lawyers, accountants, solicitors and financial institutions.

For areas covered by completed resource operations plans, the department is providing up-to-date data on its website on the volume of water in each trading zone and on the corresponding minimum and maximum limits for pre-tested trades. It is also considering options for reporting trading data online. It intends to publish periodic reports and annual summaries of permanent transfers on its website. The data will include changes to the location of water use (arising from trades) and the price paid a megalitre, for each water management area or scheme. In addition, the department is providing access to raw data to a private organisation that processes data for clients on land transfers.

Queensland has not advised of any developments on interstate trade.

Submissions

As noted in section 4.2, the Pioneer Valley Water Board requested the Council's support for the National Water Initiative to provide for irrigation water supply businesses to hold bulk entitlements for their schemes, rather than individual irrigators holding entitlements. It noted that water allocations will be separated from land titles and fully transferable once the resource operations plan for the Pioneer catchment commences (scheduled for late 2004). The board, which is a statutory authority, is proposing to convert its irrigation scheme into an irrigator-owned cooperative. Under the proposed arrangements, individual entitlements would be converted to shares in the cooperative. Each share would attract an annual fixed charge (to meet the loan repayment and fixed costs of the scheme). Water trade would occur through trading of the shares, subject to any trading restrictions required to address the hydrological and physical constraints of the system. The board considered that providing for the irrigation water supply businesses to hold bulk entitlements would help to ensure the financial viability of irrigation schemes (when water is traded out of a scheme's area) and simplify arrangements for trading.

Queensland rural water boards (representing nine irrigation water supply boards) also supported irrigation water supply businesses holding bulk entitlements under arrangements similar to those proposed by Pioneer Valley Water Board. The organisation considered that such an approach would ensure the financial viability of irrigation schemes while fully complying with CoAG obligations on water trading.

Payne Butler Lang Solicitors and Fergus Duncan Real Estate have been heavily involved in the trading of water entitlements in the Burnett region, the latter as a water broker. In a joint submission, they raised the following concerns about the arrangements for water trading under the Burnett Basin resource operations plan.

- The number of river zones (13 in the upper Burnett alone) is excessive. There should be only three or four zones set with reference to water infrastructure and the practical limits on water movement.
- The minimum and maximum nominal volumes (that is, the pre-tested trading limits) specified in the plan were set too conservatively and are severely hampering water trading. A significant number of trades were made in the upper Burnett in the second half of 2003 but trading has effectively ceased because the limits have been reached. The plan should allow 10–20 per cent of the allocations in each zone to be traded, compared with the average limit of 3.8 per cent on the volume of allocations imported into a zone.
- The Department of Natural Resources and Mines undertook to review the river zone limits in late 2003 and early 2004, but has not done so. It has promised to complete a review by June 2005. A six-monthly review process should be established.
- The department has taken an inflexible approach to assessing land and water management plans. This has resulted in farmers limiting their estimates of water requirements, increasing crop loss risks in dry years.
- There is no online service providing information on water sales (via trading) in Queensland. A comparable system to that for land sales is required for efficient water trading to develop.

Discussion and assessment

Queensland has developed arrangements to enable permanent intrastate trade in water allocations (including leasing) but is in the early stages of implementation. Resource operations plans are required to enable permanent trading (outside the schemes covered by the trading trial) and to define the trading rules, but Queensland has completed only three (of 19) plans. Temporary trade, via seasonal assignments, is permitted in supplemented systems and in other areas where water entitlements are adequately specified and the environmental risks are understood. There is no restriction on the number of consecutive periods in which water can be temporarily traded.

Pending the completion of the relevant resource operations plans, under the trading trial in the Mareeba–Dimbulah and Mary River schemes, permanent trade is limited to landholders in the schemes and to water used for stock, domestic and primary production purposes. These interim arrangements are inconsistent with the CoAG water trading obligations.

Interstate trade involving Queensland depends on the completion of the resource operations plans for the Border Rivers, Condamine–Balonne, Moonie and Warrego/Paroo/Bulloo/Nebine basins. The completion of the plans will enable Queensland's Murray–Darling Basin Ministerial Council cap on diversions to be finalised. Queensland will also need to finalise administrative

arrangements with the other Murray–Darling Basin states (particularly New South Wales) to enable permanent trading to occur.

In previous NCP assessments, the Council was satisfied that water allocations in Queensland will be sufficiently well specified to facilitate trading once the resource operations plans are in place. Water allocations are being progressively separated from land title as the plans are completed: holders of water allocations are not required to own land or have the ability to use the water. Further, allocations are recorded on a water allocations register, which provides security of title and includes details of third party interests. The consent of registered interests is required before a change to an allocation can be registered.

The arrangements for water trading in Queensland include measures to ensure trade does not adversely affect the environment or other water users. The underlying principle for the trading rules in the resource operations plans is that transfers must not compromise the achievement of the key environmental flow and water allocation security objectives of the relevant water resource plan. In addition, irrigators are generally required to prepare land and water management plans before water obtained via trading can be used. With respect to the Burnett Basin, Queensland advised that there have been issues concerning the ability of some applicants to supply the information required by the Department of Natural Resources and Mines for approval of land and water management plans.

Queensland advised that the trading restrictions in resource operations plans typically relate to the physical constraints of the supply system and to the flows necessary to ensure the achievement of environmental and water allocation security objectives. In response to concerns about the limits on trading between zones in the Burnett Basin resource operations plan (including concerns in the submission from Payne Butler Lang Solicitors and Fergus Duncan Real Estate), Queensland has advised that the Department of Natural Resources and Mines is undertaking further work to amend the pre-tested limits if it is possible to do so while still complying with the water resource plan. (It has briefed Mr Duncan on its actions.) Queensland has also indicated that the resource operations plan will be amended to include new infrastructure in 2005, when additional water will become available and all zones and limits will be amended accordingly. For other resource operations plans, Queensland is aiming for zones to be as broad, and trading rules to be as flexible, as possible while meeting the water allocation security objectives and the environmental flow provisions of the relevant water resource plan. The Council notes that Queensland has a process to enable trade to occur outside the pre-tested limits in the resource operations plans if that trade complies with the water resource plan.

Based on the Council's consideration of the resource operations plans for the Burnett and Fitzroy basins, constraints on trading in the trading rules appear to reflect environmental and physical constraints. Queensland will need to ensure the trading rules in subsequent plans also facilitate trading where water systems are physically shared or hydrologic connections and water supply considerations permit trading.

Queensland has released an options paper on approaches to managing assets that may become stranded as a result of trading water permanently out of irrigation schemes, and expects to determine its final policy position by late 2004. It has indicated that it may delay (until the policy is settled) the release of draft resource operations plans for catchments where the stranding of assets could occur (such as the Pioneer catchment). Queensland has an opportunity to consider the issues raised by the Pioneer Valley Water Board and Queensland rural water boards as part of this process.

Given the experience in southern states, Queensland needs to be wary of the potential for irrigation cooperatives or corporations to introduce their own restrictions on trade out of irrigation areas (irrespective of whether they hold bulk water entitlements). As a signatory to the National Water Initiative, Queensland has committed not to impose new barriers to trade (including barriers in the form of arrangements for addressing stranded assets) and to ensure mechanisms such as access and exit fees do not become an institutional barrier to trade. It has also committed to implement measures to facilitate the rationalisation of inefficient infrastructure or unsustainable irrigation supply schemes, and to consider the need for structural adjustment assistance in such cases. The introduction of arrangements that restrict water trading, for reasons other than the physical or hydrological constraints of systems or to protect the environment, would contravene these commitments.

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. The National Water Initiative extends to 2007 the timeframe for establishing institutional and regulatory arrangements that facilitate intra- and interstate trade. By the end of 2007, Queensland expects to have completed 17 of the 19 resource operations plans under its implementation program (although groundwater and/or overland flows may still need to be included in some cases). The two remaining plans (Moreton and Wet Tropics) are scheduled for completion in 2008. Queensland expects little demand for trading in the Wet Tropics and low to moderate demand in the Moreton region.

The Department of Natural Resources and Mines confirmed that demand for trading is low in the areas not intended to be covered by water resource and resource operations plans. It will consider implementing water management and trading arrangements in these areas if the demand for trading increases. It will consider water trading in advance of water resource planning, however, only if environmental impacts are adequately understood and can be managed.

Given the infancy of permanent trading in Queensland, water trading mechanisms are still developing. Trading is possible, however, through private trades, brokers and a private web based water exchange. Information on prices, quantities and locations has been limited but is improving. The Department of Natural Resources and Mines has improved the availability of information on water allocations and the process and rules for trading. It is also expanding the scope of the trading information included on its website.

Queensland is in the early stages of implementing its arrangements for permanent water trading, both intra- and interstate. Noting the National Water Initiative commitments on trading and Queensland's expected progress with water planning by 2007, the Council considers that Queensland has made satisfactory progress against its CoAG obligations on water trading for the 2004 NCP assessment.

4.5 Investments in new rural water schemes

Assessment issue: Investments in new rural water schemes or extensions to existing schemes are to be undertaken only after appraisal indicates the scheme or extension is economically viable and ecologically sustainable.

In the 2003 NCP assessment, the Council concluded that Queensland had met CoAG obligations relating to economic viability and ecological sustainability for the Burnett Water Infrastructure Project, except for the raising of the Ned Churchward Weir, for which the environmental processes were still to be completed.

If the raising of the Ned Churchward Weir proceeds, Queensland will need to demonstrate compliance with the CoAG obligation on ecological sustainability.

References: 1994 CoAG water reform agreement, clause 3(d)(iii); Intergovernmental Agreement on a National Water Initiative

The \$210 million Burnett Water Infrastructure Project in Queensland involves the construction of the 300-gigalitre Burnett River Dam, Eidsvold Weir and Barlil Weir, and the raising of the Jones Weir and Ned Churchward (formerly Walla) Weir. In the 2003 NCP assessment, the Council concluded that Queensland had met CoAG obligations relating to the project's economic viability and ecological sustainability, except for the raising of the Ned Churchward Weir, for which the environmental processes were still to be completed.⁷ In that assessment, Queensland provided independent economic analyses⁸ that showed the project would be economically viable and confirmed

⁷ Subsequent to the Council completing the 2003 NCP assessment, the Australian Government Minister for the Environment and Heritage listed the Queensland lungfish as a vulnerable species under the *Environment Protection and Biodiversity Conservation Act 1999*. The Minister thus imposed additional conditions on the Burnett project relating to the lungfish.

⁸ The main economic analysis was by Network Economics Consulting Group and is publicly available (NECG 2001). Additional studies considered the prospects for Burnett primary producers (ACIL Consulting) and the capacity and willingness of potential users to pay for new water allocations (PricewaterhouseCoopers). These additional studies contain commercial-in-confidence material and have not been made public. However, Queensland reported the main findings of the studies in its 2003 NCP annual report (Government of Queensland 2003) and provided the Council with a copy of each of the studies on a commercial-in-confidence basis.

that the project (except for the Ned Churchward Weir) met Queensland's and the Australian Government's environmental approval processes.

Developments since 2003

Burnett Water Infrastructure Project

Construction of the Burnett River Dam and Eidsvold Weir commenced in late 2003 and early 2004 respectively. Queensland has indicated that construction of the Barlil Weir and the raising of the Jones Weir are scheduled to commence as soon as outstanding planning matters are resolved. It has advised that the environmental impact assessment process for the raising of the Ned Churchward Weir remains on hold, pending the completion of environmental studies on a species of turtle.

Nathan Dam

The proposed Nathan Dam is an 880-gigalitre dam project within the Dawson subcatchment of the Fitzroy River in central Queensland. A private sector proponent, Sudaw Developments Ltd, proposes to construct the dam at an estimated cost of \$150 million.

Queensland has advised that the state environmental impact assessment processes for the project are complete but the project has been designated a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth). The Australian Government Minister for the Environment and Heritage determined the project to be a controlled action in September 1992, finding that it was likely to have a significant impact on certain listed threatened species and ecological communities, but no significant impact on the heritage values of the Great Barrier Reef World Heritage Area. In December 2002, the Minister determined that the dam proponent would need to assess these impacts of the project through a public environment report.

The Queensland Conservation Council and WWF Australia sought a Federal Court review of the Minister's determinations. In December 2003 the Federal Court determined that the Minister was required to have regard for not just the immediate impacts of the dam, but also other effects, including the effects of the irrigated agriculture (such as cotton growing) and other developments likely to be permitted by the dam. The court's determination obliges the Minister to reconsider the project. The Australian Government appealed the determination to the full bench of the Federal Court. The Federal Court has rejected the appeal. The Queensland Government has advised the Council that it is not aware that any of the elements of the Nathan Dam case would have implications for the Burnett project.

Submissions

In its submission to the 2004 NCP assessment, the Queensland Conservation Council has reiterated the view in its submission to the 2003 NCP assessment that the Burnett Water Infrastructure Project is neither ecologically sustainable nor economically viable. It also expressed concern with the National Competition Council's approach and findings on the project in the 2003 NCP assessment.

The Wide Bay Burnett Conservation Council has raised similar concerns with the Burnett project and supported the Queensland Conservation Council's submission.

The submissions from WWF Australia and the Queensland Conservation Council have raised issues regarding cost recovery and community service obligations for the Burnett project, as considered in section 4.1.

Discussion

In the 2003 NCP assessment, the Council finalised its assessment of Queensland's compliance with CoAG obligations relating to the economic viability and ecological sustainability of the Burnett Water Infrastructure Project (except for the raising of the Ned Churchward Weir). It concluded that Queensland had met its CoAG obligations.

If Queensland proceeds with the raising of the Ned Churchward Weir, it will need to demonstrate that the project is ecologically sustainable. In the 2003 NCP assessment, the Council expressed its view that approval of the weir raising under Queensland's and the Australian Government's environmental approval processes, and a commitment by Queensland to meet all conditions imposed as a result of these processes, would constitute compliance with the CoAG obligation.

The submissions from the Queensland Conservation Council and the Wide Bay Burnett Conservation Council have argued that the Burnett Water Infrastructure Project does not meet the economic viability and ecological sustainability tests. However, the National Competition Council explored these matters in the 2002 and 2003 NCP assessments (NCC 2002, 2003a), and the 2004 submissions have raised no new issues and provided no additional information on the Burnett project. The submissions have misunderstood the nature of the CoAG obligation relating to the appraisal of new water infrastructure, and the National Competition Council's role in assessing governments' compliance (see chapter 1).

If the Nathan Dam proceeds, Queensland will need to demonstrate that this project is ecologically sustainable. As with the Burnett appraisal process, Queensland will need to demonstrate that the Nathan Dam project is approved under Queensland's and the Australian Government's

environmental assessment processes and that any conditions imposed by those processes are met. The obligation under the NCP to demonstrate that the project is economically viable is not relevant because the Nathan Dam is a private sector project.

5 Western Australia

5.1 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.

Compliance with the pricing commitments in the 1994 Council of Australian Governments (CoAG) water reform agreement requires governments to ensure user charges for water and wastewater services are set to fully recover (within the cost recovery band) the cost of supplying the services (see chapter 1). Water service 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)

Cost recovery by urban water businesses, and institutional reform – outstanding issue, 2003 National Competition Policy assessment

Outstanding issues: Western Australia is to demonstrate transparently that the prices of urban water and wastewater services are set to achieve full cost recovery in accord with the CoAG pricing principles. Also, Western Australia is to separate institutionally, as far as possible, the roles of water resource management, standards setting and regulatory enforcement, and service provision. Arising from the National Competition Council's 2003 National Competition Policy (NCP) assessment, the Australian Government suspended 10 per cent of Western Australia's 2003-04 competition payments, with the suspension to be lifted if Western Australia creates the Economic Regulation Authority (proposed at the time of the 2003 NCP assessment) with responsibility for the water industry and issues terms of reference for the authority to investigate urban water and wastewater pricing.

Future reform: Metropolitan water businesses should continue movement toward upper bound pricing by 2008. Independent bodies should set or review prices, or price setting processes, for water storage and delivery by government water service providers. Western Australia was not a signatory to the National Water Initiative at the time of the 2004 NCP assessment.

References: 1994 CoAG water reform agreement, clauses 3(a) and (b) and 6(c) and (d); 1998 CoAG pricing principles; Intergovernmental Agreement on a National Water Initiative

There are three major providers of urban water and wastewater services in Western Australia: the Water Corporation, the Bunbury Water Board and the Busselton Water Board.¹ The Water Corporation is by far the largest business, providing water supply, sewerage, drainage and irrigation services to 1.7 million people in 300 towns and communities.

In the 2003 NCP assessment, the Council found that Western Australia had not transparently demonstrated that the prices of urban water and wastewater services are set to achieve full cost recovery in accord with the CoAG pricing principles. While the government stated that the Water Corporation sets prices to achieve full cost recovery, it provided no information to show that the corporation's price setting accords with the CoAG pricing principles (including the principle of transparency).

The Council considered that Western Australia also needed to address water institutional arrangements. At the time of the 2003 NCP assessment, the Office of Water Regulation advised on both pricing and standards setting, and the Minister for Environment and Heritage had responsibility for water resource management, water service standards and price regulation. This institutional arrangement creates potential conflicts. The lack of transparency of Western Australia's pricing outcomes exacerbated the Council's concerns about potential conflicts.

The Council originally raised these issues in the 2001 NCP assessment. At that time, Western Australia committed to establishing an independent economic regulator with responsibility for the water sector, including

¹ There are also some 20 local government authorities operating wastewater schemes.

responsibility for recommending on water and wastewater prices. At the time of the 2003 NCP assessment, the Economic Regulation Authority Bill 2002 was before the Parliament, and the government indicated that it would ask the Economic Regulation Authority (ERA), when created, to inquire into urban water and wastewater pricing. The ERA's report would be available to the government when it set urban water and wastewater charges.

Because governments needed to have substantially achieved CoAG objectives on urban water and wastewater pricing and institutional structure by 2003, the Council's 2003 NCP assessment recommended that the Australian Treasurer suspend 10 per cent of Western Australia's 2003-04 competition payments. The Council recommended that the suspension be lifted if Western Australia established the ERA and announced appropriate terms of reference for the ERA to investigate urban water and wastewater pricing (NCC 2003a, pp. xl). The Treasurer suspended 10 per cent of Western Australia's 2003-04 competition payments for water reform matters in accord with the Council's recommendation (Costello 2003).

Activity since the 2003 National Competition Policy assessment

On 27 November 2003 Western Australia passed the *Economic Regulation Authority Act 2003*, establishing the ERA to oversee the water, electricity, gas and rail industries. On 1 January 2004 the ERA formally commenced and the Office of Water Regulation ceased to exist.

The ERA investigates water issues — a role that includes recommending on pricing, on reference from the Western Australian Treasurer — and has taken over the licensing and performance monitoring functions previously performed by the Office of Water Regulation. The Act obliges the Treasurer to consult with the ERA on the terms and conditions of a reference before a formal reference is made. It also requires the ERA to make public the terms and conditions of its inquiries (including the time period and arrangements for public consultation), and sets the ERA's procedures for conducting an inquiry and reporting its findings. Water policy is now the responsibility of the newly created Office of Water Policy, within the Environment portfolio.

On 16 June 2004 the government released terms of reference for the ERA to investigate and recommend on the future pricing of the urban water and wastewater services provided by the Water Corporation, the Bunbury Water Board and the Busselton Water Board (Ripper 2004). The terms of reference state that the ERA, in undertaking its inquiry and in developing its recommendations, is to have regard to the 1994 CoAG water reform agreement and the CoAG pricing principles.

The terms of reference require the ERA to produce a draft report and a final report, with the latter to be available by 12 August 2005. The government has advised that it will consider the report and ensure 2006-07 urban water and wastewater prices account for the ERA recommendations. The government

considers that the nominated timeframe is necessary to enable the ERA to appropriately consider the operations of the service providers (including the regulatory asset base), the non-capital cost estimates and the rate of return on capital, depreciation and forecast capital expenditure programs.

The Western Australian Treasurer stated that the government envisages a further reference to the ERA in mid-2005 for the investigation of broader pricing issues. The second inquiry would examine the prices charged by service providers other than the Water Corporation and the water boards, and would cover rural water prices (Ripper 2004).

Discussion and assessment

The 1994 CoAG water reform agreement obliges governments to ensure water and wastewater prices are set transparently to achieve at least the lower bound of cost recovery. As far as possible, the roles of water resource management, standards setting and regulatory enforcement, and service provision are to be separated institutionally. While Western Australia is not a signatory, the National Water Initiative confirmed these obligations and committed governments to use independent bodies to set or review prices, or price setting processes, for water storage and delivery by government water service providers, and to publicly review and report on pricing. The Western Australian Parliament's assent to the Economic Regulation Authority Act and the establishment of the ERA formally separates institutional responsibility for policy making and water regulation (including price regulation) from service delivery: the ERA has responsibility for water regulation and advising on pricing, while the new Office of Water Policy has responsibility for advising on water policy.

Under the Economic Regulation Authority Act, the government can refer water and wastewater pricing for investigation by the ERA, which has no constraints on its inquiries. The government has released terms of reference for the ERA to investigate and recommend on water and wastewater pricing by the three large urban service providers. The terms of reference ask the ERA to consider and recommend on prices that account for the requirements of the 1994 CoAG water reform agreement and the CoAG pricing principles. The outcome of the ERA investigation will be available to the government in setting urban water and wastewater prices in 2006-07, and as a public report. Acknowledging that the ERA is newly created and is conducting public investigations in a number of areas (including water pricing), the Council accepts that this timeframe is appropriate.

The Council considers that Western Australia has made satisfactory progress against both its urban water and wastewater pricing obligations and its institutional reform obligations. This does not mean, however, that the state's water and wastewater prices are now set in accord with the CoAG pricing principles. Western Australia will not meet this obligation until the ERA completes its investigation and the government implements the authority's recommendations. Western Australia is also to prepare terms of reference for

a broader ERA investigation of water and wastewater pricing that covers, among other matters, local government water pricing issues.

Under the National Water Initiative (Western Australia was not a signatory at the time of the 2004 NCP assessment) governments committed to ensure that metropolitan water businesses continue to move towards the upper bound of cost recovery pricing by 2008 (CoAG 2004).

Cost recovery and consumption based pricing by rural water service providers

Assessment issue: Western Australia is to demonstrate that government-owned irrigation schemes and government-owned suppliers of bulk water are setting prices based on the principles of full cost recovery and consumption based pricing. Government-owned water businesses must also show that they are managing any subsidies consistent with efficient and effective service provision and use. In the 2001 NCP assessment, the Council found that some government-owned schemes and suppliers were not meeting these obligations. It also noted that the government was subsidising the cost of rural water services provided by the Water Corporation as part of a broader CSO, rather than a separately identified subsidy. For the 2004 NCP assessment, the Council has looked for Western Australia to have substantially met full cost recovery and consumption based pricing objectives. For any rural water business that did not achieve at least lower bound cost recovery by 30 June 2004, Western Australia has needed to show that the business had substantially met cost recovery objectives at 30 June 2004 or is applying a price path that should achieve cost recovery within a short period after 30 June 2004, with any transitional CSOs separately identified and made transparent. As part of this obligation, Western Australia should have identified any rural water businesses that are unlikely to achieve full cost recovery, and demonstrated that the CSOs supporting these schemes are transparent.

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. Western Australia was not a signatory to the National Water Initiative at the time of the 2004 NCP assessment.

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

Western Australia has transferred each of its four irrigation schemes to local cooperatives: the South West Irrigation Management Cooperative (now Harvey Water), Preston Valley Irrigation Cooperative, Ord Irrigation Cooperative and Gascoyne Water Cooperative. The Water Corporation supplies bulk water to each of these cooperatives. In 2002-03 it supplied 587 061 megalitres of water to the irrigation industry (approximately 64 per cent of total water supplied by the Water Corporation to customers in that year). Rural bulk water supply agreements between the Water Corporation and cooperatives were set up as part of the handover of irrigation schemes.

Western Australia has advised that the bulk water supply agreements require the cooperatives to pay a bulk water charge comprising fixed and volumetric components. The charge recovers asset consumption (based on a

renewals annuity) and ongoing operation and maintenance costs. However, the charge does not recover the full cost of bulk water supply, which Western Australia defines as depreciation, a return on assets, and operations and maintenance costs.

The Western Australian Government makes a CSO payment to the Water Corporation for the difference between the depreciation, return on assets, operation and maintenance costs and the revenue raised from bulk water charges for each irrigation scheme. The purpose of the CSO is to ensure that irrigators face the same bulk water charge, consistent with the government's uniform pricing policy. The government has advised that in 2003-04 it paid a total CSO of around \$9.6 million to the Water Corporation. This provided a subsidy of around \$3.5 million for South West Irrigation Cooperative, \$0.5 million for Preston Valley Irrigation Cooperative, \$3.9 million for the Ord Irrigation Cooperative and \$1.6 million for the Gascoyne Water Cooperative.

Western Australia anticipates that the CSO payment for 2004-05 and out years will be similar to the payment in 2003-04. It considers there may be some change in relation to the South West Irrigation Cooperative, however, where the current bulk water supply agreement will expire in 2006. Western Australia has indicated that the trading of water from the South West Irrigation Cooperative to the Water Corporation would most likely be considered in the negotiation of a more cost-reflective (upper bound pricing) bulk water charge in the next bulk water supply agreement. The bulk water supply agreements for the other three cooperatives are not due for renewal for 10–15 years. Western Australia has advised that it will review pricing arrangements when the agreements are due for renewal.

One of the conditions of transfer of the schemes to the irrigation cooperatives is that the cooperative must increase water charges over an agreed period of time. In return the government agreed to provide an operating subsidy to the irrigation cooperatives to cover revenue shortfalls during the cooperatives' first years of operation. The government provides such subsidies to the Ord Irrigation Cooperative and the Gascoyne Water Cooperative. In 2002-03 the Ord Irrigation Cooperative received its first subsidy payment of \$2.5 million, which the government is phasing out over 10 years. In 2003-04 the Gascoyne Water Cooperative received its first subsidy payment of \$1.2 million. This will be phased out over 15 years. (The cooperatives report on the operating subsidies received each year in their annual reports.) The government has ceased providing operating subsidies to the South West Irrigation Management Cooperative and the Preston Irrigation Cooperative, which are now achieving lower bound cost recovery.

As discussed, on 16 June 2004 the Treasurer released a media statement that the government will issue the ERA with terms of reference for an inquiry and report into all water issues, including rural water charges (Ripper 2004). The Treasurer's statement indicated that the ERA inquiry will thoroughly investigate the cost recovery and pricing principles of the Water Corporation's bulk water charges to rural users. The Treasurer advised that he will request this investigation in mid-2005.

Discussion

Full cost recovery

Under the 1994 CoAG water reform agreement and the National Water Initiative, Western Australia needs to show its rural water services are achieving at least the lower bound of cost recovery and applying the CoAG pricing principles. 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 on debt, provision for future asset refurbishment/replacement, and dividends (if any).

Western Australia has advised that its bulk water charges raise revenue sufficient to recover a renewals annuity charge and ongoing operation and maintenance costs, but has not provided information to show the extent of cost recovery (against the CoAG pricing principles) by each publicly owned bulk water service. Western Australia's bulk water charge does not recover any externality costs incurred in relation to the irrigation schemes, the interest cost on debt, taxes and tax equivalents, or any dividends. It appears, therefore, not to incorporate all the cost components of the CoAG lower bound of cost recovery. Moreover, the bulk water price setting process is not transparent. As a result, it is unclear whether pricing meets the requirements of the 1994 CoAG water reform agreement and the CoAG water pricing principles.

Consumption based pricing

Under the 1994 CoAG water reform agreement, governments need to adopt pricing regimes based on the principle of consumption based pricing. Western Australia has advised that all bulk water charges comprise a fixed component and a volumetric component, but has provided no information to explain which components are fixed and which can vary depending on volume. On the information provided, the Council is unclear whether the bulk water charges fully satisfy CoAG requirements.

Transparent reporting of subsidies

The government makes a specific CSO payment to the Water Corporation, equivalent to the difference between the cost to the corporation of providing bulk irrigation services and the revenue that the corporation raises from the bulk water charge to irrigation schemes. Western Australia's definition of cost recovery includes depreciation, a return on assets, and operations and maintenance costs. As with Western Australia's lower bound cost definition (discussed above), this definition does not cover all cost components recognised in the CoAG pricing principles.

Western Australia does not appear to publicly report the CSO payments made for supply to each irrigation scheme, although it disaggregated these subsidies in material provided to the 2004 NCP assessment, following a request by the Council. Western Australia has explained that the intent of the CSOs is to ensure irrigators face the same bulk water charge consistent with the government's uniform pricing policy.

Western Australia is reducing the operational and bulk water supply subsidies over time. It will also renegotiate the bulk water supply agreement with the South West Irrigation Cooperative so bulk water charges more closely reflect the upper bound of the CoAG pricing principles.

Assessment

Both the 1994 CoAG water reform agreement and the National Water Initiative commit governments to establishing rural water prices that achieve at least the lower bound of cost recovery and move towards the upper bound where practicable. The agreements recognise that cost recovery might not be achieved in some systems and that governments might deem it necessary to provide a (transparent) CSO. The National Water Initiative also commits governments to use independent bodies to set or review prices, or price setting processes, for water storage and delivery by government water service providers, and to publicly report on pricing by government (and private) water service providers to ensure they apply best practice water pricing.

Western Australia has transferred the management of its four irrigation schemes to local cooperatives, and the Water Corporation supplies bulk water to each of these cooperatives through bulk water supply agreements. The agreements require bulk water charges that comprise fixed and volumetric components and recover some cost recovery components of the CoAG pricing principles. Western Australia subsidises the bulk water charges and the operations of two local grower cooperatives.

Western Australia still has several rural pricing matters to address. Most importantly, it needs to ensure rural businesses achieve at least lower bound cost recovery. It needs to show that its consumption based charges are set on the basis of efficient resource pricing. It could also improve the transparency of CSO payments to the Water Corporation by publicly reporting the (separate) CSOs attached to each irrigation scheme (as it did for this assessment following the Council's request). The foreshadowed ERA investigation into the cost recovery and pricing principles underpinning the Water Corporation's bulk water charges to rural users will be an important step towards best practice rural pricing. The government is due to provide the ERA with terms of reference in mid-2005. It is not clear, however, how the government will implement the ERA recommendations, given that Western Australia will not be reviewing bulk water pricing arrangements for up to 15 years.

The Council considers that Western Australia has made satisfactory progress against its rural water pricing reform obligations for the 2004 NCP assessment.

Cost recovery in issuing licences for water extraction

Assessment issues: Western Australia is to demonstrate that fees charged for water licences achieve full cost recovery, in accord with the CoAG pricing principles. In previous NCP assessments, the Council found that the state's licence fees were not consistently applied, and reflected historical charges rather than resource management and other licensing costs. For the 2004 NCP assessment, the Council has looked for Western Australia to demonstrate that licence fees for unregulated and groundwater users reflect the cost of resource management and licensing.

Future reform: Signatories to the National Water Initiative are to bring into effect by 2006 consistent approaches to pricing and attributing the costs of water planning and management. This should involve identifying all costs associated with water planning and management, including the proportion of these costs that can be attributed to water access entitlement holders, consistent with the principle of linking charges as closely as possible to the costs of activities or products. Western Australia was not a signatory to the National Water Initiative at the time of the 2004 NCP assessment.

References: 1994 CoAG water reform agreement, clauses 3(a) and (b); 1996 Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) paper; 1998 CoAG pricing guidelines; 1999 tripartite meeting; Intergovernmental Agreement on a National Water Initiative

The Water and Rivers Commission grants licences (water entitlements) to individuals and companies to use water resources. With some minor exceptions, these licences are granted without a charge. Western Australia argues that it is socially equitable and appropriate, given the complexities of charging, to fund the commission from consolidated revenue.² Recurrent expenditure on activities (broadly classified as water resource information, water allocation and state development, protection and conservation, and waterways and catchments) was approximately \$46.5 million in 2002-03.

Western Australia considers that the CoAG water reforms do not require cost recovery for water resource management, only that these costs be transparent. It has argued that transparent reporting of budgeted costs is achieved by the commission publishing budgets in its annual reports (Government of Western Australia 2004).

Western Australia explained that the commission had investigated the possibility of introducing licence fees in two stages: fees would be introduced to cover administrative costs, and then increased to cover all other relevant costs. However, after consulting stakeholders and developing a possible administration fee arrangement during 2003, the government decided not to

² There are some state and Australian Government purpose-funded programs (for example, the Natural Heritage Trust).

introduce licence fees. It decided instead to review the level of commission activity and the strategies for funding the commission's water licensing and compliance functions.

The government considers that it is appropriate to fully fund water resource management from consolidated revenue because major water users already perform significant resource management activity. It has noted that one of the largest and most geographically spread licence holders — the Water Corporation — is required to perform considerable water management activities. These activities include catchment management and the management of commission-vested land on which the Water Corporation has assets, monitoring and metering in catchments and groundwater areas, and the funding of work to investigate new water sources. The government has also advised that the Water Corporation funds a considerable amount of activity and is active in implementing the state Water Strategy — for example, the Water Corporation contributed \$8 million to the development of the Blackwood Groundwater Area Management Plan. Other water service providers and private abstractors who are investigating or developing a resource carry out similar activities.

Discussion and assessment

The 1994 CoAG water reform agreement envisages that governments ensure charges for rural water supply fully cover the cost of supplying water to users. It commits governments to impose charges based on the principle of full cost recovery (including natural resource management costs), with any remaining subsidies being transparent. Work by ARMCANZ in 1996 under the auspices of CoAG, the National Water Initiative and other jurisdictions' approaches to charging confirm this direction.

The 1996 ARMCANZ paper on the allocation and use of groundwater states that the states and territories should identify the full cost of groundwater management (recommendation 9). ARMCANZ classified groundwater management activities as:

- direct management activities — the operation of water allocation regulatory systems (for example, licensing, day-to-day management and administration), as well as metering and water level monitoring that are carried out to directly support management
- indirect management activities — policy making, investigation, assessment, monitoring, maintenance of technical databases, and related activities.

The ARMCANZ paper states that governments should recover the cost of direct management activities from users, and that they should consider (appropriate) apportionment of indirect costs. Any remaining subsidies should be transparent where full cost recovery cannot be achieved. Governments should also consider the consequences of differential pricing for surface water

and groundwater. In line with the ARMCANZ work, CoAG extended elements of the 1994 water reform agreement to apply to the pricing of groundwater (the 1996 water strategic reform framework), although it did not establish this reform as an obligation relevant to recommendations on competition payments.

The 1998 CoAG pricing principles provide further evidence of CoAG's intent that water users face all appropriate costs of using water, including the costs of licensing related activities. They require water businesses to recover the cost of externalities (defined for lower bound cost recovery to be the environmental and natural resource management costs that are attributable to, and incurred by, water businesses). Similarly, the National Water Initiative commits governments to adopt consistent approaches to pricing and attributing the costs of water planning and management. This work should involve the identification of all costs associated with water planning and management, and the identification of the proportion of costs that can be attributed to water access entitlement holders, consistent with the principle of linking charges as closely as possible to the costs of activities or products. (The Council acknowledges, however, that Western Australia had not signed the National Water Initiative at the time of this 2004 NCP assessment.)

Western Australia and the Northern Territory are the only jurisdictions that do not charge for water licences. All other jurisdictions either impose a fee regime linked to the cost of licensing and associated water management activities or are considering the introduction of a cost-reflective charging regime. Although not charging for licences, Western Australia does impose licence conditions that transfer responsibility for some water resource management (and thus some of the associated costs) to licensees. It has reported, for example, that the costs of the Water Corporation's water management activities can be significant (such as the corporation's \$8 million contribution to the Blackwood Groundwater Area Management Plan).

Nevertheless, water users probably face only a small proportion of the costs of water management. Moreover, the ad hoc nature of the current arrangements means it is impossible to determine whether users face appropriate direct and indirect costs as intended by CoAG. (From its investigation of cost-reflective licence fees, Western Australia is likely to have gained some understanding of the nature of its licensing and water management costs, but it did not provide this information to the Council.) A related matter is the Auditor General of Western Australia's criticism of the state's management of its water resources. The Auditor General attributed poor performance to, in part, a decline in (real) funding for core water management operations (see section 5.3).

The Council considers that Western Australia's argument that it has met CoAG requirements by transparently reporting commission costs risks undermining the CoAG objective of achieving an efficient and sustainable water industry. Accordingly, the Council considers that Western Australia has provided inadequate justification in arguing that the complexities of levying an appropriate water resource management charge warrant taxpayer funding of licensing related activities. As noted, most other states are well

advanced in working through these complexities and applying water licence charges that reflect costs consistent with CoAG's intention that water use charges should include appropriate natural resource management costs.

The Council considers that it is appropriate for Western Australia to have additional time to resolve matters relating to charging for licences and associated water management. The signatories to the National Water Initiative have committed to address water management cost recovery by 2006. The 2005 NCP assessment, which CoAG senior officials established as an assessment of compliance against the full 1994 water reform program, should consider Western Australia's progress with attributing licensing related costs to water users.

5.2 Water access entitlements

Assessment issue: Western Australia is to institute a statutory water access entitlement system and support systems for the consumptive use of water, separate from land. The arrangements are to be substantially completed by 2005 for all river systems and groundwater resources covered by Western Australia's 1999 implementation program.

At the time of the 2003 NCP assessment, Western Australia had established a system of water access entitlements separated from land title and specified in volumetric terms. Water licences are issued for between five and 10 years or for an indefinite period, with a presumption that fixed term licences will be renewed. Only a person who owns, occupies or has access to the land on which the water occurs may hold a licence, and then only if they intend to use the water. Licences include a time limit for water entitlements to be used before the entitlement may be forfeited. The then Water and Rivers Commission had the power to issue a direction overriding all other rights recognised by the *Rights in Water and Irrigation Act 1914*. Western Australia had a register of water entitlements, which records third party interests. It had also developed an Internet version of the register, but that was not operational.

For the 2004 NCP assessment, the Council has looked for Western Australia to:

- remove the restriction on who can hold a water licence or demonstrate that it is in the public interest and consistent with 1994 CoAG water reform obligations
- report on the policy for managing unused licensed entitlements and its consistency with 1994 CoAG obligations
- report on any directions issued that override other rights in the Act, and their impact on the security and value of water entitlements
- progress the implementation of the online version of the register of water entitlements.

Western Australia has not signed the National Water Initiative. As a result, the Council considers that Western Australia is not obliged to amend its water licences to specify them as a perpetual share of the available water resource.

References: CoAG water reform agreement, clause 4; 1999 tripartite meeting

Under the Rights in Water and Irrigation Act, water users in proclaimed areas generally require a licence.³ Water licences are separate from land titles, specified in volumetric terms and transferable. The reliability of entitlements is determined in water management plans (see section 5.3). Licences may be issued for between five and 10 years, or for an indefinite period, and there is a presumption that fixed term licences will be renewed if licence conditions are met.

The Act restricts who can hold a water licence. Only a person who owns, occupies or has access to the land on which the water occurs may hold a licence, and then only if they intend to use the water. Licences include a time limit for water entitlements to be used before the entitlement may be forfeited. The Department of Environment (which subsumed the Water and Rivers Commission in July 2004) administers the water licence system. The department may change the conditions of a licence but, under the Act, must ensure changes are made in a fair way that properly considers the needs of all licence holders. Compensation is generally payable only where the impact of a licensing decision is inconsistent with the impact on other water users in the area.

To manage areas of overallocation or water shortages, or areas in which extraction is causing environmental harm, the Act provides for the Department of Environment to issue a direction overriding all other rights recognised by the Act. The department is required to give reasons for a direction, and water users can appeal to a tribunal to ensure their rights are protected. At the time of the 2003 NCP assessment, the former Water and Rivers Commission had issued only one such direction. Issued in 2002, the direction required the Water Corporation to reduce temporarily its extraction from some wells in the south west of the state, where unacceptable environmental impacts would otherwise occur. The commission compensated for the reductions by issuing fixed term nonrenewable licences allowing an increase in extractions from other sources.

The former Water and Rivers Commission released draft policy guidelines in March 2003 on the management of unused licensed water entitlements for public consultation. It also released a discussion paper in March 2003 on the use of its unused allocations (WRC 2003c).

The Rights in Water and Irrigation Act provides for a register of licences and entitlements, which the Department of Environment maintains. Entitlement holders can register third party interests, including the interests of financial institutions. The register is accessible to the public at the department's

³ The Act provides for any watercourse, wetland or groundwater area to be proclaimed for the purpose of sustainable management. Licences are not required for riparian water rights and rights to take surface water and water from non-artesian wells for stock or domestic purposes. Areas of minor resource allocation and use (where allocations are less than 30 per cent of sustainable yield) are generally not proclaimed or subject to licensing requirements. Nearly all groundwater and some surface water areas have been proclaimed.

offices. At the time of the 2003 NCP assessment, Western Australia had developed an Internet version of the register, but that was not operational.

Reform progress

In 2003-04 the Department of Environment did not issue any directions overriding other rights under the Rights in Water and Irrigation Act.

In September 2003 in a performance report that included the management of the state's water resources, the Auditor General for Western Australia found that the Water and Rivers Commission was falling behind in its processing of water licences (AGWA 2003). The average waiting time for a licence was three months, with some taking more than nine months. At June 2003 over 1000 new applications were waiting to be processed. The Auditor General also found that only 11 per cent of the state's 25 650 water licences had been checked for compliance and that thousands of licences were renewed after only minimal assessment. Western Australia is reviewing options to reduce delays in the processing of licence applications and to increase compliance inspections. (The Auditor General's broader findings on water resource management, along with the government's response, are considered in section 5.3.)

In November 2003 the former Water and Rivers Commission finalised policy guidelines on the management of unused entitlements (WRC 2003b). The intent of the policy is to ensure water resources are allocated and used effectively by minimising unused licensed entitlements, ensuring licensed entitlements are fully used for the benefit of the licence holder and the state, reducing speculation in the granting of water entitlements, and ensuring decisions on managing and recouping unused entitlements are fair and equitable among existing and potential water users. The policy applies to all licences granted under the Rights in Water and Irrigation Act to take water; it does not apply to water entitlements that have been purchased (via trading) or to unused entitlements resulting from improvements in water use efficiency, meaning the department does not reclaim such unused entitlements.

Under the policy, before granting a licence, the department considers several criteria, including the applicant's ability to use the water entitlement within a reasonable and agreed timeframe. For new developments (or extensions to existing developments) licences granted by the department include a condition requiring the licensee to implement the development and use all of the water within a prescribed timeframe. The department audits compliance with the licence conditions over time, including differences between the licensed entitlement and the volume of water used. Where the department establishes that the water entitlements are consistently not being fully used, it negotiates with the licensee on its short and long term water requirements. The department may recoup (and re-issue or retire) the unused water entitlements if it is not satisfied that a licensee continues to require all of its entitlements. In making a decision, the department accounts for extenuating

circumstances (such as sudden market changes and where a licence holder paid a premium for the water entitlements when purchasing a property in a fully allocated area). The department's level of management of unused entitlements reflects the extent to which available water is allocated, with fully allocated areas subject to more active management.

In December 2003 the former Water and Rivers Commission published a 'situation statement' outlining proposed reservations of water resources for future public drinking water supplies for the state, based on projected population growth and groundwater demand. The commission placed a high priority on the availability and protection of groundwater resources suitable for public drinking water supplies. Its statement is intended to provide the background for water supply planning for at least the next three decades. The department is still to finalise its policy position on the reservation and protection of water resources for future use in Western Australia, following the release of a discussion paper in March 2003. The discussion paper indicated that Western Australia is considering the feasibility of issuing licences for a finite period to permit short to medium term access to water resources that are reserved for future town supply.

Before commencing the Internet version of its register of water licences and entitlements, the department is undertaking a data cleansing project. It expects to complete the project and make its register available online during 2004.

The Rights in Water and Irrigation Act is scheduled for review in 2005. Western Australia has commenced preliminary discussions with selected stakeholder groups, to identify areas for reform. Western Australia has advised that particular issues identified include strengthening the register and establishing the conditions under which entitlements may become permanent.

Discussion and assessment

In previous NCP assessments, the Council found that Western Australia's Rights in Water and Irrigation Act establishes a comprehensive system of water entitlements that are separated from land title, specified in volumetric terms and tradable, consistent with the obligation in the 1994 CoAG water reform agreement.⁴ Under the Act, Western Australia maintains a publicly accessible register of water licences and entitlements, which includes provision for registering third party interests. It expects soon to provide online access to the register.

⁴ Western Australia's arrangements, which do not provide for perpetual access entitlements (specified as shares of water available for consumption), will be inconsistent, however, with those of governments that have signed the National Water Initiative.

Western Australia retains a restriction on who can hold a water licence — specifically, the holder must own, occupy or have access to the land on which the water occurs, and intend to use the water. The Rights in Water and Irrigation Act requires the part of the Act that includes this restriction to be reviewed in 2005. Because the water entitlement is separate from land title, removal of this remaining link between water entitlements and land is arguably not required under the water entitlement provisions of the 1994 CoAG water reform agreement. The restriction may, however, constrain water trading (see section 5.4).

The power of the Department of Environment to issue a direction overriding all other rights recognised by the Rights in Water and Irrigation Act reduces the security of water entitlements and may have an impact on their value. Western Australia previously advised that the power is intended to enable the department to manage water resources where immediate action is necessary and that it is likely to be applied only temporarily and in extreme circumstances. In practice, the department does not appear to have used the power in a manner that would significantly influence the value of water entitlements. The department's predecessor issued only one such direction, to prevent unacceptable environmental impacts. Moreover, in that case, it compensated for the direction by allowing an increase in extractions from other water sources. The requirement that the department disclose its reasons for a direction, along with the ability of water users to appeal to a tribunal, helps minimise the risk for water entitlement holders.

The state's policy guidelines on the management of unused entitlements also potentially undermine the security of water entitlements by enabling the Department of Environment to reclaim unused entitlements. The impact of the policy on water entitlement security is lessened, however, by several factors, including that:

- the policy does not apply to entitlements that have been purchased (via trading) or to unused entitlements resulting from improvements in water use efficiency
- for new developments, the department includes a condition in the licences that makes clear that some or all of the water entitlements may be recouped if not used within a prescribed timeframe — given that Western Australia grants the entitlements rather than charges for them, this condition appears to be a necessary part of the system for new developments
- the department accounts for extenuating circumstances, including cases where a licence holder paid a premium for the water entitlements when purchasing a property in a fully allocated area
- a decision by the department to recoup unused entitlements is subject to appeal.

The effect of the policy guidelines on water trading is discussed in section 5.4.

While some aspects of Western Australia's water entitlement arrangements could be improved, to increase the security of entitlements, the Council considers that Western Australia has made satisfactory progress against its 1994 CoAG obligations for the 2004 NCP assessment. The Council notes Western Australia's scheduled review of the Rights in Water and Irrigation Act.

5.3 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). Western Australia elected not to sign the National Water Initiative, which complements and extends the 1994 CoAG water reform agreement.

At the time of the 2003 NCP assessment, Western Australia's water planning process was on track against the revised implementation program agreed in the 2002 NCP assessment. For the 2004 NCP assessment, the Council has asked Western Australia to update its progress and provide a representative sample of water management plans (including plans for fully allocated systems) to demonstrate that Western Australia is satisfactorily addressing CoAG obligations on allocating water among consumptive and environmental uses.

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

Western Australia derives most of its water supply from groundwater. Its approach to allocating water to the environment (formalised in the Rights in Water and Irrigation Act) is delivered via a tiered system of statutory water management plans (regional, subregional and local).⁵ Plans are developed

⁵ If the use of overland flow causes a reduction in the flow of a watercourse or has a significant effect on the quality of the water that an ecosystem receives, these flows can be managed under local by-laws.

through a consultative process and set out the basis for allocating water, setting environmental flows and adjusting allocations. Each plan includes arrangements for ongoing monitoring and review. Water management plans continue indefinitely, with review every seven years (or later if water use has not increased).

The subregional (or local) plans define environmental water requirements (the water regime required to maintain ecological values at a low level of risk) and environmental water provisions (the water reserved for the environment). Environmental water provisions may be set as notional or interim allocation limits, or as formal assignments if the water resource is highly or fully committed. Where stakeholders accept some ecological impact, the environmental water provisions may be less than environmental water requirements.

The Environmental Protection Authority has an ongoing role in assessing the adequacy of environmental water requirements and environmental water provisions set in the plans. The state groundwater environmental protection policy and other similar policies provide for the statutory identification and priority management of 'critical areas' through regulations and other subordinate legislation. These areas may include those in which the environmental provisions are not being attained or those that the Environmental Protection Authority considers to be 'stressed'.

The Rights in Water and Irrigation Act provides for the establishment of water resource management committees, including community and stakeholder representatives. The Department of Environment also consults the public as a normal part of its planning processes for establishing and reviewing water management plans. Its processes for significant plans include a formal public review.

Western Australia nominated 77 water sources (40 river basins and 37 groundwater management areas) under its 1999 implementation program. None of the 40 river systems was identified as stressed or overallocated. Under its revised implementation program, agreed in the 2002 NCP assessment, Western Australia scheduled 37 water management plans covering most of the groundwater resources and main irrigation rivers covered by its original 1999 implementation program plus some new systems that had been identified as fully allocated or overallocated.

At the time of the 2003 NCP assessment, Western Australia advised that its planning processes (including reviews of existing plans) were on track for completion by 2005. It had completed ten plans and identified a further nine low priority systems for which it proposed no further action.

Reform progress

Western Australia completed only one plan in 2003-04 covering the lower Gascoyne River — the Carnarvon local plan — bringing the number of completed plans to 11. The Council has considered this plan in the 2004 NCP assessment (see pp. 5.22–26).

During 2003-04 Western Australia again revised its water planning priorities (table 5.1). Under the revised timetable, there are seven water allocation plans and reviews scheduled for completion in 2005. The bulk of the remaining 15 plans are scheduled for completion during the following two years (including the four added to the program since 2002-03). Among the plans Western Australia expects to complete in 2005 are its s46 reviews of the Gnangara and Jandakot mounds (the latter was reassessed from low priority status during 2003-04). Western Australia's progress with these reviews is discussed below (see pp. 5.26–27).

Table 5.1: Status of water planning in Western Australia, as at May 2004

<i>Plan</i>	<i>Current status</i>
Albany local ^a	Strategy completed in 2001-02. Second review scheduled for 2009-10.
Arrowsmith subregional	Completed in 2001-02. Second review scheduled for 2009-10.
Blackwood subregional groundwater ^b	Interim ecological water requirements developed. Interim allocation management strategy scheduled for June 2005 and final plan scheduled for October 2007.
Bolgart groundwater management review	Low priority, no further action proposed.
Bremer Bay groundwater protection	Low priority, no further action proposed.
Bremer Bay local ^a	Low priority, no further action proposed.
Broome subregional	Scheduled for review in 2004-05.
Bunbury subregional	Incorporated into Busselton–Capel subregional review.
Busselton–Capel subregional groundwater	Review commenced. Scheduled for completion in 2006-07.
Canning River interim local ^c	Monitoring indicates system is exhibiting stress. Interim management strategy being developed.
Cape-to-Cape (Vasse) surface water subregional	Incorporated Busselton–Capel subregional review.
Carnarvon local ^a	Completed in 2003-04.
Cockburn subregional ^a	Completed in 2001-02. Second review scheduled for 2009-10. Sub-area allocation limit and boundary review in process, due for completion in June 2004.

(continued)

Table 5.1 continued

<i>Plan</i>	<i>Current status</i>
Collie Water Resource Management Strategy ^a	Draft surface water plan completed in 2003. Final plan scheduled for completion in 2004-05. Groundwater environmental water provision to be determined in 2006-07 and plan to be made in 2007-08.
Derby local	Review scheduled for 2004-05.
Esperance local ^a	Completed in 2001-02. Second review scheduled to occur by 2009-10.
Exmouth local	Review scheduled for 2006-07.
Gascoyne Junction interim local	Low priority, no further action proposed.
Gingin subregional	Completed in 2001-02. Second review scheduled to occur by 2009-10
Gnangara groundwater review ^a	Review (under s46 of the Environmental Protection Act) scheduled for completion by June 2005. Review will be incorporated in the Perth–Gingin subregional plan.
Goldfields regional	Low priority, no further action proposed.
Harvey basin regional	Completed in 1999. Plan operating well. Second review deferred until 2009-10.
Jandakot groundwater review ^a	Reassessed from low priority. Review (under s46 of the Environmental Protection Act) scheduled for completion by June 2005.
Jurien subregional	Completed in 2001-02. Second review scheduled to occur by 2009-10.
Kemerton local	Completed in 2001-02. Second review scheduled to occur by 2009-10.
Kimberley regional	Low priority, no further action proposed.
La Grange subregional	To be incorporated in Kimberley plan for which no further action is proposed.
Marbellup interim local	Completed in 2001-02. Second review scheduled to occur by 2009-10
Murray subregional	Low priority, no further action proposed.
Murray surface water	Review scheduled for 2005-06.
Ord River	Draft plan completed in 2001-02. Final plan rescheduled for completion in June 2005.
Perth Northwest Corridor groundwater management	To be incorporated in the Perth–Gingin subregional plan. Draft plan scheduled for 2006-07.
Perth–Bunbury regional ^a	Review scheduled for 2004-05. The need to progress this plan is being reviewed in light of the other priorities.
Perth–Gingin subregional ^{a,c}	Draft plan scheduled for 2006-07.
Pilbara regional	Issue scoping, initial cultural values assessment completed. Plan intended to deal with increased stress from mining activity. Strategy to be completed in 2004-05.

(continued)

Table 5.1 continued

<i>Plan</i>	<i>Current status</i>
Rockingham–Stake Hill subregional	Completed in 2001-02. Second review scheduled to occur by 2008-09.
Rottneest groundwater management review	Low priority, no further action proposed.
South West Coastal groundwater management review	To be incorporated in the Kemerton plan.
Swan subregional ^a	To be incorporated in the Perth–Gingin subregional plan.
Wanneroo local ^a	To be incorporated in the Perth–Gingin subregional plan. Draft plan scheduled for completion in 2006-07.
Whicher regional (Busselton Coast–lower Blackwood groundwater and surface water) ^b	Due to other priorities, preparation of plan deferred until 2005-06.

^a The Auditor General has identified that licensed water use in parts of these groundwater management areas exceeded the estimated sustainable limits. ^b Added to the program in 2002-03. ^c Added to the program in 2003-04.

Sources: Government of Western Australia 2002, 2003, 2004

In 2003 the Office of the Auditor General for Western Australia reviewed the state's water planning processes. It found deficiencies in the former Water and Rivers Commission's processes, record keeping, compliance monitoring and resourcing (AGWA 2003). The audit revealed, for example, that the commission did not have the information needed to accurately determine the sustainable level of groundwater and surface water use in many areas. The audit identified that licensed water use in parts of 13 of the state's 44 groundwater management areas exceeded the estimated sustainable limit. (Most of these groundwater areas are included under Western Australia's implementation program.) Moreover, the commission had prepared a detailed environmental assessment for only three of these areas.⁶ The audit also found that the commission had progressively wound back its monitoring program and that only about 11 per cent of all water licences have ever been checked for compliance. It noted that the commission had lost all of the last 25 appeals against its decisions to refuse further water allocations with the Appeals Tribunal often finding that the commission's decisions lacked scientific rigour.

The Auditor General considered that a number of factors seriously affected the former Water and Rivers Commission's capacity to manage the state's water resources, including:

- a doubling in demand for water over the previous 15 years
- a 33 per cent decline in funding (in real terms) since 1998 for the core water resource management operations of investigation, assessment, planning, licensing and regulation

⁶ Since publication of the Auditor General's report the former Water and Rivers Commission has completed another water management plan.

- amendments in 2001 to the Rights in Water and Irrigation Act, which considerably increased the commission's workload by requiring more rigorous environmental assessment and greater community consultation.

The commission has acknowledged that management of the state's water resources deteriorated in the five to six years to 2003. It noted that it is investigating specific solutions and is adopting the Auditor General's recommendation to take a strategic approach to addressing the identified problems. As discussed the former Water and Rivers Commission has reviewed the state's water planning priorities. It has also been progressively reviewing allocation limits using the most up to date information to ensure the limits set take account of appropriate environmental water provisions (Government of Western Australia 2004).

In addition, the State Government has amalgamated its water resource management and environmental protection functions through the creation of the Department of Environment (which subsumed the Water and Rivers Commission). It has also introduced the Water Resources Management (Administration) Bill 2003 into Parliament, in which the government proposes to establish a water resources council (with expertise in water resources management, conservation, economic development, community development and natural resources law) to advise the department and the Minister for the Environment on water resources management, including its funding and effectiveness. The water resources council will be assisted by regional- and/or local-level advisory committees.

The Carnarvon local plan

The lower Gascoyne River drains the Gascoyne River basin and enters the Indian Ocean at Carnarvon, 980 kilometres north of Perth. The Gascoyne River is an intermittent stream that has been dry for twice the time it has been flowing since records commenced in 1957. Its mean annual flow duration is 110 days and usually flows occur within a two year period, although periods in excess of two years between flows have been recorded.

The alluvial plain of the lower Gascoyne River contains two aquifer systems. The riverbed sand aquifer is the closest to the surface. It is located between the banks of the river and varies in width between 100 and 1200 metres. The water contained in this aquifer is predominantly fresh (less than 500 milligrams of total dissolved solids per litre) and of recent age. The older alluvium aquifer occurs under the riverbed sand aquifer and extends for a further distance from the river. Salinity values vary substantially across the aquifer, from 500 to 6000 milligrams of total dissolved solids per litre, with water quality declining and becoming brackish with increasing distance from the river. The two aquifers are hydraulically connected and receive recharge from the lower Gascoyne River when it flows.

Given the unpredictability of surface water supplies, the Carnarvon district relies on groundwater for irrigation, stock and domestic and town water services. Thus water management involves managing groundwater reserves.

The former Water and Rivers Commission subdivided the groundwater reserves of the lower Gascoyne River into 12 basins. Licensed private users may extract water from basin A only. The licences provide for unrestricted access to the groundwater, and to surface water during times of river flow. When there is no river flow, private users are restricted to a set groundwater entitlement. The commission reserved basins B–L for the exclusive use of the Water Corporation for supplying irrigation and town water. It did not restrict the source from which groundwater may be extracted, although most of the town water is supplied from the older alluvium aquifer.

The sustainable yield of the two aquifers is 18 000 megalitres a year (WRC 2004). Current annual licences provide for 19 100 megalitres a year to be extracted from basins A–L — 15 500 for irrigation and 1800 megalitres for town supply plus a reserve of 1800 megalitres for future use. While this allocation exceeds the estimated sustainable yield, only about 8000 megalitres a year is used on average. Moreover, the results of hydrological modelling indicate that an excess drawdown of the groundwater probably would not cause permanent problems because the aquifers are quick to recharge during flood events. Prolonged extraction during periods of no surface flow, however, could result in lateral movement of salt within the system and elevate salinity levels in the groundwater reserves.

Specialist consultant SMEC determined the ecological water requirements for the groundwater reserves of the lower Gascoyne River. SMEC identified Chinaman's Pool, Rocky Pool and the temporary pools along the river bed as groundwater dependent ecosystems of high ecological value (given their unique ecology) and high social value (given their recreational and aesthetic importance to the Carnarvon community) (WRC 2004). It also found that the riverbank vegetation — in particular, the river red gum trees (*Eucalyptus camaldulensis*) — depend on groundwater.

SMEC did not assign an environmental water requirement for the pools because it lacked sufficient data on their ecology and the water requirements of aquatic communities within them. It did, however, state that these pools are highly groundwater dependent and that groundwater extraction could affect the health of aquatic flora and fauna. SMEC recommended that the Water and Rivers Commission conduct flora and fauna surveys to determine the environmental water requirements for these ecosystems as a part of the planning process.

SMEC estimated that the riparian vegetation (river red gums) needs about 4250 megalitres a year to maintain optimum health, although about 1600 megalitres a year would be sufficient to sustain life during drought. It noted that the river red gums typically draw water from 5 metres below the surface, but can adapt to declining groundwater levels by increasing root growth (which occurs at a maximum rate of 0.5 millimetres a day). During

times of prolonged drought, therefore, the trees could draw water from as far as 20 metres below the surface.

On 1 January 2004 Western Australia implemented the groundwater management strategy for the lower Gascoyne River (WRC 2004). The strategy applies to the groundwater reserves in the Carnarvon area. It aims to allocate the groundwater resources in an equitable and sustainable manner for the long term benefit of the Carnarvon community taking into consideration the inherent social, economic and environmental impacts of using groundwater. The commission developed the strategy in consultation with the community, with assistance from the Carnarvon Water Allocation Advisory Committee. The committee comprised representatives from the former Water and Rivers Commission (chair), growers, the Department of Indigenous Affairs, the Shire of Carnarvon, the Carnarvon Land Conservation District Committee and the Water Corporation. The commission also released a draft report and sought public submissions in finalising the strategy. The Department of Environment, in consultation, will review the strategy in its seventh year of operation.

The strategy provides for a reduction in the water allocated to consumptive uses to meet sustainable yields. Total allocation under the strategy will be 18 000 megalitres a year, with 14 400 megalitres (10 400 megalitres from basins B–L) a year for irrigation, 1800 megalitres a year for town water supply and 1800 megalitres a year reserved for future town water supply. Under specified drought conditions, provisions in the strategy permit a temporary increase in the allocation of irrigation water from basins B–L to cater to growers' demands. It also sets out some additional water quality and ecology provisions that require water users to:

- cease to extract when salinity in a bore exceeds 1000 milligrams total dissolved solids per litre
- restrict abstraction of basin A groundwater to 10 megalitres a month for any one property
- place all new wells in the older alluvium aquifer only
- institute a 500-metre buffer zone for the placement of bores from the river bank for a distance of 2 kilometres downstream of Rocky Pool
- draw down aquifer water levels in basins B–L to no more than the levels experienced during the 18-month no-flow period in 1994
- in any extended drawdown in basins B–L not exceed the rate of 5 millimetres a day (to protect river red gums).

The strategy states that groundwater extraction is likely to have little impact on groundwater dependent ecosystems because the condition of the pools is more affected by extended periods of no flow and associated increases in salinity than by groundwater extraction. While it has provided no specific supporting evidence, Western Australia advised that historical pumping

regimes in the Carnarvon local area have not affected the identified groundwater dependent ecosystems (in particular Rocky Pool and the riparian vegetation). It further advised that Chinaman's Pool is in the tidal influence and is not impacted by groundwater pumping in the area due to marginal water quality. The strategy contains provisions for monitoring salinity, water levels and river red gum health. It does not, however, indicate whether the government has adopted SMEC's recommendation to conduct flora and fauna surveys to determine the environmental water requirements for Chinaman's Pool and Rocky Pool.

The strategy makes the Water and Rivers Commission (now the Department of Environment) responsible for coordinating the monitoring programs and reporting on outcomes. The strategy includes an adaptive management approach, and the foreshadowed review of the strategy must take account of the monitoring results.

Best available science

The former Water and Rivers Commission conducted hydrological investigations and developed the Gascoyne River floodplain aquifer model, basing its approach on the internationally accepted MODFLOW groundwater model. The commission adapted this model to determine sustainable yields and recharge values for the Carnarvon aquifers. The commission did not, however, provide information on data quality or the confidence limits attached to the estimates of recharge.

The specialist consultant, SMEC, based its environmental water requirement assessments on a single site visit. It relied predominantly on existing literature for descriptions of the ecology and for an assessment of the extent to which the ecology is groundwater dependent. SMEC did not use a recognised environmental water requirement method or a holistic or multidisciplinary approach. It did, however, adopt a precautionary approach and include recommendations for further monitoring and investigation to determine more accurate environmental water requirements. Although no formal independent peer review was undertaken, Western Australia has advised that ecological experts within the Department of Environment reviewed the SMEC work.

Balancing economic, environmental and other interests

The strategy contains provisions aimed at ensuring the health of the water resource and identified dependent ecosystems. The provisions aim to prevent the lateral movement of salt through the system, protecting the ecosystems that depend on groundwater resources and the associated recreational values. The strategy does not, however, adopt all of the recommendations of the ecological investigation. It addresses the requirements of the river red gum communities and provides a buffer zone to afford protection to Rocky Pool. While the strategy makes clear that the provisions can be changed over time

in response to improved information, it includes no explicit proposal to investigate the water requirements of the pools' flora and fauna.

The strategy re-allocates currently unused licensed water allocations from irrigators to the environment. This re-allocation was determined through a consultative process in a manner that ensures water use does not exceed the estimated sustainable yield of 18 000 megalitres a year, but can cater to future demand for irrigation and drinking water. While the strategy includes provisions to meet the identified needs of groundwater dependent ecosystems, the available information does not make clear whether the strategy adequately caters for the pool ecosystems. Western Australia has advised that the management regime is based on observed historical trends and that identified groundwater dependent ecosystems have not been affected by the historical pumping regimes in the area.

Monitoring and adaptive management

The strategy contains a monitoring program to assess the effects of groundwater extraction on salinity and river red gum health, which is tied to an adaptive management system. In reviewing the strategy the Department of Environment must take account of the monitoring results.

Western Australia has advised that it compares trends in water use against historic water use data. It explained that it takes a precautionary approach aimed at ensuring that use in excess of historic levels is not at a level that will have an adverse impact on ecosystems. The strategy, however, does not provide a means for addressing the data gaps identified by SMEC's investigation of Chinaman's Pool and Rocky Pool. While SMEC's data were limited, it identified these two habitats as being groundwater dependent and potentially at risk from extraction practices.

Stakeholder consultation and transparent processes

The development of the strategy involved extensive stakeholder consultation. The Carnarvon Water Allocation Advisory Committee was broadly representative of relevant economic, social and environmental interests. However, some aspects of the Carnarvon plan lack transparency. The plan does not, for example, demonstrate an intention to monitor the health of the pools or conduct research to determine appropriate environmental water requirements.

Jandakot and Gnangara mounds

As indicated in table 5.1 the Department of Environment is conducting a review (under s46 of the *Environmental Protection Act 1986*) of the environmental conditions applying to the Jandakot and Gnangara mounds. In 2001 the former Water and Rivers Commission initiated the review because it

had consistently been unable to fully comply with environmental conditions relating to groundwater abstraction at the mounds.⁷ Through the review process the department is investigating the effects of groundwater level changes to the mounds. Based on its findings it will develop strategies to better manage the mounds (including recommendations for changes to the environmental conditions where this is appropriate).

The department is conducting the s46 review in two stages. In the first stage it is focusing on short term strategies for managing water over the summer for the critical areas where noncompliance with the environmental conditions has occurred. It had scheduled the first stage of the review to be completed in 2003, but subsequently extended this timeline to late 2004. At the second stage of the review the department will develop long term management strategies for sustainable water use at the mounds.

The former Water and Rivers Commission has used existing and new environmental studies, supplemented with hydrological investigations and groundwater modelling to ascertain the condition of wetlands (connected to the mounds). At the request of the Environmental Protection Authority, the commission appointed a Peer Review Group (consisting of experts in the fields of land management, wetland ecology and groundwater modelling) to independently review these scientific investigations.

The Peer Review Group reiterated the findings of Balla (1994) that the wetlands on the Swan Coastal Plain are significant ecological and social assets, especially given that over 80 per cent of the wetlands in the Perth region have been lost. The group reported that there is considerable evidence of severe stress and loss of wetlands, especially on the Gnangara Mound (WRC 2003a). It considered that groundwater extraction should be reduced in many areas of both mounds to help redress the environmental damage. Further, the group considered that the current environmental conditions applying to the aquifers are reasonable and should not be reduced.

The Environmental Protection Authority is concerned about the poor condition of the mounds and the delays in addressing this matter. In its most recent advice to the Minister for the Environment, the Environmental Protection Authority stated that the sustainable limits for groundwater abstraction from the mounds need to be urgently reviewed and revised (EPA 2004a, 2000b). It considered that deferring action is no longer legally or environmentally acceptable. Further, it recommended that the department submit a detailed timetable for completion of the s46 review, to be agreed with the Minister as soon as possible.

⁷ The conditions (which have been in place since 1992 and 1999 respectively) require the department to maintain water levels above a specified minimum. This aims to provide sufficient water to sustain the important groundwater dependent ecosystems in the areas, such as wetlands and terrestrial vegetation.

Discussion and assessment

Western Australia's current program covers 41 water planning areas. It has water management plans in place for around a quarter of these areas and expects to complete plans for another 22 areas in 2005 or soon after. Its program identifies eight low priority areas where the water systems are not in danger of becoming overallocated or stressed. For these areas Western Australia does not propose to prepare water management plans. If Western Australia meets its current water planning timetable it will complete around two-thirds of its scheduled water plans by 2005.

Western Australia's performance to date, however, raises doubt as to whether it can meet its CoAG water planning obligations within a reasonable time. Western Australia has had to realign its planning priorities twice to consolidate its planning program and extend the completion timelines. Despite this effort, problems with delays continue to occur. In relation to the s46 review, for example, even though there is evidence that the Gnamangara and Jandakot mounds are under stress the Department of Environment has delayed completing its review to the point where the Environmental Protection Authority has had to make recommendations to the Minister for the Environment seeking urgent action. The 2003 Auditor General's report also questioned whether Western Australia devotes sufficient resources to enable it to properly meet its water planning responsibilities.

In addition, the environmental assessment underpinning the Carnarvon local plan did not use a recognised environmental water assessment method, a holistic method or a multidisciplinary approach. This raises questions about whether Western Australia has relied upon the best available science in determining the environmental water requirements for the lower Gascoyne River. Moreover, its environmental water assessment identified data gaps and made recommendations for research into the environmental requirements of the ecosystems identified as highly groundwater dependent and of significant value. The government did not adopt these recommendations or explain why it failed to adopt them.

Western Australia is, however, addressing some of the deficiencies in its water planning processes. Apart from reviewing its planning priorities Western Australia is progressively reviewing allocation limits to ensure they account for environmental water requirements. It has amalgamated its water resource management and environmental protection functions in the Department of Environment, which may help to address some of the identified funding problems. It also intends to establish a water resources council to provide advice on water resources management, including its funding and effectiveness.

The recent changes aimed at improving the state's water planning processes suggest that Western Australia is committed to completing allocations for the systems on its 1999 implementation program by 2005 or soon after. The Council therefore considers that Western Australia has made satisfactory progress for the 2004 NCP assessment. The evidence of deficiencies in the

state's water planning processes indicates, however, that Western Australia has some work to do during 2004-05 to improve its processes. For the 2005 NCP assessment, Western Australia should show that it is determining environmental water requirements (including any assessments undertaken for the review of the arrangements for the Jandakot and Gnangara mounds) on the basis of the best available science. It should look to develop water management plans that are transparent and provide supporting evidence for the decisions on allocations, including robust socioeconomic evidence to explain any trade-offs accepted between environmental and human uses. Western Australia should also demonstrate that it has progressed its water planning consistent with the timeframe that it provided for this 2004 NCP assessment. Under this timetable Western Australia committed to substantially complete its water planning program by the end of 2005.

5.4 Water trading

Assessment issue: Trading arrangements in water allocations or entitlements are to be instituted to maximise water's contribution to national income and welfare, within the social, physical and ecological constraints of catchments. Any restrictions on trading need to be shown to be in the public interest. CoAG senior officials asked the Council to assess governments' progress with developing intrastate trading arrangements in 2003 and interstate arrangements in 2004. Trading arrangements are to be substantially implemented by 2005.

In the 2003 NCP assessment, which considered intrastate trade, the Council found that Western Australia had established a framework for the transfer of water entitlements, but that trading was still in its early stages. The Council identified constraints on trade, including:

- provision for local by-laws to prohibit trades
- restrictions on who can hold a water licence (that is, only a person who owns, occupies or has access to the land on which the water occurs, and then only if they intend to use the water)
- the Department of Environment's power to reclaim, and not approve trade in, water entitlements that have not been used.

Western Australia is also developing water management plans, which may contain trading rules.

Interstate trade involving Western Australia will be possible only if stage 2 of the Ord Irrigation Project proceeds. In the 2001 NCP assessment, the Council noted that the Northern Territory had agreed in principle for Western Australia's water trading arrangements to apply throughout the territory sector of stage 2 of the project.

Western Australia needs to remove constraints on water trading or demonstrate that they are in the public interest. It also needs to ensure the trading rules in water management plans facilitate trading where this is socially, physically and environmentally sustainable.

References: CoAG water reform agreement, clause 5; 1999 tripartite meeting

Western Australia established provisions for water trading through amendments to the Rights in Water and Irrigation Act in 2001. Interstate trade involving Western Australia (with the Northern Territory) will be

possible only if the state proceeds with stage 2 of the Ord Irrigation Project. In the 2001 NCP assessment, the Council noted that the Northern Territory had agreed in principle for Western Australia's water trading arrangements to apply throughout the territory sector of stage 2 of the project.

The regulation of intrastate trading

The Rights in Water and Irrigation Act permits a licence holder to transfer all or part of their water entitlements to another party entitled to own a licence.⁸ Trades may be permanent or temporary, and require the approval of the Department of Environment. The department may not approve a trade without the written permission of a party with a registered interest in the entitlement.

Under the Act and the statewide policy on transferable water entitlements issued in 2001 (WRC 2001):

- trades must be consistent with an approved water management plan or, if there is no plan, with the department's policy or guidelines
- the department may refuse trades to:
 - protect the environment and other users from damage
 - ensure outcomes continue to be beneficial to the state
 - prevent non-efficient uses and monopolies in water
 - meet policy objectives
 - encourage or preserve complementarity and diversity (in the market)
 - preserve the trading market from distortion
- the department actively discourages speculation in the market
- a decision by the department not to approve a trade is subject to appeal to a tribunal.

To supplement the Act and the statewide policy, in February 2003 the then Water and Rivers Commission released an interim subpolicy to guide the operational management of trading (WRC 2003d). The subpolicy sets out the resource management process to be undertaken as the level of water use in an area approaches the sustainable limit, in preparation for the commencement of trading in that area. The initial stages of the process (for example, the determination of environmental water provisions and the review of

⁸ Riparian right allocations, stock and domestic rights and environmental water provisions are not tradable.

sustainable limits) are typically completed through subregional or local area water management planning. The Department of Environment subsequently identifies, recoups and re-allocates unused entitlements. Where the resource management process has not been completed, or the water resources are highly or fully allocated, trading applications must be supported by the relevant regional manager and the managers of various branches of the department (hydrology and water resources, catchments and waterways, and resource allocation). The managers are required to consider a range of matters, including whether the trade is likely to have adverse environmental, social and economic impacts.

To limit the scope for speculation in the water market, the Act contains constraints on water trading, including provisions for:

- local by-laws to prohibit trades
- restrictions on who can hold a water licence (that is, only a person who owns, occupies or has access to the land on which the water occurs, and then only if they intend to use the water)⁹
- the Department of Environment to vary a water licence if the licence holder has not consistently used their entitlements (this provision underpins Western Australia's policy that the department can reclaim, and not approve trade in, water entitlements that have not been used).

The Act also contains, however, a provision for making local by-laws to enable a person other than whoever owns, occupies or has access to the land to hold a licence.

As noted in section 5.2, the department is investigating more efficient use of its unused allocations, including the feasibility of issuing short to medium term licences to permit access to water reserved for future town supply. A discussion paper released in March 2003 (WRC 2003c) acknowledged that the impact of such a change on trading would need to be considered (including whether and how to charge for temporary access to unused allocations).

While regional management plans are high level and usually make little reference to trading issues, subregional and local area water management plans may include trading provisions. The plans are required to be compatible with the statewide trading policy or to address potential conflicts or limitations. Some entitlements may not be tradable, as a result of water resource management constraints identified in the plans. (Western Australia's progress in developing water management plans is discussed in section 5.3.) The groundwater management strategy for the Carnarvon region (finalised in January 2004), for example, reiterates the trading requirements of the Act and the statewide policy. It also includes local trading rules aimed

⁹ Special provisions apply when a person who is not eligible to hold a licence is buying property and wants to make prior arrangements to purchase an entitlement. In these circumstances, the department may give an undertaking that it will approve the trade once the property purchase is finalised.

at avoiding adverse impacts on the environment, water quality and other water users. The local trading rules include measures to manage salinity impacts, for example, by not permitting transfers to areas sensitive to increases in salinity.

Recent trading activity

In many parts of Western Australia, water resources are not fully allocated and the demand for trading is low. The only significant area for trading in surface water is the South West Irrigation Management Scheme. Most trades are temporary transfers. In 2002-03 temporary transfers within the scheme amounted to around 10.9 gegalitres (7 per cent of licensed entitlements), permanent transfers were less than 0.2 gegalitres (significantly less than 1 per cent), and around 3 gegalitres (2 per cent) were transferred with property sales. There is also some trading in groundwater. In the 10 months to May 2003, groundwater trading consisted of 1.7 gegalitres in temporary transfers, 0.06 gegalitres in permanent transfers and 15.5 gegalitres transferred with property sales.

It is not compulsory for applicants to provide details of the price of water trades, so such information is limited. In the 2003 NCP assessment, Western Australia provided a few examples of groundwater trades, for which prices ranged from around \$500 a megalitre in the Wanneroo area to \$1300 a megalitre in the Busselton–Capel area, for permanent trades of around 30 megalitres.

For groundwater trading applications, Western Australia provided information indicating that the approval process ranged from a few days to 10 months. Trades were generally approved within two months.

Reform progress

The Council noted the following developments of relevance to water trading in section 5.2:

- In November 2003 the former Water and Rivers Commission finalised policy guidelines on the management of unused entitlements (WRC 2003b). Under the policy, the Department of Environment may recoup (and re-issue or retire) unused water entitlements if it is not satisfied that a licensee continues to require all of its entitlements. It may not approve trade in unused entitlements. The policy does not apply, however, to water entitlements that have been purchased (via trading) or unused entitlements resulting from improvements in water use efficiency. In making a decision, the department accounts for extenuating circumstances (such as sudden market changes and where a licence holder paid a premium for the water entitlements when purchasing a property in a fully allocated area).

- The department is still to finalise its policy position on the reservation and protection of water resources for future use in Western Australia, following the release of the discussion paper in March 2003.

Western Australia has indicated that it will review the effectiveness of its statewide policy on transferable water entitlements via a semi-formal consultation process. It intends to seek submissions from parties who have encountered difficulties in trading.

In addition, Western Australia has advised that:

- it has not introduced any local by-laws to prohibit water trade
- it is investigating ways in which to collect information on the prices of water trades, such as through the stamp duty system, and make it publicly available
- it has commenced discussions with a broking company in South Australia with a view to allowing buyers and sellers to use the broker's website to register their interest in trading.

Discussion and assessment

In the 2003 NCP assessment, the Council found that Western Australia had implemented arrangements for water trading, although it identified questions about the consistency of the arrangements with CoAG obligations. Interstate trade involving Western Australia will be possible only if stage 2 of the Ord Irrigation Project proceeds.

The Rights in Water and Irrigation Act permits a licence holder to transfer all or part of its water entitlements (temporarily or permanently) to another party entitled to own a licence, subject to the approval of the Department of Environment. In previous NCP assessments, the Council found that water entitlements are sufficiently specified in Western Australia to enable water users to form a reasonable expectation of the potential benefits and risks of trading. Licences may be issued for between five and 10 years, or for an indefinite period. There is a presumption that fixed term licences will be renewed if licence conditions are met. While the state's register of water licences and entitlements does not provide indefeasibility of title, it does allow the entitlement holder to register interests. The department may not approve a trade without the written agreement of any person with a registered interest in the entitlement.

Western Australia's trading arrangements contain measures to protect the environment and the interests of other water users. Trades must be consistent with an approved water management plan or, if there is no plan, with the Department of Environment's policy or guidelines. Under the Act, the department is required to assess any potential environmental, hydrological and hydro-geological impacts associated with each trade. It can

refuse a trade if there would be significant impacts on river or groundwater health or other water users. While the department has taken up to 10 months to assess complex trading applications, the process is usually much shorter, with recent trades generally approved within a few days to two months.

Until the state's water trading market further develops, the Department of Environment has the additional role of collecting and providing market information. Western Australia is also pursuing other means of facilitating trading, including through a broking company in South Australia.

As the Council reported in section 5.2 and in previous NCP assessments, the power of the Department of Environment to issue a direction, overriding all other rights recognised by the Rights in Water and Irrigation Act, increases the risk to entitlement holders and may have an impact on the value of water entitlements and their tradability. The Council notes, however, that Western Australia intends to use the provision only in extreme circumstances. In practice, the government has not used the power in a manner that would significantly influence the value of water entitlements or hinder trade. The requirement for the department to disclose its reasons for a direction, along with the ability of water users to appeal to a tribunal, helps minimise the risk for water entitlement holders.

In previous NCP assessments, the Council identified several measures in the Rights in Water and Irrigation Act and the statewide trading policy that may constrain trade in water entitlements, including:

- provision for local by-laws to prohibit trades
- restrictions on who can hold a water licence (that is, only a person who owns, occupies or has access to the land on which the water occurs, and then only if they intend to use the water)
- the Department of Environment's power to reclaim, and not approve trade in, water entitlements that have not been used.

The three provisions appear to be largely a response to community concern about potential speculation in the water market. Nonetheless, the provisions have the potential to reduce the security of entitlements and constrain the movement of water to its most profitable use. (The effect of the second and third provisions on the security and value of water entitlements was discussed in section 5.2.) The restrictions on who can hold water licences, for example, may affect the entry and activities of agents, brokers and other potential participants in the water trading market, and the ability of financial institutions to obtain ownership of a water entitlement in the case of default. The policy for managing unused entitlements may encourage overuse to protect ownership. Even where trading is established in an area, the policy enables the department to recoup unused entitlements if they were not acquired through trading or if speculative behaviour occurs. All of the provisions have the potential to reduce the returns available to holders of water entitlements.

Western Australia provided the following information on the three provisions:

- No local by-laws have been introduced to prohibit water trade.
- The government considers the restriction on who can hold a water licence to be a reasonable interim step to allow the community to become familiar with water markets and trading. The Rights in Water and Irrigation Act requires the part of the Act that includes the restriction to be reviewed in 2005. Given that water trading markets are relatively undeveloped, the government considers that the requirement is not distorting the market; in any case, most constraints can be readily overcome.
 - To enable sale of a water licence via a leaseback arrangement, the licence holder would need only to be granted occupancy rights for the land as part of the contract.
 - Financial institutions seeking to hold security over the licence could take an interest in the land to enable them to take control of the licence in their own name if the licence holder defaults.
 - There is provision for local by-laws to be made to enable a person other than whoever owns, occupies or has access to the land to hold a licence, such as those holding a security interest (although the provision has not been used to date).
- The impact of the Department of Environment's power to reclaim, and not approve trade in, water entitlements that have not been used is lessened by several factors:
 - The policy does not apply to entitlements that have been purchased (via trading) or unused entitlements resulting from improvements in water use efficiency.
 - For new developments, the department includes a condition in the licences that makes clear that some or all of the water entitlements may be recouped if not used within a prescribed timeframe.
 - The department accounts for extenuating circumstances, including cases where a licence holder paid a premium for the water entitlements when purchasing a property in a fully allocated area.
 - A decision by the department to recoup unused entitlements is subject to appeal.

The Council considers that the above factors mitigate the extent to which the three provisions hinder water trade and conflict with CoAG obligations.

Apart from the three provisions, the statewide trading policy indicates that the Department of Environment can refuse trades to prevent monopolies in water. Western Australia advised that the inclusion of this provision was a result of the consultative process undertaken during the policy's development.

There is, however, no statutory power for the department to refuse a trading application for this reason. As a result, Western Australia intends to amend the policy to remove the provision by December 2004.

Western Australia's subregional and local area water management plans may contain trading rules. The plans are required to be compatible with the statewide trading policy, or address potential conflicts or limitations, so the completed plans reflect the above inconsistencies with CoAG obligations. The groundwater management strategy for the Carnarvon region, for example, includes the statewide restrictions on who may hold a licence, trading in unused entitlements, and trade that may lead to monopolies in water. The local trading rules in the Carnarvon groundwater strategy, however, are aimed at avoiding adverse impacts on the environment, water quality and other water users, so are consistent with CoAG obligations. Western Australia will need to ensure the local trading rules in future water management plans are also consistent with CoAG obligations.

While elements of Western Australia's water trading arrangements are not consistent with 1994 CoAG obligations, given the low demand for trading in most areas of the state, the Council accepts that these elements currently do not constrain trade to a significant extent. The Council considers, therefore, that Western Australia has made sufficient progress against its CoAG obligations on water trading for the 2004 NCP assessment.

The required 2005 review of the relevant part of the Rights in Water and Irrigation Act and the proposed review of the effectiveness of the statewide trading policy provide Western Australia with an opportunity to reform its arrangements so water can be used to maximise its contribution to national income and welfare, subject to the ecological and physical constraints of catchments. For the state's trading arrangements to comply with 1994 CoAG obligations as the demand for water trading increases, the Council considers that Western Australia would need to amend its legislation and related arrangements to:

- remove the provision for making local by-laws to prohibit trades, or clarify that such by-laws would be used only in response to the environmental or physical constraints of the water source
- remove the restriction on who can hold a water licence, so there is no longer any link to land or the capacity to use the water
- remove the power of the Department of Environment to reclaim unused water entitlements in areas where entitlement and trading arrangements have been fully established.

5.5 Other matters from the 2003 National Competition Policy assessment

National Water Quality Management Strategy

The National Water Quality Management Strategy (NWQMS) comprises 21 guidelines promoting the sustainable use of water resources. The strategy incorporates a mix of regulatory and market based approaches, education and guidance. It is based on principles of ecologically sustainable development, an integrated approach to water quality management and community involvement in setting water quality objectives.¹⁰ The guidelines allow governments to respond to circumstances at regional and local levels.

The Australian Government, after consulting with the states and territories, proposed a two-yearly review to assess the implementation of the NWQMS. Because the two-year timeframe expired in 2003, the Council expected state and territory governments to have largely implemented the NWQMS by the time of the 2003 NCP assessment. Although most governments had some elements remaining in 2003, the Council considered that all except Western Australia were progressing satisfactorily.

At the time of the 2003 NCP assessment, Western Australia had just released the state Water Quality Management Strategy implementation plan. The Council noted this to be a significant step, but considered that Western Australia's overall implementation of NWQMS arrangements was slow. The government appeared to be still developing its institutional framework, and advised that it was still to achieve consistency in the approaches of the Environmental Protection Authority and the Natural Resource Management Council. The Council undertook to assess Western Australia's progress again in 2004, particularly in the areas that the government had undertaken to address in 2003-04. The key outstanding areas included the implementation of guidelines for fresh and marine water quality and guidelines for water quality monitoring and reporting (NWQMS papers 4 and 7).

Since the 2003 NCP assessment, Western Australia has released State Water Quality series document 6 (SWQ6). The guideline encompasses Western Australia's implementation of NWQMS papers 4 and 7. The government developed the framework in co-operation with the Environmental Protection Authority, and followed consultation with natural resource management

¹⁰ The process for water quality management is described in the NWQMS Implementation Guidelines (ARMCANZ and ANZECC 1998), the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000a) and the Australian Guidelines for Water Quality Monitoring and Reporting (ANZECC 2000b).

agencies, industry, peak bodies, the Conservation Council and the broader community. Western Australia considered that the framework addresses all issues raised by stakeholders.

SWQ6 requires that environmental values for water quality be developed through community consultation. An environmental value is a statement of visionary purpose for the use of a water resource. It may be related to ecosystem or community benefits. A set of environmental quality objectives is then developed for each value, which reflects the desired state of water quality.¹¹ In turn, two-tiered environmental quality criteria (or benchmarks) are set for each objective. The lower bound (the 'environmental quality guideline') sets a trigger level that should, if breached, initiate an investigation. The upper bound (the 'environmental quality standard') sets a trigger that should, if breached, initiate a response to fix the problem. Typically, the resource management agency with day-to-day responsibility for the resource (for example, a natural resource management group) would rectify problems.

While SWQ6 does not have legal or coercive powers, Western Australia intends it to assist the Environmental Protection Authority in developing policy under the *Environmental Protection Act 1986*, and in setting Ministerial and licensing conditions for activities subject to the Act. The authority can use the environmental quality criteria in SWQ6 to guide the setting of discharge limits in discharge licences, for example, and can take enforcement action under the Act for breaches of those licences. The authority must also:

- give final approval to the environmental values, environmental quality objectives and environmental quality criteria determined for each water resource
- conduct periodic reviews of the effectiveness of management agencies in achieving environmental quality objectives, and report publicly on these matters to the government.

SWQ6 incorporates a number of variations from the NWQMS guidelines.¹² Western Australia considers this variation to be consistent with the NWQMS

¹¹ SWQ6 provides that the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (NWQMS paper 4) and the Australian Guidelines for Water Quality Monitoring and Reporting (NWQMS paper 7) be used as default environmental quality objectives unless more appropriate information for local water resources is available.

¹² The two-tiered benchmarking parameters, ('environmental quality guideline' and 'environmental quality standard'), for example, do not correspond directly with the NWQMS framework. In addition, Western Australia adopts different approaches for ambient waters of good quality and those that are degraded. For good quality water sources, SWQ6 adopts the trigger guidelines from NWQMS paper 4 as default environmental quality guidelines; for degraded waters, SWQ6 uses aspirational targets as the basis for remediation. However, the guideline values are used in all cases as the benchmark for assessing waste discharges.

framework, which allows for flexibility and adaptation to local situations. Western Australia has explained that the variations give resource managers flexibility to address the state-specific issues. In particular, it is concerned that NWQMS papers 4 and 7 offer only limited guidance on several water quality issues affecting the state, including salinity, eutrophication and sedimentation.

Western Australia has advised that it will conduct workshops on SWQ6 within the Department of Environment and with consultants and industry during 2004. It envisages that these workshops will flow on to the setting of environmental values, environmental quality objectives and environmental quality criteria for significant water bodies on a priority basis. Western Australia noted that successful implementation will require an initiative from a lead agency such as the Department of Environment to apply the framework to a few demonstration areas (such as the Swan–Canning and Collie catchments). It has also noted that the state's natural resource management groups are identifying environmental values, environmental quality objectives and environmental quality criteria for their respective areas.

While the focus of SWQ6 is on matters related to NWQMS paper 4 (water quality guidelines), it also addresses water quality monitoring issues (NWQMS paper 7). SWQ6 recognises that water quality monitoring is critical to effective achievement of water quality objectives and provides general guidance on monitoring techniques. It also calls on NWQMS paper 7 as a 'useful set of standards to assist stakeholders to design consistent programs and collect comparable data that can be integrated across broad regions' (Government of Western Australia 2004, p. 25). SWQ6 provides that government agencies — in conjunction with natural resource management groups, parties that use the water source (for waste discharge, for example) and other stakeholders — have prime responsibility for water quality monitoring.

Western Australia has also made some progress in implementing other NWQMS guidelines since the 2003 NCP assessment. In relation to the 1996 Australian Drinking Water Guidelines (NWQMS paper 6), the Advisory Committee for the Purity of Water commissioned an assessment of the state's drinking water management and protection practices against the national guidelines. The Department of Environment is also preparing a policy document describing the custom and practice of protecting public drinking water sources.

Western Australia advised that it is considering how best to incorporate the next (2002) iteration of the Australian Drinking Water Guidelines once those guidelines are formally approved. The Department of Environment is developing a policy document for public comment as part of this work. The government reported that work is also under way to implement NWQMS papers 8 (groundwater protection), 10 (urban stormwater), 11 (effluent management), 14 (reclaimed water), and 16 (dairy sheds and processing plant effluent).

Discussion and assessment

With the release of SWQ6, Western Australia has satisfactorily implemented the undertakings regarding the NWQMS that it made at the time of the 2003 NCP assessment. While considerable work is required to develop environmental values, objectives and criteria, and to implement appropriate monitoring systems, SWQ6 provides a foundation for these steps to occur. The Council thus considers that Western Australia has satisfactorily addressed its CoAG obligations for the 2004 NCP assessment.

Notwithstanding this recent progress, Western Australia's implementation of the NWQMS remains incomplete in several other areas. For 2004-05, Western Australia has prioritised implementation of the guidelines for drinking water (NWQMS paper 6), groundwater protection (paper 8), urban stormwater (paper 10), effluent management (paper 11), reclaimed water (paper 14) and dairy sheds and processing plant effluent (papers 16a and 16b). The Council would expect Western Australia to have completed these elements of the NWQMS by the 2005 NCP assessment.

Water legislation review and reform

Governments agreed to review and, where appropriate, reform by 30 June 2002 all existing legislation that restricts competition. Reform is appropriate where competition restrictions do not provide a net benefit to the whole community and are not necessary to achieve the objective of the legislation. Any new legislation that restricts competition must also meet these tests.

The Western Australian Government reviewed 32 pieces of water industry legislation, endorsing the findings of those reviews, mostly in 1999 or 2000. It is reviewing the Health (Treatment of Sewerage and Disposal of Effluent and Liquid Waste) Regulations 1993 as part of a wider review of health industry legislation and subsidiary legislation. At the time of the 2003 NCP assessment, Western Australia was still to implement the recommended reforms to 19 water industry regulatory instruments.

In 2004, Western Australia has again reported that it has completed none of the 19 reforms. The government had proposed to reform seven of the 19 instruments via the Acts Amendment and Repeal (Competition Policy) Bill in 2002, later delayed to 2003. Parliamentary Counsel then decided that the scope of the water amendments required an industry-specific Bill. Accordingly, Cabinet approved the redrafting of the amendments as the Water Industry Legislation Amendment Bill in February 2004. Western Australia proposed to introduce the Bill in the autumn sitting of Parliament in 2004, but did not meet this timeframe. It has stated that the amendments were delayed by a range of factors, including the priority listing for drafting and the restructure of the Office of Water Regulation. In July 2004, Western Australia provided the Council with a draft explanatory memorandum and

summary of the Bill, which it expected to introduce to Parliament in late 2004.

Discussion and assessment

Western Australia substantially completed its review of water industry legislation and regulation several years ago. Its review of the Health (Treatment of Sewerage and Disposal of Effluent and Liquid Waste) Regulations 1993 is being undertaken as part of a wider review of health industry legislation.

Western Australia has made little progress since the 2003 NCP assessment in implementing the recommended reforms. The reform of seven regulatory instruments via the Water Industry Legislation Amendment Bill remains incomplete, five years after the reviews were completed. Further, the Office of Water Policy has not completed regulatory amendments to the remaining 12 regulations and by-laws. The Competition Principles Agreement requires governments to have completed, by 2002, the review and appropriate reform of legislation that restricts competition, so the Council finds that Western Australia has not met its NCP review and reform obligations relating to water industry legislation.

Institutional reform

At the time of the 2003 NCP assessment, Western Australia was still to complete CoAG water reform agreement institutional reforms to:

- separate the roles of water standards setting and regulation from service delivery (see section 5.1)
- devolve a greater degree of responsibility for irrigation scheme management to local bodies
- implement integrated catchment management.

Devolution of greater responsibility for irrigation scheme management

The CoAG water reform agreement requires that governments devolve a greater degree of responsibility for the management of irrigation schemes to local bodies. Devolution can take different forms, ranging from the scheme manager's consultation with local constituents on management issues to full devolution of operational responsibility to the local level. Any devolution of operational responsibility should occur within a regulatory framework that ensures all of CoAG's water reform objectives can be met.

At the time of the 2003 NCP assessment, Western Australia had implemented measures to devolve the management of three of its four irrigation systems: the South West Irrigation Management Cooperative, the Gascoyne Water Cooperative and the Preston Valley Irrigation Cooperative. Progress was under way to devolve the management of the fourth system — the Ord Irrigation Scheme. The Council undertook to consider in the 2004 NCP assessment the state's progress with devolution for the Ord scheme.

The management of the Ord scheme was transferred from the Water Corporation to the Ord Irrigation Cooperative in 2002. Western Australia reported in 2003 that a transfer of the scheme's assets would follow in December 2003. Once the proposed transfer is complete, the cooperative will own and operate the scheme's distribution system and retail the delivery of water services to growers. The Water Corporation will continue to own, operate and maintain the main irrigation channel and hillside levies. Western Australia has reported in 2004 that the transfer of scheme assets has been delayed. It had expected the transfer to take place by mid-2004.

Discussion and assessment

The transfer of management of the Ord scheme to a local cooperative was a significant step in Western Australia's devolution process. While the state has delayed the transfer of scheme assets to the cooperative, the Council accepts that Western Australia has demonstrated a commitment to this final stage of reform. The Council expects Western Australia to have completed the devolution process by the time of the 2005 NCP assessment.

Integrated catchment management

The CoAG water reform agreement requires that governments establish institutional arrangements for an integrated approach to the management of water and land resources, including management at the catchment level. Catchment management should address issues such as salinity, river degradation and pollution, biodiversity loss and soil degradation. It should be implemented via partnerships among the different levels of government and nongovernment organisations. Approaches include the regional strategies being developed under bilateral agreements by the Australian, state and territory governments under the National Action Plan for Salinity and Water Quality.

Regional strategies

The Council raised concerns in the 2003 NCP assessment about the pace at which Western Australia was addressing integrated catchment management issues. Western Australia proposed to implement reform via natural resource management strategies developed by community based groups. The six

regional groups had developed their strategies by 2001, but the government had not endorsed any strategies under state processes by the time of the 2003 NCP assessment. Western Australia reported in 2003 that the strategies required further work to meet accreditation criteria under the national action plan, and that progress was slow due to the state not having reached a bilateral agreement on the plan with the Australian Government. It also attributed the lack of reform activity to delays in funding from the Natural Heritage Trust extension. This funding was provided in June 2003.

Western Australia reached a bilateral agreement on the national action plan with the Australian Government in October 2003. The six regional groups were then able to refine their strategies through state and national processes in preparation for public consultation. Western Australia had expected most strategies to be ready for consultation by April 2004, with possible accreditation to follow in August–December 2004. The state has been working with the regional groups to try to meet these milestones. It is providing technical advice and helping to identify priorities, targets and management actions as required under the national action plan.

Western Australia advised in July 2004 that consultation on two strategies had commenced in April, but that consultation on another two was delayed to mid-year (table 5.2). The Joint State Commonwealth Steering Committee has completed its preliminary reviews of the four strategies.

Table 5.2: Progress with natural resource management strategies

<i>Regional group</i>	<i>Progress</i>
Avon Catchment Council	Public consultation commenced in April 2004.
Swan Catchment Council	Public consultation commenced in April 2004.
South West Catchments Council	Release for public consultation delayed from April to June 2004.
South Coast Regional Initiative Planning Team	Release for public consultation delayed from April to June or July 2004.
Northern Agricultural Catchment Council	Public consultation scheduled for July 2004.
Rangelands Coordinating Group	Public consultation scheduled for June 2005. ^a

^a The Rangelands group commenced only in December 2002. In contrast, other regions have had several years experience and earlier work on which to draw. The Rangelands group also covers 90 per cent of the state, in contrast to other groups that are smaller in area and have more concentrated support bases. The agreement between Western Australia and the Australian Government to implement the Natural Heritage Trust extension recognises these differences.

Source: Government of Western Australia 2004

Waterways Western Australia

In 2000 the former Water and Rivers Commission published a draft management framework (Waterways WA) to facilitate and support land care practices to protect rivers with high environmental values. Western Australia reported in 2003 that the framework would be in place by the end of that year. The Council undertook to monitor implementation.

Western Australia reported in 2004 that the draft strategy is being implemented via the integration of its directions into the regional strategies (see above). This approach reflects the government's objective to coordinate the management of waterways within an integrated catchment management framework.

Discussion and assessment

Western Australia's implementation of integrated catchment reforms has quickened considerably since the government agreed with the Australian Government on implementing the Natural Heritage Trust extension (in December 2002) and the National Action Plan for Salinity and Water Quality (in October 2003). The agreements provide funding to refine the six regional strategies for community consultation and eventual accreditation under the national processes. Western Australia released its most advanced strategies for consultation in April 2004, in accord with its published milestones. While there was a further delay with two strategies, Western Australia now appears to be addressing these matters satisfactorily. For the 2005 NCP assessment, the Council expects the state will have developed all but the Rangelands strategy to an accreditable stage under the national action plan.

6 South Australia

6.1 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 of urban water and wastewater services provided by SA Water

Assessment issue: South Australia is to demonstrate that SA Water sets prices for water and wastewater services to achieve full cost recovery in accord with the CoAG pricing principles. During the 2003 National Competition Policy (NCP) assessment, South Australia undertook to publish annual pricing transparency reports on SA Water's water and wastewater prices, with the first statement to cover charges applying from 1 July 2004. The reports are intended to (1) establish the relationship between Cabinet decisions on water and wastewater prices, and the CoAG pricing principles, (2) provide information on SA Water's financial performance in the context of a decision and past and future expenditures, and (3) address details of revenues, CSOs, SA Water's capital expenditure program and SA Water's profit and the distribution of that profit. As part of the transparency report, the Essential Services Commission of South Australia (ESCOSA) reviews the processes adopted and the information used, in terms of the adequacy of the application of the CoAG pricing principles. For the 2004 NCP assessment, the National Competition Council has looked for South Australia to have published its first transparency report, and for the report to provide a robust case that SA Water's 2004-05 water and wastewater prices satisfactorily address CoAG's requirements on best practice pricing.

Future reform: Metropolitan businesses should price at least at the lower bound of cost recovery, and continue movement towards upper bound pricing by 2008.

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

SA Water is the primary supplier of water and wastewater services to Adelaide and South Australian country towns. It provides these water and waste water services to over one million people. Each year the South Australian Cabinet determines the price SA Water may charge for its water and wastewater services. Accordingly, the government intends producing annual water and wastewater pricing transparency statements — incorporating comment by ESCOSA on processes and information — as the basis for its future decisions on SA Water's water and wastewater service prices.

On 1 June 2004 the South Australian Treasurer tabled the state's first urban water pricing transparency statement, *Transparency statement — urban water prices in South Australia 2004-05* (Government of South Australia 2004). The statement is available on the Department of Treasury and Finance website (www.treasury.sa.gov.au). It comprises three parts: the government's statement prepared by the South Australian Department of Treasury and Finance (part A), the ESCOSA report (part B), and the government's response to the ESCOSA report (part C).

In August 2004 South Australia completed part A of its pricing transparency statement for SA Water's wastewater pricing for 2004-05. It has provided the statement to ESCOSA for comment and intends to finalise the entire statement by December 2004.

The government decided that the price of SA Water's urban water services in 2004-05 should increase by 3.5 per cent over the previous year's price. It considered that this is consistent with CoAG pricing requirements, and noted that revenue earned by SA Water in 2004-05 will achieve the lower bound of

cost recovery. The water pricing transparency statement calculates the (minimum and maximum) revenue outcomes that SA Water would need to achieve full cost recovery as defined by CoAG, and examines all relevant cost components. Transparency statement outcomes in relation to the major cost elements are summarised below.

Water pricing transparency statement findings relevant to the CoAG pricing principles lower bound of cost recovery

Operations, maintenance and administrative costs — efficient business costs

The government's statement argues that SA Water's current urban water service arrangements represent efficient business costs. It offered three reasons for its view:

1. SA Water participates in industry benchmarking analyses, including the Water Services of Australia's annual benchmarking report on the Australian urban water industry.
2. SA Water complies with its Customer Service Charter and minimum water quality standards monitored by the Department of Human Services.
3. SA Water outsources a number of functions (including the management of water and wastewater services for the Adelaide metropolitan areas and the operation of regional water treatment plants) using a competitive tendering process.

ECSOSA considered that the information provided in the government's statement lacks detail. It argued that compliance with the CoAG pricing principles on efficient costs requires the statement to include at a minimum:

- information on costs for both the Adelaide systems (found in WSAAfacts) and the country systems (because country systems assets are around 50 per cent of total SA Water assets in terms of replacement value, and are the systems that attract CSO funding)
- information on both cost performance and level of service for these regions
- an analysis of the differential impact of cost drivers on the retail versus wholesale (treatment and transmission) activities.

The government stated that it intends to provide additional information on SA Water's country systems, service standards, and cost drivers to support its decision on 2005-06 water and wastewater prices. It will provide this information in the 2005-06 urban water and wastewater pricing transparency statement, except for commercial-in-confidence information (which will be available to ESCOSA).

Interest cost on debt

The government's 2004-05 statement indicates that SA Water's borrowing costs are included as an expense to SA Water unless they relate to the construction of a qualifying asset (assets that take longer than 12 months to complete), in which case they are capitalised to the cost of the assets. Pursuant to the *Public Finance and Audit Act 1987*, the government guarantees SA Water borrowings.

Provision for future asset refurbishment/replacement using an annuity approach

The government's 2004-05 statement indicates that SA Water uses the straight-line depreciation method to produce a broad estimate of the cost of maintaining its water services asset base. The government notes, however, that SA Water is continuing to enhance its asset replacement forecasts.

ESCOSA considers that it is inappropriate to use straight-line depreciation as a proxy for asset renewal annuity in the calculation of the minimum revenue requirement, because the two approaches are likely to produce significantly different outcomes. It considers that SA Water's approach does not strictly comply with the CoAG pricing principles, but has acknowledged that the information necessary to comply with the principles is not currently available. ESCOSA considers that SA Water should estimate annuity based provisions for asset replacement/rehabilitation and report these provisions in each transparency statement.

The government intends to develop an appropriate annuity method for estimating provisions for asset refurbishment/rehabilitation consistent with the ESCOSA comments. It also intends to include an estimate, to the extent possible, in the 2005-06 urban water and wastewater pricing transparency statement.

Externalities

The government's 2004-05 statement indicates that explicit charges incurred by SA Water are included in the revenue outcomes used to establish water prices. An example is SA Water's payments to the catchment water management boards, including the 1 cent a kilolitre levy paid to the River Murray Catchment Water Management Board.

Water resource management in South Australia is the responsibility of the Department of Water, Land and Biodiversity Conservation, except to the extent that SA Water administers policy on water conservation by its customers. The department is funded from consolidated revenue, so water resource management costs are currently borne by the South Australian community. The government explained that it is reviewing the value of externalities and resource management costs attributable to SA Water as a result of providing services to urban water consumers.

ESCOSA has assessed that the 2004-05 transparency statement's treatment of externalities (resource management costs attributable to, and incurred by, SA Water) complies with the CoAG pricing principles. It considers, however, that the incorporation of all charges associated with the department's relevant activities is necessary to achieve the intent of the CoAG strategic framework — that is, that the price of water should include the true cost of water resource management. ESCOSA noted that water resource management charges that reflect the true cost provide a better signal as to the cost-effectiveness of alternative technical solutions to providing water services.

ESCOSA considers that the information in the transparency statement on externality costs should be enhanced. In particular, the statement should include advice on the cost of the department's (extraction based) water resource management services and their application to all relevant beneficiaries, including SA Water. ESCOSA also considers that the department's water resource management charges should be identified in terms of key catchments and that the charges relating to the supply of water to regions attracting CSOs should be differentiated.

The government is developing water resource management policies, which may affect the costs associated with providing water and wastewater services. It will report on any policy implications, including those for all relevant beneficiaries. This work is being undertaken separately from the 2005-06 urban water and wastewater pricing transparency report. The government has indicated it will address any outcomes, insofar as they affect future urban water and wastewater pricing decisions, in future transparency statements.

Taxes and tax equivalent regimes (excluding income tax)

The government's 2004-05 statement includes accrual tax expenses paid by SA Water in the estimated minimum revenue, in accord with the state's competitive neutrality policy. ESCOSA has assessed that SA Water's inclusion of tax equivalent regime costs in the minimum revenue requirement calculation is appropriate and complies with the CoAG pricing principles.

Dividends (if any)

The government has advised that SA Water's dividend policy is part of the business's total contribution (dividend and tax payments) to state revenue. The combined contribution is equivalent to 55 per cent of earnings before interest, tax, depreciation and amortisation. ESCOSA considers that South Australia's current approach does not comply with the CoAG principles. It noted in particular that SA Water's dividend policy is not reported on a standalone basis and that it is not clear that the dividend payments meet the CoAG commercial reality test. It has suggested that the transparency statement, for compliance with the CoAG principles, should:

- report the dividend policy transparently rather than as a combined dividend/tax contribution to the South Australian Government
- report depreciation calculated in accord with adjusted asset values
- outline SA Water's capital structure policy and demonstrate that the dividend policy is not leading to changes in capital structure
- include a statement from the Minister for Administrative Services as to the level of capital expenditure necessary to maintain SA Water's ongoing business operations.

The ESCOSA comments are relevant to the consideration of dividends in determining both the lower and upper bound prices.

The government has advised that it intends to develop a dividend policy (distinct from tax equivalent payments) and capital structure policy for SA Water (and all other public nonfinancial corporations) in accord with the ESCOSA suggestions. It intends to implement these policies for SA Water as far as possible before the 2005-06 urban water and wastewater pricing decision.

The government considers, however, that the process for considering capital expenditure provides adequate transparency. It has stated that it will review (separately from the transparency report process) the ownership structure of all South Australian Government public nonfinancial corporations (covering among other matters, dividend, capital structure and community service obligation policies). The government considers, given the proposed review, the use of an annuity for minimum revenue outcome purposes, and transparency in the current capital expenditure review process, that the Minister for Administrative Services does not need to make a statement on SA Water's capital expenditure requirements.

Water pricing transparency statement finding relevant to the CoAG pricing principles upper bound of cost recovery

Operations, maintenance and administrative costs — efficient business costs

The operations, maintenance and administrative cost estimates for the upper bound of cost recovery are the same as for the lower bound. Matters relevant to pricing compliance are discussed above.

Provision for the cost of asset consumption

The government's 2004-05 statement used a straight-line depreciation method to calculate depreciation expenses as part of estimating the upper bound of cost recovery. ESCOSA considers that this method complies with the CoAG pricing principles. It has noted, however, that the actual calculation of depreciation expenses was not provided in the 2003-04 transparency statement. This calculation should be included in the transparency statement and, therefore, available to the Cabinet when it decides water prices.

The government has undertaken to provide additional information on the method of calculating depreciation expenses, and on the level of those expenses in the estimate of maximum revenue, as part of the 2005-06 urban water and wastewater pricing transparency statements.

Asset valuation method

The government's 2004-05 statement indicates that SA Water assets were valued according to the optimised deprival value method for the year ending June 2002. Every three years the Hunter Water Corporation Pty Ltd reviews SA Water's asset valuation method. The most recent review in May 2002 concluded that SA Water adopted a modern equivalent replacement asset cost for valuing water assets. Contributed assets were included in SA Water's asset base in the 2004-05 water price setting process, and are recognised as revenue by SA Water when it gains control of the contribution.

ESCOSA has assessed that SA Water's approach is consistent with the CoAG pricing principles. It has raised concerns, however, about the treatment of contributed assets and the consequent effects for determining depreciation expenses and the return on capital. ESCOSA considers that it is not sufficient to state only that contributed assets are included in the asset base. In ESCOSA's view, more effective compliance with CoAG pricing principles would be achieved if SA Water removed the value of contributed assets from the regulatory asset base used to derive the upper bound cost recovery targets in future urban water pricing decisions. ESCOSA has stated that this approach may require SA Water to maintain a separate asset register for pricing purposes.

The government has undertaken to develop an appropriate method for treating contributed assets in SA Water's asset base to establish water and wastewater prices. It intends to finalise this method for inclusion, to the extent possible, in the 2005-06 urban water and wastewater pricing transparency statements.

Provision for the cost of capital

The government's 2004-05 statement did not derive the weighted average cost of capital (WACC) that should be used for setting prices. It referred to a consultancy study, which estimated a regulatory WACC of 6 per cent. Despite

this estimate, the transparency statement used an estimate for real pre-tax WACC of 6–8 per cent. The government has indicated that it will estimate an appropriate WACC after reviewing the ownership structure of South Australian public nonfinancial corporations.

ESCOSA considers that the transparency statement, although recognising the opportunity cost (as required by the CoAG pricing principles), does not provide sufficient information on the WACC. It has indicated that the government should determine an appropriate WACC for setting maximum revenue, or at least use a much smaller range when deciding on water pricing. The WACC calculation should be based on an efficient supplier's benchmark, such as the capital structure of an efficient water utility. ESCOSA has pointed out that the target revenue may remain below the maximum revenue, even after any adjustments to the asset values. Even in such a case, it is important to know by how much the target revenue is below the maximum revenue, because this will provide greater transparency and guidance on possible long term price paths and cross-subsidies.

The government has undertaken to develop an appropriate WACC to establish water and wastewater prices. It intends to finalise this WACC for inclusion, to the extent possible, in the 2005-06 urban water and wastewater pricing transparency statements.

Externalities

The treatment of externalities in the 2004-05 transparency statement complies with the CoAG requirement for the lower bound of cost recovery. ESCOSA considers that the government should establish the true cost of water resource management to determine water prices consistent with upper bound cost recovery.

As discussed, the government is developing water resource management policies, which may affect the costs associated with the provision of water and wastewater services. It has undertaken to address outcomes, insofar as they affect future urban water and wastewater pricing decisions, in future pricing transparency statements.

Taxes or tax equivalent regimes

The 2004-05 transparency statement includes all relevant taxes paid by SA Water, although it reports taxes and the dividend to the government as a combined SA Water contribution to revenue. It does not include a separate tax equivalent amount in calculating the maximum revenue outcome. It has argued that there is no requirement to include a separate allowance for income tax equivalents, because SA Water uses the pre-tax approach to estimating its return on assets.

ESCOSA has assessed that the information on tax equivalents could be better presented to achieve greater transparency and consistency. To achieve this, it has suggested:

- the taxation amount and the dividend amount be reported separately
- a post-tax WACC be used to calculate the maximum revenue, with the taxation amount included in the cash flows.

The government has undertaken to separately disclose tax equivalent payments and dividend payments to the Cabinet and in the 2005-06 urban water and wastewater pricing transparency statement. It has stated, however, that it will continue to use a pre-tax WACC.

Timeframe for the 2005-06 transparency statement

The government has advised that it is still to decide the method it will use to set SA Water's 2005-06 urban water and wastewater prices. After it has decided this, the Treasurer will provide a draft transparency statement to the Cabinet as the basis for the Cabinet setting 2005-06 prices. The draft transparency statement will include the government's assessment of the extent to which SA Water prices are consistent with the CoAG pricing principles. The government will then finalise the statement and provide it to ESCOSA by December 2004, from when ESCOSA will have two to three months to comment on the statement.

Discussion and assessment

South Australia's first publicly available annual transparency statement, covering the price of SA Water's urban water services in 2004-05, was prepared by the South Australian Department of Treasury and Finance, with ESCOSA commenting on procedural and data matters and on whether water pricing complies with the CoAG pricing principles. The government responded to all ESCOSA comments.

The water pricing transparency statement demonstrates that SA Water is pricing its water services to achieve the lower bound of cost recovery in 2004-05. This outcome meets the CoAG obligation on cost recovery for the 2004 NCP assessment. SA Water will need to move substantially towards upper bound cost recovery by 2008 to meet its National Water Initiative commitments.

While SA Water's water prices are achieving the lower bound of cost recovery, ESCOSA has indicated several areas in which the current arrangements do not comply with the CoAG pricing principles or are not best practice for the water industry. The government has undertaken to rectify most water pricing noncompliance, as identified by ESCOSA, in the next annual water and wastewater transparency statements. The matters raised by ESCOSA that

South Australia does not propose to rectify relate to the inclusion of a capital expenditure statement from the Minister for Administrative Services in future transparency statements and the use of a post-tax WACC for estimating return on assets.

The use of a post-tax WACC (as opposed to South Australia's use of pre-tax WACC) more accurately reflects the upper bound of cost recovery because it recognises tax equivalents (income tax). It would therefore mean that the taxation regime used to determine SA Water's upper bound of cost recovery is equivalent to private sector taxation arrangements (thus satisfying competitive neutrality objectives). The Council also notes ESCOSA's comment that the regulatory trend is towards using a post-tax cost of capital regime. The Council encourages South Australia to further consider its approach to calculating the WACC (recognising taxation equivalence obligations) and to including taxation amounts in SA Water's cash flows. The CoAG pricing principles oblige governments to ensure that water and wastewater prices reflect the expenditure needed for asset replacement and refurbishment, though not necessarily via a Ministerial statement. South Australia's review of the ownership structure of its public nonfinancial corporations (being undertaken independently of the water transparency statement process) may improve the transparency of SA Water's capital structure and expenditure.

South Australia is undertaking a similar process for SA Water's wastewater pricing. The government produced the statement in August 2004 and has provided it to ESCOSA for comment. It expects to finalise the statement by December 2004. South Australia considers that it should be able to address in the wastewater statement most minor issues raised by ESCOSA in the 2004-05 urban water pricing transparency statement.

Although the ESCOSA comments reveal some noncompliance with the CoAG pricing principles, and the government has not yet finalised the first wastewater pricing transparency statement, the Council considers that South Australia has made sufficient progress on water and wastewater pricing for this 2004 NCP assessment. The government has published the 2004-05 water pricing transparency statement and committed to implement most of the ESCOSA advice on water pricing, and it is producing the first wastewater statement.

To comply with CoAG's requirements on pricing, South Australia will need to demonstrate via the 2005-06 and subsequent annual transparency statements (or via price investigations by ESCOSA) that SA Water is achieving at least the lower bound of cost recovery in accord with the CoAG pricing principles, and is continuing to move towards the upper bound of cost recovery by 2008 consistent with the government's commitment under the National Water Initiative. Under the National Water Initiative, governments also committed to ensuring that the economic regulator sets or reviews prices or price-setting processes for water storage and delivery. South Australia therefore needs to ensure that ESCOSA continues to have full opportunity to comment publicly on the processes adopted and the data used in preparing the Cabinet advice on SA Water's pricing, and on whether the CoAG pricing principles are being appropriately applied.

Cost recovery and consumption based pricing by rural water service providers

Assessment issue: South Australia is to demonstrate that government-owned irrigation schemes and government-owned suppliers of bulk water are setting prices based on the principles of full cost recovery and consumption based pricing. Government-owned water businesses must also show that they are managing any subsidies consistent with efficient and effective service provision and use. In the 2001 NCP assessment, South Australia reported that it had devolved the management or privatised many of its irrigation districts. At that time, South Australia advised that all irrigation schemes were recovering costs in accord with the CoAG pricing principles, though did not provide detailed information to support this advice. Volumetric charging was not possible in the lower Murray reclaimed irrigation areas, but this may change with the rehabilitation of the district. For the 2004 NCP assessment, the National Competition Council has looked for South Australia to demonstrate that any remaining government owned irrigation schemes or bulk water suppliers to irrigation schemes are achieving at least lower bound full cost recovery and are setting prices on a consumption basis where possible. Where an irrigation scheme would not achieve full cost recovery by 30 June 2004, the Council has looked for South Australia to show that the scheme has made substantial progress towards lower bound cost recovery and to advise when lower bound cost recovery is likely to be achieved. South Australia has also needed to demonstrate that any CSOs supporting rural schemes are transparent.

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 must 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

South Australia advised that it does not supply irrigation and drainage services to the privately-owned irrigation districts and that none receives government funding. It has transferred all irrigation districts to private ownership except for nine districts. These nine districts are in the lower Murray reclaimed irrigation areas and comprise two thirds of the total region. The government is upgrading the infrastructure that provides irrigation and drainage services to the nine districts so that it can meter water use (by June 2007), and meet the water use efficiency targets and the drainage requirements set by the Environment Protection Authority. It has announced a financial package for rehabilitating the swamps in the lower Murray reclaimed irrigation areas, which includes \$2.7 million from the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust.

South Australia intends to transfer its ownership of the lower Murray reclaimed irrigation areas' irrigation and drainage infrastructure assets to irrigators. The transfer will require the owners of irrigated properties to establish an irrigation trust (or several trusts) so they can jointly manage the irrigation district. The trust will be responsible for the operation, maintenance and future replacement of the infrastructure. Levee banks and waterfront land will remain government owned.

Under the *Irrigation Act 1994*, the Minister for Environment and Conservation has authority to set charges to irrigators. The Minister may impose charges to recover the costs of supplying water (or draining water) or

to meet other related liabilities. Other liabilities include the provision for asset replacement. South Australia did not provide information on how the Minister has set charges, or whether the charges recover all costs.

South Australia provided 2003-04 cost information for the nine government-owned districts, including on the costs of operations and maintenance, tax and capital works. (South Australia did not attribute any depreciation costs because it intends abandoning the assets by the end of 2004. The irrigation trust will replace these assets when rehabilitation and subsequent privatisation occurs.) South Australia advised that it sets irrigation and drainage charges to cover the costs of operations and maintenance, tax and capital works, but provided no information on the revenue raised in 2003-04.

Discussion and assessment

Under the 1994 water reform agreement and the National Water Initiative, South Australia needs to show that all government-owned rural systems at least achieve lower bound cost recovery in accord with the CoAG pricing principles, and it needs to move towards the upper bound where practicable. 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).

While South Australia stated that the nine government-owned irrigation districts (within the lower Murray reclaimed irrigation areas) are setting charges for irrigation and drainage services that recover (at least) the lower bound costs, the information it provided was not sufficient to demonstrate this. The Council accepts, however, that South Australia is to transfer ownership of these districts to irrigators. When that occurs, irrigators will be responsible for setting charges, and there will be no government contribution.

In the 2001 NCP assessment South Australia advised that charges to irrigators in the lower Murray reclaimed irrigation areas are not volume based, but rather comprise a service charge and a charge based on the area of land serviced. At that time, South Australia noted it had no capacity to impose volume based charges but that this may change as the district is rehabilitated. In this 2004 NCP assessment, South Australia has confirmed that one of the objectives of the lower Murray rehabilitation project is to meter water use by 30 June 2007, and that following privatisation irrigators (and not the government) will be responsible for setting charges.

South Australia's proposal to transfer the ownership of the remaining government-owned irrigation assets is consistent with the CoAG institutional reform obligations. South Australia will, however, need to consider appropriate regulatory arrangements for water trading (including for the lower Murray reclaimed irrigation areas) to ensure that trading outcomes are consistent with the commitments it has made under the National Water

Initiative. These commitments include taking all necessary steps by June 2005 to facilitate permanent trade out of water irrigation areas (up to an interim annual threshold of 4 per cent), and to review the impact of trade under the interim threshold in 2009 to consider raising the threshold (see section 6.4).

Cost recovery in issuing licences for water extraction

Assessment issue: South Australia is to demonstrate that its approach to charging for water licences, renewals and transfers will achieve cost recovery in accord with the CoAG pricing principles. In the 2001 NCP assessment, the Council found that the licence fees represent a reasonable approximation of the administrative costs of undertaking relevant activities, and that customers are likely to pay amounts that reflect the cost of services received. The Council reached a similar finding in regard to levies charged by catchment management boards: it appeared that the beneficiaries of the boards' activities were contributing appropriately to the cost of securing those benefits. For the 2004 NCP assessment, the Council has looked for South Australia to provide information on any changes to licence fee structures since the 2001 NCP assessment.

Future reform: Signatories to the National Water Initiative are to bring into effect by 2006 consistent approaches to pricing and attributing the costs of water planning and management. This should involve the identification of all costs associated with water planning and management, and the identification of the proportion of costs that can be attributed to water access entitlement holders, consistent with the principle of linking charges as closely as possible to the costs of activities or products. These approaches should be consistent across sectors and jurisdictions in which water entitlements can be traded.

References: 1994 CoAG water reform agreement, clauses 3(a), (d) and (e); 1996 Agriculture and Resources Management Council of Australia and New Zealand (ARMCANZ) paper; 1998 CoAG pricing principles; 1999 tripartite meeting; Intergovernmental Agreement on a National Water Initiative

The Council has previously found that licence fees and catchment management board levies represent a reasonable approximation of the administrative costs of undertaking relevant activities in South Australia, and that customers are likely to pay amounts that reflect the cost of services received. South Australia did not report any changes to its licence fee and levy structures for this 2004 NCP assessment. The Council considers that South Australia has addressed its obligations in this area for the 2004 NCP assessment.

The National Water Initiative commits governments to bring into effect by 2006 consistent approaches to pricing and attributing costs of water planning and management. This should involve the identification of all costs associated with water planning and management, and the identification of the proportion of costs that can be attributed to water access entitlement holders consistent with the principle of linking charges as closely as possible to the costs of activities or products. The National Water Initiative requires consistency in pricing policies across sectors and jurisdictions where entitlements can be traded.

Murray–Darling Basin Commission costs — River Murray Water and water resource management cost allocation

Assessment issue: The River Murray Basin states have different policies on passing on River Murray Water costs and water resource costs to water users. In the 2001 NCP assessment, South Australia advised that it does not pass on River Murray Water charges for bulk water, or water resource management costs, to irrigators. For the 2004 NCP assessment, the Council has looked for South Australia to show that it allocates Murray–Darling Basin Commission (MDBC)s costs robustly and transparently among users.

Future reform: Signatories to the National Water Initiative are to achieve lower bound pricing for all rural systems in line with existing NCP commitments, and bring into effect by 2006 consistent approaches to pricing and attributing costs of water planning and management. This should involve identifying all costs associated with water planning and management, including the proportion of these costs that can be attributed to water access entitlement holders, consistent with the principle of linking charges as closely as possible to the costs of activities or products. These approaches should be consistent across sectors and jurisdictions in which water entitlements can be traded.

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

In previous assessments, the Council noted that the Murray–Darling Basin states have different policies on passing on River Murray Water costs¹ and MDBC water resource management costs to water users. South Australia meets its share of River Murray Water costs and water resource management costs from consolidated revenue, rather than by passing on costs to irrigators via water charges. New South Wales and Victoria pass on to irrigators a portion of the River Murray Water charges for bulk water, but apply different charging arrangements. Charges are part fixed and part variable in New South Wales and mostly fixed in Victoria. A consultancy study undertaken for the MDBC found that these differential charging arrangements for bulk water are likely to impede the expansion of permanent interstate trade (Scriver and Hassall and Associates 2003) (see section 6.4).

The MDBC's independent audit of cost sharing arrangements, conducted in 2002, considered that the following actions are necessary to provide clear price signals to water users:

- All River Murray Water costs need to be recognised and all subsidies and CSOs need to be disclosed.
- Financial and pricing information for River Murray Water should be publicly available.

¹ River Murray Water recovers the full cost of constructing, operating, maintaining and renewing assets from the MDBC's member governments. River Murray Water recovers 75 per cent of the cost of asset refurbishment and replacement from the states, with the Australian Government paying the remaining 25 per cent. The states meet the full cost of asset operation and maintenance.

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- States should disclose the level of subsidy and/or CSO per megalitre provided to each water business that receives bulk water from River Murray Water. Disclosure of the level of subsidy is particularly important because the Murray–Darling Basin states have different policies on passing on River Murray Water costs to water users (Langford and Scriven 2002).

At the time of the 2003 NCP assessment, South Australia indicated that it would investigate cost recovery matters relating to River Murray Water via a consultancy to be completed by October 2003. The brief for this study stated that South Australia is seeking a ‘review of costs associated with managing River Murray Water in South Australia, New South Wales and Victoria’. South Australia is also seeking to identify the beneficiaries of each state’s expenditure, compare each state’s water charging policies, comment on the extent to which externalities are accounted for, and discuss the effect of different policy, regulatory and administrative arrangements.

South Australia has engaged Marsden Jacob Associates to conduct the study. At the time of the 2004 NCP assessment, the report had been completed and the government was considering its release.

Discussion and assessment

Under the 1994 CoAG water reform agreement and the National Water Initiative, South Australia committed to implement best practice water pricing and institutional arrangements. These are arrangements that, among other things:

- promote the economically efficient and sustainable use of water resources and water infrastructure, and government resources devoted to water management
- facilitate the efficient functioning of water markets (including interjurisdictional markets) in both rural and urban settings
- apply user pays principles and achieve pricing transparency for water storage and delivery in irrigation systems
- achieve cost recovery for water planning and management, with consistent approaches to attributing planning and management costs by 2006.

South Australia’s current approach of using consolidated revenue to meet all the costs of River Murray Water supplying water to the state’s irrigators, and MDBC water resource management, means that irrigators do not face the cost of any MDBC services they use. The state’s approach is unlikely to promote the economically efficient and sustainable use of water resources and infrastructure because users are not faced with economic signals to conserve. In addition, there is a lack of transparency in the current arrangements, as South Australia does not report the taxpayer funded River Murray Water costs as a subsidy or CSO to irrigators, and the basis upon which it does this

— though transparent reporting would still leave the matter of full subsidisation and this would be unlikely to facilitate efficient water use and trade in water entitlements. South Australia's approach does not therefore comply with the best practice pricing principles in the 1994 CoAG water reform agreement and the National Water Initiative.

To comply with water reform obligations, South Australia will need to implement a charging arrangement that, by the end of 2004, attributes appropriate water storage and delivery costs to users. South Australia's share of Murray River Water's costs are relevant to this water reform obligation. Together with New South Wales and Victoria, South Australia will also need to ensure that, by 2006, it has identified all costs associated with water planning and management, and attributed costs appropriately to irrigators. The action taken will need to be consistent with other Murray–Darling Basin states to facilitate the efficient functioning of water markets (see section 10.3).

The Marsden Jacob Associates study is likely to be a useful step towards implementing best practice pricing in South Australia. The brief for the study indicates that it is intended to provide advice on the quantum of River Murray Water's costs attributable to South Australian irrigators, and identify differences in jurisdictional approaches in setting prices to irrigators.

6.2 Water access entitlements

Assessment issue: South Australia is to institute a statutory water access entitlement system and support systems for the consumptive use of water, separate from land. The water access entitlement system should be specified as a perpetual or open-ended share of the consumptive pool of a water source. These arrangements should be in place by 2006.

At the time of the 2003 NCP assessment, South Australia had established a system of water entitlements (termed allocations) separated from land title and specified in volumetric terms, with water licences issued in perpetuity. It had converted water allocations to a volumetric basis in most areas of the state, except the South East Catchment. South Australia had also established a register of water licences and allocations, which records third party interests. It was in the initial stages of upgrading its register towards a full Torrens title system and to enable access via the Internet.

For the 2004 NCP assessment, the Council has looked for South Australia to ensure its water access entitlements system and supporting arrangements are consistent with the state's commitments under the National Water Initiative. South Australia will need to specify its water access entitlements as shares of water available for consumption (rather than specified volumes), finish the conversion process in the South East Catchment and finalise the upgrade of its register of water entitlements.

References: 1994 CoAG water reform agreement, clause 4; 1999 tripartite meeting; Intergovernmental Agreement on a National Water Initiative

Under South Australia's *Water Resources Act 1997*, the extraction of water from a prescribed water resource requires a licence.² (Licences are set based on the level of consumptive use and the condition of the water resource.) Licences specify volumetric entitlements (the volume of water that may be taken in a given year, termed 'allocations' in South Australia) and the conditions of use. Licences are the holder's personal property, issued in perpetuity (unless terminated under the Act), separate from land title, transferable and enforceable. The Act provides for both water 'holding' allocations and water 'taking' allocations.³ The 'holding' allocation enables a person to hold water but not use it without first converting it to a 'taking' allocation.

The State Water Plan sets 2005 as the target for converting all water allocations from an area to a volumetric basis, and for all water use to be measured. In the 2003 NCP assessment, South Australia advised that it had converted water allocations to a volumetric basis in most areas of the state. The main area still to be converted was the South East Catchment, which is a significant groundwater catchment (having seven prescribed water resources). South Australia expected to complete the conversion process in 2006.

The Water Resources Act provides the framework for a hierarchy of water management plans for water resources in South Australia. Water allocation plans are the main tool for allocating water to water users and the environment in prescribed areas (see section 6.3). Local water management plans and broader catchment water management plans may be used to manage nonprescribed water resources.

The Minister for Environment and Conservation may reduce the allocations on a licence if it is necessary to prevent a reduction in water quality or to prevent damage to an ecosystem, if there is insufficient water to meet existing or expected future demands, or if there is a reduction in the quantity of water available under intergovernmental agreements covering the Murray–Darling Basin or groundwater. The Water Resources Act does not provide for compensation in the event that a water allocation is reduced (provided the reduction accords with the objectives of the Act). Decisions are subject to appeal to the Environment, Resources and Development Court.

In line with the requirements of the Act, South Australia maintains a water licence register. The register records all water licences and transfers, and includes provision for the registration of third party interests. Registered third parties must be notified before a licence transaction may proceed. At the time of the 2003 NCP assessment, South Australia was in the initial stages of

² In most areas, licences are not required for stock and domestic use. The exceptions are the River Murray and the Northern Adelaide Plains and Far North prescribed wells areas.

³ Provision for holding allocations has been made only in the River Murray and the South East Catchment.

upgrading its water licence register towards a full Torrens title system and to enable access via the Internet.

Reform progress

South Australia has advised that it has progressed the volumetric conversion of allocations in the South East Catchment and is on schedule to complete the process by December 2006. By June 2005 it expects around 56 per cent of allocations (approximately 2300 licences) in the catchment to still be area and crop based. During 2003-04 South Australia produced draft reports on defining irrigation requirements and on 'climatic variability and volumetric allocations' in the South East Catchment. It completed the installation of monitoring equipment for its field irrigation system trial sites, and it developed a process to ensure all trial sites are operating effectively. It also implemented a communication strategy (including local television news, three metering trade days, local government tours during Water Week, information sheets and the department's website) to inform the public of the project's requirements and progress.

South Australia expects to implement the first stage of its upgraded water licence registry system, the Water Information and Licensing Management Application, in 2004. The system incorporates the major business processes required to support the administration of the Water Resources Act, including the processing of water licence applications, the transfer of water licences and allocations, and the collection of levies, fees and charges. It includes an Internet based public register of water licences and interests. As a result of the system, South Australia expects to significantly improve data integrity, assessments of the salinity and other impacts of water use and transfers, and reporting for planning and other purposes. Future stages of the upgrade will include the development of a spatial interface and e-commerce facilities.

Discussion and assessment

The Water Resources Act establishes a comprehensive system of water allocations separated from land title and specified in volumetric terms. Licences are issued in perpetuity, although the Minister may reduce the allocations specified on the licence if necessary (for example, to prevent damage to ecosystems or if there is insufficient water to meet demand on a sustainable basis). South Australia also has a water licence register, which records third party interests, and which it is upgrading (including to enable access via the Internet). Both the system of water allocations and the register are consistent with 1994 CoAG water reform obligations.

South Australia has converted its water allocations from an area to a volumetric basis in most of the South East Catchment. It expects approximately 56 per cent of entitlements in the catchment to still be area

and crop based in 2005 (the deadline for substantial completion of allocation arrangements under the 1994 CoAG agreement), with the conversion process to be completed by December 2006.

The National Water Initiative requires participating states and territories to introduce perpetual water access entitlements, with similar status to that of freehold land, and to have compatible, publicly accessible and reliable systems for registering entitlements (including any encumbrances) and (permanent and temporary) trades. South Australia's water licences are issued in perpetuity. The requirement that water access entitlements be specified as shares of water available for consumption will require South Australia to amend its current arrangements by the end of 2006.

The Council considers that South Australia has made satisfactory progress against its CoAG obligations on water entitlements for this 2004 NCP assessment.

6.3 Water planning — providing a better balance in water use

Assessment issue: Governments are to establish systems of water allocations including formal allocations of water to the environment. In allocating water to the environment, governments are to have regard for the ARMCANZ/Australian and New Zealand Environment and Conservation Council (ANZECC) National Principles for the Provision of Water for Ecosystems. Environmental requirements are to be determined wherever possible on the best available scientific information, having regard to the water needs required to maintain the health and viability of river systems and groundwater basins. For river systems that are overallocated or deemed to be stressed, governments are to provide a better balance in water resource use, including appropriate allocations to the environment to enhance/restore the health of river systems. Governments should also consider environmental contingency allocations and with a review of allocations five years after they have been initially determined.

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). In the 2004 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 substantially complete allocation arrangements (including appropriate allocations to the environment) by 2005 for all stressed and overallocated river systems and groundwater resources covered by their 1999 programs, and to make substantial progress by 2010 towards adjusting overallocated and overused rivers and groundwater systems. Signatory governments also committed to preparing water plans by the end of 2007 for other systems that are overallocated, fully allocated or approaching full allocation and plans by the end of 2009 for systems that are not yet fully allocated.

South Australia has completed all of the water allocation plans listed on its 1999 implementation program. In the 2002 NCP assessment, the Council indicated that it would consider any new systems that South Australia prescribes as additions to South Australia's implementation program (but not subject to CoAG's target for completion by 2005). At the time of the 2003 NCP assessment, South Australia had prescribed the Tintinara Coonalpyn wells area, Morambro Creek, the Great Artesian Basin, the Marne River and Saunders Creek, and had proposed to prescribe other water resources. South Australia is

(continued)

undertaking a stressed resources review to improve its approach to identifying water resources under stress (or at risk of stress) and developing appropriate management responses. It decided that the review's findings on monitoring would be further considered in a complementary review of the state's water monitoring programs.

For the 2004 NCP assessment, the Council has asked South Australia to report on:

- the water allocation plan for the Tintinara Coonalpyn prescribed wells area (completed in January 2003)
- progress with its stressed resources review and the complementary review of water monitoring programs.

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

Under the Water Resources Act, the State Water Plan 2000 provides the policy framework for water resources management and sustainable use throughout South Australia. The policy is implemented via catchment water management plans, water allocation plans and local water management plans for areas prescribed under the Act. These plans must:

- assess the state and condition of the water resources
- identify existing and future risks of damage to, or degradation of, the state's water resources
- include proposals for the use and management of the water resources to achieve the objectives of the Water Resources Act
- include proposals for monitoring changes in the state and condition of the water resources.

All water plans, including the State Water Plan, must be reviewed every five years to ensure consistency with the Act in light of new information and advances in technology and management.

South Australia identified 15 water sources, mostly groundwater, on its 1999 implementation program. At the time of the 2003 NCP assessment, South Australia had satisfactorily completed water allocation plans for all 15 of the prescribed water resource areas covered by its 1999 program. The Council indicated in the 2002 NCP assessment that it would consider any new systems that South Australia prescribes as additions to South Australia's implementation program (but not subject to CoAG's target for completion by 2005). At the time of the 2003 NCP assessment, South Australia had prescribed the Tintinara Coonalpyn wells area, Morambro Creek, the Far North Wells (Great Artesian Basin), the Marne River and Saunders Creek, and had proposed to prescribe other water resources. South Australia is undertaking a stressed resources review to improve its approach to identifying water resources under stress (or at risk of stress) and developing appropriate management responses. It decided that the review's findings on monitoring would be further considered in a complementary review of the state's water monitoring programs.

Reform progress

South Australia completed a water allocation plan for the Tintinara Coonalpyn prescribed wells area in January 2003, which the Council considered in this 2004 NCP assessment. South Australia is also drafting a water allocation plan for Morambro Creek, which it expects to adopt early in 2005, and plans for the Marne River and Far North Wells. It is prescribing the water resources in the Eastern Mount Lofty Ranges area and, in October 2004, announced its intention to prescribe the water resources of the Western Mount Lofty Ranges. Table 6.1 shows the status of water allocation plans for prescribed areas in South Australia.

South Australia continues to progress the stressed resources review that commenced in 2002. It has advised that it completed the following key tasks during 2003:

- the development of a spatial classification tool based on the River Styles ® method for surface water systems
- the refining and trialling in two groundwater systems of groundwater stress assessment criteria
- the development of draft surface water stress assessment criteria.

Table 6.1: Water allocation plans for prescribed areas in South Australia

<i>Water allocation plan</i>	<i>Status of plan</i>
Angas–Bremer	Adopted on 2 January 2001
Barossa	Adopted on 22 December 2000
Clare Valley	Adopted on 22 December 2000
Comaum–Caroline	Adopted on 29 June 2001
Eastern Mount Lofty Ranges ^a	Prescription process under way. Expected to be prescribed in the second half of 2004.
Western Mount Lofty Ranges ^a	Intent to prescribe announced in October 2004
Far North Wells ^a	Water allocation plan being drafted. Expected to be adopted in late 2005.
Lacepede Kongorong	Adopted on 29 June 2001
Mallee	Adopted on 21 December 2000
Marne/Saunders ^a	Water allocation plan being drafted. Expected to be adopted in late 2005.
McLaren Vale	Adopted on 6 November 2000. Draft review of the plan completed, to be finalised by November 2005.
Morambro Creek ^a	Water allocation plan being drafted. Expected to be adopted in early 2005.
Musgrave	Adopted on 2 January 2001

(continued)

Table 6.1 continued

<i>Water allocation plan</i>	<i>Status of plan</i>
Naracoorte Ranges	Adopted on 29 June 2001
Noora	Adopted on 2 January 2001
Northern Adelaide Plains	Adopted on 22 December 2000
Padthaway	Adopted on 29 June 2001
River Murray	Adopted on 1 July 2002
Southern Basins	Adopted on 31 December 2000
Tatiara	Adopted on 29 June 2001
Tintinara Coonalpyn ^a	Adopted on 22 January 2003

^a Additional systems identified since the development of the 1999 implementation plan.

Source: Government of South Australia 2004

By early 2005, South Australia intends to complete and validate the surface water stress assessment criteria, trial these criteria in several catchments, identify any data gaps and decide on its approach to applying the River Styles method.

South Australia established the State Water Monitoring Coordinating Committee in 1998 to conduct a review of the state's water monitoring requirements. The aim of the review is to ensure that water monitoring is efficient, effective and appropriately funded, and that information is accessible to the public. As part of this review, the committee has conducted a state-level review of monitoring design, criteria and priorities, and reporting protocols. It is extending the review to the regional and catchment scale to identify data gaps and prepare integrated water monitoring strategies at that level. It has also commenced work on data sharing and cost sharing arrangements. Existing work and further work proposed for the stressed resources review for 2004 will inform this other review.

Tintinara Coonalpyn water allocation plan

The Tintinara Coonalpyn prescribed wells area is located about 200 kilometres south east of Adelaide and covers 3423 square kilometres. The groundwater resource consists of two aquifers: a regionally unconfined limestone aquifer and an underlying confined aquifer.

The Tintinara area covers the Coastal Plain and the Mallee Highlands. The hydrogeology of this area is very different from that of most other groundwater areas. The area's groundwater is rising as a result of broad scale clearance of native vegetation that occurred predominately in the 1950s to 1970s. Less than 4 per cent of the native vegetation on the Coastal Plain remains.

The water allocation plan for the Tintinara Coonalpyn prescribed wells area prepared by the South East Catchment Management Board was adopted by the Minister in January 2003. The board employed private consultants to first assess the water needs of the area's ecosystems. The consultants identified

several water dependent ecosystems (in both the Coastal Plain and the Mallee Highlands) that are not at risk from the current extraction and use of water from either of the aquifers (table 6.2). The consultants identified the critical issue as managing broad scale land use to reduce rising watertables (URS 2001).

The consultants considered that the perched wetlands⁴ in the eastern part of the area could be affected by poor irrigation practices, leading to localised water logging. They found that the current irrigation management practices, aimed at preventing water logging that adversely affects agricultural production, are sufficient to protect the wetlands.

Table 6.2: Groundwater dependent ecosystems in the Tintinara Coonalpyn prescribed wells area

<i>Dependent ecosystems by area</i>	<i>Description</i>	<i>Environmental water requirements</i>	
		<i>Minimum requirement</i>	<i>Optimum requirement</i>
Coastal Plain			
Wetlands and phreatophytes (for example, pink gums and blue gums)	Underground water levels must be kept at levels that do not increase the duration and frequency of water logging beyond the range of natural variability. Salinity levels of groundwater must be kept within the range of 'natural' salinity levels.	Watertable at 1–2 metres above the level before post-settlement disturbance	No rise in the watertable level before post-settlement disturbance
Dissolution features and hypogean environments	Changes in underground water levels and quality must not affect fauna and flora (if present).	Unknown	No rise in the watertable level before post-settlement disturbance
Mallee Highlands			
Perched wetlands (for example, Bucks Camp Soakage and Rabbit Island Soakage)	Irrigation drainage should not increase the duration, frequency or timing of waterlogged conditions beyond the range of natural variability. Irrigation drainage should not increase levels of salinity, agricultural chemicals or other pollutants.	Maintainance of current water quality and availability conditions	Conditions before post-settlement disturbance
Phreatophytes (for example, pink gums)	Watertables must be kept at levels that do not cause water logging and salt stress.	Depth to groundwater no less than 10 metres	Conditions before post-settlement disturbance
Dissolution features and hypogean environments	Changes in underground water levels and quality must not affect fauna and flora (if present).	Unknown	Conditions before post-settlement disturbance

Source: South East Catchment Water Management Board 2003b

⁴ Perched wetland systems occur in areas where soils such as clay do not allow water to pass through.

The water allocation plan sets permissible annual volumes (the volumes of water available for licensed extraction) for seven management areas. South Australia nominally sets permissible annual volumes based on the estimated annual vertical recharge to the groundwater resource. For the Tintinara Coonalpyn prescribed wells area, these volumes also account for rising water levels, although this issue is predominantly addressed in the complementary South East Catchment water management plan.

The plan does not provide a volumetric allocation for the environment, but the board expects that management of the water resource should meet the minimum requirements of dependent ecosystems. A paucity of data, however, means there is some uncertainty about the sufficiency of the current plan. To date, the board has set the permissible annual volumes using estimates of hydrological recharge and sustainable yield developed from data obtained from monitoring bores. It considers that the water balance estimates are accurate to within plus or minus 30 per cent only (South East Catchment Water Management Board 2003b).

There are provisions for monitoring and adaptive management, enabling the plan to be adjusted as better information is obtained. As part of the monitoring program, licensees were required to install meters on their extraction wells, which were in place by 1 July 2003. Each licensee must also prepare and submit an annual report to the Department of Water, Land and Biodiversity Conservation, including details on water use and salinity levels. If monitoring indicates that salinity or water level trends are approaching a resource trigger set in the plan, the board will determine appropriate remedial action to prevent further degradation of the resource and to minimise potential impacts. Actions may include temporary restrictions or reductions to licensed allocations. The triggers in the plan are set primarily for the benefit of human use, but would have indirect environmental benefits.

The plan requires the board to monitor the ecological health of groundwater dependent ecosystems. It must investigate the dependency of the Coastal Plain's pink gums on underground water, consider the ecology of dissolution features (caves) and hypogean ecosystems, and assess the risk from irrigation to the perched wetlands in the Mallee Highlands. The plan states that the board would determine the details of its monitoring program for the Tintinara Coonalpyn prescribed wells area in the catchment management plan. The *South East Catchment water management plan 2003–2008* released in May 2003 does not appear to include these details, but it does set out broad strategies for monitoring water dependent ecosystems (South East Catchment Water Management Board 2003a). These strategies include a proposal to develop management plans for key water dependent ecosystems.

The board will review the permissible annual volumes and water allocation plan for the Tintinara Coonalpyn prescribed wells area every five years. It can also initiate an earlier review if monitoring detects adverse trends in the water quality or water levels. In addition to requiring annual reporting, the South East Catchment water management plan requires specific reporting on the health and condition of the water resources and ecosystems every five years. The board will use this information to evaluate changes in trends and

to consider options and actions to address new or emerging trends in catchment condition.

While the Tintinara Coonalpyn plan does not provide a specific environmental water allocation, and data inaccuracies create some doubt as to whether provisions in the plan will meet minimum environmental requirements, the plan does consider the needs of water dependent ecosystems and is open to amendment depending on monitoring outcomes. At this stage, however, the board has not fully developed the monitoring proposal for the area. It would be appropriate for the National Water Commission to monitor South Australia's progress on this aspect on the plan.

Assessment

South Australia is continuing to progress its water reform processes in a manner consistent with its 1994 CoAG water reform obligations. It has moved forward with its stressed rivers review and complementary state water monitoring review to the point at which these projects appear to be close to completion. It has also completed water allocation plans for all 15 of the prescribed water resource areas covered by its 1999 program, and it is continuing to identify additional water systems and develop plans to manage water allocations in a sustainable way.

6.4 Water 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. 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, in the southern Murray–Darling Basin, the relevant governments (including 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.

In the 2003 NCP assessment, which considered intrastate trading arrangements, the Council found that South Australia had developed an effective framework for water trading. It identified, however, constraints on trading that are inconsistent with CoAG obligations, including limits on trade out of some irrigation districts (for example, the Central Irrigation Trust's 2 per cent cumulative limit on the proportion of entitlements that can be permanently traded out of the trust's districts) and the reduction factors applied to transfers of water allocations in some prescribed areas (so the amount of water acquired by the buyer is less than that sold). Permanent interstate trade is permitted only in high security water entitlements in the area covered by the MDBC's pilot interstate trading project.

(continued)

South Australia needs to:

- make substantive progress towards removing constraints on trade out of irrigation districts, consistent with its National Water Initiative commitments
- remove the reduction factors that apply to transfers in some areas, or demonstrate that they are consistent with CoAG obligations
- ensure the trading rules in water allocation plans facilitate trading where water systems are physically shared or hydrologic connections and water supply considerations permit trading
- develop arrangements for interstate water trade beyond the MDBC's pilot interstate trading project.

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

In South Australia, water trading is possible in irrigation schemes and in prescribed areas in which water licences have been issued. Trade may be temporary (for the short or long term) or permanent. South Australia also participates in the MDBC's pilot project for permanent interstate water trading (see chapter 10). 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).

Irrigation trusts

Under the Irrigation Act, the irrigation trust in an irrigation area holds a water 'taking' allocation. Whether the trust devolves all or part of this allocation to its members varies among the trusts. (In the 2003 NCP assessment, South Australia advised that a small number had devolved ownership of the water allocations to irrigators through internal administrative arrangements.) Where the allocation is devolved, subject to the trust's approval, the owner of an irrigated property may transfer all or part of their allocation to another land owner within their district or to the trust. An irrigation trust may trade all or part of its surplus allocation (the allocation held by the trust in excess of the sum of entitlements held by individual irrigators) to another party outside the trust.

Some irrigation trusts have imposed constraints on water trading that appear to be inconsistent with CoAG requirements for water trading. The Council has sought to clarify the detail of these constraints in both this assessment and the 2003 NCP assessment, considering a study on water trading arrangements undertaken for the MDBC (Hassall and Associates 2002) and asking the South Australian Government to specify the detail of any trading restrictions imposed by the trusts. While available information is inconsistent, there appear to be some significant restrictions. The major restrictions identified by the study undertaken for the MDBC include the following:

- For permanent trades, the Central Irrigation Trust imposes a 2 per cent cumulative limit on the proportion of allocations that can be traded out of

the trust's districts, and a limit on transfers from a property of 25 per cent of the landholder's original water allocation.

- The Central Irrigation Trust also has a limit of 4000 megalitres a year for temporary trade to private diverters, although it advised the South Australian Government that this limit has not been reached.
- The Renmark Irrigation Trust does not permit permanent trade.
- The Sunlands and Golden Heights irrigation trusts permit permanent trade only into their areas (Hassall and Associates 2002).

Other areas

Outside the irrigation areas, water trading is possible in any prescribed area in which licences have been issued to water users under the Water Resources Act (see sections 6.2 and 6.3). The water allocation plans for prescribed areas include objectives and principles or rules for trading (see box 6.1 for the objectives included in the most recently completed plan). The trading provisions in the plans must be consistent with the overarching State Water Plan, which includes the following provisions of relevance to trading:

- The nature of South Australia's highly variable surface water and watercourse water resources generally means that water allocations may be transferred downstream in a catchment but not upstream.
- While transfers of water between catchments are generally not supported, given the potential environmental impacts, a transfer is supported if it is within the ecological limits of the taking and receiving environments. South Australia has advised that water transfers from the River Murray to the Barossa and Clare valleys are two examples of successful inter-catchment transfers.
- In relation to groundwater trading, transfers are not permitted:
 - between management zones (which may include aquifers) unless specifically provided for within the water allocation plan
 - to areas of high intensity extraction unless a detailed hydrological assessment and a monitoring program suggest minimum risks to the resource and any groundwater dependent ecosystems
 - unless they have positive or neutral effects on water quality outcomes, consistent with the higher value uses required of the water bodies.

Box 6.1: Transfer objectives for confined aquifers in the water allocation plan for the Tintinara Coonalpyn prescribed wells area

- To prevent loss of biodiversity and to protect local and regional ecological processes dependent on underground water from significant degradation, arising from the taking and use of underground water from the confined aquifer
- To ensure that the management, taking and use of underground water from the confined aquifer protects the environment and prevents and/or addresses significant degradation of any other resource including soil, water and vegetation
- To promote the efficient use of water according to industry best practice standards
- To manage the confined aquifer underground water resource in a cautious manner so that it may continue to be utilised by future generations and is available for stock and domestic supply
- To provide flexible and fair access to the confined aquifer
- To encourage and expedite an active water market so that water allocations are readily available for future economic development

Source: South East Catchment Water Management Board 2003b

The transfer of a licence and/or all or part of the water allocation attached to the licence is subject to the approval of the Minister for Environment and Conservation. All parties having a registered interest in the licence must be notified of an application to trade before the Minister can grant approval. The Minister may direct that an expert (approved or appointed by the Minister) assess the effect of the application being approved. In reaching a decision, the Minister must ensure:

- the transferred allocation and the conditions placed on the licence are consistent with the relevant water allocation plan
- the trade is in the public interest.

The Minister may reduce the allocation (by applying a 'reduction factor') or vary the conditions of the transferred licence before approving the trade. (The Minister's decision may be appealed.) A reduction factor of 20 per cent is applied to permanent and temporary transfers in the Northern Adelaide Plains.⁵ Under this arrangement, the transfer results in the volume of water allocations acquired by the buyer being 20 per cent less than the volume sold.⁶

⁵ Reduction factors have applied to transfers of allocations in the Northern Adelaide Plains since 1984. The 20 per cent reduction factor has applied since early 2002. At the completion of a temporary transfer, the 20 per cent of water allocations retained by the Minister is returned to the licence holder. Transfers within families, between partners in a partnership, or within the same entity are generally not subject to the reduction. The reduction may be waived where the transfer results from the sale of land.

⁶ In the 2003 NCP assessment, the Council noted that a reduction factor also applied in McLaren Vale to transfers of water allocations from other crops (which use more water) to grapevines. The reduction factor was a transitional measure pending the conversion of water licences from an area basis to a volumetric basis. South Australia indicated that the reduction factor returned a licence to its intended volumetric entitlement.

The Department of Water, Land and Biodiversity Conservation maintains a website to facilitate water trading and provide market information. The website contains year-to-date, as well as historical, water trading market information for all areas of South Australia. While there is provision for pricing information to be included, traders are not legally required to report prices to the department. The department intends to obtain and report verified data on prices from RevenueSA, which collects the information for stamp duty purposes. The website also provides a mechanism for buyers and sellers to make initial contact. It includes a water trading noticeboard for potential traders to place 'wanted to buy' and 'for sale' advertisements detailing volumes, prices and contact information, but does not provide for trades to be processed.

Recent trading activity

Water trade in South Australia is concentrated in the River Murray (table 6.3). There is also significant trade in other areas, but mostly in groundwater (table 6.4).

In the River Murray, intrastate transfers accounted for almost three-quarters of water trade in 2002-03, when:

- most trade (almost 80 per cent of intrastate and over 90 per cent of interstate trade, by volume) occurred via temporary transfers
- the volume of temporary interstate transfers from South Australia was more than double that transferred into the state, with New South Wales accounting for almost two-thirds of temporary trade into and out of South Australia
- the volume of permanent interstate transfers into South Australia was three times that transferred out of the state, with Victoria accounting for nearly 80 per cent of permanent trade into South Australia.

Table 6.3: Water trading in the River Murray, South Australia

	2001-02		2002-03	
	no.	Megalitres	no.	Megalitres
Intrastate transfers				
Permanent	94	8 022	205	12 999
Temporary	238	63 520	300	48 738
Total	332	71 542	505	61 737
Interstate transfers				
Permanent				
Victoria to South Australia	14	1 270	2	1 100
New South Wales to South Australia	3	104	6	320
South Australia to other states	–	–	2	477
Total	17	1 374	10	1 897

(continued)

Table 6.3 continued

	2001-02		2002-03	
	no.	Megalitres	no.	Megalitres
Temporary				
Victoria to South Australia	2	2 150	15	2 225
New South Wales to South Australia	11	4 220	13	3 315
South Australia to Victoria	4	1 160	36	5 118
South Australia to New South Wales	25	11 371	45	9 444
Total	42	18 901	109	20 102
Total permanent	111	9 396	215	14 896
Total temporary	280	82 421	409	68 840
Total transfers	391	91 817	624	83 736

Source: Government of South Australia 2004

In the prescribed wells areas for which South Australia provided data (table 6.4), most groundwater trade occurs via licence transfers (mainly accompanying land sales). In 2002-03 licence transfers accounted for over three-quarters of the volume of water traded. Permanent transfers of water allocations (separate from licence transfers) exceeded temporary transfers in most of these areas. In aggregate, permanent transfers of allocations accounted for three times the volume of temporary transfers in 2002-03.

Table 6.4: Water trading in selected prescribed wells areas, South Australia, 2002-03

Prescribed wells area	Temporary allocation transfers	Permanent allocation transfers	Licence transfers	Total transfers	Total transfers
	ML	ML	ML	ML	no.
Comaum–Caroline	712	1 000	1 760	3 472	48
Lacepede–Kongorong	140	2 630	16 294	19 064	117
Mallee	86	1 038	na	1 124	6
Naracoorte Ranges	936	1 919	7 568	10 423	63
Padthaway	219	36	545	800	5
Tatiara	534	1 547	4 262	6 343	33
Tintinara–Coonalpyn	–	–	6 973	6 973	12
Total ^a	2 627	8 170	37 402	48 199	284

^a The total number of transfers comprised 32 temporary allocation transfers, 82 permanent allocation transfers and 170 licence transfers. **na** Not available.

Source: Government of South Australia 2004

South Australia has advised that the price range for recent water trades in the River Murray was \$100–1100 a megalitre for temporary transfers and \$930–2000 a megalitre for permanent transfers. Prices for permanent transfers were highest in McLaren Vale (\$16 880–20 730 a megalitre) and the Barossa Valley (\$4500–5400 a megalitre). In other areas, the price range for permanent transfers of groundwater was typically \$10–500 a megalitre. Recent temporary transfers in the South East Catchment were priced at \$10 a megalitre.

For water taking allocations, South Australia has indicated that the time taken to approve a permanent trade varies considerably, depending on the complexity of the technical assessment required. Generally, the assessment needs to consider both the seller's and buyer's points of extraction and use. The Department of Water, Land and Biodiversity Conservation aims to assess within eight to 10 weeks the applications to trade water taking allocations. In some areas, however, particularly for groundwater but increasingly for the River Murray (where salinity impacts need to be assessed), the process can take up to six months. For water holding allocations (in the River Murray and the South East Catchment), the department generally processes trades within 10–15 days, because a technical assessment is not required.

Reform progress

In its 2004 NCP annual report, South Australia has not reported any significant changes to the legislative and institutional arrangements for water trading since the 2003 NCP assessment. The Department of Water, Land and Biodiversity Conservation is developing and/or improving systems to track the time taken for trades and to identify where delays are occurring. It is aiming to improve the timeliness of trading without compromising resource management.

Discussion and assessment

In previous NCP assessments, the Council found that South Australia's legislation and related arrangements provided an effective framework for water trading, although it identified constraints on trading that are inconsistent with CoAG obligations. South Australia is also still to develop arrangements for interstate trade beyond the MDBC's pilot project.

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. The National Water Initiative extends to 2007 the timeframe for establishing institutional and regulatory arrangements that facilitate intra- and interstate trade (although barriers to temporary trade are to be removed immediately). In the southern Murray–Darling Basin, the relevant governments (including South Australia) committed to take all steps (including legislative and administrative changes) to enable by June 2005 exchange rates and/or tagging of water access entitlements traded from interstate sources to buyers in their jurisdictions.

In the 2003 NCP assessment, the Council indicated it was satisfied that water entitlements in South Australia are sufficiently specified to enable efficient trade. Licences are issued in perpetuity and are separate from land title. In most irrigation areas, the irrigation trust holds the water taking allocation and provides a share of this allocation to individual irrigators. This entitlement is freely transferable within the scheme and can be traded

outside the scheme through the trust. Outside the irrigation areas, water licences are vested in the end users and specifically recognised as personal property. The register of water licences includes provision for the registration of third party interests. Registered third parties must be notified, and have an opportunity to object, before the Minister can approve a trade. Further, South Australia's provision for water holding allocations allows financial institutions to more easily obtain ownership of a water allocation in the case of default.

South Australia's trading arrangements contain a range of measures to protect the environment and the interests of other water users. In approving trades, the Minister must account for the relevant water allocation plan and the broader public interest. For longer term trades, approval to use the traded water is also subject to the completion of an irrigation drainage and management plan, with the water purchaser obliged to offset any salinity impacts over time.

Permanent and temporary water trading in South Australia is undertaken through a variety of mechanisms, including private trades, brokers and water exchanges (including the Central Water Exchange operated by the Central Irrigation Trust). The website established by the Department of Water, Land and Biodiversity Conservation has improved the availability of water market information throughout the state and facilitated contact between buyers and sellers. While the department can take up to six months to assess trading applications, this occurs only in cases requiring complex technical assessments (for example, to consider salinity impacts). The approval process is often much shorter, and South Australia is working to speed up the process without compromising resource management.

In the 2003 NCP assessment, the Council considered the trading provisions in South Australia's two most recently completed water allocation plans (the plans for the River Murray and the Tintinara Coonalpyn prescribed wells area). It found that the plans do not appear to contain provisions that conflict with CoAG water trading obligations. Their trading provisions are directed at facilitating trade in a manner that maximises economic benefits while protecting the environment and the interests of other water users. Under the National Water Initiative, South Australia will need to ensure the trading rules in subsequent plans facilitate trading where water systems are physically shared or hydrologic connections and water supply considerations permit water trading.

The Council identified two water trading compliance issues for South Australia in the 2003 NCP assessment. The most significant issue is the limits on trade out of some irrigation districts (such as the Central Irrigation Trust's 2 per cent cumulative limit on permanent trade out of the trust's districts). In previous NCP assessments, the Council acknowledged that the irrigation trusts imposed these limits in response to concern that net trade out of districts may result in adverse outcomes including the diminution of local production and regional economies, a reduction in the rate base for local governments, the loss of economies of scale, the potential 'stranding' of irrigation infrastructure and, more recently, uncertainty about the amount of water available for extraction once The Living Murray Initiative is implemented. In its 2004 NCP annual report, South Australia has reiterated its position that

it has met its obligations under the 1994 CoAG water reform agreement because the trading limits have been applied by the private irrigation trusts under their articles of association and are not government policy.

The limits on trade out of irrigation districts, however, impede water trading both within South Australia and interstate, and inhibit the state's capacity to achieve CoAG objectives.⁷ While the ability to vary trading rules rests with the boards of the trusts and their member customers, the CoAG water agreements place responsibility on the South Australian Government to facilitate trading in water, subject to protecting the environment and third party interests. The government acknowledged this responsibility in the National Water Initiative, committing to take all necessary steps to facilitate permanent trade out of water irrigation areas (up to an interim annual threshold limit of 4 per cent) by June 2005. A review in 2009 is to consider raising the threshold. Barriers to temporary trade are to be removed immediately.

The other compliance question that the Council identified in the 2003 NCP assessment is the 20 per cent reduction factor applied to water allocations that are traded (permanently or temporarily) in the Northern Adelaide Plains. At that time, South Australia advised that it intended to continue to apply the reduction factor to reduce the demand on groundwater, as a precautionary measure. As the Council has previously indicated (NCC 2003a), reduction factors on traded allocations provide a disincentive to trade and are a less direct influence on water use. Reduction factors are thus likely to be inconsistent with CoAG trading obligations. Alternative ways of limiting water use that are less likely to adversely affect trade include the government reducing allocations for all water licence holders in an area by a uniform percentage and/or buying allocations in the market.

Given the commitments made by South Australia under the National Water Initiative, the Council considers that the state has made sufficient progress against its CoAG obligations on water trading for this 2004 NCP assessment.

⁷ At the time of the 2002 NCP assessment, South Australia reported that the 2 per cent cumulative limit imposed by the Central Irrigation Trust had been reached for about 25 per cent of allocations held by the trust. This had occurred in five of the smaller irrigation districts in the trust's area (each with an allocation of less than 5 gegalitres). The three districts holding the majority of the water (20 gegalitres or more per district) had not reached their 2 per cent cumulative limit. South Australia has not provided more recent data.

6.5 Investments in new rural water schemes

Assessment issue: Investments in new rural water schemes or extensions to existing schemes are to be undertaken only after appraisal indicates the scheme or extension is economically viable and ecologically sustainable.

In the 2003 NCP assessment, the Council concluded that South Australia had met the CoAG obligation relating to economic viability for the Clare Valley Water Supply Scheme. Based on an ecological study of the project, the Council's preliminary view was that South Australia would also comply with the CoAG obligation relating to ecological sustainability if it implemented appropriate responses to the study's recommendations.

South Australia needs to demonstrate that it has acted to address the matters raised in the ecological study for the Clare Valley project, and report on the initial outcomes of the regional monitoring of groundwater and surface water.

References: 1994 CoAG water reform agreement, clause 3(d)(iii); Intergovernmental Agreement on a National Water Initiative

The Clare Valley Water Supply Scheme, a SA Water project, involves the construction of 83 kilometres of new pipeline and related infrastructure (at a capital cost of \$27 million). The scheme will enable up to 7.3 gigalitres a year of filtered and treated River Murray water to be transferred to the Mid North region of South Australia. The water will be used to improve the reticulated supply of high quality water to several townships, augment supplies to the mid-north region and supply water to the Clare Valley region for irrigation and bulk water purposes. The South Australian Government approved the scheme subject to the establishment of an ongoing groundwater and surface water monitoring program. Originally scheduled for completion by November 2003, the scheme is now expected to be completed by late 2004.

In the 2003 NCP assessment, the Council concluded that South Australia had complied with the CoAG obligation to demonstrate that the scheme is economically viable. Based on an ecological study of the scheme by consultants Resource and Environmental Management, the Council's preliminary view was that South Australia would also comply with the CoAG obligation to demonstrate that the scheme is ecologically sustainable if it implemented appropriate responses to the study's recommendations (NCC 2003a).

Developments since 2003

South Australia has advised that it is addressing, consistent with its commitment in approving the Clare Valley Water Supply Scheme, the five key potential environmental risks identified in the environmental assessment report: (1) waterlogging and drainage hazard formation, (2) higher stream baseflow and baseflow salinity, (3) groundwater salinisation, (4) impacts from the release of chloraminated water to the environment and (5) impacts from pipeline construction.

The Department of Water, Land and Biodiversity Conservation and SA Water are establishing an environmental management regime to address the first three risks. The regime is being applied at two levels:

1. At the regional level, the environmental management regime involves determining the volume of imported water that may be applied in each subcatchment of the Clare Valley without adversely affecting ecosystem health, land productivity, water resource quality and/or downstream catchments. The sustainable volume for each subcatchment has been determined via scientific investigation and the existing water allocation plans for the Clare Valley and the River Murray. In addition, the Department of Water, Land and Biodiversity Conservation is implementing a regional monitoring program using an adaptive management approach. Baseline monitoring has commenced for groundwater, surface water quality and in-stream biota. Stream flow monitoring will soon commence. South Australia has advised that the initial outcomes from the regional monitoring program for groundwater and surface water will not be available until the water supply scheme commences operation over the summer of 2004-05.
2. At the property level, the department is using detailed mapping data to help assess applications for permits and licences to use water from the scheme. Irrigators require a permit to use water from the scheme during the peak irrigation period, and a River Murray licence to take water off-peak. The department will not grant permits and licences in areas in which there is an unacceptable risk to the environment. Both the permits and licences will be subject to conditions on the use of the water (which may vary between properties), as well as ongoing annual reporting to monitor catchment condition.

The potential environmental impacts from the release of treated (chloraminated or chlorinated) water (the fourth risk) will be addressed by the application of SA Water's standard environmental impact assessment procedures for operational water releases. The same procedures will apply to any water releases required during the commissioning of the pipeline.

Potential environmental impacts associated with pipeline construction (the fifth risk) are being addressed by:

- planning and design of the pipeline route and associated infrastructure to avoid environmentally significant areas and minimise impacts on vegetation
- requiring contractors to meet environmental management plans for construction activities, with periodic auditing of construction works by SA Water environmental officers.

South Australia advised that it has undertaken a community consultation program covering the scheme's benefits, the availability of water to towns and irrigators, and the possible environmental impacts of the water imported into the region. The program included media releases and public notices, radio

interviews, community information days, brochures and displays, face to face briefings for stakeholders, letters to residents and irrigators, and regular information updates in four regional newspapers and on the SA Water website.

Discussion and assessment

The Council found in the 2003 NCP assessment that South Australia had complied with the requirement to show that the Clare Valley Water Supply Scheme is economically viable. The Council's preliminary view in the 2003 NCP assessment was that South Australia would also comply with the CoAG obligation to show that the project is ecologically sustainable if it addressed the matters raised in the ecological study.

Following the ecological study, South Australia has adopted environmental management measures and processes aimed at addressing potential environmental risks. While the initial outcomes from the regional monitoring program for groundwater and surface water will not be available until the water supply scheme commences, the adaptive management approach being implemented by the Department of Water, Land and Biodiversity Conservation and SA Water should ensure that appropriate action is taken if monitoring identifies any adverse environmental effects.

The Council considers that South Australia has met the CoAG obligation to demonstrate that the Clare Valley scheme is ecologically sustainable.

6.6 Other matters from the 2003 National Competition Policy assessment

Water legislation review and reform

Governments agreed to review and, where appropriate, reform by 30 June 2002 all existing legislation that restricts competition. Reform is appropriate where competition restrictions do not provide a net benefit to the whole community and are not necessary to achieve the objective of the legislation. Any new legislation that restricts competition must also meet this test.

At the time of the 2003 NCP assessment, South Australia had substantially completed its review and reform of water industry legislation. The Council found that South Australia would complete its program with the repeal of two Acts (the *Irrigation (Land Tenure) Act 1930* and the *Loans for Fencing and*

Water Piping Act 1938), which the State proposed for late 2003. For the 2004 NCP assessment, the Council has considered whether South Australia repealed the Acts.

South Australia repealed the Loans for Fencing and Water Piping Act in July 2003. It has advised that it intends to deal with the Irrigation (Land Tenure) Act in the context of a single piece of legislation that addresses all tenure matters associated with Crown land. Parliamentary Counsel has completed a draft Crown Land Management Bill 2004 for agency and public consultation. South Australia plans to introduce a settled Bill to Parliament in February 2005.

Discussion and assessment

South Australia will complete its review and reform program for water industry legislation with the repeal of one Act (scheduled for early 2005). With the repeal of this Act, South Australia will satisfy its NCP review and reform obligations on water industry legislation.

Institutional reform

At the time of the 2003 NCP assessment, South Australia was still to complete CoAG water reform agreement institutional reforms to:

- devolve a greater degree of responsibility for irrigation scheme management to local bodies
- implement integrated catchment management.

Devolution of greater responsibility for irrigation scheme management

The CoAG water reform agreement requires that governments devolve a greater degree of responsibility for the management of irrigation schemes to local bodies. Devolution can take different forms, ranging from the scheme manager's consultation with local constituents on management issues, to full devolution of operational responsibility to the local level. Any devolution of operational responsibility should occur within a regulatory framework that ensures all of CoAG's water reform objectives can be met.

At the time of the 2003 NCP assessment, South Australia had commenced measures to devolve the management of irrigation districts in the lower Murray reclaimed irrigation areas. The government owns and operates nine irrigation schemes in the lower Murray, comprising 70 per cent of the irrigation areas.

A major study, completed in June 2001, recommended that the most viable parts of the irrigation areas be rehabilitated following the restructure of the dairy industry. The government approved this option and agreed to provide financial assistance to landowners for restructuring and rehabilitation. It reported in 2003 that funding had commenced via the National Action Plan for Salinity and Water Quality and private irrigator contributions. The government expected to complete the rehabilitation program by 2008.

In the government-owned districts, South Australia has made the provision of funding conditional on the districts converting to private irrigation districts. South Australia expects all government-owned districts to convert, which will mean that irrigators have ownership of schemes. Property owners will, for example, become members of an irrigation trust that jointly makes management decisions. Infrastructure assets would be transferred to the trust, which would be responsible for their operation, maintenance and replacement.⁸

The Council found in the 2003 NCP assessment that South Australia was progressing devolution arrangements for the lower Murray. By making financial assistance conditional on conversion into a private irrigation district, the government was providing incentives for the conversion to occur. At October 2004, three districts had formally applied to the Minister to convert. Applications for funding close on 26 November 2004.

South Australia has reported in 2004 that although restructuring and rehabilitation funding assistance was made available from February 2003, the drought and consultation processes had delayed the commencement of works to late 2004. As an interim step towards self-management, South Australia transferred responsibility for the operation and maintenance of irrigation infrastructure from SA Water to the Lower Murray Operations Pty Ltd (a company formed by the irrigators) in 2003. In the same year, the Minister for the River Murray established a process for individual irrigators to trade water. The scheme provides for the Minister to act as an intermediary in the sale of water from the allocation he holds for the district. South Australia attached two conditions to the water trades, which it considers are needed to safeguard the resource and other irrigators:

1. Unless the irrigator installs a water meter, the whole allocation must be sold and the authorised area of land must be retired from irrigation.
2. The irrigator must pay a one-off fee (\$2 a megalitre), to be accumulated in a fund for works to physically isolated retired land.

Discussion and assessment

The Council found in the 2003 NCP assessment that South Australia was making significant progress in developing arrangements to devolve the

⁸ Levee banks and waterfront land will remain government owned.

management of government irrigation districts in the lower Murray reclaimed irrigation areas (as part of a wider restructuring and rehabilitation exercise). While progress has since been delayed by the drought and consultation processes, there have been two further significant steps: (1) the transfer of the operation and maintenance of irrigation infrastructure from SA Water to a private irrigator company and (2) the commencement of water trading. The Council considers, for the 2004 NCP assessment, that South Australia has continued to meet its CoAG obligations to devolve irrigation scheme management, but notes that significant work remains to be done. For the 2005 NCP assessment, the Council would expect South Australia to have made further progress in implementing devolution arrangements.

The Council draws attention to its comments in section 6.4 concerning the obligation on governments under the 1994 CoAG water reform agreement to ensure that regulatory arrangements facilitate trading in water, subject to protecting the environment and third party interests. South Australia acknowledged this responsibility under the National Water Initiative, committing to immediately remove any barriers to temporary trade and to take all necessary steps to facilitate permanent trade out of water irrigation areas (up to an interim annual threshold limit of 4 per cent) by June 2005, with a review in 2009 to consider raising the threshold.

Integrated catchment management

The CoAG water reform agreement requires that governments establish institutional arrangements for an integrated approach to the management of water and land resources, including at the catchment level. Catchment management should address issues such as salinity, river degradation and pollution, biodiversity loss and soil degradation. It should be implemented via partnerships among the different levels of government and nongovernment organisations. Approaches include the regional strategies being developed under bilateral agreements between the Australian, state and territory governments under the national action plan.

South Australia's review of the Water Resources Act recommended that administrative arrangements for natural resource management should be reformed as a matter of urgency. The complexity of the arrangements has attracted widespread criticism from stakeholders. At the time of the 2003 NCP assessment, South Australia had released the Natural Resources Management Bill 2003 for consultation.

South Australia has now enacted the *Natural Resources Management Act 2004*. The Act consolidates in a single piece of legislation the Water Resources Act, the *Soil Conservation and Land Care Act 1989* and the *Animal and Plant Control (Agricultural Protection and Other Purposes) Act 1986*, and the existing administrative processes for delivering the Natural Heritage Trust extension and the National Action Plan for Salinity and Water Quality.

Discussion and assessment

The enactment of the Natural Resources Management Act is a significant step in the reform of South Australia's natural resource management arrangements. The Council considers that South Australia has satisfactorily addressed its integrated catchment management obligations for the 2004 NCP assessment.

7 Tasmania

7.1 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.

Compliance with the pricing commitments in the 1994 Council of Australian Governments (CoAG) 1994 water reform agreement requires governments to ensure user charges for water and wastewater services are set to fully recover (within the cost recovery band) the cost of supplying the services (see chapter 1). Water service 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)

Cost recovery and consumption based pricing by rural water service providers

Assessment issues: Tasmania is to demonstrate that government-owned irrigation schemes and local governments that supply bulk water to rural users are setting prices based on the principles of full cost recovery and consumption based pricing. Government-owned water businesses must also show that they are managing any subsidies consistent with efficient and effective service provision and use. In the 2003 National Competition Policy (NCP) assessment, the National Competition Council found that some government-owned irrigation schemes were not achieving lower bound cost recovery and were receiving government subsidies. The Council previously found that Tasmania imposes charges for rural water services that are set on a consumption basis. For the 2004 NCP assessment, the Council has looked for Tasmania to show that its schemes are setting prices that achieve lower bound cost recovery and continuing to move to upper bound pricing where practicable. The government also needs to ensure subsidies are transparently reported and, where practicable, consider alternative management arrangements that remove the need for ongoing subsidisation.

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. (Tasmania has not signed the Intergovernmental Agreement on a National Water Initiative.)

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

Irrigators source most of their water from unregulated streams and farm storages using privately funded infrastructure. About 10 per cent of all water used is provided by the three government-owned irrigation schemes: Cressy–Longford, South East and Winnaleah. In previous NCP assessments, the Council established that Cressy–Longford and Winnaleah price the water they supply at the lower bound of cost recovery, and transparently account for transitional subsidies from the government that cover the finance costs (interest and repayment of the loan) of establishing the schemes. The government considers the subsidies are warranted to provide economic development within remote/rural areas.

South East is on a price path aimed at achieving lower bound cost recovery by 2010-11. It transparently accounts for transitional subsidies from the government that cover the finance costs of establishing the scheme. Tasmania indicated a possibility that the scheme may achieve lower bound cost recovery earlier than 2010-11. It expects the cost of operating the scheme will fall significantly over the next 10 years and the scheme will raise more revenue via the sale of additional entitlements.

Two-part tariff arrangements apply in the Cressy–Longford and the Winnaleah irrigation schemes. In each case, the two-part tariff comprises a fixed charge per megalitre of irrigation entitlement and a volumetric charge per megalitre of water used (to cover variable costs). In Winnaleah, the volumetric charge varies over the irrigation season. Water charges in the South East Irrigation Scheme are based solely on the volume of entitlements held by the user, not on the volume of water used. Tasmania explained that

the proportion of fixed to variable costs in this scheme is very high and, therefore, that the price structure is an appropriate reflection of costs.

Submission

WWF Australia raised a water pricing matter — in relation to the appraisal of the economic viability of the proposed Meander Dam — that it considered to be relevant to assessing Tasmania's compliance with the CoAG obligations for appraising new water infrastructure. It asked the Council to consider whether the Meander Dam (and similar projects) will achieve full cost recovery and whether community service obligations will be made transparent.

Discussion and assessment

Cost recovery and transparent reporting of subsidies

The Cressy–Longford and Winnaleah irrigation schemes continue to price at the lower bound of cost recovery and to account for transitional CSOs for debt repayment in accord with the minimum requirements of the CoAG pricing guidelines. Although the South East Irrigation Scheme is not expected to reach the lower bound of cost recovery until 2010-11, subsidies are transparent and falling. This arrangement is sufficient to meet the minimum requirements of the CoAG pricing guidelines.

The 1994 CoAG water reform agreement obliges governments, before investing in new rural schemes or extensions to existing schemes, to demonstrate that the scheme is economically viable and ecologically sustainable. The economic viability test involves a consideration of whether an infrastructure project will deliver an overall public benefit to Australia — that is, to be economically viable, a scheme must deliver a net benefit, taking into account the private (scheme related) and social (broader than the scheme) benefits and costs. While a project's commercial viability is an important element of the economic viability test, a project that is not commercially viable may still satisfy the economic viability test if there is robust evidence that the project would deliver a net social benefit that outweighs the costs that arise because it is not commercially viable. To demonstrate economic viability, the Council looks for governments to have analysed all relevant economic and social costs and benefits, including any costs of mitigating adverse environmental effects resulting from the scheme. For large developments, a robust cost–benefit analysis is an effective way of meeting the CoAG obligation. Appraisals should be based on the best information available, with any assumptions and limitations clearly stated.

Consumption based pricing

In previous NCP assessments, the Council found that Tasmania's irrigation services meet the CoAG obligation to price on a volumetric basis. The Council noted in particular the Winnaleah scheme, which sets prices according to the season and the volume consumed. The Council commented, however, that it may not be appropriate for the volumetric component of the price to be zero in the off-peak season unless the marginal cost of water use is very low. In this 2004 NCP assessment, Tasmania responded to the Council's comment by noting that the Winnaleah scheme is now privately owned and that the government has no role in determining the scheme's prices.

Cost recovery in issuing licences for water extraction

Assessment issues: Tasmania is to demonstrate that fees charged for water licences achieve full cost recovery, in accord with the CoAG pricing principles. In previous NCP assessments, the Council found that the pricing structure for unregulated water extractions meets reform obligations. For the 2004 NCP assessment, the Council has looked for Tasmania to demonstrate that licence fees for unregulated and groundwater users appropriately reflect the cost of resource management and licensing.

Future reform: Signatories to the National Water Initiative are to bring into effect consistent approaches to pricing and attributing the costs of water planning and management by 2006. This should involve identifying all costs associated with water planning and management, including the proportion of costs that can be attributed to water access entitlement holders, consistent with the principle of linking charges as closely as possible to the costs of activities or products. Tasmania was not a signatory to the National Water Initiative at the time of the 2004 NCP assessment.

References: 1994 CoAG water reform agreement, clauses 3(a) and (b); 1996 Agriculture and Resources Management Council of Australia and New Zealand (ARMCANZ) paper; 1998 CoAG pricing guidelines; 1999 tripartite meeting; Intergovernmental Agreement on a National Water Initiative

Under the *Water Management Act 1999*, water users must hold a licence to take water except (in general) for taking water for stock and domestic purposes or for taking groundwater or dispersed surface water. The licence fee comprises a direct charge reflecting standard administrative costs and a variable management fee to cover, among other matters, compliance auditing and water quality monitoring. Licence fees may vary according to how and how much water is taken, its source, the purpose for which it is taken, and the security of supply.

The government reviewed licence fees during 2004. The review proposed a fee increase so licensing charges recoup around \$400 000, or 13 per cent of the annual cost of the Department of Primary Industries, Water and Environment's water management activities. The proposed increase would almost double licence fee revenue received in 2002-03. The review considered the proposed fee structure to closely reflect the private benefit to irrigators (DPIWE 2004).

Submission

The Tasmanian Conservation Trust submitted that licence fees involve a subsidy to water users by the Tasmanian Government. The trust considers that the subsidy arises because the cost of employing regional water management officers is not passed on to private users. The Tasmanian Conservation Trust questioned how this arrangement complies with NCP requirements.

Discussion and assessment

The 1994 CoAG water reform agreement envisages that governments ensure charges for rural water supply fully cover the cost of supplying water to users. It commits governments to progressively review charges so they comply with the principle of full cost recovery (including the recovery of natural resource management costs), making any remaining subsidies transparent. Work by the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) in 1996 conducted under the auspices of CoAG, the National Water Initiative, and other jurisdictions' approaches to charging confirm this direction.

The 1996 ARMCANZ paper *Allocation and use of groundwater* (recommendation 9) states that the states and territories should identify the full cost of groundwater management. ARMCANZ classified groundwater management activities as:

- direct management activities — the operation of water allocation regulatory systems (for example, licensing, day-to-day management and administration), as well as metering and water level monitoring that is carried out to directly support management
- indirect management activities — policy, investigation, assessment, monitoring, the maintenance of technical databases and related activities.

The 1996 ARMCANZ paper states that governments should recover the cost of direct management activities from users and should consider (appropriate) apportionment of indirect costs. Any remaining subsidies should be transparent if full cost recovery cannot be achieved. Governments should also consider the consequences of differential pricing between surface water and groundwater. CoAG extended elements of the 1994 water reform agreement in line with the ARMCANZ work to apply to the pricing of groundwater (the 1996 water strategic reform framework) although it did not establish this as an obligation relevant to recommendations on competition payments.

Following the *Review of fees payable under the Water Management Act 1999* (DPIWE 2004), the Tasmanian Government has increased licence fees so they now recover about 13 per cent of water management costs. Taxpayers meet the remaining costs. According to the review, this level of cost recovery reflects the distribution of public and private benefits from the Department of

Primary Industries, Water and Environment's natural resource management function. The recommended fees also reflect increased costs of service.

The issue raised by the Tasmanian Conservation Trust — that the government's payment of the salaries of regional water management officers involved in considering applications for dam permits and water licences may not comply with NCP requirements — was also raised in its submission to Tasmania's *Review of fees payable under the Water Management Act 1999* (DPIWE 2004). In line with CoAG requirements, Tasmania has undertaken a rigorous and transparent review of licence fees, identified costs (including salary costs), apportioned these costs according to private/public beneficiaries, and transparently reported any remaining subsidies. The Council considers, therefore, that the matter raised by the Tasmanian Conservation Trust should have no implications for Tasmania's compliance with the CoAG water pricing obligations.

Cost recovery and consumption based pricing by urban water service providers

Assessment issue: Four submissions questioned whether Tasmania is meeting the cost recovery and consumption based pricing components of urban water reform.

References: 1994 CoAG water reform agreement, clauses 3(a) and (b) and 6(c) and (d); 1998 CoAG pricing principles; Intergovernmental Agreement on a National Water Initiative

Future reform: Metropolitan water businesses should continue to move towards upper bound pricing by 2008. Independent bodies should set or review prices, or price setting processes, for water storage and delivery by government water service providers. (Tasmania has not signed the Intergovernmental Agreement on a National Water Initiative.)

Four parties — the Tasmanian Conservation Trust, Mr Robert Rockefeller (Nekon Pty Ltd), Mr Anthony Hocking (Enterprise Marketing and Research Services Pty Ltd), and the Property Council of Australia — made submissions to the 2004 NCP assessment that cover issues relating to urban bulk and retail water supply and institutional reform. The Council considered matters relating to urban pricing (including the matters raised in the four submissions) in the 2001, 2002 and 2003 NCP assessments. In the 2003 NCP assessment, the Council found that Tasmania had complied, or was moving satisfactorily towards compliance, with its urban retail full cost recovery and institutional reform obligations (NCC 2003a). It considered, in the light of this progress, that further consideration of Tasmania's actions on retail pricing should be left until the 2005 NCP assessment.

For this reason, the Council has not considered the matters raised by the four submissions in this 2004 NCP assessment. The Council notes, however, Tasmania's advice that all urban water and wastewater services will achieve cost recovery by 2004-05, in accord with strategies agreed following the Government Prices Oversight Commission's 2002 audit of urban water and wastewater services.

The Council also notes the Government Prices Oversight Commission finding in its 2004 investigation into the bulk water authorities' pricing policies that:

progress to reform pricing policies has varied between the authorities and some aspects have fallen short of best practice in setting prices that convey the true cost of current and future supply. In consequence, true costs are being hidden through subsidies by owners of the authorities and by cross-subsidies between users. (GPOC 2004, Foreword)

The 2004 investigation recommended on maximum allowable revenues, pricing policies and demand management strategies. The Council considers that Tasmania's progress with reforming its bulk water pricing arrangements should be considered in the 2005 NCP assessment, when Tasmania's bulk water authorities should be expected to have implemented the Government Prices Oversight Commission's recommendations on best practice pricing.

7.2 Water access entitlements

Assessment issue: Tasmania is to institute a statutory water access entitlement system and support systems for the consumptive use of water, separate from land. The arrangements are to be substantially completed by 2005 for all river systems and groundwater resources covered by Tasmania's 1999 implementation program.

At the time of the 2003 NCP assessment, Tasmania had established a system of water access entitlements (termed 'allocations') separated from land title and specified in volumetric terms. Water licences are issued for 10 years, with a presumption of renewal. Within irrigation districts, only an owner or occupier of land in the district, or a person who may hold land in the district, could hold irrigation rights. A holder of an irrigation right who no longer owned or occupied land in the district was required to transfer the right within six months or forfeit it. Tasmania had a register of water entitlements, which records third party interests. It was in the process of converting existing water rights to the new system of licences and allocations.

For the 2004 NCP assessment, the Council has looked for Tasmania to:

- remove the restriction on who can hold irrigation rights, or demonstrate that it is in the public interest and consistent with 1994 CoAG water reform obligations
- progress the conversion to its new licence and allocations system, consistent with its 1994 water reform agreement obligation to substantially complete allocation and trading arrangements by 2005.

Tasmania has not signed the Intergovernmental Agreement on a National Water Initiative. As a result, the Council considers that Tasmania is not obliged to amend its 10-year licences to specify them as a perpetual share of the available water resource to comply with its CoAG obligations.

References: CoAG water reform agreement, clause 4; 1999 tripartite meeting

Under the Water Management Act, water entitlements (termed 'water allocations' in Tasmania) and licences are legally separate from land titles and transferable. Licences are specified in volumetric terms and also indicate the reliability of the water allocations. To obtain a water allocation, a person

must hold a water licence.¹ Licences are issued for 10 years, with a presumption of renewal, and are subject to a review of conditions after five years.² In the transition from the previous system, the Minister for Primary Industries and Water may vary licence conditions, reduce the water allocations on a licence, or impose restrictions on the taking of water, to meet environmental requirements. Tasmania identified 16 water sources for which it intends to develop water management plans to address the competing demands of consumptive users and the environment (see section 7.3).

Within irrigation districts, the *Irrigation Clauses Act 1973* (as amended in 1997 and 2001) establishes a system of irrigation rights. The rights are separate from land titles and transferable within the district. At the time of the 2003 NCP assessment, however, only an owner or occupier of land in the district, or a person who may hold land in the district, could hold irrigation rights. A holder of an irrigation right who no longer owned or occupied land in the district was required to transfer the right within six months or forfeit it. The Minister could give a single extension of six months.

Under the Water Management Act, a water licence holder is entitled to compensation when it is necessary to reduce water allocations because total allocations exceed the quantity of water available or because they are inconsistent with the objectives of the Act. No compensation is payable, however, if the reduction in allocations is required to meet an environmental water provision in an approved water management plan.

The Water Management Act provides for a register of licences, which includes provision for registering financial interests. The Department of Primary Industries, Water and Environment maintains the register, which is known as the Water Information Management System.

Reform progress

Tasmania has completed the process of converting to its new system of licences and allocations, with the following exceptions:

¹ Riparian and casual land users may take water without a licence for stock and domestic purposes. Occupiers of land may take surface water (not flowing in a watercourse) and groundwater (subject to the recent changes reported in the reform progress section) for any purpose. These entitlements are subject to the water extraction not leading to environmental harm and not being contrary to a water management plan. Water may not be taken in excess of reasonable requirements. Maximum takes may be set by Regulation (and are in place for riparian rights under the Water Management Regulations 1999).

² Special 99-year licences are issued to corporate bodies using water to generate at least 400 gigawatt hours of electricity annually or to other bodies approved by an advisory committee comprised of relevant Ministers. Special licences have been issued for Hydro Tasmania and the Wesley Vale pulp and paper mill.

- For two bulk water authorities (Hobart Water and Cradle Coast Water) the conversion process is complicated by the quantity and priority of their historical water entitlements being unclear.
 - For Hobart Water, Tasmania reported that it had had to correct a legislative error before it could progress the conversion.³ The correction was included in Water Management Act amendments that took effect in June 2004. Tasmania anticipates that the conversion process will be completed in the first quarter of 2005, following negotiations with Hobart Water on the licence conditions.
 - For Cradle Coast Water, Tasmania expects the conversion process to be completed by December 2004.
- For one town supply (Burnie Council), the conversion process is more complicated than for other local governments. Tasmania expects the new licences to be in place by December 2004.
- For a small number of conversions of previous prescriptive rights to licences and allocations under the Act, the registered owner of the right cannot be located.

Under the amendments to the Water Management Act in June 2004, Tasmania established a process for proclaiming ‘groundwater areas’. Previously, landholders could take groundwater without a licence, provided it was not in excess of reasonable requirements, would not lead to environmental harm and was not contrary to a water management plan. This arrangement will continue to apply to the majority of the state where groundwater use is within sustainable limits. If groundwater use is not sustainable, the government decided, given the lengthy and complex process required to establish water management plans, to adopt a simpler and more expedient process for establishing groundwater rules. In proclaimed groundwater areas, the taking of groundwater may require a licence. The Department of Primary Industries, Water and Environment will work with stakeholders to implement management rules to ensure the equitable and sustainable use of groundwater in proclaimed areas. The government considers that these changes will enable management rules to be applied on an as-needed basis, accounting for each area’s circumstances.

Under concurrent amendments to the Irrigation Clauses Act, Tasmania removed the restrictions on who may hold irrigation rights. It is no longer necessary for holders of irrigation rights to be an owner or occupier of land, or

³ Tasmania advised that a similar, but unrelated, error had prevented the conversion of the water entitlements of the Rivers and Water Supply Commission. The error meant that the commission’s water entitlements were not preserved when the Water Management Act and the *Rivers and Water Supply Commission Act 1999* commenced in January 2000. As an interim measure, the Minister exempted the commission from the need to hold water licences for its water supply schemes. The exemption included conditions that the licences would otherwise have included. The error was also corrected in the amendments to the Water Management Act in June 2004.

a person who may hold land, in the irrigation district. The government also removed the requirement for the holder of an irrigation right who no longer owns or occupies land in the district to transfer the right within six months or forfeit it.

Submissions

The Tasmanian Conservation Trust expressed concern that the Tasmanian Government does not intend to separate land and water rights. It was also concerned that the government would not consult interested parties in preparing a public benefit study on this issue.

Discussion and assessment

In previous NCP assessments, the Council found that Tasmania's Water Management Act and Irrigation Clauses Act establish a comprehensive system of water entitlements separated from land title and specified in volumetric terms, consistent with the obligation in the 1994 CoAG water reform agreement. Under the legislation, Tasmania maintains a register of water licences, which includes provision for registering financial interests. The recent legislative amendments extend Tasmania's water licensing arrangements to areas in which groundwater use is not sustainable, without the need to first complete a water management plan.

Tasmania has almost completed the process of converting water allocated under its previous system to licences and allocations under the new system. Given that it expects to complete the remaining conversions by the first quarter of 2005, Tasmania is on track to meet its CoAG obligation for substantial completion by 2005.

In response to the submission from the Tasmanian Conservation Trust, the Tasmanian Government reiterated that land and water rights have been separated in Tasmania since the commencement of the Water Management Act in January 2000. The Council notes that the recent amendment to the Irrigation Clauses Act removes the final link between land and irrigation rights (see section 7.4).

The Council considers that Tasmania has made satisfactory progress against its 1994 CoAG obligations relating to water entitlements for the 2004 NCP assessment.

7.3 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). Tasmania elected not to sign the National Water Initiative, which complements and extends the 1994 CoAG water reform agreement.

At the time of the 2003 NCP assessment, Tasmania was close to completing its first water management plan, for the Great Forester River. Following completion of this plan, Tasmania proposed to develop generic principles to guide the preparation of future water management plans, with the aim of accelerating the process. Tasmania released draft guidelines for assessing applications for new water allocations from watercourses (including for proposed dams) and commenced a project on the conservation of freshwater ecosystem values. For the 2004 NCP assessment the Council has looked for Tasmania to have progressed its water management arrangements, including the provision of appropriate allocations to the environment, consistent with its 1994 water reform obligation to complete allocation and trading arrangements by 2005.

References: 1994 CoAG water reform agreement, clauses 4(b)–(f); 1999 tripartite meeting

Under the Water Management Act, the Department of Primary Industries, Water and Environment has responsibility for determining environmental water requirements — that is, the water regime that sustains the values of an ecosystem at a low level of risk. Tasmania listed 45 of its 96 major rivers and streams on its 1999 implementation program (appendix A). The work is undertaken on a priority basis.

- For more developed water sources, the department prepares a water management plan that incorporates an environmental water provision to preserve water for the environment. The provision is determined by community agreement, taking account of environmental, economic and social considerations. It represents that part of the environmental water requirement that the community agrees should be met. Overland flows can be included in a water management plan and regulated under the Act. Tasmania's 1999 implementation program includes 16 river systems to be managed via water management plans.

- For other lower priority water sources, the department uses a rapid (desktop) assessment method to determine environmental water requirements and the total available yield of the water source. Typically, Tasmania uses a benchmarking approach to extrapolate environmental water requirements. The total available yield is determined as the water remaining at 80 per cent reliability after taking account of the environmental water requirement. It provides a benchmark against which decisions about the need to develop a water management plan can be made. In the absence of a water management plan for these systems, Tasmania approves additional licensed water allocations that exceed the total available yield only if it can be demonstrated (using a rigorous environmental flow assessment) that it will not cause harm to river health.

Despite having an abundance of water relative to other parts of Australia the timing and distributional pattern of rainfall in Tasmania means that demand for surface water can exceed natural stream flow during the summer irrigation period. Since 1995 therefore Tasmania has protected summer low flows through a moratorium on new water licences and by setting thresholds for imposing restrictions on water use during summer. Tasmania advised that it determined the trigger points for imposing water restrictions to reflect key river health parameters. It has not updated the trigger points to reflect the scientifically derived environmental water requirements. The effectiveness of the current system is, however, monitored through the river health assessment program.

More recently, Tasmania adopted *Guidelines to assess applications for new water allocations from watercourses during winter* (Water Resources Policy Number 2003/1) for determining environmental water requirements for the rest of the year. The guidelines also cover water allocations for dams and transfers of water allocations within a catchment. Where a catchment is covered by a water management plan the specific provisions of the plan replace the general summer and winter environmental flow protection measures.

The Water Management Act requires anyone wishing to construct a new dam to obtain a permit. A statutory committee, the Assessment Committee for Dam Construction, assesses the permit applications, including against environmental objectives.

Reform progress

Tasmania has determined environmental water requirements for 43 of its 45 listed rivers. Of the two outstanding, Tasmania has advised that the assessment for Montagu River is close to completion and the assessment for the Forth River is scheduled to be finalised in June 2006 (see table A.13). In addition Tasmania has completed environmental flow assessments for Brumbies Creek and Dee, King, and Blackman rivers (these waterways are not covered by Tasmania's 1999 implementation program).

Despite having expected to have completed eight of its 16 water management plans by this time, Tasmania has completed only the Great Forester Catchment Water Management Plan 2003 (table 7.1). This plan came into effect on 13 August 2003. Tasmania noted that the 1999 criteria it used for nominating priority catchments did not include an assessment of the environmental condition of the rivers. Its more recent data indicates that all 16 rivers are in good condition and that current water use does not have an adverse impact on river health in these catchments.⁴

Tasmania has, however, identified five other catchments — Brid River, Clayton's Rivulet, Inglis and Flowerdale rivers, Mountain River and Rubicon River — that are at risk of overuse because water users have historically extracted greater volumes of water than strictly permitted by their licences. Tasmania initiated a new process — water use sustainability projects — to provide greater certainty for water dependent businesses while reducing the risk of moving to a situation of unsustainable water use. Under the projects, Tasmania determined each irrigator's water extraction during the 2002-03 irrigation season. It uses these figures to cap summer water use in the identified catchments until water management plans are developed. In the future, water extraction in these catchments will be metered to ensure compliance with the cap.

Table 7.1 outlines Tasmania's progress in preparing water management plans for the systems covered by its 1999 implementation program and the additional rivers for which is preparing water use sustainability projects.

Table 7.1: Timetable for water management plans in Tasmania, as at August 2004

<i>Water management plan</i>	<i>Completion timeline</i>	<i>Current status</i>
Brid River ^a	na	Water use sustainability project under way. It is scheduled to be completed in January 2005.
Clayton's Rivulet ^a	na	Water use sustainability project under way. It is scheduled to be completed in June 2005.
Clyde River	April 2005	Draft plan prepared for statutory approval.
Coal River	December 2005	Environmental flows study complete.
Derwent River ^b	Low priority (after 2006)	Hydro Tasmania has commenced a water management review. Consultation is in progress. Data collection is progressing.
Elizabeth River ^c	November 2005	Environmental flows study complete and water use sustainability project in progress.
Great Forester River	Completed	Plan adopted in August 2003. River managed according to plan.

(continued)

⁴ Tasmania has assessed the health of the 16 catchments at 213 sites (749 samples were collected) using the nationally recognised AUSRIVAS method. The data show that the rivers are in good condition (mean AUSRIVAS score 0.90 (n=213)).

Table 7.1 continued

<i>Water management plan</i>	<i>Completion timeline</i>	<i>Current status</i>
Inglis and Flowerdale rivers ^a	nd	Water use sustainability project under way. It is scheduled to be completed in November 2004.
Lake River and Macquarie River below Lake River ^c	November 2005	Environmental flows study complete and water use sustainability project in progress.
Lakes Crescent and Sorell	April 2005	Draft plan prepared for statutory approval.
Liffey River	December 2005	Environmental flows study complete. Water management plan to be completed as part of the Meander River catchment.
Little Swanport River	December 2004	Draft plan released for public consultation.
Macquarie River downstream of Ross ^c	November 2005	Environmental flows study complete and water use sustainability project in progress.
Meander River	December 2005	Process to recommence after the Meander Dam issue is resolved. The completion date for the Meander River plan may be effected this matter
Mountain River ^a	nd	Water use sustainability project under way. It is scheduled to be completed in January 2005.
North Esk River ^d	Low priority	Environmental flows study complete.
Rubicon River ^a	nd	Water use sustainability project under way. It is scheduled to be completed in November 2004.
South Esk River (upstream of Macquarie including St Pauls and Nile rivers)	August 2005	Environmental flows study complete. Hydrological modelling and water use sustainability project in progress.
St Patricks River ^d	Low priority	Environmental flows study complete.
Tooms River ^c	November 2005	Environmental flows study complete.
Upper and lower Mersey River	December 2004	Draft plan released for public consultation.
Upper and lower Ringarooma River including the Ledgerwood River	April 2005	Environmental flows study complete. Hydrological modelling and water use sustainability project in progress.

^a Catchments added to Tasmania's implementation program since 1999 because they are at risk of over use or because increased water extraction could have adverse impacts on industries in the area.

^b The Derwent River was not included on the 1999 implementation program for priority development of a water management plan. Hydro Tasmania's review of the Derwent River Basin contains many elements of a water management plan. ^c A single water management plans will be developed to cover the rivers in the Macquarie Basin. ^d Water allocation issues have been resolved through provision of water licences for use of the Launceston urban supply. **nd** Not determined.

Source: Government of Tasmania 2004

Tasmania is implementing measures to accelerate water management planning. The Department of Primary Industries, Water and Environment has reviewed the planning process in light of its experience with the Great Forester plan. As an outcome of the review, it is developing, in consultation with key stakeholders (including the Tasmanian Conservation Trust and the Tasmanian Farmers and Graziers Association), generic principles to guide the

preparation of future plans. The government intends that the principles cover, among other things, the following issues:

- All irrigation extractions should be metered. Tasmania is progressively installing meters in priority catchments. The catchments targeted in 2003-04 were Mountain, Flowerdale, Inglis, Rubicon, Brid, Legerwood, upper and lower Mersey and Buttons.
- Where appropriate, historical use (outside of the licensing system) should be formally recognised as a low surety water allocation capped at 2002-03 season use.
- Priorities should be determined for the protection of freshwater ecosystem values. In 2002 Tasmania commenced the Conservation of Freshwater Ecosystem Values Project to identify natural ecosystem conservation values and priorities at the state, bio-region, catchment and subcatchment levels. It expects to complete the project report in 2004. Outputs from the project will be incorporated into future water management plans.
- Comprehensive water resource information is required to develop a plan. The Department of Primary Industries, Water and Environment has commenced a project, due for completion in December 2004, to develop a holistic method for determining environmental flows.
- There should be a requirement for ongoing monitoring.

On 26 June 2004 the government implemented amendments to the Water Management Act to align it with other similar resource planning processes. In the future, water management plans will need to specify the environmental and socioeconomic objectives for the relevant water source. The government has also introduced a requirement for the Resource Planning and Development Commission to independently review the Department of Primary Industries, Water and Environment's responses to representations on draft water management plans, and to recommend to the Minister on the adequacy of these responses. In accord with the *Resource Planning and Development Commission Act 1997*, the commission may conduct hearings to assist it with its review. Other amendments to the Act remove the requirement for the Minister to advertise rights of appeal following the adoption of a plan, and remove the requirement for a plan to be reviewed at least once every five years. Instead, any review requirements will be specified in individual plans or undertaken at the direction of the Minister.

Key amendments to the Water Management Act also create a single system for access to both surface water and groundwater. The amendments provide for the proclamation of 'groundwater areas'. Within these areas, the department must work in partnership with stakeholders to implement management rules to ensure the fair, equitable and sustainable use of groundwater. In addition, groundwater drillers will need to be accredited and will be subject to a code of practice. The government has advised that these changes recognise the increasing demand for groundwater, and that some

parts of the state 'are already experiencing demonstrable impacts of overuse of groundwater:

[T]his includes the impact of new groundwater bores on water availability for existing groundwater users and the reduction in the contribution of ground water to surface water systems. Overextraction is also causing ground subsidence in some areas. The high-intensity groundwater use areas where some of these impacts are evident include Mella, Broadmarsh, Togari and Forest in the north west; Wesley Vale, Moriarty, Sassafras, Sheffield, Spreyton and Longford in the north; and Sorell in the south. (Aird 2004, pp. 46)

With the amendments to the Water Management Act having been implemented and development of generic principles for water planning well advanced, Tasmania has advised that it expects to have developed water management plans for all 15 remaining catchments by the end of 2005 (although it conceded that some target dates may slip).

The Great Forester Catchment Water Management Plan

The Great Forester River and catchment is situated in north east Tasmania. It is mostly riverine, although the Great Forester River enters the McKerrows March wetland towards the bottom of the catchment. There is also an aquifer system within the underlying Scottsdale sedimentary basin, but little is known about its ecosystem requirements.

In the 1920s the Great Forester River was significantly altered by construction of a 4 kilometre diversion, known as the Adam's Cut, which shortened the last section of the river by 7 kilometres. This enabled 325 hectares of floodplain and swampy land to be reclaimed. The DIPWE is uncertain whether the 7 kilometres of natural river channel receives mainstream flows from the Great Forester River.⁵

The Great Forester is an unregulated river. Estimated extraction represents about 6 per cent of the median annual flow, with most of this water taken directly from the river during the irrigation season. In its *State of rivers report for rivers in the Great Forester Catchment*, Tasmania reported that its river health monitoring surveys indicate that the catchment is in good health, particularly in the middle to upper reaches (DPIWE 1999). Some sites are in poorer ecological condition, but this condition is largely related to adjacent land use rather than stream flow. The survey data also show that the river has recovered from a pyrethrum spill that occurred in April 1994 (DPIWE 1999).

⁵ This part of the river, the wetlands and the aquifer are covered by the water management plan, but were not included in the environmental flows analysis, which formed the scientific basis for the environmental water allocation to the river.

McKenny and Read (1999) undertook an environmental flows analysis for the Great Forester Catchment using the RHYHAB computer model (River HYdraulics and HABitat simulation). This model is based on the instream flow incremental method (IFIM). It is a habitat based model that uses information on the preferences of key species to determine appropriate environmental flows. For their analysis, McKenny and Read targeted four detailed and specific assessment species with relatively strong habitat preferences: the blackfish (*Gadopsis marmoratus*), the jollytail (*Galaxias maculatus*), the shortfinned eel (*Anguilla australis*), and both juvenile and adult brown trout (*Salmo trutta*). The study also included a range of insects, worms, mites and molluscs.

Although irrigators extract water from the Great Forester catchment throughout the year, McKenny and Read focused their assessment on the low flow period between December and April, when the river is most likely to be under stress. They used sampling data collected during February and March 1998 at two reference sites (one in the upper catchment and one in the lower catchment) to derive minimum summer flow recommendations for specific months. McKenny and Read determined flow requirements for a low (no), moderate and high risk to the ecology (table 7.2). Low risk involves setting flows to maintain at least 85 per cent of the usable habitat, moderate risk involves setting flows to maintain 60–85 per cent of usable habitat, and high risk involves setting flows that maintain less than 60 per cent of the usable habitat.

Table 7.2: Environmental water requirements for the Great Forester River^a

Month	Risk to catchment habitat			Risk to native fish habitat		
	Low (no) ^{b,c}	Moderate ^d	High ^e	Low (no) ^c	Moderate ^d	High ^e
	ML a day	ML a day	ML a day	ML a day	ML a day	ML a day
December	≥105	105–65	≤65	≥65	65–15	≤15
January	≥75	75–45	≤45	≥75	75–15	≤15
February	≥65	65–45	≤45	≥65	65–15	≤15
March	≥50	50–35	≤35	≥50	50–15	≤15
April	≥85	85–50	≤50	≥85	85–15	≤15

^a All figures presented were converted to megalitres and rounded to the nearest 5 megalitres based on 1 cumec being equivalent to 86.4 megalitres. ^b The environmental water requirement set in the Great Forester plan. ^c The environmental water requirement or minimum flow required to maintain at least 85 per cent of usable habitat. ^d The environmental water requirement or minimum flow required to maintain 60–85 per cent of usable habitat. ^e The environmental water requirement or minimum flow required to maintain up to 60 per cent or less of usable habitat.

Sources: DPIWE 2003a; McKenny and Read 1999

McKenny and Read recommended implementing the ‘no risk’ environmental water requirement. While they noted that their analysis was strongly influenced by the requirements for brown trout, they considered the no risk provision was also necessary to protect the endangered giant freshwater crayfish (*Astacopsis gouldi*). McKenny and Read conceded, however, that little is known about the water requirements of the crayfish.

The Department of Primary Industries, Water and Environment developed the final Greater Forester plan with advice and assistance from the Great Forester Catchment Water Management Planning Consultative Group (DPIWE 2003b). The consultative group had 11 members, comprising representatives of vegetable growers and lower catchment irrigators (two), dairy farmers (two), hop growers (one), poppy growers (one), the Brid-Forester Integrated Catchment Management Group (two), Forestry Tasmania (one), the Dorset Council (one) and the environmental group Dorset Waterwatch (one).

The Great Forester plan requires persons who extract surface water and groundwater to hold a licence, sets water allocations for each irrigation season (1 November to 30 April), enables the transfer of water licences and allocations, provides for metering, and provides for the measurement of water flow through dams. It includes a water restriction management plan.

The plan adopts as the environmental water requirements the recommended low risk minimum flows (shown in the second column of table 7.2). It's stated long term environmental vision, however, is to implement a 'moderate risk' environmental water provision, subject to maintaining the economic and social wellbeing of the community. While the plan does not define moderate risk, the draft plan (DPIWE 2003a) had proposed increasing the environmental water provision over time until it is consistent with McKenny and Read's moderate risk scenario (shown in the third column of table 7.2).

As a first step, the plan sets the environmental water provision as a managed minimum flow of 30 megalitres per day during the irrigation season (December to April). It achieves this by imposing water restrictions once flows fall to 40 megalitres a day, with a ban imposed at 30 megalitres. This provision represents a slight tightening of existing water restrictions. The plan states that the aim of setting the environmental water provision at 30 megalitres a day is to reduce the environmental risk to aquatic ecosystems in the catchment to an 'acceptable level'. As shown in table 7.2, the analysis of McKenny and Read indicates that reducing flows to this level involves a moderate risk that the ecological value of native fish could degrade and a higher risk that the value of the other species could degrade.

Under the plan, the Department of Primary Industries, Water and Environment will collect and record information relating to the state of the aquatic environment in catchment watercourses, water quality, water management activities and compliance, and changes in areas of land used for plantation forestry and other relevant activities. The overall aim of the department's monitoring is to gather sufficient information to assess the environmental and economic effects of the plan. The department is required to publish an annual monitoring and assessment report, and hold an annual public meeting with water users to discuss the report. The plan also proposes further study to:

- determine environmental water requirements outside the irrigation season

-
- better understand the wetland environment
 - determine the relationships between flow and water quality in the lower catchment
 - determine the habitat requirements of relevant species.

The plan requires the department to review the plan three years after its endorsement by the Minister. This review is scheduled for 2006-07.

In August 2003 the Tasmanian Conservation Trust lodged an appeal with the Resource Management and Planning Tribunal because it considered that the plan does not comply with ARMCANZ/ANZECC national principle 2 as required under Tasmania's policy principle 1 of the Water for Ecosystems Policy (Policy no. 2001/1 of the Water Management Act). The trust argued that the specified managed minimum flow in the irrigation season (30 megalitres a day) is significantly lower than the recommended environmental water requirement. In September 2003 Dorset Waterwatch also advised the department that it wished to rescind its agreement to the plan and record a dissenting report.

In November 2003 the tribunal found that the plan failed to strictly comply with the requirements of s14 of the Water Management Act because there is a lack of adequate scientific evidence. Based on scientific expert evidence, however, the tribunal accepted that 'for at least the three year period until the first review, the minimum flow provided by the plan would adequately protect the health of the river' (Tasmanian Conservation Trust v Minister for Primary Industries, Water and Environment (2003) TASRMPAT 266 at 16–17). The tribunal concluded that 'it is appropriate to use the plan as a framework for maintaining the status quo while information is gathered' (re Tasmanian Conservation Trust at 16–17).

The tribunal ordered several amendments to the plan. Some amendments make clear that the managed minimum flow of 30 megalitres a day is a short term target pending further review of environmental water needs. Another amendment indicates that the formal review of the plan is anticipated to take about six months (rather than a year), but will be completed as soon as practicable. The tribunal also specified matters that the review must consider. It ordered that the review:

- use a hydrological model of the catchment sufficient to allow the impact of the natural flow to be compared with other uses in the catchment, including passive uses
- identify and describe the ecosystems, including any threatened or endangered species that need water and the quantity of water they need
- determine an environmental water provision that relates to the whole year and not just the irrigation season
- use a method to determine the environmental water provision that is scientifically justifiable and consistent with any water quality guidelines and State policies

- describe clearly the method used to determine the environmental water provision.

Comments from stakeholders

In October 2003 Dorset Waterwatch wrote to the Council to express two concerns about the development of the final Great Forester plan, and it subsequently provided a number of other documents. Two aspects of its two particular concerns can be summarised as follows:

1. Irrigators are overrepresented on the community consultative committee following the decision of the Department of Primary Industries, Water and Environment that irrigators should comprise at least 60 per cent of committee representatives. Dorset Waterwatch considered that the majority representation of irrigators on the consultative committee may make it difficult for the committee to reach consensus to increase the environmental water provision (now 30 megalitres a day) if the current provision proves inadequate.
2. There is a lack of scientific research and documentation supporting the environmental water provision in the final plan. Dorset Waterwatch noted the following examples:
 - Environmental water provisions were re-set for the second and all subsequent drafts and the final plan to a 'high risk' 30 megalitres a day without any clear basis in science and despite the advice of McKenny and Read for a 'low risk' outcome to protect the giant freshwater crayfish.
 - The economic assessment (Armstrong 2001), which concluded there would be widespread economic hardship under the 'moderate risk' environmental water provision, was based on interviews with only three irrigators (all very large enterprises and relatively high water users) and did not appear to be supported by a risk assessment framework or a detailed social impact study.
 - The Department of Primary Industries, Water and Environment had not addressed criticisms of the economic study in the 2002 NCP assessment.

Dorset Waterwatch suggested the water management planning process should incorporate:

- independent, peer reviewed science and risk assessment as the basis for establishing environmental water provisions
- a comprehensive framework and protocol for corrective action, if it proves to be necessary, in association with ongoing monitoring and research
- consultative arrangements that better reflect the composition of water users and other interests in a catchment.

The Tasmanian Government stated that it does not agree with the Dorset Waterwatch. It considers that its approach is supported by the decision of the Resource Management and Planning Tribunal, which required only minor amendments to the Great Forester plan (not related to the concerns of Dorset Waterwatch).

The government made the following comments on Dorset Waterwatch's concerns about the composition of the community consultative committee:

- There is no statutory requirement for the establishment of consultative committees.
- The decision to form the consultative group reflected public concerns about potential economic and social impacts of the environmental water provision in the draft plan.
- The purpose of establishing the consultative group was to advise the Department of Primary Industries, Water and Environment and the Minister on possible amendments to the draft plan. The consultative group comprised representatives of all local interests in the catchment. Water users are a diverse group and often have different timing and reliability requirements for water access. Because interests sometimes conflict, it is important to represent this diversity of water users. In any case, the balance of interests on a consultative group should not be of concern because consultative groups have no statutory power or decision-making function.
 - At all times, every attempt is made to ensure advice from consultative group is agreed by consensus. Changes made during the life of a plan should also be consensual, to provide certainty.
 - In deciding to implement a plan, the department (and the Minister for Primary Industries, Water and Environment) must ensure the plan gives effect to the objectives of the Act, including that the plan 'maintain ecological processes and genetic diversity for aquatic systems' (Water Management Act, s6(1)(c)).
 - All stakeholders have an opportunity to make dissenting representations to the department and to the Minister, regardless of whether they are members of a consultative group.

The government made the following comments on Dorset Waterwatch's concerns about the availability of scientific research and documentation to support the environmental flows adopted in the plan.

- The department used nationally recognised scientific methods to determine the environmental water requirements for the Great Forester catchment. The methods were subject to independent peer review.
- A number of scientific studies were used to develop the plan. Independent expert assessment of the scientific reports presented at the Resource Management and Planning Tribunal hearing supports the view that the environmental water provision is sufficient to protect the environment until the review of the plan in 2006-07.

- The plan adopts an adaptive management approach and includes an extensive ecological and water use monitoring program.
- Environmental water provisions are determined through a consultative process and are set to balance environmental, economic and social considerations and to comply with the Water Management Act.

Discussion

Best available science

The method used to determine environmental water requirements for the Great Forester catchment was limited to minimum summer flows using a species-specific IFIM method rather than a holistic approach. The ecological assessment does not consider the end of system flows, the water requirements for the terminal wetland or interactions between the surface water and groundwater systems. This general approach, however, reflected current scientific thinking when the environmental water requirements for the Great Forester Catchment were determined some six years ago.

Nevertheless, questions remain about Tasmania's approach to determining environmental water requirements. Tasmania determines its environmental water requirements on the basis of community values. These include broad water value categories — the ecosystem, consumptive and nonconsumptive use, recreational use, the physical landscape and aesthetic requirements. Thus the environmental water requirement is a decision that reflects a balance of environmental and nonenvironmental values, rather than a true evaluation of the water requirements needed to sustain the long term ecological values of the catchment. (There is subsequent account taken of economic and other interests in setting the environmental water provision.)

For the Great Forester catchment, the recommended environmental water requirements are strongly influenced by the flow needs of the brown trout. Brown trout are an introduced species with very different water requirements from those native fish. They prefer stable flow conditions and relatively high summer flows, whereas most native species have adapted to the variable flow conditions characteristic of Australian streams. Brown trout prey on native fish and can be aggressive competitors for food and habitat (Clunie *et al.* 2002). They have also been found to contribute to the decline and fragmentation of native fish and macroinvertebrate communities in Australia (Arthington and Blühdorn 1995).

The plan's environmental water provision (30 megalitres a day) involves a further reduction in the environmental water requirements, to accommodate economic and other interests. Although the stated long term objective for the plan is to implement moderate risk environmental water requirements, the current environmental water provision involves a high risk to the health of the catchment. The regard shown in the Great Forester plan for ARMCANZ/ANZECC national principle 2, which calls for the provision of

water sufficient to sustain the ecological values of aquatic ecosystems, is therefore questionable. There is some doubt that a contemporary environmental study using a best practice approach would determine environmental water requirements for the Great Forester River similar to those recommended by McKenny and Read (1999).

The Resource Management and Planning Tribunal has directed the Tasmanian Government to improve substantially the scientific basis for determining future environmental water provisions in the Great Forester Catchment in a manner consistent with the requirements of the ARMCANZ/ANZECC national principles. To do this, Tasmania is developing a holistic approach, which it expects to complete by September 2004. Tasmania has also committed to undertake extensive monitoring and further research over the three years before the review to improve understanding of the environmental water requirements of the catchment.

Expert evidence at the tribunal hearing considered that the proposed minimum managed flow in the plan is unlikely to compromise the ecological condition of the river before the plan is reviewed in 2006-07. The Council considers that to demonstrate that the Great Forester arrangements are based on the best available science, Tasmania should use the forthcoming review to determine the river's environmental water requirements separately from other community values, so any trade-offs among competing objectives in determining the river's environmental water provision are transparent. Consistent with CoAG's objectives in the 1994 water reform agreement, the review should aim to achieve an appropriate balance of long term sustainability in environmental allocations and human demands, including water for irrigation, recreational trout fishing and other consumptive uses.

Balancing economic, environmental and other interests

The Great Forester plan does not explain how the environmental water provision for the river was determined or provide independent, rigorous and transparent evidence to support the managed minimum flow of 30 megalitres a day. While the expert opinion provided to the Resource Management and Planning Tribunal is that the health of the river will not be compromised under the plan in the short term, it also indicates that Tasmania will need to act soon if the ecological health of the river is to be maintained or improved.

Unlike the draft plan, the final plan does not set out a pathway towards achieving a more sustainable balance in water use. It states, however, that its long term environmental vision is to implement 'moderate risk' environmental water provisions, subject to maintaining the economic and social wellbeing of the community. It also establishes a review (to be conducted in 2006-07) to re-assess the environmental water requirements of the catchment following further research and monitoring of its ecological health. Following the tribunal ruling the review must use scientifically justifiable methods consistent with Tasmania's legislation and policies for determining the environmental water provision.

The tribunal decision and the expert evidence on ecological health indicate that the Great Forester plan satisfactorily addresses the obligations on the allocation of water to the environment set by CoAG (pending the review in 2006-07). Moreover, the development of the plan, which has involved considerable debate over a long period, and the availability of avenues to challenge decisions, indicates that Tasmania's processes are robust.

Monitoring and adaptive management

Tasmania committed to undertake extensive monitoring and further research to improve understanding of the environmental water requirements for the catchment. It will report annually on the outcomes of its monitoring program, and the 2006-07 review of the Great Forester plan will account for the monitoring and other information collected. In addition, Tasmania has used the experience and information gleaned from developing the Great Forester plan to adapt its water management planning processes and the scientific methods that will be used to determine environmental water provisions in other systems.

Tasmania has removed the statutory requirement to review plans at least once every five years. Instead any review requirements will be specified in individual plans or undertaken at the direction of the Minister. While flexibility is desirable, careful review of water management plans is often essential to ensuring processes can be adapted to account for changes in a system's ecological health and condition. Given that Tasmania is in the process of developing its first plans and a new scientific assessment method, maintaining the statutory requirement to review plans within five years would seem prudent. In this regard, all governments including Tasmania committed under the 1994 CoAG water reform agreement to consider establishing environmental contingency allocations that provide for review of the allocations after five years (CoAG 1994, clause 4(e)).⁶ In addition, the guidelines for water planning and planning processes in the National Water Initiative state that the duration of a plan should be consistent with the level of knowledge about, and the development of, the particular water source, and that there should be a review process that allows for changes in light of improved knowledge.⁷

⁶ The draft plans for the Mersey and Little Swanport rivers, which were completed after the amendments to the Water Management Act both contain review provisions. The draft plan for the Mersey River proposes that the plan be reviewed ten years after its adoption. The draft plan for Little Swanport River proposes a review in the 5th year of operation of the plan.

⁷ The Council notes that Tasmania has not signed the Intergovernmental Agreement on a National Water Initiative.

Stakeholder consultation and transparent processes

The Great Forester water management plan was developed via a consultative process open to all relevant stakeholders. There were, however, some criticisms of the process. As discussed, Dorset Waterwatch, a representative on the consultative committee, considered that water users (particularly irrigators) were overrepresented. In 2002 the Tasmanian Conservation Trust criticised the Tasmanian Government's public consultation and education on water management issues, stating that it has been 'erratic and irregular' and that the government 'appears to only pay heed to water users' (Tasmanian Conservation Trust 2002, p. 5). The government, on the other hand, stated that water users often have different and sometimes conflicting timing and reliability requirements for water access, so it is important to represent this diversity.

Irrigators are the group most likely to be affected by the plan, so they must be appropriately represented and their views must be fully considered. It is also important that the consultative process provides adequately for other interests. The limited explanation (including scientific evidence) to support the recommended environmental water provisions suggests the consultative process might have given less weight to the interests of stakeholders other than irrigators. It also points to some transparency and accountability problems with the Great Forester process.

Notwithstanding these issues, the capacity for aggrieved parties to appeal to the Resource Management and Planning Tribunal provides a safeguard that enhances transparency and accountability, and an additional avenue for stakeholder involvement. The appeals mechanism is expensive and time consuming, however, and overreliance on it can undermine people's confidence in stakeholder based water management planning. Tasmania appears to have drawn some lessons from the Great Forester experience and is taking steps to improve its processes. Among other things, Tasmania has amended the Water Management Act to require the Resource Planning and Development Commission to independently review the Department of Primary Industries, Water and Environment's responses to representations on draft water management plans.

Assessment

Tasmania has determined environmental water requirements for 43 of the 45 rivers and streams covered by its 1999 implementation program. It has also implemented a water management plan for the Great Forester catchment. Tasmania expects to complete its assessment of environmental water requirements and implement water management plans for the remaining 15 high priority river systems by the end of 2005 or soon after. In addition, amendments to the Water Management Act are likely to improve the way in which Tasmania manages its rivers and groundwater systems. Tasmania is thus determining environmental allocations broadly in line with

its 1999 implementation program determined under the 1994 CoAG water reform agreement.

There are some questions about Tasmania's approach to determining environmental flow requirements, as illustrated by the discussion of the Great Forester plan. Tasmania uses 'community values', which include both environmental and non-environmental objectives, to set environmental flow requirements. This method cannot provide a true evaluation of the water required to sustain water dependent ecologies.

The approach envisaged in the 1994 CoAG water reform agreement and the National Water Initiative does not rule out governments altering recommended environmental flows for socioeconomic or other public benefit reasons. But if such alterations are made, there should be robust evidence to support the trade-offs from the recommended flows. The Great Forester plan did not include a rigorous and transparent assessment of the trade-offs between environmental and human uses, which in turn reduced the effectiveness of consultation and affected the confidence of some stakeholders.

Tasmania appears to be improving its water planning processes following the experience of the Great Forester plan. It is developing a holistic approach to determining environmental water requirements that it will apply in all future water planning. Its approach would be improved, however, if the method of determining environmental water requirements is aimed more directly at estimating the volume of water needed to ensure the long run health and viability of water systems, rather than seeking to build non-environmental trade-offs into the estimate of environmental needs. Alterations to recommended flows could still be made (where there is robust socioeconomic information), but only after the true environmental requirements are known.

Other aspects of Tasmania's water planning framework are likely to assist the rigour of the state's water allocation outcomes. Tasmania has robust appeal processes that provide a safeguard and enhance transparency and accountability. Following the Great Forester process, Tasmania implemented measures to take better account of all interested parties' views.

Tasmania also recently implemented amendments to its Water Management Act to improve and accelerate its water planning processes. One amendment, however, removes the statutory requirement for the review of water management plans. While flexibility is desirable, and Tasmania's water management plans can still contain review provisions, this change has the potential to adversely affect the quality of water management outcomes. As recognised by the ARMCANZ/ANZECC national principles and the National Water Initiative, effective review processes are essential to an adaptive management approach.

The Council has identified some questions about Tasmania's approach to determining environmental water requirements. It would be desirable, therefore, for Tasmania to re-assess the environmental water requirements for all the water systems covered by its 1999 implementation program. Because Tasmania has not identified any stressed or overallocated water

systems, this work could be done over time without affecting current water planning processes.

The Council considers that Tasmania has satisfactorily addressed CoAG water management obligations for the 2004 NCP assessment. The 2005 NCP assessment should conclude on Tasmania's implementation of its obligation to provide appropriate environmental water allocations.

7.4 Water trading

Assessment issue: Trading arrangements in water allocations or entitlements are to be instituted to maximise water's contribution to national income and welfare, within the social, physical and ecological constraints of catchments. Any restrictions on trading need to be shown to be in the public interest. CoAG senior officials asked the Council to assess governments' progress with developing intrastate trading arrangements in 2003 and interstate arrangements in 2004. Trading arrangements are to be substantially implemented by 2005.

In the 2003 NCP assessment, the Council found that Tasmania had removed the two trading restrictions previously identified by the Council as likely to be inconsistent with CoAG water trading commitments. After further considering Tasmania's trading arrangements and those in other states, however, the Council identified two additional such restrictions:

1. Within irrigation districts, only an owner or occupier of land, or a person who may hold land, in the district could hold irrigation rights.
2. In unregulated systems, the Minister could refuse or modify a proposed transfer if the quantity of water available would exceed the amount that could be used sustainably for the intended purpose.

Tasmania is also developing water management plans, which may contain trading rules.

Tasmania needs to have reviewed the remaining restrictions on trade and either removed them or demonstrated that they provide a net public benefit. It also needs to ensure the trading rules in water management plans facilitate trading where this is socially, physically and environmentally sustainable.

References: CoAG water reform agreement, clause 5; 1999 tripartite meeting

In Tasmania, water trading is permitted in both irrigation schemes and unregulated systems.

The regulation of intrastate trading

Under the Irrigation Clauses Act, irrigation rights within irrigation schemes are separated from land titles and transferable within the irrigation district. They can be leased or sold. Transfers are subject to any conditions imposed by the scheme's managing authority under its transfer rules. The rules cover the physical limits of scheme infrastructure, environmental constraints and the rights of third parties (other users and parties with a financial interest in an irrigation right). If rights are to be traded out of an irrigation district, then

the scheme's managing authority would need to transfer a portion of its licence on behalf of the irrigator.

Under the Water Management Act, water licences and allocations for water resources outside irrigation schemes are separated from land titles and transferable. Transfers may be by permanent sale (termed 'absolute transfers') or temporary lease (termed 'limited period transfers'). Transfers are subject to the approval of the Minister for Primary Industries and Water. The transfer must accord with any relevant water management plan or, where there is no plan, with the objectives of the Act. The Minister may refuse to approve a proposed transfer if it would have a significant adverse impact on other water users or the environment, and may require a transfer applicant to pay for an assessment of the transfer's effects. Transfers also require the consent of any person with a registered interest in the licence. If the receiving party does not hold a water licence, they must apply for a licence when applying for the transfer.

In the 2003 NCP assessment, the Council found that Tasmania had removed the two trading restrictions previously identified by the Council as likely to be inconsistent with CoAG water trading commitments:

1. In government-owned irrigation districts, the Rivers and Water Supply Commission's power to refuse a transfer of water if it was likely to result in the movement of water from irrigated agriculture to another purpose.
2. In unregulated systems, the transitional provision that a permanent transfer would not be permitted unless certain conditions were met (primarily that the transferring party had obtained financial advice on the effects of the transfer).

After further considering Tasmania's trading arrangements and those in other states, in the 2003 NCP assessment the Council identified two additional restrictions likely to be inconsistent with CoAG obligations:

1. In irrigation districts, only an owner or occupier of land, or a person who may hold land, in the district could hold irrigation rights. A holder of an irrigation right who no longer owned or occupied land in the district was required to transfer the right within six months (with a possible extension of a further six months) or forfeit the right.
2. In unregulated systems, the Water Management Act enabled the Minister to refuse or modify a proposed transfer if, after the transfer, the quantity of water available to the receiving party would exceed the amount that could be used sustainably for the intended purpose.

At that time, Tasmania advised that these requirements were intended to ensure water is used for the purpose for which it was provided and to militate against speculation in the water market. The Council indicated, however, that the restrictions were also likely to affect the entry and activities of agents, brokers and other potential participants in the water trading market. As a result, the restrictions may reduce returns available to holders of irrigation rights and water licences, and constrain the extent to which water

is put to its most profitable use. Tasmanian Government officials indicated a preparedness to consider the continuing need for the restrictions before the 2004 NCP assessment.

The water management plans being developed by Tasmania may contain trading rules. The rules in the penultimate draft plan for the Great Forester catchment — the only almost-completed plan available at the time of the 2003 NCP assessment — reiterated the requirements of the Water Management Act and did not appear to impose additional conditions on trade.

Recent trading activity

Water trading in Tasmania is at an early stage of development. Most water trading, other than that directly related to rural property sales, has occurred within the major irrigation schemes and through privately arranged transfers between landholders. Almost all permanent water transfers accompany land sales.

In the three government-owned irrigation schemes, water transfers (both permanent and temporary) accounted for at least 10 per cent of water use in each of the previous three years (table 7.3). In the South East Irrigation Scheme, almost one-quarter of water supplied was traded in 2002-03. Based on the two schemes for which data are available for 2003-04, the number of temporary transfers exceeded permanent transfers. The volume of permanent transfers (all of which resulted from land sales), however, slightly exceeded temporary transfers. The government-owned irrigation schemes account for only around 10 per cent of the state's water use.

Table 7.3: Irrigation rights transferred in Tasmanian Government-owned irrigation schemes, 2000-01 to 2003-04^a

	<i>Water supplied</i>		<i>Water trades</i>	
	<i>ML</i>	<i>no.</i>	<i>ML</i>	<i>%</i>
Cressy–Longford Irrigation Scheme				
2000-01	7 162	8	373	5
2001-02 ^b	5 489	7	550	10
2002-03	9 980	22	948	10
2003-04 ^c	na	na	na	na
South East Irrigation Scheme				
2000-01	4 293	48	394	11
2001-02	1831	15	241	13
2002-03	3 822	59	833	22
2003-04 ^c	2 402	14	265 ^d	11

(continued)

Table 7.3 continued

	<i>Water supplied</i>		<i>Water trades</i>	
	<i>ML</i>	<i>no.</i>	<i>ML</i>	<i>%</i>
Winnaleah Irrigation Scheme				
2000-01	3 507	4	74	2
2001-02	3 523	15	525	15
2002-03	4 777	23	868	18
2003-04 ^c	2 715	6	297 ^e	11

^a Temporary trade accounts for the majority of this trade. ^b Data to 20 March 2002. ^c Data to 31 January 2004. ^d Comprises five permanent trades (103 megalitres) and nine temporary trades (162 megalitres). ^e Comprises one permanent trade (197 megalitres) and five temporary trades (100 megalitres). **na** Not applicable.

Source: Government of Tasmania 2004

In unregulated systems, almost all transfers have been permanent transfers accompanying land sales (table 7.4). Tasmania has advised that transfers separate from land sales account for less than 1 per cent of water use. It previously indicated that there has been little, if any, demand for trade between irrigation schemes and unregulated systems.

Water trade in unregulated systems is expected to increase significantly over the next three to four years. Hydro Tasmania will transfer over 50 000 megalitres of water to irrigators over this period. This follows the signing of a memorandum of understanding between the Department of Primary Industries, Water and Environment, Hydro Tasmania and the Tasmanian Farmers and Graziers Association. The transfer arrangements are intended to provide security of water entitlements for irrigators without significantly affecting Hydro Tasmania's commercial operations. Tasmania has advised that separate transfers would be negotiated with Hydro Tasmania for future dam developments, including the Meander Dam project.

Table 7.4: Water transfers in unregulated systems, January 2000 to February 2004

<i>Trading period</i>	<i>Permanent transfers</i>		<i>Temporary transfers</i>	
	<i>ML</i>	<i>no.</i>	<i>ML</i>	<i>no.</i>
January 2001 to June 2001	3 400	38	–	–
July 2001 to February 2002	48 579	151	3 670	32
March 2002 to February 2003	7 677	63	215	3
March 2003 to February 2004	1 914	34	–	–

– Nil.

Source: Government of Tasmania 2004

Reform progress

Tasmania removed the two restrictions on water trading that the Council identified in the 2003 NCP assessment by legislative amendments that commenced in June 2004:

-
- In irrigation districts, to hold irrigation rights it is no longer necessary to be an owner or occupier of land, or a person who may hold land, in the district. The provisions relating to the divesting of rights have also been removed.
 - In unregulated systems, the Minister is no longer able to refuse or modify a proposed transfer if the quantity of water available would exceed the amount that could be used sustainably for the intended purpose.

In December 2003, as part of the Tasmanian Government's commitments under its bilateral agreement to implement the National Action Plan for Salinity and Water Quality, the Department of Primary Industries, Water and Environment released a policy paper, *Guiding principles for water trading in Tasmania* (DPIWE 2003c). The paper specifies the guiding principles for assessing applications for water transfers under the Water Management Act. By documenting the principles, the government aims to assist water users to understand the arrangements for transfers, and to provide greater certainty in the approval process. In the paper, the department foreshadows that it will develop and publish exchange rates for trading between zones in water sources.

Tasmania's first water management plan (the plan for the Great Forester catchment) commenced in August 2003 (see section 7.3). The trading rules in the plan mirror the requirements of the Water Management Act at that time. Under the plan, the Department of Primary Industries, Water and Environment will make information on the number, volume and average price of transfers publicly available on an annual basis, subject to voluntary disclosure by applicants and the protection of personal details. Tasmania expects this type of information to become more widely available as water management plans are developed throughout the state.

Tasmania advised that the department had been informed of a recent feasibility study of the establishment of a water brokerage in the state. The study indicated that a dedicated water brokerage would not be commercially viable. It considered that the potential for water trading in Tasmania is generally limited, partly because the small size of water catchments restricts the number of potential purchasers.

Discussion and assessment

Tasmania made significant progress in addressing its water trading commitments in 2003-04. It removed the two trading restrictions that the Council identified in the 2003 NCP assessment as being likely to be inconsistent with CoAG water trading commitments. In addition, it has almost completed the conversion of all former water rights (attached to land titles) to tradable licences and allocations under the new system.

In previous NCP assessments, the Council found that water market and trading administration does not appear to represent an impediment to trade.

While Tasmania's register of water licences and allocations does not provide indefeasibility of title, water allocations are sufficiently well defined so as not to impede to trade. In addition, transfers require the consent of all parties with a registered financial interest. For the 2003 NCP assessment, data provided by Tasmania on the time taken to approve trades indicated that approval processes are unlikely to impede efficient trade.

The publication of Tasmania's guidelines for water trading should assist water users to understand the trading and approval process. The guidelines do not impose any additional conditions on trade. They foreshadow the recent legislative amendments and will be amended to reflect the changes.

While there is a limited choice of water trading mechanisms and little market information available in Tasmania this is understandable given the level of trade. The Tasmanian Government does not impede the establishment of new trading mechanisms and it will supply more information as water management plans are completed.

Trading arrangements also adequately address risks for the environment by requiring, for example, that transfers are consistent with the objectives of the water legislation and any relevant water management plan. The trading rules in the Great Forester plan reiterate the requirements of the Water Management Act as it applied when the plan commenced in 2003. While the plan states that an applicant must demonstrate that the water available to the transferee does not exceed the volume that could be used sustainably on their land for the intended purpose, the recent changes to the Act mean these provisions no longer have effect. Following its scheduled review in 2006-07, the plan will be able to be amended to reflect the recent changes to the Act.

Tasmania will need to ensure the trading rules in the water management plans that are still to be completed are also consistent with CoAG obligations. This should be the case if the rules reflect the requirements of the Water Management Act (as amended).

The Council considers that Tasmania has made satisfactory progress against its 1994 CoAG obligations relating to water trading for the 2004 NCP assessment.

7.5 Investments in new rural water schemes

Assessment issue: Investments in new rural water schemes or extensions to existing schemes are to be undertaken only after appraisal indicates the scheme or extension is economically viable and ecologically sustainable.

At the time of the 2003 NCP assessment, the Australian Government's approval process for the Meander Dam project under the *Environment Protection and Biodiversity Conservation Act 1999* was still to be completed. The Council's preliminary view was that Tasmania had provided a robust case to show that the project would be economically viable. It had insufficient information to reach a preliminary view on whether the project would be ecologically sustainable.

If the Meander Dam project proceeds, Tasmania will need to demonstrate compliance with the CoAG obligations on economic viability and ecological sustainability.

Reference: CoAG water reform agreement, clause 3(d)(iii)

The Meander Dam project is a proposal to construct a 43 gigalitre dam on the Meander River in Tasmania's central north. This dam would be used to supply licensed water users (including irrigation, town domestic water supplies and a proposed mini hydroelectric power plant) and environmental flows for the Meander River. At the time of the 2003 NCP assessment, the Australian Government's approval process for the project under the *Environment Protection and Biodiversity Conservation Act* was still to be completed.

In the 2003 NCP assessment, the Council's preliminary view was that Tasmania had provided a robust case to show that the project would be economically viable. It had insufficient information to reach a preliminary view on whether the project would be ecologically sustainable (NCC 2003a).

Developments since 2003

The Australian Government Minister for the Environment and Heritage approved the project on 18 September 2003 subject to conditions, including the submission of management plans for the two nationally threatened species (*Epacris aff. exserta* and the spotted tailed quoll). The Tasmanian Conservation Trust appealed the Minister's decision but withdrew its appeal in June 2004 following further scientific work that showed the plant species (now known as *Epacris Franklinii*) has a widespread distribution, including several populations in south east Tasmania. Given that the plant is no longer listed as being threatened, the Minister has amended his approval accordingly.

Following the Tasmanian Conservation Trust's withdrawal of its appeal, the Tasmanian Government proceeded with a tender process for the construction of the dam. Tenders closed on 15 October 2004, and the government is currently assessing proposals.

Submissions

WWF Australia considered that the Council should assess, before construction commences, the ability of the Meander Dam (and other such projects) to achieve CoAG obligations relating to full cost recovery and the transparency of CSOs. These issues relate to the CoAG obligations for water pricing, so the submission is considered in section 7.1.

Discussion

The Council aims to assess new rural schemes against the CoAG obligations relating to economic viability and ecological sustainability in the year in which the relevant government decides the scheme can proceed. The Meander Dam project cannot proceed until Tasmania finalises its management plan for the spotted tailed quoll and receives approval for the plan from the Australian Government Minister for the Environment and Heritage. The Tasmanian Government indicated that the project would proceed on approval of the plan.

The Council has not considered actions relating to the Meander Dam as part of the 2004 NCP assessment. If there is a decision taken during 2004-05 to proceed with the dam, Tasmania's compliance with the CoAG obligations on new rural infrastructure will need to be considered in the 2005 NCP assessment. The assessment will need to consider the economic and environmental studies undertaken by the Australian and Tasmanian governments. It will also need to account for the information previously provided by other parties, including the Tasmanian Conservation Trust and WWF Australia.

7.6 Other matters from the 2003 National Competition Policy assessment

Institutional reform

At the time of the 2003 NCP assessment, Tasmania was still to complete CoAG water reform agreement institutional reforms to:

- separate the roles of water standards setting and regulation from service delivery
- devolve a greater degree of responsibility for irrigation scheme management to local bodies.

Institutional role separation

Governments should separate responsibilities for providing water and wastewater services from responsibilities for regulation, water resource and environmental management and standards setting in areas such as health and plumbing. This separation is intended to prevent conflicts of interest that might arise if a monopoly water business (or its Minister) has responsibilities for both providing water and setting its price and quality. Economic regulation should be independent, given that water and wastewater businesses are public monopolies.⁸

At the time of the 2003 NCP assessment, Tasmania was reviewing its arrangements for handling complaints about the service standards of local government water businesses. This review was occurring as part of a wider review of the *Local Government Act 1993*. For the 2004 NCP assessment, the Council has considered the adequacy of Tasmania's complaints-handling processes in the light of the review.

Tasmania reported in 2004 that it has completed consultation on an exposure Bill and draft regulations. The Bill specifies that local governments must adopt formal complaints handling policies and procedures (to be prescribed in regulations). The procedures will include a complaints register to help identify systemic problems. It will remain open to a customer to seek an independent review of a local government's decision through the Local Government Ombudsman. Tasmania intends to introduce the Bill during the spring session of Parliament 2004.

Discussion and assessment

For the 2004 NCP assessment, Tasmania has made satisfactory progress in its review of complaints procedures for local government water businesses. It should be expected to have enacted the reform legislation and published the regulations on complaints procedures by the 2005 NCP assessment.

Devolution of greater responsibility for irrigation scheme management

The CoAG water reform agreement requires that governments devolve more responsibility for the management of irrigation schemes to local bodies. Devolution can take different forms, ranging from the scheme manager's consultation with local constituents on management issues, to full devolution of operational responsibility to the local level. Any devolution of operational

⁸ Independent economic regulation also addresses CoAG obligations in water pricing, provided (1) the regulator takes account of CoAG pricing principles and (2) its recommendations are made available in a public report.

responsibility should occur within a regulatory framework that ensures all of CoAG's water reform objectives can be met.

At the time of the 2003 NCP assessment, Tasmania had implemented measures to devolve the management of two of its three state-owned irrigation schemes. An association of local irrigators has managed the Cressy–Longford scheme since April 2002, while a draft agreement on devolution for the Winnaleah scheme was discussed with irrigators in March 2003. The Council noted a lack of progress for the third scheme — the South East Irrigation Scheme.

Tasmania reported in 2004 that it had formally handed over management of the Winnaleah Scheme to irrigators in December 2003. The Winnaleah irrigators are now responsible for day-to-day scheme operations, administration and management (including price setting), and own the operational assets. The Rivers and Water Supply Commission retains ownership of water delivery and water storage assets. Little progress has been made towards devolution for the South East Irrigation Scheme. Tasmania has reported that the scheme's operational arrangements are more complex than those of other schemes, and that several pricing issues need to be resolved. Tasmania has advised that negotiations on devolution for the scheme are a priority for the Rivers and Water Supply Commission in 2004.

Discussion and assessment

With the transfer of management responsibility for the Winnaleah scheme in December 2003, Tasmania has completed the devolution process for two of its three state-owned irrigation schemes. Progress remains slow in the South East scheme.

8 Australian Capital Territory

8.1 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 in issuing licences for water extraction

Assessment issue: The ACT is to demonstrate that its approach to charging for water extraction licences will achieve cost recovery in accord with the CoAG pricing principles. In previous National Competition Policy (NCP) assessments, the National Competition Council found that the ACT set fees for water extraction licences on a relatively ad hoc basis and should consider more robust estimates of the costs of processing and enforcing licences, and an appropriate method of allocating these costs (for example, using an avoidable cost method). For the 2004 NCP assessment, the Council has looked for the ACT to provide information on the extent to which current water licence fees reflect costs.

Future reform: Signatories to the National Water Initiative are to bring into effect by 2006 consistent approaches to pricing and to attributing the costs of water planning and management. This should involve identifying all costs associated with water planning and management, including the proportion of these costs that can be attributed to water access entitlement holders, consistent with the principle of linking charges as closely as possible to the costs of activities or products. These approaches should be consistent across sectors and jurisdictions in which water entitlements can be traded.

References: 1994 CoAG water reform agreement, clauses 3(a), (d) and (e); 1996 Agriculture and Resources Management Council of Australia and New Zealand (ARMCANZ) paper; 1998 CoAG pricing principles; 1999 tripartite meeting; Intergovernmental Agreement on a National Water Initiative

The *Water Resources Act 1989* provides for a range of fees for the issuing of allocations, permits and licences (covering application and annual administration costs) and a charge for water abstraction. The ACT has advised that all water users are required to pay the licence application and annual administration fees. It initially set these two fees at \$50 and \$100 respectively. It set the annual administration fee (excluding the water abstraction charge) to recover the estimated costs of administering the licence system and monitoring compliance with licensed activities. The ACT compared its cost estimates with those in New South Wales to ensure cross-border equity. Fees are subject to an annual CPI adjustment.

The ACT has reviewed the fees charged under the Water Resources Act. The main finding was a need to increase the annual administration fee to more accurately reflect the costs of administering the licensing system (estimated at \$300 a licence). It increased the administration fee with date of effect 1 July 2004. All other fees appear to have been increased by the annual adjustment for the consumer price index.

The water abstraction charge aims to recover from water users the costs of water provision that are not incurred by the service provider — the ACT Electricity and Water Corporation (ACTEW). It includes administration and regulation costs, catchment management and operation costs, as well as an imputed cost to downstream users (the environment and humans) from the consumption of water in the ACT. The purpose of the charge is to provide a better signal to consumers as to the 'true' cost of using water, to encourage more efficient water use. Set on the recommendation of the Independent Competition and Regulatory Commission, the fee when introduced was \$0.10 a kilolitre. The ACT Government increased the water abstraction

charge to \$0.20 a kilolitre from 1 January 2004, based on a charge review undertaken by the commission.

Discussion and assessment

The National Water Initiative commits governments to bring into effect by 2006 consistent approaches to pricing and to attributing the costs of water planning and management. This should involve identifying all costs associated with water planning and management, including the proportion of costs that can be attributed to water access entitlement holders, consistent with the principle of linking charges as closely as possible to the costs of activities or products.

Although the ACT did not provide detailed information on how it calculated its various licence fees, the Council notes that the ACT sought to ensure its licence fee structure recovers appropriate costs and is consistent with licence fees in New South Wales. The ACT uses the commission to recommend the charge for water abstraction providing an independent and rigorous assessment of the appropriate charge. The Council considers that the ACT has satisfactorily addressed its CoAG water pricing obligations for the 2004 NCP assessment.

8.2 Water access entitlements

Assessment issue: The ACT is to institute a statutory water access entitlement system and support systems for the consumptive use of water, separate from land. The water access entitlement system should be specified as a perpetual or open-ended share of the consumptive pool of a water source. These arrangements should be in place by 2006.

At the time of the 2003 NCP assessment, the ACT had established a system of water entitlements separated from land title and specified in volumetric terms. Water entitlements are issued in perpetuity. The ACT had a register of water entitlements, but the register did not record third party interests and was accessible only in hard copy form at the Environment Management Authority's office. While the ACT had agreed to participate in the Murray–Darling Basin Ministerial Council cap on water diversions, it was yet to finalise the territory's cap.

For the 2004 NCP assessment, the Council has looked for the ACT to ensure its water access entitlements system and supporting arrangements are consistent with the territory's commitments under the National Water Initiative, including in relation to the registry of entitlements. The Council also looked for the ACT to progress towards setting an appropriate Murray–Darling Basin Ministerial Council cap, to determine the amount of water available for consumptive uses in the ACT.

References: 1994 CoAG water reform agreement, clause 4; 1999 tripartite meeting; Intergovernmental Agreement on a National Water Initiative

In the ACT, the Water Resources Act is the legal basis for allocating water, issuing licences to take water, and determining environmental flow requirements. Water entitlements are separated from land title and issued in perpetuity, and provide the holder with a right to a share of the available resource.¹

The Environment Management Authority (within Environment ACT) maintains a register of licences and water entitlements. A hard copy of the register may be inspected at the authority's office. There is no facility to record third party interests in an entitlement.

Under the Act, water entitlements are managed through the ACT's water resources management plans, the first of which came into effect in 2000. The initial plan set out estimates of total water resources, environmental flow requirements and water available for consumption to 2010. At the time of the 2003 NCP assessment, the ACT Government anticipated reaching a final position on its component of the Murray–Darling Basin Ministerial Council cap on water diversions during 2003.

Reform progress

The ACT Government released its strategy for sustainable water resource management, *Think water, act water*, in April 2004 (Government of the ACT 2004a). The strategy was developed via a public process involving the release of a draft strategy in November 2003 for three months of public comment.

Think water, act water is the ACT's new water resources management plan. In line with the requirements of the Water Resources Act, it includes a description of the ACT's water resources, details of water entitlements and action to be taken to manage water resources. Under the strategy, the ACT Government aims to reduce per person consumption of mains water by 12 per cent by 2013 and 25 per cent by 2023. It is proposing to reduce consumption through water efficiency measures (including subsidies for households to adopt water efficient appliances), water recycling and the use of stormwater and rainwater (including subsidies for rainwater tanks). The government is aiming to increase the use of reclaimed water from 5 per cent to 20 per cent by 2013.

Think water, act water also commits ACTEW to completing feasibility studies into future water supply options by the end of 2004, in case the measures aimed at reducing consumption do not result in sufficient water savings to

¹ Holders of territory leases issued before December 1998 have common law rights to groundwater. The rights to groundwater remain connected to land until the lease is re-issued. At the time of the 2001 NCP assessment, the ACT advised that most groundwater use will be subject to the allocation system in five to 10 years, because leases for many significant users of groundwater are due for renewal over that period.

avoid a new water supply. The government also undertook to review its environmental flow guidelines (see section 8.3).

The ACT Government has agreed to participate in the Murray–Darling Basin Ministerial Council cap. It is developing an appropriate cap in consultation with other members of the Murray–Darling Basin Commission (MDBC). It aims to complete a memorandum of understanding with the New South Wales and Australian governments by 2005. The memorandum of understanding will include provision for a cap (Government of the ACT 2004b).

Discussion and assessment

The ACT's Water Resources Act establishes a comprehensive system of water entitlements separated from land title and specified in volumetric terms, consistent with the obligation in the 1994 CoAG water reform agreement. Water entitlements are issued in perpetuity, consistent with the commitment given by the ACT under the National Water Initiative.

The ACT's registry of water entitlements does not record third party interests and is accessible only in hard copy form at the Environment Management Authority's office. The National Water Initiative requires participating states and territories to ensure they have compatible, publicly accessible and reliable systems for registering entitlements (including any encumbrances) by 2006. This requirement is likely to require further work by the ACT, which has advised that it can readily address any need to record third party interests.

The Murray–Darling Basin Ministerial Council cap for the ACT will need to be finalised to determine the amount of water available for consumptive uses in the ACT. This is a necessary precursor to interstate trading. Other issues related to the ACT cap are considered in section 8.4.

The Council considers that the ACT has made satisfactory progress against its CoAG obligations on water access entitlements for the 2004 NCP assessment.

8.3 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 ACT had environmental flows in place for all of its 32 subcatchments at the time of the 2001 NCP assessment. In 2002 it commenced development of a new water resource strategy. For the 2004 NCP assessment, the Council has asked the ACT to report on the outcome of this strategy. The Council has also asked the ACT to report on progress with finalising the ACT component of the Murray–Darling Basin Ministerial Council cap on water diversions and provide details on its component of the cap.

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

Water planning in the ACT is guided by the principles of ecological sustainability, with the aim of protecting the environmental and use values of ACT water bodies. The Water Resources Act reflects this aim by requiring water to be allocated for environmental flows before consumptive uses. Environmental allocations for each of the ACT's 32 subcatchments are set out in the Water Resources Management Plan and were in place for all subcatchments by the time of the 2001 NCP assessment. Unless the plan provides for it, no new allocations of water can be made for consumptive use.

The ACT Government considers that it has adopted a conservative approach to water extractions. It dedicates approximately 269 gigalitres of water of a

total annual useage of 494 gigitalitres (approximately 55 per cent) to environmental flows. The ACT's environmental flow guidelines protect flows up to the 80th percentile (that is, the flow that is exceeded 80 per cent of the time). For most subcatchments, extraction for consumptive use is limited to 10 per cent of flows above the 80th percentile. For water supply catchments, 100 per cent of flows above the 80th percentile are available for extraction (except for spawning flows). Under the licensing conditions the government requires ACTEW, the ACT water supply utility, to meet these minimum requirements within a tolerance band of plus or minus 20 per cent. Groundwater extraction is limited to 10 per cent of average annual recharge.

In addition to setting extraction limits, the ACT conducts low-flow monitoring programs and uses the results of this monitoring to adjust its flow management regime. It argues that this work enables it to maintain a sustainable balance between environmental needs and human use.

Table 8.1 provides a snapshot of water allocations in the ACT under the current plan. The table shows that the environment is allocated just over half of the total annual water supply and, in most subcatchments, receives an allocation of over 90 per cent, although the annual environmental water provision is much smaller in the key water supply catchments. In the Corin, Bendora and lower Cotter subcatchments the environmental water provision is about 25–28 per cent of the total supply. In the Googong, Tinderry and Burra subcatchments, it is around 9 per cent of the total supply.

Table 8.1: ACT controlled water resources, as at 30 September 2003

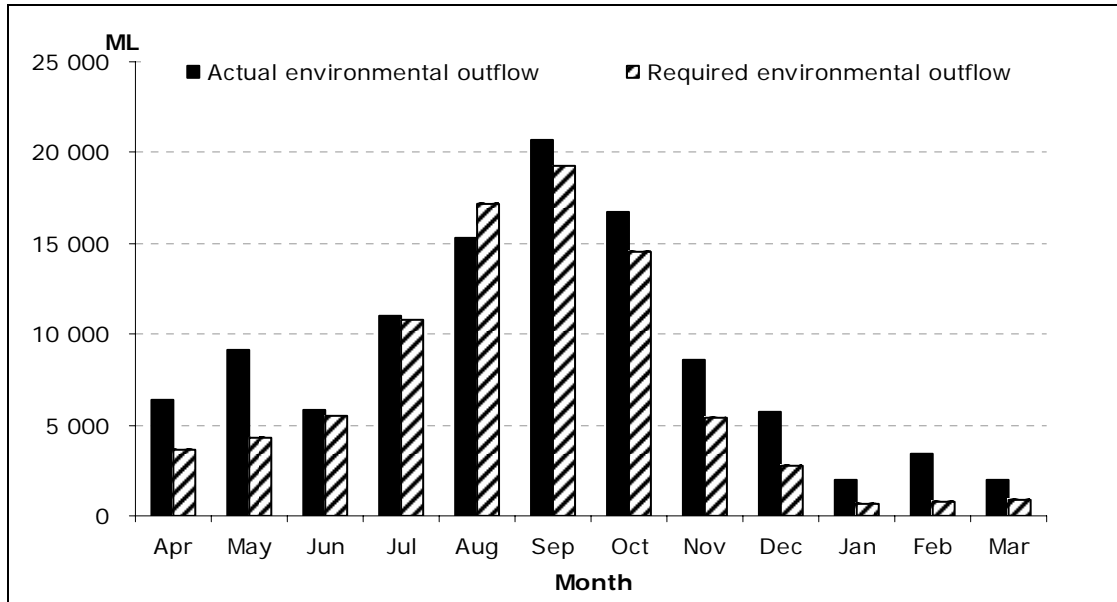
<i>Subcatchment</i>	<i>Total water allocation</i>	<i>Allocation for the environment</i>	<i>Allocation available for use</i>		
			<i>Total</i>	<i>Existing use</i>	<i>Reserved</i>
	<i>Megalitres</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>
Corin	75 751	25	75	39	2
Bendora	33 906	28	72	62	4
Lower Cotter	36 045	26	74	0	33
Tinderry	82 805	9	91	12	3
Googong	8 575	9	91	14	3
Burra	11 784	9	91	14	4
All other	244 910	92	8	1	1
Total	493 776	55	45	13	4

Source: Government of the ACT 2004a

However, because the ACT is not currently using all allocated consumptive water, the excess water can be re-allocated to the environment. Figure 8.1 shows that over the period from April 2001 to March 2002, for example, environmental water releases from the Bendora, Corin, Cotter and Googong dams were typically above requirements. While the figure indicates that releases were less than required at times, Environment ACT found that releases were within the acceptable tolerance bands or that there was a

genuine reason for not implementing the required flow (for example to conduct maintenance) (Environment ACT 2003).

Figure 8.1: Environmental water outflows from the Bendora, Corin, Cotter and Googong dams, April 2001 to March 2002



Source: Environment ACT 2003

Reform progress

As discussed in section 8.2, the ACT Government released its water resources strategy, *Think water, act water*, in April 2004, setting the direction for achieving the short and long term (until 2050) sustainable water resource management objectives in the Water Resources Act. The strategy sets water allocations and provisions for future water use and is the ACT's new water resources management plan, which came into effect on 1 July 2004. The strategy's key environmental objectives are to protect the water quality of ACT rivers, lakes and aquifers, maintain and enhance environmental amenity, recreational and designated use values, and protect the health of people in the ACT and down river. Accordingly, *Think water, act water* commits the ACT Government to:

- continue environmental and health water quality programs to meet the aim of 'same or better quality' for water leaving the ACT compared with the water entering
- review the environmental flow guidelines in 2004 taking account of scientific knowledge gained since 1999
- review water resource monitoring
- implement a riparian management plan

- ensure best practice management of the ACT's water resources, including continuous re-assessment and improvement in management.

The ACT Commissioner for the Environment will provide an independent check on the effectiveness with which the ACT meets these objectives by reporting in the ACT's three-yearly *ACT state of the environment report*.

In the most recent state of the environment report, the ACT Commissioner for the Environment reported that the drought and the 2003 bushfires had caused a decline in river health (as measured by aquatic macroinvertebrate populations). Impacts include a general decline in water quality in unforested catchments, and a reduction in the amount of water released for environmental flows in the Cotter River.

The commissioner also noted that estimates of recharge rates suggest extraction of groundwater from most subcatchments may be within 70 per cent of the estimated sustainable yield, but that that lack of precise data makes it difficult to determine the true sustainable yield and the impact of current extraction rates (ACT Commissioner for the Environment 2004). The commissioner recommended that the ACT Government undertake a catchment-by-catchment hydrological study of groundwater systems to assess water quality and quantity, and its connectivity, spatial distribution and temporal variability. In light of the impact of the January 2003 bushfires on stream water quality, aquatic habitat and the water supply dams, the report also proposed that the ACT adopt a whole-of-catchment approach to planning and managing water and other conservation values, and fund this approach by increasing water use charges. The ACT Government must respond to the report's recommendations within six months of its tabling in the Legislative Assembly, which occurred on 31 March 2004.

The ACT has advised that it is considering several options for an ACT cap as its component for the Murray–Darling Basin. It will make a final decision on this matter once the necessary interstate trading arrangements are in place (see section 8.4).

Discussion and assessment

The ACT has a water resources management plan in place, which provides environmental water allocations for each of its surface water and groundwater resources. It has thus met its 1994 CoAG water reform obligation to provide water for the environment. The ACT has also developed a new strategy for water management, which sets directions until 2050. The strategy is broadly consistent with the commitments provided by the ACT under the National Water Initiative.

8.4 Water trading

Assessment issue: Trading arrangements in water allocations or 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. 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 (including the immediate removal of all restrictions on temporary trade).

In the 2003 NCP assessment, which considered intrastate trading arrangements, the Council found that the ACT permits permanent and temporary trades subject to the approval of the Environment Management Authority. There are no other legislative impediments to trading. The absence of water trading within the ACT largely reflects the territory's small industrial and agricultural sectors relative to the available resource. Interstate trade involving the ACT depends on the finalisation of the Murray–Darling Basin Ministerial Council cap on diversions for the ACT, and on agreement with other jurisdictions on the terms and conditions of trade.

The ACT needs to finalise the cap and develop interstate trading arrangements.

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

The Water Resources Act permits the permanent or temporary transfer of all or part of a water entitlement with the approval of the Environment Management Authority. In determining whether to approve the transfer, the authority is required to account for the environmental record of the applicant. Where the authority refuses the transfer, the Act permits the ACT Administrative Appeals Tribunal to review the decision.

There has been no water trading in the ACT or between the ACT and other jurisdictions, largely reflecting the territory's relatively small industrial and agricultural sectors relative to the available resource. The ACT Government previously advised that there is insufficient demand in the territory to justify the establishment of intra-territory trading rules (beyond the requirement for the approval of the Environment Management Authority) or an intra-territory trading market.

While the Water Resources Act also provides for trade between the ACT and other jurisdictions, interstate trade depends on the finalisation of the Murray–Darling Basin Ministerial Council cap on water diversions for the ACT, and on agreement with other jurisdictions on the terms and conditions of trade.

Reform progress

As noted in section 8.2, the ACT Government, in consultation with the other members of the MDBC, is developing an appropriate Murray–Darling Basin Ministerial Council cap. The ACT has advised that it cannot finalise a cap until interstate trading arrangements are determined, because the main

options for its cap rely on the availability of interstate trade to meet future growth in water demand in the ACT. The ACT Government is participating in the development of interstate trading arrangements through the MDBC, and is aiming to complete a memorandum of understanding with the New South Wales and Australian governments (which will include provision for a cap) by the end of 2005.

There were no developments on intra-ACT trade and no trading activity during 2003-04.

Discussion and assessment

Through the Water Resources Act, the ACT Government has removed all legislative impediments to intrastate trade in water. Given that there is little, if any, demand for intra-territory trading, the requirement for trades to be approved by the Environment Management Authority is sufficient to ensure trading occurs within the physical and ecological constraints of catchments. As the demand for trade increases, the ACT may need to develop specific intra-territory trading rules.

The ACT is progressing the two main requirements for interstate trading: (1) its Murray–Darling Basin Ministerial Council cap; and (2) agreement with other jurisdictions on the terms and conditions of trade. The National Water Initiative extends to 2007 the timeframe for establishing institutional and regulatory arrangements that facilitate interstate trade. The ACT's completion of a memorandum of understanding with the New South Wales and Australian governments (including provision for a cap) would represent a significant first step. Completion of the memorandum of understanding by the end of 2005, as proposed, should provide sufficient time for the ACT to finalise its interstate trading arrangements in line with the National Water Initiative timetable. (While the southern Murray–Darling Basin states have agreed to facilitate interstate trade by taking all necessary steps to enable by June 2005 exchange rates and/or tagging of water access entitlements, the ACT is not covered by this element of the National Water Initiative.)

To facilitate interstate trading, the ACT may also need to further develop its register of water entitlements. The ACT's register is not accessible electronically and does not record third party interests. The National Water Initiative obliges governments to implement compatible, publicly accessible and reliable registers (including any encumbrances) by 2006.

The Council considers that the ACT has made satisfactory progress against its CoAG obligations on water trading for the 2004 NCP assessment.

9 Northern Territory

9.1 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 in issuing licences for water extraction

Assessment issue: The Northern Territory is to demonstrate that its approach to charging for water extraction licences will achieve cost recovery in accord with the CoAG pricing principles. In previous assessments, the National Competition Council found that the Northern Territory does not charge fees for licences granted under the *Water Act 1992*. For the 2004 National Competition Policy (NCP) assessment, the Council looked for the Northern Territory to provide information on the extent to which current water licence fees reflect costs.

Future reform: Signatories to the National Water Initiative are to bring into effect consistent approaches to pricing and attributing costs of water planning and management by 2006. This should involve identifying all costs associated with water planning and management, including the proportion of these costs that can be attributed to water access entitlement holders, consistent with the principle of linking charges as closely as possible to the costs of activities or products. These approaches should be consistent across sectors and jurisdictions where water entitlements can be traded.

References: 1994 CoAG water reform agreement, clauses 3(a), (d) and (e); 1996 Agriculture and Resources Management Council of Australia and New Zealand (ARMCANZ) paper; 1998 CoAG pricing principles; 1999 tripartite meeting; Intergovernmental Agreement on a National Water Initiative

The Northern Territory reported that 56 licences have been issued for surface water extraction. Of these, four are held by the Power and Water Corporation for public water supply and 52 are held by small-scale private irrigators. The total licensed entitlement for surface water extraction is 44 gegalitres a year, with the Power and Water Corporation entitled to 38 gegalitres and private irrigators entitled to 6 gegalitres.

There are 88 groundwater licences, of which 10 are held by the Power and Water Corporation for the operation of public water supply borefields, and 78 are held by private users. The total licensed groundwater extraction is 78 gegalitres a year, with the Power and Water Corporation entitled to 31 gegalitres and private irrigators entitled to 47 gegalitres.

The Northern Territory advised a taxpayer funded cost of \$450 000 for water resource management associated with water extraction licences that it considers are subject to the 1994 water reform agreement.¹ This is the cost of surface water and groundwater extraction licence services provided by the Department of Infrastructure, Planning and Environment. Because it reserves 80 per cent of surface water and groundwater for environmental use, the government considers that the proportion of licensing costs attributable to water users is \$90 000 (or 20 per cent of the total licensing cost of \$450 000).

The Northern Territory advised that it considered two options for recovering the costs apportioned to water users: (1) a pro rata approach based on the number of licences in operation and (2) cost recovery on the basis of volumes

¹ The Northern Territory noted that the pricing obligations in the 1994 water reform agreement do not apply to groundwater harvested by small private users

extracted annually. It considered that the volumetric approach represents a more equitable way to apportion costs. This approach would add \$83 000 annually to the cost base of the Power and Water Corporation, equivalent to 0.23 per cent of its revenue from public water supply customers. The corporation would need to increase water tariffs by 0.12 cents a kilolitre to recover this additional operational cost directly from customers. The Northern Territory considers that imposing such a small additional charge would not improve the efficiency of resource allocation, investment or consumption. Consequently, it has not sought to recover licensing costs through water charges. It considers that providing this subsidy does not undermine the overall policy objectives of the 1994 water reform agreement.

The Water Act provisions allow the Controller of Water Resources to require a licensee to provide any data or information deemed necessary as part of the licence conditions. The Northern Territory argued that licensees bear a significant proportion of monitoring and reporting costs, but did not provide any information to substantiate this statement.

Discussion and assessment

The National Water Initiative commits governments to bring into effect by 2006 consistent approaches to pricing and attributing costs of water planning and management. This should involve the identification of all costs associated with water planning and management, and the identification of the proportion of costs that can be attributed to water access entitlement holders consistent with the principle of linking charges as closely as possible to the costs of activities or products.

The Northern Territory and Western Australia are the only jurisdictions that do not charge for water licences. All other jurisdictions either impose a fee regime linked to the cost of licensing and associated water management activities or are considering the introduction of a cost-reflective charging regime. While it does not charge for licences, the Northern Territory may impose licence conditions that transfer responsibility for some water resource management (and thus some of the associated costs) to the Power and Water Corporation. Not charging a fee for licensing and associated water management costs to Power and Water Corporation, however, is not consistent with CoAG's intention that water use charges should include appropriate natural resource management costs.

Arising from the 1999 tripartite meeting on water, private withdrawals of groundwater are not subject to the pricing obligations in the 1994 water reform agreement for the purpose of NCP compliance assessment. Accordingly, the Council has not considered issues relating to the recovery of costs associated with private groundwater use in the 2004 NCP assessment.

Under the National Water Initiative, the Northern Territory will need to adopt by 2006 an appropriate and consistent approach to attributing the costs of water management to licence holders. Appropriate attribution will become

more important if arrangements for water trading between the Northern Territory and the Ord Irrigation Project in Western Australia are introduced (see section 9.4).

9.2 Water access entitlements

Assessment issue: The Northern Territory is to institute a statutory water access entitlement system and support systems for the consumptive use of water, separate from land. The water access entitlement system should be specified as a perpetual or open-ended share of the consumptive pool of a water source. These arrangements should be in place by 2006.

At the time of the 2003 NCP assessment, the Northern Territory had established a system of water entitlements separated from land title and specified in volumetric terms. Water licences are generally issued for up to 10 years. The Northern Territory had a register of water entitlements, but this register does not record third party interests and is available only in hard copy form from the Department of Infrastructure, Planning and Environment.

For the 2004 NCP assessment, the Council has looked for the Northern Territory to ensure its water access entitlements system and supporting arrangements are consistent with the government's commitments under the National Water Initiative. The Northern Territory will need to specify its water access entitlements as perpetual shares of water available for consumption and further develop its register of water entitlements.

References: 1994 CoAG water reform agreement, clause 4; 1999 tripartite meeting; Intergovernmental Agreement on a National Water Initiative

The Northern Territory specifies water access entitlements via surface water and groundwater extraction licences issued under the Water Act. Water entitlements are separated from land title and specified in volumetric terms. Licences are generally issued for up to 10 years, with the Minister able to approve a longer period. Subject to the Act, water resources and the rights to the use, flow and control of all water are vested in the Northern Territory Government.

Water planning in the Northern Territory is undertaken through an integrated regional resource management process covering both surface water and groundwater (see section 9.3). The government may declare water allocation plans for water control districts. The plans are set for 10 years and reviewed every five years. Water advisory committees oversee implementation of the plans.

The Northern Territory has a register of water entitlements and licences. The registry database contains details of licence holders, quantities of water and dates for renewal, but does not record third party interests. A hard copy of the register is available from the Department of Infrastructure, Planning and Environment.

Reform progress

The Northern Territory finalised a water allocation plan for the Ti-Tree Water Control District in August 2002. It is developing plans for three other districts (Darwin, Alice Springs and Daly) and expects to complete these plans in 2005. It does not intend to develop water allocation plans for the remaining two districts (Tennant Creek and Gove). The Northern Territory's progress with the three water allocation plans under development is discussed in section 9.3.

The Northern Territory monitors the need for further development of its water registry system. It advised that third party interests could be readily incorporated, but that there is no demand for this change from licence holders or financial institutions. It also advised that it may implement an Internet based system in the future.

Discussion and assessment

In previous NCP assessments, the Council found that the Northern Territory's Water Act establishes a comprehensive system of water entitlements separated from land title and specified in volumetric terms, consistent with the obligation in the 1994 CoAG water reform agreement. Licences are generally issued for up to 10 years. In the 2001 NCP assessment, the Council accepted that the ability of third parties to register an interest was not then an issue in the Northern Territory.

The National Water Initiative requires participating states and territories to introduce perpetual water access entitlements, with similar status to freehold land, and to ensure they have compatible, publicly accessible and reliable systems for registering entitlements (including any encumbrances) and (permanent and temporary) trades. The requirement that water access entitlements be specified as perpetual shares of water available for consumption will require the Northern Territory to amend its arrangements by 2006. Similarly, notwithstanding the absence of demand for water trading, the Northern Territory will need to further develop its registry of water entitlements. In its annual report, the Northern Territory stated that policy decisions arising from the National Water Initiative may prompt it to establish a more sophisticated register.

The Council considers that the Northern Territory has made satisfactory progress against its CoAG water entitlements obligations for the 2004 NCP assessment.

9.3 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 Northern Territory's 1999 implementation program listed four of its six water control districts for the implementation of management strategies (including water allocation plans) by 2005. It did not identify these districts to be stressed systems. At the time of the 2003 NCP assessment, the Northern Territory had completed five major research projects on environmental flows in the Daly and Douglas rivers and a water allocation plan for the Ti-Tree Water Control District. It also had plans under way for the other water control districts covered by its 1999 program.

For the 2004 NCP assessment, the Council has asked the Northern Territory to report on progress against its 1999 implementation program and to report on any progress in its scientific research on environmental water requirements.

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

Water planning in the Northern Territory occurs through an integrated regional resource management process. Under the Water Act, a water allocation plan covering both surface water and groundwater may be developed for a declared water control district for the purpose of managing water extraction at sustainable levels.

Under its 1999 implementation program, the Northern Territory is developing water allocation plans for four of its six water control districts. The plans are set for 10 years and reviewed every five years. Water advisory committees oversee implementation of the plans. There are no stressed or overallocated rivers or groundwater systems covered by the Northern Territory's 1999 program.

Reform progress

The Northern Territory implemented the Ti-Tree Region Water Resource Strategy 2002 (comprising a water allocation plan and an ongoing work plan for the region) in August 2002. It is developing the remaining three plans — for the Katherine–Daly, Darwin and Alice Springs water control districts — and expects to declare these plans in 2005. Box 9.1 summarises the Northern Territory's progress with its water strategies.

Given that the Ti-Tree strategy is the Northern Territory's only completed water plan, the Council has considered it against the CoAG objectives for water planning in this 2004 NCP assessment. The Council has accounted for the extent to which the Northern Territory addressed the CoAG obligation to allocate an appropriate amount of water for environmental purposes in the Ti-Tree Basin.

Box 9.1: Northern Territory's progress with water allocation plans

Ti-Tree water control district

The Ti-Tree Region Water Resource Strategy (including the water allocation plan) and ongoing work plan, was declared under the Water Act on 16 August 2002. The Ti-Tree Water Advisory Committee oversees implementation of the strategy.

Darwin water control district

The preliminary draft water allocation plan has been completed. It proposes retaining a contingent provision for the environment of at least of 80 per cent of regional surface water and groundwater. The regional groundwater resource modelling is being reviewed and upgraded for the final plan. Community consultation will commence soon and the Northern Territory has scheduled the final plan for declaration in 2005.

Katherine–Daly water control district

The preliminary draft water allocation plan has been completed and is being used to regulate irrigation development for the region. Development of the final plan is under way, and regional water balances have been defined. The Daly Region Community Reference Group is conducting community consultation and expects to submit a final draft water allocation plan and a draft integrated regional land use plan to the government later in 2004.

Alice Springs water control district

Development of the draft water allocation plan is under way. Currently the main focus of activity is on defining regional water balances for the major groundwater systems. Community consultation is expected to commence soon, and the Northern Territory has scheduled the final plan for declaration in 2005.

Source: Government of the Northern Territory 2004

The Northern Territory is using the results of five major research projects on environmental flows in the Daly and Douglas rivers to provide a 'best available' scientific basis for establishing environmental flows.² In 2004 the government advised that:

- it intends to adopt the research recommendations on flow seasonal variability, frequency, magnitude and duration in the Daly River in the Daly Region Water Allocation Plan
- the Expert Reference Group is refining its scientific findings to aid the Daly Region Community Reference Group to finalise the water allocation plan
- it is using the research findings on the environmental water requirements of the wetlands and native woodlands in the Darwin rural area to refine regional water balance models, and is undertaking additional research to determine the water requirements for groundwater dependent ecosystems for the Darwin Region Water Allocation Plan.

Ti-Tree Region Water Resource Strategy

The Ti-Tree Basin is a 5500 square kilometre sedimentary basin located 200 kilometres north of Alice Springs in the arid zone of the Northern Territory. It services a water control district covering 14 000 square kilometres with a population of less than 500. The basin contains no permanent surface water sources, so users in the region rely on groundwater. This water is used mainly for horticulture, which is the most significant economic activity in the region, generating income of approximately \$20 million a year (DIPE 2002b). Based on current trends, the Department of Infrastructure, Planning and the Environment expects the irrigated area to double in the near future.

The Department of Infrastructure, Planning and Environment developed the Ti-Tree Region Water Resource Strategy with advice from the Ti-Tree Water Advisory Committee. This committee comprised irrigators, other landholders, representatives of the community, Indigenous groups and Northern Territory Government representatives. It also included an expert hydrogeologist. The stated purpose of the strategy is to provide for the best long term use of water, balancing social and environmental protection needs while allowing for economic growth (DIPE 2002b). The strategy has a life of 10 years and will be reviewed, under the supervision of the Ti-Tree Water Advisory Committee, within five years.

As required under the Water Act, the strategy allocates water resources for defined 'beneficial uses'. The beneficial uses were determined through a

² The Council considered these research projects in previous assessments, finding that they provided an appropriate scientific basis for determining environmental flows.

community process and declared under the Act in August 2002. The declared beneficial uses are:

- agricultural — to provide irrigation water for primary production including related research
- cultural — to provide water to meet aesthetic, recreational and cultural needs
- environmental — to provide water to maintain the health of aquatic ecosystems
- public water supply — to provide source water for drinking purposes delivered through community water supply systems
- riparian — public rights and ownership rights to take water for rural stock and domestic purposes (DIPE 2002a).

The strategy allocates surface water across the entire water control district, but recognises three separate groundwater use zones: western, central and eastern. The strategy allocates only good quality groundwater (salinity less than 1000 milligrams a litre), which is suitable for irrigation and drinking. Table 9.1 shows the allocation of surface water and groundwater by declared beneficial use category and zone.

Table 9.1: Water allocation for the Ti-Tree Water Control District, by use

<i>Water use</i>	<i>Surface water</i>	<i>Groundwater zone</i>		
		<i>Western</i>	<i>Central</i>	<i>Eastern</i>
Agricultural irrigation	–	80%	80%	–
Public water supply	–	10%	–	–
Environmental and cultural	95%	–	–	–
Riparian — homestead and stock supply	5%	1%	1%	1%
Reserved for later allocation	0%	9%	19%	100%
Aquifer storage		680 GL	1 130 GL	1 560 GL
Annual recharge rate ^{a,b}		3.67 GL	3.47 GL	2.90 GL
Water use in 2002		900 ML	1.7 GL	20 ML
Sustainable yield ^b		3.2 GL	7.0 GL	nd

^a Estimate. ^b While the strategy indicates that the total annual recharge rate is 10 040 megalitres, the CSIRO (2001) estimated it to be 1140 megalitres. – The beneficial use category is not declared for the specified zone. **nd** Not defined. **ML** Megalitres. **GL** Gigalitres.

Source: DIPE 2002b, pp. 6, 11

Because surface water in the basin is ephemeral, the strategy allocates it primarily for environmental and cultural uses. A small amount of stream flow and catchment runoff is allocated for stock and domestic uses. One per cent of

the groundwater in each zone is also allocated for this purpose. In the western and central zones, the strategy allocates most of the groundwater water for farm irrigation purposes, although some water in the western zone is allocated for drinking water. Allocations for drinking water and irrigation are intended to provide sufficient water to meet the likely future increase in demand as the region develops. A small contingency in the western and central zones is reserved for later allocation. Irrigation development prospects in the eastern zone are not defined, but the strategy work plan schedules the development of a water allocation plan for this zone in 2004. The new plan will allocate the water resource that is currently reserved.

The strategy permits up to 10 200 megalitres a year to be taken from the basin: 3200 megalitres a year from the western zone (equivalent to the reported sustainable yield) and 7000 megalitres a year from the central zone. The strategy notes that extraction at the maximum level for the central zone may draw down the groundwater by up to 20 metres over 290 years. The Northern Territory considers this to be an 'acceptable long term rate of loss from groundwater storage', given there are no known groundwater dependent ecosystems (DIPE 2002b, p. 12).

Because the strategy assumes the regional groundwaters have no cultural significance and no dependent ecosystems, it does not allocate groundwater for the benefit of the environment. The Ti-Tree Basin does, however, contain an intermittent wetland, Stirling Swamp, which occasionally forms from flood waters. In discussions with the Council, the CSIRO advised that this wetland is groundwater dependent and receives the discharge water from the Ti-Tree aquifers. In July 2004, the CSIRO commenced a joint project with the Northern Territory Government to determine the cultural and ecological water requirements in the water control district, including Stirling Swamp, riparian vegetation along the river and creek lines and terrestrial vegetation.

Primary responsibility for promoting, reviewing and updating the strategy lies with the Ti-Tree Water Advisory Committee. The Natural Resources Division of the Department of Infrastructure, Planning and the Environment must consult with the committee and stakeholders to ensure achievement of the water resource outcomes identified in the strategy and must assess water resources and provide the technical advice needed for informed decision making. Irrigators and the Power and Water Corporation are required to monitor water use and report in accord with the requirements of the Water Act.

There is a work plan for improving knowledge, information and management of the water resources in the water control district. Among other tasks, it foreshadows monitoring and reporting on hydrological parameters, investigating and determining the environmental and cultural significance of water resources, and initiating pump monitoring by all licence holders. The Northern Territory intends to use this information to update and extend its water allocation strategy.

Best available science

The Ti-Tree strategy sets allocations using an estimate of long term average recharge from direct rainfall (approximately 2 millimetres a year or 2 megalitres a year for each square kilometre) plus an additional estimate of flood water recharge.³ The plan uses an estimate of total recharge for the basin (10 200 megalitres a year) to set extraction limits. The Northern Territory Government advised that it set extraction limits using CSIRO data sourced from Harrington *et al.* (1999).

There are differences between the CSIRO's estimates of recharge and those the Northern Territory used to set extraction limits for the basin. These result from differing assumptions about the area of freshwater, rainfall and flooding. As a result of the way in which the Northern Territory applied the CSIRO data, the permitted extraction under the Ti-Tree Basin water allocation plan is almost 10 times the CSIRO estimate of total recharge (10 200 megalitres a year compared with 1140 megalitres a year). The CSIRO study considered that extraction of more than 1000 megalitres a year from the Ti-Tree Basin would be unsustainable and could lead to lateral inflow of saline water and deterioration of the water resource.

The Council discussed this issue in a meeting with Northern Territory Government officials and the CSIRO. The CSIRO accepted that recharge is difficult to estimate and margins of error in the order of 30 per cent are not uncommon. It advised that it had used one method for estimating recharge, while there are a number of different approaches available. It also stated that small changes to key parameters would align its figures more closely with the Northern Territory's. The Northern Territory and the CSIRO undertook to investigate this matter over the next twelve months and report on the outcome of their investigation for the 2005 NCP assessment.

In addition, the Northern Territory advised that it did not use the universally accepted hydrological model MODFlow, but developed an in-house model for assessing the Ti-Tree Basin hydrology. Inputs included the results of the CSIRO investigation, as well as water levels in monitoring bores across the control district over the past decade. The Northern Territory did not provide any information on its model.

The strategy provides for monitoring and reporting on water quality, but does not consider the water quality implications of groundwater extraction or discuss data quality, data reliability or confidence levels in determining the water allocations. There is no evidence to indicate that the scientific methods and outputs, including the Northern Territory's in-house flow model, were peer reviewed.

³ The water allocation strategy cites no references, but states that recharge figures were based on 'a severe distillation of rigorous and extensive assessment work to date' supplemented using 'extrapolations, approximations and guesswork' (DIPE 2002a, p. 6).

Balancing economic, environmental and other interests

As discussed above, the stated objective of the Northern Territory Government in the Ti-Tree strategy is to set extractions to achieve the best long term use of water, balancing social and environmental protection needs while allowing for economic growth. The water allocation plan reserves most of the surface water for the environment (because the ephemeral nature of the stream flow means that there are few alternative uses for the surface water). In the central zone, permitted water extraction may draw down the aquifer, although the territory considers the extent of drawdown to be acceptable. The plan reserves some groundwater for later allocation, which could be used to accommodate future expansion of irrigation and/or for providing extra water to the environment or for other purposes.

The CSIRO work (Harrington *et al.* 1999) indicates that the sustainable yield of high quality water in the basin may be only about 10 per cent of the sustainable yield assumed in the water allocation plan. While the CSIRO analysis indicates that any long term drawdown in the groundwater level could have adverse consequences, from the lateral movement of saline groundwater, it accepted that, even if extraction of groundwater exceeds recharge, there are unlikely to be significant short term environmental consequences. The Northern Territory Government and the CSIRO are investigating this issue.

The Northern Territory advised that it will reassess the water sharing arrangements in the Ti-Tree strategy taking account of any new information gained, including from its work with the CSIRO. In making a decision on whether to alter the water allocations, the Northern Territory has undertaken to consider (through the normal water planning consultative processes) any trade-offs between setting allocations at the estimated recharge compared with permitting drawdown to accommodate economic or social interests.

Because the Northern Territory had no evidence of groundwater dependent ecosystems, it provided no specific groundwater allocation for the environment under the Ti-Tree strategy. While this is inconsistent with the precautionary principle (particularly given the CSIRO advice that Stirling Swamp receives the discharge from the Ti-Tree aquifers), the CSIRO accepts that over the short term the provisions in the strategy are unlikely to compromise the health of any groundwater dependent ecosystems in the basin. Moreover, by reserving water for future allocation, the plan provides some water to the environment for the lifetime of the water allocation plan within the strategy (Government of the Northern Territory 2004). In accord with the strategy the Northern Territory is conducting further investigations (which commenced in July 2004) to establish the extent and nature groundwater dependent ecosystems. It will consider an environmental allocation as part of the first review of the strategy.

Monitoring and adaptive management

The Water Act (s34) requires the Controller of Water Resources to implement a continuous program for assessing water resources. This program includes the investigation, collection, collation and analysis of data on the occurrence, volume, flow, characteristics, quality, flood potential and use of water resources. In addition, the strategy work plan proposes the monitoring of key parameters, the development of a water allocation plan for the eastern zone, and investigation of the potential to develop the more saline water that is currently excluded from the water allocation plan. It provides for regular reporting in newsletters, fact sheets and seminars, and through the provision of an annual report to the Minister for Transport and Infrastructure, Lands and Planning and Parks and Wildlife. The work plan also proposes a review of the strategy within five years.

Stakeholder consultation and transparent processes

A committee comprising government and relevant community interests oversees the process for developing water resource strategies (including water allocation arrangements) in the Northern Territory. The process includes opportunities for stakeholder involvement. The Council understands that the Ti-Tree Region Water Resource Strategy took several years to develop and involved considerable consultation and negotiation.

Despite the time taken to develop the strategy, there is no public information on the hydrology modelling, the consultative process, stakeholder comments or the committee's responses to any comments received. The absence of information on the hydrology modelling and source references for the information used to determine available water and estimate the sustainable yields for each zone in the Ti-Tree Water Control District might have adversely affected the robustness of stakeholder contributions. The Northern Territory Government advised, however, that during development of the strategy the committee and other stakeholders had access to relevant information.

In addition, the strategy provides for regular reporting on catchment health in newsletters, fact sheets and seminars. It also provides for the advisory committee to report annually on the status of the water allocation strategy to the Minister for Transport and Infrastructure, Lands and Planning, and Parks and Wildlife, although this report is not made public.

Comments from stakeholders

In a submission to the 2004 NCP assessment, the Arid Lands Environment Centre expressed dissatisfaction with the Northern Territory's progress in implementing the CoAG water reforms in the arid zone. The environment centre stated:

NCP assessments since 1999 demonstrate a consistent lack of attention by the NT Govt to research into environmental water requirements in the arid zone ...

In the absence of a scientific basis for determining environmental water requirements, water allocation planning in the arid zone is based on a contingency policy of depleting no more than 80 per cent of aquifer storage over a specific planning time frame (currently 100 years). In the Australian Natural Resources Atlas produced in 2001 by the Australian Land and Water Audit, the Mereenie aquifer which provides drinking water to Alice Springs was listed as over-allocated, that is, allocation for extraction exceeded sustainable yield. The 2001 NCP assessment accepted the NT Govt's stance that it considers none of its groundwater resources over-allocated because it defines sustainable yield as 'the groundwater extraction regime, measured over a specific planning time frame, that allows acceptable levels of stress and protects dependent economic, social and environmental values'.

Clearly the determination of 'acceptable levels of stress' for arid zone aquifers should be addressed as a high priority.

Subsequent NCP assessments in 2002 and 2003 have ignored the question of research into arid zone environmental water requirements and have made no reference to the question of aquifer over-allocation, stating only that there are no stressed or over-allocated surface water systems.

Given the extraction regime outlined by the 80 per cent policy, and the documented depletion of the Mereenie aquifer, the Arid Lands Environment Centre considers that as a matter of priority the NT Govt should instigate research into environmental water needs in the Alice Springs region, specifically the degree of groundwater dependence of riparian vegetation and associated fauna in the Todd River, the Emily Plain and other floodout areas, and also the impact of the current groundwater extraction regime on a basin-wide basis, including the impact on any groundwater dependent or partially groundwater dependent ecosystems in groundwater discharge areas such as salt lakes associated with the Amadeus Basin. (Arid Lands Environment Centre submission, pp. 1–2)

The Northern Territory Government acknowledged that it has insufficient scientific information on its arid zone groundwater dependent ecosystems to assist in developing a uniformly consistent method for determining environmental water requirements. Instead it uses a risk assessment approach. Under this approach the Northern Territory accords ecosystems dependent on shallow groundwater systems the highest priority. Water requirements for these ecosystems, such as the river red gum population around Alice Springs, are incorporated into existing water management processes.

The Northern Territory considers that its current water use and development proposals impose only a low risk of compromising the health of ecosystems located near deeper aquifers. It is proposing not to undertake any further research on many of the aquifers in the Alice Springs area as these are too deep for any vegetative dependency. Similarly, the Northern Territory reported no evidence to indicate that groundwater extraction has an impact on arid zone water holes. It will, however, identify priorities for research into groundwater outflow as part of the Alice Springs Regional Water Resource Strategy. It is also investigating the environmental water requirements for groundwater dependent ecosystems in the Ti-Tree Basin and will report on the outcomes or progress with its research for the 2005 NCP assessment.

In relation to the Mereenie Sandstone Aquifer, the Northern Territory Government advised that it is not practicable or cost effective to establish a uniform extraction framework over the whole aquifer. It pumps water at Roe Creek Borefield only, and its strategy is to continue to lower the groundwater level at this site to induce a greater flow elsewhere in the system. It estimates that it is cost effective to draw down the aquifer to approximately 300 metres, but at the current rate of extraction of less than 10 gigalitres a year, this would not occur for a very long time.

Discussion and assessment

The National Water Initiative committed signatory governments (including the Northern Territory) to substantially complete water allocation arrangements by 2005 for all stressed and overallocated river systems and groundwater resources on governments' 1999 implementation programs. The Northern Territory listed four water control districts on its 1999 implementation program, and proposes to implement management strategies (including water allocation plans that set the volumes of water available for consumptive and environmental uses) for all four districts by 2005. Adherence to this timetable would accord with the Northern Territory's commitments under the National Water Initiative.

The Northern Territory has completed only the water management strategy for the Ti-Tree Basin. In this strategy, the stated objective is to set extraction limits to achieve the best long term use of water, balancing social and environmental needs while allowing for economic growth. While the strategy sets extraction limits in the western zone based on the Northern Territory's estimated aquifer recharge rates, it also allows for possible long term net loss in aquifer storage (by up to 20 metres over 290 years). The Northern Territory is aware of differences between its estimate of recharge and those made by the CSIRO. Both the Northern Territory and the CSIRO agree that it is difficult to estimate recharge and will work together to develop a robust estimate of the annual recharge of the Ti-Tree basin by the time of the 2005 NCP assessment.

Most of the basin's surface water is reserved for identified water dependent ecosystems. The strategy does not identify a groundwater dependent

ecosystem, but the Northern Territory Government has commenced a number of its research projects to determine whether there are ecologies that depend on groundwater. It will update its water allocation plans on the basis of new information gained.

The Ti-Tree strategy raises some questions about the transparency of the Northern Territory processes. The strategy provides no public information on the hydrology modelling, consultative process, stakeholder comments or the committee's responses to any comments received. The absence of information has made it difficult to determine whether the strategy is based on the best available science and whether this has affected the robustness of its consultative processes. The Northern Territory is, however, working to improve its estimate of recharge to the basin and is conducting research jointly with the CSIRO to determine the water needs of basin ecosystems. The Northern Territory Government will make this information publicly available. This aspect of the Northern Territory's processes should be further considered in the 2005 NCP assessment.

Notwithstanding the questions about elements of the Ti-Tree strategy, the Council considers that the Northern Territory has satisfactorily addressed CoAG water planning obligations, including appropriate allocations to the environment, for this 2004 NCP assessment. The Northern Territory's work on estimating recharge to the Ti-Tree Basin aquifers, research into groundwater dependent ecosystems and its progress in completing water allocation plans that employ robust evaluations of the science and other public interest benefits for the remaining three water systems covered by its 1999 implementation program should be considered in the 2005 NCP assessment.

9.4 Water trading

Assessment issue: Trading arrangements in water allocations or 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. 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 (including the immediate removal of all restrictions on temporary trade).

In the 2003 NCP assessment, which considered intrastate trading arrangements, the Council found that the Northern Territory had removed legislative impediments to trading. In the 2001 NCP assessment, the Northern Territory advised that it had agreed in principle with Western Australia for that state's water trading arrangements to apply throughout the Northern Territory sector of stage 2 of the Ord Irrigation Project (if it proceeds).

(continued)

The Northern Territory is developing water allocation plans (which contain rules for trading) for four of its six water control districts, including the now completed Ti-Tree plan. In the 2003 NCP assessment, the Council found that the trading rules in the Ti-Tree plan reflect the physical and environmental constraints of the water source. The Northern Territory needs to ensure the trading rules in the remaining water allocation plans facilitate trading where water systems are physically shared or hydrologic connections and water supply considerations permit trading.

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

The Water Act establishes water entitlements that are fully separated from land title. It permits permanent and/or temporary trading of water entitlements. Given the geographically dispersed nature of developed water resources in the Northern Territory, the Act limits trading to within a water control district. It also permits only the water allocated for consumptive beneficial uses⁴ in a water allocation plan to be traded. Any other specific trading rules are specified in the water allocation plans. The Northern Territory maintains a publicly available register, which contains details of licence holders, quantities held and dates for renewal (but does not provide for third party interests to be registered).

The Northern Territory has agreed in principle with Western Australia for that state's water trading arrangements to apply throughout the Northern Territory sector of stage 2 of the Ord Irrigation Project (if it proceeds). There are no other regions in the Northern Territory where interstate trade could take place.

The Northern Territory's legislation does not provide for trade between consumptive and nonconsumptive water uses to prevent environmental and cultural water allocations from being traded to water irrigators and other water users. In addition, for the 2003 NCP assessment, the Northern Territory indicated that it will adopt two general restrictions on water trading in its water allocation plans:

1. For river systems, upstream trade will be approved only after it has been demonstrated that there will be no impact on the environmental provisions of the relevant water allocation plan.
2. For groundwater sources, trading will be restricted to within-aquifer transactions, reflecting physical and environmental constraints.

The water allocation plan for the Ti-Tree Water Control District (the only plan declared to date) restricts trading in groundwater to within-zone transactions. The restriction reflects the Northern Territory's management of groundwater resources within separate zones, as well as the need to limit the volume of extractions from each zone to a sustainable level. There are no constraints on trading within each zone.

⁴ The Act lists agriculture, aquaculture, public water supply, manufacturing and riparian (rural stock and domestic) to be consumptive beneficial uses.

Reform progress

The Northern Territory has declared a water allocation plan for the Ti-Tree Water Control District and is developing the water allocation plans and trading rules for the other three districts covered by its 1999 implementation program (see section 9.2). It expects to complete these arrangements during 2005. There has been no trading in the Ti-Tree district.

Discussion and assessment

At current levels of development, water supplies in the Northern Territory are generally plentiful relative to demand. As a result, there is little, if any, demand for water trading and there has been no trade in licensed water entitlements.

The Northern Territory's water licence register is not accessible electronically and does not record third party interests. While there appears to have been little demand for water trading, and interstate trading is likely only if the Ord (stage 2) project proceeds, the National Water Initiative requires the Northern Territory to consider introducing a more sophisticated register. The initiative obliges governments to implement compatible, publicly accessible and reliable registers (including any encumbrances) by 2006.

In the 2001 NCP assessment, the Council accepted that the Northern Territory's prohibition on trade between consumptive and nonconsumptive water uses — to prevent environmental and cultural water allocations from being traded to water irrigators and other water users — is consistent with the 1994 CoAG water reform obligations.⁵

In the 2003 NCP assessment, the Council found that the general trading restrictions that the Northern Territory proposes to include in its water allocation plans, as well as the specific trading provisions in the Ti-Tree plan, reflect physical and environmental constraints, so are consistent with CoAG obligations. The Northern Territory needs to ensure the trading rules in the remaining water allocation plans facilitate trading where water systems are physically shared or hydrologic connections and water supply considerations permit trading.

Because the Northern Territory has finalised only the Ti-Tree water allocation plan, the trading of water entitlements is possible in only that district. The Northern Territory's expected timeframe of 2005 for finalising the water allocation plans for the three other districts covered by its 1999 implementation program accords with CoAG water planning and trading obligations, including obligations in the National Water Initiative.

⁵ Under the National Water Initiative, if water that is provided to meet environmental and other public benefit outcomes is held as a water access entitlement, it may be traded on the temporary market when not required for these purposes.

The Council considers that the Northern Territory has made satisfactory progress against its CoAG water trading obligations for the 2004 NCP assessment.

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 gegalitres 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 gegalitres, 750 gegalitres and 1500 gegalitres of water for the River Murray system. (The Expert Review Panel had previously considered increasing water in the River Murray by 750 gegalitres 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 gegalitres 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 gegalitres, including just under 5 gegalitres 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

<i>Interstate water transfers</i>	<i>Total volume of transfers</i>	<i>Net volume of transfers</i>
	<i>Megalitres</i>	<i>Megalitres</i>
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 Scriver 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 area⁵
 - 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

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 gegalitres 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.

A Water allocations — progress towards meeting CoAG obligations

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). In the 2004 National Water Initiative, signatory governments¹ committed to substantially complete allocation arrangements (including appropriate allocations to the environment) by 2005 for all stressed and overallocated river systems and groundwater resources covered by their 1999 programs. Signatory governments also committed to preparing water plans by the end of 2007 for other systems that are overallocated, fully allocated or approaching full allocation and plans by the end of 2009 for systems that are not yet fully allocated. This appendix outlines the 1999 implementation program for each state and territory and provides an overview of each jurisdiction's progress towards completing its program.

New South Wales

In 2001 New South Wales advised that it would develop 39 water sharing plans covering 51 water systems: 7 regulated rivers; 32 stressed unregulated subcatchments; and 12 stressed aquifers (NCC 2001b). These plans were originally scheduled for completion in 2002-03.

New South Wales has gazetted 36 plans, of which 31 commenced on 1 July 2004. The other five gazetted plans are scheduled to commence on 1 July 2005. New South Wales is progressing the remaining three plans and developing 'macro plans' for the rivers and groundwater sources not covered by the 39 water sharing plans.

¹ The governments of Western Australia and Tasmania have not signed the Intergovernmental Agreement on a National Water Initiative.

Rivers and streams

Regulated river catchments

Regulated rivers in New South Wales account for about 80 per cent of water use in the state and include the major river systems listed in table A.1. New South Wales has environmental flow requirements in place for all of its regulated rivers. It has completed water sharing plans for seven of its regulated rivers.

Table A.1: Progress towards completing the 1999 implementation program, New South Wales regulated river catchments, August 2004

<i>Regulated river catchment</i>	<i>Plan status</i>
Barwon–Darling ^a	In 2001 New South Wales stated that it would commence a plan after it had addressed issues with the Murray–Darling Basin Commission cap.
Barwon–MacIntyre	Environmental flow provisions subject to inter-government negotiation.
Bega	
Belubula	
Border Rivers	Environmental requirements developed through the Border Rivers Commission.
Gwydir	The Gwydir regulated river plan was gazetted in February 2003. It was amended in 2004.
Hunter	The Hunter regulated river plan was gazetted in July 2004.
Lachlan	The Lachlan regulated river plan was gazetted in February 2003. It was amended in 2004.
Macquarie Cudgegong	The Macquarie and Cudgegong regulated river plan was gazetted in February 2003. It was amended in 2004.
Murray	The Murray regulated river plan was gazetted in February 2003. It was amended in 2004.
Murrumbidgee	The Murrumbidgee regulated river plan was gazetted in February 2003. It was amended in 2004.
Namoi	The Namoi regulated river plan gazetted February 2003. It was amended in 2004.
Peel	

^a The Barwon–Darling River is not a regulated river, but is significantly influenced by tributary regulation.

Sources: NCC 1999, 2001b; DIPNR website (<http://www.dipnr.nsw.gov.au/water/sharing/>)

High stressed unregulated river catchments

Table A.2: Progress towards completing the 1999 implementation program, New South Wales unregulated river catchments, August 2004

<i>Catchment</i>	<i>Plan status</i>
Barwon region	
Glen Innes	
Inverell	
Lower Peel	
Myall Creek	
Phillips Quirindi Mooki	The Phillips Creek, Mooki River, Quirindi Creek and Warrah Creek water sources plan was gazetted in February 2003. It was amended in 2004.
Tenterfield Creek ^a	The Tenterfield Creek plan was gazetted in February 2003. It was amended in 2004.
Upper Horton	The Rocky Creek, Cobbadah, upper Horton and lower Horton plan was gazetted in February 2003. It was amended in 2004.
Warialda Creek	
Central West region	
Bell River	
Burrangong Creek	
Castlereagh above Binnaway	The Castlereagh River above Binnaway plan was gazetted in February 2003. It was amended in 2004.
Crowther Creek	
Goonigal Creek	
Lachlan River above Reid's Flat	
Lawsons Creek	
Mandagery Creek	The Mandagery Creek plan was gazetted in February 2003. It was amended in 2004.
Molong Creek and Tributaries	
Queen Charlottes Vale Creek/Evan Plains Creek	
Summerhill Creek	
Unregulated lower Macquarie system	
Hunter region	
Black	
Bylong	
Dart	
Goulburn & Residual	
Halls	
Hunter Residual	
Jilliby Jilliby	The Jilliby Jilliby Creek plan was gazetted in February 2003. It was amended in 2004.

(continued)

Table A.2 continued

<i>Catchment</i>	<i>Plan status</i>
Hunter region (<i>continued</i>)	
Ourimbah ^a	The Ourimbah Creek plan was gazetted in February 2003. It was amended in 2004.
Pages	
Wollombi	
Wybong	The Wybong Creek plan was gazetted in February 2003. It was amended in 2004.
Murray region	
Billabong	The Upper Billabong plan was gazetted in February 2003. It was amended in 2004.
Murrumbidgee region	
Murrumbidgee II	The Adelong Creek and Tarcutta Creek plans were gazetted in February 2003. These plans were amended in 2004.
Yass Upper	
North Coast region	
Acacia Creek	
Alstonville Area	
Apsley River	The Apsley River plan was gazetted in February 2003. It was amended in 2004.
Boambee creek	
Bonville Creek	
Cobaki Creek	
Coffs Harbour Creek	
Blicks River ^a	
Bucca Bucca Creek ^a	
Commissioners Waters	The Commissioners Waters plan was gazetted in February 2003. It was amended in 2004.
Coopers Creek ^a	The Coopers Creek plan was gazetted in February 2003. It was amended in 2004.
Duroby Creek	
Gara River	
Hickeys Creek	
Korora Basin	
Kyogle Area	
Malpas Dam	
Missabotti Creek	
Myrtle Creek	
Peacock Creek	
Sheens Creek	
South Creek – South Arm	
Terania Creek	
Toorumbée ^a	The Toorumbée Creek plan was gazetted in December 2002. It was amended in 2004.

(continued)

Table A.2 continued

<i>Catchment</i>	<i>Plan status</i>
North Coast region (<i>continued</i>)	
Tuckean Area	
Tyagarah Creek	
Upper Brunswick River	The upper Brunswick River plan was gazetted in February 2003. It was amended in 2004.
Upper Duck Creek	
Upper, mid and lower Orara River ^a	In progress.
Upper Nymboida River ^a	
Wilson River	
Woolgoolga Creek	
Sydney south coast region	
Bombala River	
Bungonia	
Candelo Creek	
Capertree River	
Cattai Creek	
Coolumbooka River	
Currumbene Creek	
Dignams Creek	
Flat Rock Creek	
Kangaroo River	The Kangaroo River plan was gazetted in February 2003. It was amended 2004.
Lake Burragorang	
Lower Coxs River	
Lower Shoalhaven River	
Maclaughlin River	
Mid Coxs River	
Monkey Creek	
Narira Creek	
Nepean River	
South Creek	
Wandella Creek ^a	The Wandella Creek plan was gazetted in February 2003. It was amended in 2004.
Upper Coxs River	
Upper Murrumbidgee River	
Upper Nepean River	
Upper Wollondilly	
Wingecarribee River	
Wolumla Creek	
Yalwal Creek	

^a These systems were not listed on New South Wales original 1999 implementation program.

Sources: NCC 1999, 2001b; DIPNR website (<http://www.dipnr.nsw.gov.au/water/sharing/>)

Groundwater

High risk aquifers

Table A.3: Progress towards completing the 1999 implementation program, New South Wales high risk aquifers, August 2004

<i>Aquifers</i>	<i>Plan status</i>
Alstonville Basalt (GWMA 804)	The Alstonville Basalt Plateau groundwater source plan was gazetted in February 2003. It was amended in 2004.
Araluen alluvium	
Bellinger Coastal Sands	
Belubula River (GWMA 021)	
Billabong Creek Alluvium (GWMA 014)	
Border Rivers Alluvium (GWMA 022)	
Botany Sandbeds (GWMA 018)	
Cudgegong Valley (GWMA 010)	
Dubbo (within GWMA 009)	
Goulburn River Alluvium	
Great Artesian Basin (GWMA 601)	
– Main	
– Intake Beds	In progress.
Hastings River Alluvium	
Hunter River alluvium (Regulated river reaches)	
Karuah/Myall Alluvium	
Kingdom Ponds Alluvium	
Lower Gwydir Alluvium (GWMA 003)	The lower Gwydir groundwater source plan was gazetted in February 2003.
Lower Macquarie (GWMA 016)	The lower Macquarie groundwater source plan was gazetted in February 2003.
Lower Murray Alluvium (GWMA 016)	In progress.
Lower Murrumbidgee Alluvium (GWMA 002)	The lower Murrumbidgee groundwater source plan was gazetted in February 2003. Operation of the plan is deferred until July 2005.
Macleay Alluvium	
Macleay Coastal Sands	
Mangrove Mountain / Kulnura Fractured Rock Aquifer	The Kulnura Mangrove Mountain groundwater source plan was gazetted in February 2003. It was amended in 2004.
Maroota Alluvium and Sandstone	
Molong Limestone	
Murrumbateman fractured rocks	
Namoi groundwater:	
Lower Namoi Alluvium (GWMA 001)	
Upper Namoi Alluvium (GWMA 004)	The upper and lower Namoi groundwater source plan was gazetted in February 2003. Operation of the plan is deferred to July 2005.
North Coast Fractured Rocks	

(continued)

Table A.3 continued

<i>Aquifers</i>	<i>Plan status</i>
Peel Valley Alluvium (GWMA 005)	
Richmond Coastal Sands	
Richmond River Alluvium	
Stuart's Point ^a	The Stuart's Point groundwater source plan was gazetted in December 2002. It was amended in 2004.
Tomago Sandbeds	The Tomag Tomaree Stockton groundwater source plan was gazetted in February 2003. It was amended in 2004.
Upper Lachlan (GWMA 011)	
Upper Murrumbidgee Alluvium (GWMA 013)	
Viney Creek Alluvium	
Williams & Patterson Rivers Alluvium	
Wollombi Alluvium	Contained in the plan for the Kulnura Mangrove Mountain groundwater source that was gazetted in February 2003. The plan was amended in 2004.
Young Granites (GWMA 802)	

Sources: NCC 1999; DIPNR website (<http://www.dipnr.nsw.gov.au/water/sharing/>)

Medium and low risk aquifers

Table A.4: Progress towards completing the 1999 implementation program, New South Wales medium risk aquifers, as at August 2004

<i>Aquifers</i>	<i>Plan status</i>
Bega Valley Alluvium	
Bell River (GWMA 020)	
Blue Mountains Sandstone	
Broken Hill	
Brunswick Alluvium	
Castlereagh Alluvium	
Castlereagh Basalts	
Clarence Alluvium	
Clarence Coastal Sands	
Crookwell Basalts	
Darling River – anabranch	
Darling River – north of Menindee	
Darling River – south of Menindee	
Dorrigo Basalt	The Dorrigo Plateau surface water source and the Dorrigo Basalt groundwater source plan was gazetted in February 2003. It was amended in 2004.
Far West	
Great Artesian Basin (within GWMA 601) – shallow	

(continued)

Table A.4 continued

<i>Aquifers</i>	<i>Plan status</i>
Hawkesbury–Nepean Alluvium	
Hunter Coal-associated fractured rocks	
Hunter Coastal Sands	
Hunter miscellaneous tributaries alluvium	
Inverall Basalt (GWMA 803)	
Lachlan fold belt metasediments	
Lake George Alluvium	
Lower Lachlan (GWMA 012)	The lower Lachlan groundwater source plan was gazetted in February 2003.
Macquarie Marshes	
Macquarie-Lachlan Granites	
Manning River Alluvium	
Maules Creek Alluvium (GWMA 006)	
Miscellaneous fractured rocks	
Miscellaneous south coast Alluvium	
Murray Fractured Rocks – east	
Murray Fractured Rocks – west	
Murray River downstream of Murrumbidgee junction	
Murrumbidgee fractured rocks	
Muttama Creek Alluvium (part of GWMA 013)	
Namoi fractured rocks	
Namoi miscellaneous tributaries Alluvium (GWMA 007)	
North Coast metasediments	
North Coast miscellaneous Alluvium	
North Coast sedimentary rocks	
North East Hunter fractured rocks	
North West Hunter Basalts	
Orange Basalts (GWMA 801)	
Southern Coastal Sands	
Southern Highlands fractured rock	
Sydney Basin Sandstone (GWMA 603)	
Talbragar–Coolaburragundy (GWMA 019)	
Tweed Coast Sands	
Upper Macquarie (GWMA 009)	Contained in the lower Macquarie groundwater source plan, which was gazetted in February 2003.
Upper Murray Alluvium (GWMA 015)	
Upper tributaries Alluvium	
Wollombi Sandstone	

Sources: NCC 1999; DIPNR website (<http://www.dipnr.nsw.gov.au/water/sharing/>)

Victoria

Victoria has water management processes in place for stressed rivers, other regulated and unregulated rivers and streams, and groundwater.

Stressed rivers

Victoria identified the regulated rivers in table A.5 as stressed or overallocated in 1999, with an amendment in 2001. Table A.5 outlines Victoria's progress in providing water to the environment for the stressed and/or overallocated rivers covered by its 1999 implementation program (as amended in 2001).

Table A.5: Progress with environmental water provision for Victoria's stressed and/or overallocated rivers, as at September 2004

<i>Rivers and creeks</i>	<i>Current status</i>
Avoca River	Flow rehabilitation plan not required. Statewide or regional management rules will be used to manage the river, supplemented by 1500 megalitres each year of the water savings from the Wimmera–Mallee pipeline.
Broken River	Environmental flow assessment completed in 2001. The recommended environmental flows will be implemented via the bulk entitlement process by September 2004.
Lerderderg River	The flow rehabilitation plan was completed in 2003 and the recommended flows met. To overcome concerns about the need for summer flushes and the extended low summer flow period, Victoria allocated A\$360 000 from stressed river funds to modify the Lerderderg weir to enable it to pass fresher and flushing flows. It has also reviewed the bulk entitlement, which it expects to implement as the new environmental flow regime around October 2004.
Loddon River	Environmental flows investigation completed in 2002. It will use the bulk entitlement process and statewide or regional management rules to implement environmental flows.
Badgers Creek	Flow stress in Badgers Creek is caused by extractions to supply water to Healesville. To overcome this problem Victoria will connect Healesville to Melbourne's water supply. This upgrade is scheduled for 2012. In the interim Melbourne Water has committed around A\$200 000 to undertake work (conducted in conjunction with Healesville Sanctuary) to improve the health of the creek. This work includes bed and bank stabilisation, flood protection, and modification of two in-stream structures to promote fish passage.
Maribyrnong River	Victoria completed the Maribyrnong River Flow Rehabilitation Plan in June 2002. The plan indicates that flow variability is a greater problem than insufficient water. In place of implementing the remaining environmental flows in the Maribyrnong River, Victoria committed to implement the stream flow management plan for King Parrot Creek, which it considered would provide greater environmental benefits for the level of commitment required. Victoria is taking other actions through the catchment management authority processes to improve the health of the Maribyrnong River.

(continued)

Table A.5 continued

<i>Rivers and creeks</i>	<i>Current status</i>
Macalister River	The Thomson Macalister Environmental Flows Task Force reported its environmental flow recommendation in February 2004. The White Paper contains provisions that largely implement the recommendations of the task force. The Macalister River will receive 5000 megalitres a year by 2006 through a A\$5 million program of infrastructure improvement. Within 10 years the additional 2000 megalitres a year in the Macalister will be provided through water efficiency and system savings.
Snowy River	The Snowy Rescue Plan (a joint initiative between Victoria, New South Wales and the Australian Government) will return 21 per cent of the flow (212 000 megalitres) to the river over 10 years.
Thomson River (downstream of Cowwarr Weir)	The Thomson Macalister Environmental Flows Task Force reported its environmental flow recommendation in February 2004. The White Paper contains provisions that largely implement the recommendations of the task force. Victoria will commence implementation of the environmental flows via the bulk entitlement three months after the lifting of Melbourne's current water restrictions. Initially Victoria will provide 10 000 megalitres a year to the Thomson River, but it intends to increase the Environmental Water Reserve to 18 000 ML a year over the next 10 years. The additional 8000 megalitres will be derived from water savings. The Government has allocated funds to obtain the water savings and for monitoring the health of the Thomson and Macalister rivers.
Wimmera–Glenelg rivers	Victoria completed the environmental flow assessment in for the Wimmera River in 2002 and the Glenelg River in 2003. Victoria completed the bulk entitlement process for the Wimmera and Glenelg Rivers in June 2004. Victoria has implemented the MDBC cap. It has committed 34 690 megalitres of water savings a year from the Northern Mallee pipeline for the two rivers and is seeking to provide a further 65 000 to 85 000 megalitres of water for a sustainable Environmental Water Reserve if the second Wimmera–Mallee pipeline development proceeds.

Sources: DSE 2004; Government of Victoria 2004; NCC 2003a

Victoria's white paper on water (DSE 2004) states that 22 of the 29 catchments in Victoria are fully allocated and one third of rivers are in poor or very poor condition. Victoria is identifying priority actions for addressing river health problems for its regulated rivers through regional catchment and associated river health strategies. Table A.6 outlines the current status of Victoria's progress in developing its regional catchment and river health strategies.

Table A.6: Status of Victorian regional catchment and river health strategies, as at September 2004

<i>Region</i>	<i>Current Status</i>	
	<i>Regional catchment strategy</i>	<i>Regional river health strategy</i>
Corangamite	Accredited	The draft strategy is expected to be released for public comment in the latter half of 2004.
East Gippsland	First draft accreditation completed	The draft strategy (completed 2002) was re-released for stakeholder comment in April 2004.
Glenelg Hopkins	First accredited Integrated Natural Resource Management plan in Australia	The draft strategy was released for public comment in February 2004.
Goulburn Broken	Accredited	The draft strategy released for public comment March 2004.
Mallee	Accredited	The draft strategy is expected to be released for public comment in the latter half of 2004.
North Central	Accredited	The draft strategy was released for public comment in August 2004.
North East	Second draft submitted	The draft strategy is expected to be released for public comment expected in September 2004.
Port Phillip	First draft accreditation completed	The draft strategy was released for public comment in June 2004.
West Gippsland	Second draft submitted	The draft strategy was released for public comment in March 2004.
Wimmera	Accredited	The draft strategy is expected to be released for public comment expected in late October 2004.

Source: Government of Victoria 2004

Regulated rivers and streams

Victoria allocates water to consumptive uses and the environment through the bulk entitlements regime for regulated rivers. As at August 2004, Victoria had completed the bulk entitlement conversion process for 19 of its 25 water supply systems, although the entitlement for the Thomson and Macalister river system is being modified as part of the implementation of environmental flows for these rivers. (table A.7). Victoria committed to complete the bulk entitlement system, covering 78 per cent of all water used for consumptive purpose, over the next two years. It committed to complete the conversion process for the Ovens and Broken rivers by September 2004 and the conversion process for the mid-Loddon by June 2005 (DSE 2004).

Table A.7: Status of bulk entitlements in Victoria, as at August 2004

<i>Water supply system</i>	<i>Status of bulk entitlement</i>
Avoca ^a	Environmental requirements met under current management practices
Barwon	Finalised 2002
Broken ^a	Negotiation complete. Awaiting applications from relevant water authorities. (Expected completion: September 2004)
Campaspe	Finalised 1999–2000
Central Gippsland rivers – urban	Finalised 1997–98
Central Highlands – major urbans	Finalised 2002
Central Highlands region – urban (part)	Finalised 1998
East Gippsland rivers –urban	Finalised 1997
Glenelg region ^a – urban supplies	Finalised 1997
Goulburn	Finalised 1995
Grampians – urbans	Part of Wimmera-Mallee process.
Kiewa/Rubicon (Southern Hydro)	Finalised 1997
Latrobe	Finalised 1996
Lerderderg ^a	Managed under the stressed rivers program
Loddon ^a	Work progressing.
Maribyrnong ^a	Finalised 2000–01
Melbourne	Process complete. Awaiting Government resolution of a policy matter.
Moorabool	Finalised 1995
Murray	Finalised 1999
North East region – urban	Finalised 1995–99
Otway rivers – urban	Finalised 1997–98
Ovens	Negotiation complete. Awaiting applications from relevant water authorities.
Snowy ^a	Managed under Snowy Rescue Plan.
South Gippsland rivers – urban	Finalised 1997
Tarago System	Dependent on Melbourne system.
Thomson/Macalister ^a	Finalised 2001. The bulk entitlement will be modified as part of the implementation of the flow rehabilitation plan for the Thomson and Macalister river system.
Werribee	Finalised 1997
Wimmera-Mallee ^a	Finalised 2004

^a Priority rivers identified on the 1999 implementation program.

Sources: Government of Victoria 2004

Unregulated rivers and streams

For unregulated rivers, including unregulated portions of regulated systems, Victoria manages environmental flows and water allocations for consumptive purposes using stream flow management plans. Victoria's 1999 implementation program indicated that the government would develop 42 stream flow management plans. However, in light of the 2004 white paper, Victoria reviewed its arrangements, determining 21 priority catchments where the government will provide ecologically sustainable environmental water reserves by:

- developing stream flow management plans that will provide a water regime that sustains agreed ecological objectives within 10 years
- co-investing in implementing stream flow management plans that seek to provide the enhanced environmental water reserve in a shorter timeframe
- moving diverters from summer to winter diversions when this will reduce ecological damage
- co-investing with farmers to assist them to implement measures to apply the stream flow management plan, including the building of off-stream winter-fill dams.

The 21 priority catchments and the status of the stream flow management plan in each catchment is summarised in table A.8.

Table A.8: Management of unregulated catchments under stream flow management plans in Victoria, as at October 2004

<i>Stream flow management plan</i>	<i>Status</i>
Avon River	Draft plan released for public comment
Diamond Creek	Plan completed but not operational
Gellibrand River	Plan operational but not approved under current Water Act.
Hoddles Creek	Plan completed but not operational
Kiewa River	Draft plan released for public comment
King Parrot Creek	Draft plan released for public comment
Merri River	Plan operational but not approved under current Water Act.
Plenty River	Draft plan released for public comment
Upper Latrobe River	Plan operational but not approved under current Water Act.
Upper Ovens River	Draft plan released for public comment
Upper Wimmera River	Draft plan has been assessed by the Technical Audit Plan and is being amended prior to public release for comment
Yea River	Draft plan released for public comment

(continued)

Table A.8 continued

<i>Stream flow management plan</i>	<i>Status</i>
Barwon River	Environmental flows study proposed
Little Yarra River	Environmental flows study initiated
Olinda Creek	Committee established
Steels, Dixons and Pauls creeks	Committee established
Seven Creeks	Environmental flows study proposed
Stringybark Creek	Committee established
Tarra River	Environmental flows study proposed
Woori Yallock Creek	Environmental flows study proposed
Upper Maribyrnong River	Process to be recommenced

Source: Government of Victoria 2004

Groundwater

For groundwater sources where allocations exceed 70 per cent of the sustainable yield, Victoria establishes a water supply protection area and develops groundwater management plans. Victoria identified 10 water supply protection areas where groundwater allocation exceeded 70 per cent of sustainable yield on its 1999 implementation program. Except for Denison, Victoria has completed groundwater management plans for all water supply protection areas covered by its 1999 implementation program.

In 1999 Victoria also identified a number of other areas for future declaration as groundwater supply protection areas. Since that time Victoria has established an additional 15 groundwater supply protection areas. Table A.9 outlines Victoria's progress with groundwater management planning.

Table A.9: Progress with groundwater management planning in Victoria, as at February 2004

<i>Water supply protection areas</i>	<i>Status of plan</i>	<i>Target completion date</i>
Apsley	Consultative committee being established	December 2005
Ascot	Included in a proposal for the Upper Loddon	Na
Bungaree	Draft plan completed	December 2004
Campaspe ^a	Final plan completed	Na
Condah	Draft plan completed	December 2004
Denison ^a	Draft plan submitted to the minister for approval	June 2004 ^b
Deutgam	The minister did not approve the draft plan. A new consultative committee is being established and the plan will be redrafted.	June 2005
Gerangamete	Low priority ^c	

(continued)

Table A.9 continued

<i>Water supply protection areas</i>	<i>Status of plan</i>	<i>Target completion date</i>
Kaniva	Consultative committee being established	Na
Katunga ^a	Final plan completed	Na
Koo Wee Rup–Dalmore ^a	Final plan completed	Na
Lancefield	Low priority ^c	
Lang Lang	To be included in a plan for Westernport that will replace the Koo Wee Rup –Dalmore	na
Lower Loddon	Consultative committee being established	December 2005
Merrimu	Low priority ^c	na
Mid Loddon	Consultative committee being established	December 2005
Murrayville	Final plan completed	na
Neuarpur ^a	Final plan completed	na
Nullawarre ^a	Final plan completed	na
Sale	The Minister did not approve the draft plan. A new consultative committee is being established and the plan will be redrafted.	June 2005
Shepparton Irrigation Area ^a	Final plan completed	na
Spring Hill ^a	Final plan completed	na
Telopea Downs	Draft plan completed	June 2004 ^b
Wandin Yallock	Draft plan completed	December 2004
Warrion	Draft plan submitted to the minister for approval	June 2004 ^b
Wy Yung	Draft plan submitted to the minister for approval	June 2004
Yangery ^a	Final plan completed	Na
Yarram	Consultative committee being established	December 2005

^a Water supply protection areas covered by Victoria's 1999 implementation program. ^b Plans for these areas were not finalised as at September 2004. ^c Due to the small number of water users allocations are being dealt with via other mechanisms. **na** Not applicable.

Source: Government of Victoria 2004, NCC 1999

Queensland

Queensland uses water resource plans to determine rules for how water is shared between the environment and consumptive use in a particular catchment. Specific water allocations for each use and each water licence holder are included in a resource operations plan.

Queensland's 1999 implementation program for water planning covers 26 major surface water and groundwater systems located in 20 catchments.

Queensland has completed 11 of the 20 required water resource plans and 3 of the 19 resource operations plans for the river systems covered by its 1999 implementation plan. Queensland will not complete several resource operations plans until after 2005. The completed Queensland plans mostly cover surface water. Further amendments will be required to some of these plans to cover overland flows, less intensive water uses and groundwater. Table A.10 outlines the status and timetable for water resource and resource operations plans in Queensland.

Queensland publishes a summary of the status of its water planning on the Department of Natural Resources and Mines website. It reviews its arrangements periodically in response to issues raised, outcomes of community consultation and resource and risk priorities.

Table A.10: Status and timetable for water resource plans and resource operations plans in Queensland, as at March 2004

<i>Water system</i>	<i>Draft water resource plan released</i>	<i>Final water resource plan approved</i>	<i>Draft resource operations plan released</i>	<i>Final resource operations plan approved</i>
Atherton Basalts Groundwater	Incorporated into the Barron catchment planning process			
Barron ^a	December 2001	December 2002	August 2004	December 2004
Border Rivers ^b	July 2002	December 2003	March 2005	June 2005
Boyne	May 2000	December 2000	December 2001	June 2003
Brisbane	Incorporated into the Moreton catchment planning process			
Bundaberg Groundwater	Incorporated into the Burnett catchment planning process			
Burdekin ^b	June 2004 ^f	December 2004	June 2005	December 2005
Burnett ^{b,c}	June 2000	December 2000	December 2002	May 2003
Calliope	Jan 2005	July 2005	May 2006	November 2006
Condamine–Balonne ^b	December 2003	August 2004	March 2005	June 2005
Cooper	December 1999	February 2000	–	–
Fitzroy ^{b,d}	September 1998	December 1999	December 2002	January 2004
Flinders	Incorporated into the Gulf catchment planning process			
Georgina–Diamantina	November 2003	August 2004	December 2004	July 2005
Gulf	October 2004	April 2005	June 2005	December 2005
Herbert	Incorporated into the Wet tropics catchment planning process			
Logan–Albert	March 2005	March 2006	October 2006	September 2007
Marchy	September 2004	June 2005	June 2006	September 2007
Mitchell	October 2004	April 2005	June 2005	December 2005
Moonie	July 2002	December 2003	June 2004 ^f	December 2004

(continued)

Table A.10 continued

<i>Water system</i>	<i>Draft water resource plan released</i>	<i>Final water resource plan approved</i>	<i>Draft resource operations plan released</i>	<i>Final resource operations plan approved</i>
Moreton ^b	March 2006	October 2006	September 2007	May 2008
Pioneer ^e	December 2001	December 2002	August 2004	December 2004
Warrego-Paroo-Bulloo-Nebine	July 2002	December 2003	June 2004 ^f	December 2004
Wet tropics	July 2006	January 2007	2008	2008
Whitsunday	August 2005	February 2006	July 2006	January 2007

^a The Barron water resource plan includes relevant aquifers. ^b Queensland expects to amend the Border Rivers, Burdekin, Burnett, Condamine–Balonne, Fitzroy and Moreton water resource plans in future to include groundwater. ^c The Burnett water resource plan was amended in 2001-02. ^d The Fitzroy water resource plan was amended in 2003-04. ^e The Pioneer water resource plan is being amended to include groundwater. ^f Not completed by June 2004.

Source: Government of Queensland 2004

Western Australia

Western Australia nominated 77 water sources (40 river basins and 37 groundwater management areas) under its 1999 implementation program. None of the 40 river systems were identified as stressed or overallocated. Under its revised implementation program, agreed in the 2002 NCP assessment, Western Australia scheduled 37 water management plans covering most of the groundwater resources and main irrigation rivers covered by its original 1999 implementation program plus some new systems that had been identified as fully allocated or overallocated. It amends its program each year based on new information. Its current program covers 41 water planning areas.

Western Australia has implemented water management plans for around a quarter of the surface water and groundwater systems covered by its revised 1999 implementation program (table A.11). For another 20 per cent of systems, the Department of Environment advised that its information indicates that the systems are not in danger of becoming overallocated or stressed. It does not propose to prepare water management plans for these low priority areas. Western Australia has scheduled a total of seven water management plans and reviews for completion in 2005 and the bulk of its remaining 15 plans for completion over the following two years (including the four added to the program since 2002-03).

Table A.11: Status of water planning in Western Australia, as at May 2004

<i>Plan</i>	<i>Current status</i>
Albany local ^a	Strategy completed in 2001-02. Second review scheduled for 2009-10.
Arrowsmith subregional	Completed in 2001-02. Second review scheduled for 2009-10.
Blackwood subregional groundwater ^b	Interim ecological water requirements developed. Interim allocation management strategy scheduled for June 2005 and final plan scheduled for October 2007.
Bolgart groundwater management review	Low priority, no further action proposed.
Bremer Bay groundwater protection	Low priority, no further action proposed.
Bremer Bay local ^a	Low priority, no further action proposed.
Broome subregional	Scheduled for review in 2004-05.
Bunbury subregional	Incorporated into Busselton–Capel subregional review.
Busselton–Capel subregional groundwater	Review commenced. Scheduled for completion in 2006-07.
Canning River interim local ^c	Monitoring indicates system is exhibiting stress. Interim management strategy being developed.
Cape-to-Cape (Vasse) surface water subregional	Incorporated Busselton-Capel subregional review.
Carnarvon local ^a	Completed in 2003-04.
Cockburn subregional ^a	Completed in 2001-02. Second review scheduled for 2009-10. Sub-area allocation limit and boundary review in process, due for completion in June 2004.
Collie Water Resource Management Strategy (to be done as a subregional plan) ^a	Draft surface water plan completed in 2003. Final plan scheduled for completion in 2004-05. Groundwater environmental water provision to be determined in 2006-07 and plan to be made in 2007-08.
Derby local	Review scheduled for 2004-05.
Esperance local ^a	Completed in 2001-02. Second review scheduled to occur by 2009-10.
Exmouth local	Review scheduled for 2006-07.
Gascoyne Junction interim local	Low priority, no further action proposed.
Gingin subregional	Completed in 2001-02. Second review scheduled to occur by 2009-10
Gnangara groundwater review ^a	Review (under s46 of the Environmental Protection Act) scheduled for completion by June 2005. Review will be incorporated in the Perth–Gingin subregional plan.
Goldfields regional	Low priority, no further action proposed.
Harvey basin regional	Completed in 1999. plan operating well. Second review deferred until 2009-10.

(continued)

Table A.11 continued

<i>Plan</i>	<i>Current status</i>
Jandakot groundwater review ^a	Reassessed from low priority. Review (under s46 of the Environmental Protection Act) scheduled for completion by June 2005.
Jurien subregional	Completed in 2001-02. Second review scheduled to occur by 2009-10.
Kemerton local	Completed in 2001-02. Second review scheduled to occur by 2009-10.
Kimberley regional	Low priority, no further action proposed.
La Grange subregional	To be incorporated in Kimberley plan for which no further action is proposed.
Marbellup interim local	Completed in 2001-02. Second review scheduled to occur by 2009-10
Murray subregional	Low priority, no further action proposed.
Murray surface water	Review scheduled for 2005-06.
Ord River	Draft plan completed in 2001-02. Final plan rescheduled for completion in June 2005.
Perth Northwest Corridor groundwater management	To be incorporated in the Perth-Gingin subregional plan. Draft plan scheduled for 2006-07.
Perth-Bunbury regional ^a	Review scheduled for 2004-05. The need to progress this plan is being reviewed in light of the other priorities.
Perth-Gingin subregional ^{a,c}	Draft plan scheduled for 2006-07.
Pilbara regional	Issue scoping, initial cultural values assessment completed. Plan intended to deal with increased stress from mining activity. Strategy to be completed in 2004-05.
Rockingham-Stake Hill subregional	Completed in 2001-02. Second review scheduled to occur by 2008-09.
Rottneest groundwater management review	Low priority, no further action proposed.
South West Coastal groundwater management review	To be incorporated in the Kemerton plan.
Swan subregional ^a	To be incorporated in the Perth-Gingin subregional plan.
Wanneroo local ^a	To be incorporated in the Perth-Gingin subregional plan. Draft plan scheduled for completion in 2006-07.
Whicher regional (Busselton Coast-lower Blackwood groundwater and surface water) ^b	Due to other priorities, preparation of plan deferred until 2005-06.

^a The Auditor General has identified that licensed water use in parts of these groundwater management areas exceeded the estimated sustainable limits. ^b Added to the program in 2002-03. ^c Added to the program in 2003-04.

Source: Government of Western Australia 2004; NCC 2002, 2003a

South Australia

South Australia identified 15 water sources, mostly groundwater, on its 1999 water planning implementation program. It has completed water allocation plans for all 15 of the prescribed water resource areas covered by its 1999 program. South Australia subsequently identified five additional water systems, which it considered are stressed. It has commenced water allocation planning processes for these areas. In October 2004, the government announced its intention to prescribe the water resource of the Western Mount Lofty Ranges (Hill 2004). Table A.12 shows the status of water allocation plans for South Australia.

Table A.12: Water allocation plans in South Australia

<i>Water source</i>	<i>Status of plan</i>
Angas–Bremer	Adopted on 2 January 2001
Barossa	Adopted on 22 December 2000
Clare Valley	Adopted on 22 December 2000
Comaum–Caroline	Adopted on 29 June 2001
Eastern Mount Lofty Ranges ^a	Prescription process under way. The area is scheduled to be prescribed in the second half of 2004.
Western Mount Lofty Ranges	Government announced intention to prescribe on 14 October 2004
Far North Wells ^a	The proposal statement is being drafted. It is scheduled to be adopted in late 2005.
Lacepede Kongorong	Adopted on 29 June 2001
Mallee	Adopted on 21 December 2000
Marne/Saunders ^a	The proposal statement is being drafted. It is scheduled to be adopted in late 2005.
McLaren Vale	Adopted on 6 November 2000 ^b
Morambro Creek ^a	The plan is being drafted. It is scheduled to be adopted in early 2005.
Musgrave	Adopted on 2 January 2001
Naracoorte Ranges	Adopted on 29 June 2001
Noora	Adopted on 2 January 2001
Northern Adelaide Plains	Adopted on 22 December 2000
Padthaway	Adopted on 29 June 2001
River Murray	Adopted on 1 July 2002
Southern Basins	Adopted on 31 December 2000
Tatiara	Adopted on 29 June 2001
Tintinara Coonalpyn ^a	Adopted on 22 January 2003

^a Additional stressed systems identified since the development of the 1999 implementation plan. ^b A draft review of the plan has been completed. The review must be finalised by November 2005.

Source: Government of South Australia 2004

Tasmania

Tasmania has determined environmental water requirements for 43 of the 45 water systems on its 1999 implementation program (table A.13). While Tasmania has no stressed or overallocated river systems it identified 16 catchments on its 1999 implementation program for completion of water management plans (table A.14).

Since 1999 Tasmania also has completed environmental flow assessments for the Brumbies Creek and the Dee, King, and Blackman rivers (these waterways are not covered by Tasmania's 1999 implementation program). It has also identified a further five catchments at risk of over use for which it intends to prepare water management plans. For these catchments Tasmania is conducting water use sustainability projects as a means of capping extraction during the irrigation season until water management plans are finalised for these catchments.

Table A.13: Progress in determining environmental water requirements in Tasmania, as at August 2004

<i>Catchment or river</i>	<i>Date completed</i>
Ansons River	June 2000
Blythe River	December 2001
Boobyalla River	June 2000
Brid River	November 1999
Browns River	September 2001
Cam River	December 2001
Clyde River	November 2000
Coal River	October 2002
Derwent River (below Meadowbank)	February 2002
Duck River	December 2000
Elizabeth River	December 1990
Emu River	December 2001
Esperance River	November 1996
Forth River	Proposed completion June 2006
George River	November 1999
Gordon River	June 2001
Great Forester River	November 1999
Great Musselroe River	July 2000
Jordan River	August 2004
Lake River	October 2002
Leven River	February 2002

(continued)

Table A.13 continued

<i>Catchment or river</i>	<i>Date completed</i>
Liffey River	November 1999
Little Forester River	June 2000
Little Musselroe River	November 2000
Little Swanport River	December 2001
Lower Mersey River	March 2004
Lower Ringarooma River	July 2000
Macquarie River	September 1996
Meander River	September 1996
Montagu River	In progress — for completion March 2005
Mountain River	June 2000
Nicholls Rivulet	June 2000
North Esk River	August 1999
North West Bay Rivulet	June 2001
Ouse River	May 1996
Pipers River	November 1999
Rubicon River	May 2002
South Esk River	September 1996
St Patricks River	August 1999
Swan River	March 2001
Tomahawk River	July 2000
Tooms River	July 1999
Upper Mersey River	December 1997
Upper Ringarooma River	November 1999
Welcome River	December 2003

Source: Government of Tasmania 2004

Table A.14: Timetable for water management plans in Tasmania, as at October 2004

<i>Water management plan</i>	<i>Completion timeline</i>	<i>Current status</i>
Brid River ^a	na	Water use sustainability project under way. It is scheduled to be completed in January 2005.
Clayton's Rivulet ^a	na	Water use sustainability project under way. It is scheduled to be completed in June 2005.
Clyde River	April 2005	Draft plan prepared for statutory approval.
Coal River	December 2005	Environmental flows study complete.
Derwent River ^b	Low priority (after 2006)	Hydro Tasmania has commenced a water management review. Consultation is in progress. Data collection is progressing.
Elizabeth River ^c	November 2005	Environmental flows study complete and water use sustainability project in progress.

(continued)

Table A.14 continued

<i>Water management plan</i>	<i>Completion timeline</i>	<i>Current status</i>
Great Forester River	Completed	Plan adopted. River managed according to plan.
Inglis and Flowerdale rivers ^a	nd	Water use sustainability project under way. It is scheduled to be completed in November 2004.
Lake River and Macquarie River below Lake River ^c	November 2005	Environmental flows study complete and water use sustainability project in progress.
Lakes Crescent and Sorell	April 2005	Draft plan prepared for statutory approval.
Liffey River	December 2005	Environmental flows study complete. Water management plan to be completed as part of the Meander River catchment.
Little Swanport River	December 2004	Draft plan released for public comment.
Macquarie River downstream of Ross ^c	November 2005	Environmental flows study complete and water use sustainability project in progress.
Meander River	December 2005	Process to recommence after the Meander Dam issue is resolved. The completion date for the Meander River plan may be effected this matter
Mountain River ^a	nd	Water use sustainability project under way. It is scheduled to be completed in January 2005.
North Esk River ^d	Low priority	Environmental flows study complete.
Rubicon River ^a	nd	Water use sustainability project under way. It is scheduled to be completed in November 2004.
South Esk River (upstream of Macquarie including St Pauls and Nile rivers)	August 2005	Environmental flows study complete. Hydrological modelling and water use sustainability project in progress.
St Patricks River ^d	Low priority	Environmental flows study complete.
Tooms River ^c	November 2005	Environmental flows study complete.
Mersey River	December 2004	Draft plan released for public comment.
Upper and lower Ringarooma River including the Ledgerwood River	April 2005	Environmental flows study complete. Hydrological modelling and water use sustainability project in progress.

^a Catchments added to Tasmania's implementation program since 1999 because they are at risk of over use or because increased water extraction could have adverse impacts on industries in the area.

^b The Derwent River was not included on the 1999 implementation program for priority development of a water management plan. Hydro Tasmania's review of the Derwent River Basin contains many elements of a water management plan. ^c A single water management plans will be developed to cover the rivers in the Macquarie Basin. ^d Water allocation issues have been resolved through provision of water licences for use of the Launceston urban supply. **nd** Not determined.

Source: Government of Tasmania 2004

Australian Capital Territory

Under the Water Resources Management Plan, the ACT allocates water in 32 subcatchments. Table A.15 outlines the allocations of surface water and groundwater provided to the environment and for consumptive use for the ACT's 32 subcatchments.

Table A.15: ACT controlled surface water and groundwater allocations, by catchment and subcatchment, as at September 2003

Catchment and subcatchment	Total surface water ML	For the environment %	Available for consumptive use			
			Total %	Existing use %	Reserved %	Ground-water ^a ML
Murrumbidgee and tributaries						
Michelago	2 517	92	8	0	1	100
Tharwa	9 622	92	8	0	1	250
Kambah	7 259	92	8	3	1	173
Uriarra	17 009	92	8	0	1	180
Woodstock	1 334	92	8	0	7	30
Guises	2 145	90	10	0	2	76
Gudgenby and tributaries						
Naas	38 554	92	8	0	0	950
Gudgenby	50 522	92	8	0	0	1 300
Tennent	7 407	93	7	0	1	150
Cotter and tributaries						
Corin	75 751	25	75	39	2	950
Bendora	33 906	28	72	62	4	500
Lower Cotter	36 045	26	74	0	33	600
Paddys	39 799	92	8	0	1	1 010
Tuggeranong Creek and tributaries						
Tuggernanong	7 909	91	9	1	1	60
Molonglo and tributaries						
Upper Molonglo	1 274	91	9	0	1	34
Kowen	5 427	90	10	0	7	160
Fyshwick	1 896	90	10	7	3	68
Jerrabomberra Headwaters	0	0	0	0	0	0
Jerrabomberra	4 696	90	10	4	1	240
Lake Burley Griffin	5 625	91	9	1	2	68
Coppins	5 362	90	10	2	4	119

(continued)

Table A.15 continued

Catchment and subcatchment	Total surface water ML	For the environment %	Available for consumptive use			
			Total	Existing use	Reserved	Ground-water ^a
			%	%	%	ML
Molonglo and tributaries (continued)						
Woolshed	2 407	90	10	8	2	64
Sullivans	6 328	90	10	5	2	73
Woden	6 817	91	9	3	1	56
Weston	3 995	91	9	0	3	24
Queanbeyan River and tributaries						
Tinderry	82 805	9	91	12	3	0
Googong	8 575	9	91	14	3	0
Lower Queanbeyan	22	91	9	0	0	0
Burra	11 784	9	91	14	4	0
Ginninderra and tributaries						
Gungahlin	5 246	90	10	6	2	80
Lake Ginninderra	6 056	90	10	5	1	50
Parkwood	5 684	91	9	0	1	90
Total	493 776	55	45	13	4	7 455

^a The ACT allocates 10 per cent of its groundwater resources for consumptive use. ML Megalitres.

Source: Government of the ACT 2004a

Northern Territory

The Northern Territory has six water control districts. Under its 1999 implementation program the Northern Territory is developing water allocation plans for the Ti-Tree, Darwin, Katherine–Daly and Alice Springs water control districts. It has completed a plan for the Ti-Tree Basin.

Table A.16: Northern Territory's progress with water allocation plans

Water control district	Status
Ti-tree	The Ti-Tree Region Water Resource Strategy (including the water allocation plan) was declared in August 2002.
Darwin	The preliminary draft water allocation plan has been completed. Community consultation will commence soon and the Northern Territory has scheduled the final plan for declaration in 2005.
Katherine–Daly	The preliminary draft water allocation plan has been completed. The Northern Territory expects to finalise the plan in late 2004.
Alice Springs	Development of the draft water allocation plan is under way. The Northern Territory has scheduled the final plan for declaration in 2005.

Source: Government of the Northern Territory 2004

Murray–Darling Basin Commission

The Murray–Darling Basin Commission is responsible for managing the River Murray and implementing environmental flows provided through The Living Murray Initiative. The Australian Government and the governments of New South Wales, Victoria, Queensland, South Australia and the ACT agreed to implement the ‘First Step’ arrangement in the CoAG Intergovernmental Agreement on Addressing Water Overallocation and Achieving Environmental Objectives in the Murray–Darling Basin. The ‘First Step’ decision is a targeted initiative that focuses on maximising environmental benefits for six icon sites in the Murray system. It aims to recover water that will 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 the health of the River Murray on a system wide basis.

B Allocating water to the environment

The Council of Australian Governments (CoAG) 1994 water reform agreement recognises the environment as a legitimate user of water. Among other things, it obliges governments to give priority to formally determining allocations or entitlements to water, including to the environment (see box B.1). Environmental requirements are to be determined, wherever possible, using the best scientific information available, and have regard to the water needs required to maintain the health and viability of river systems and groundwater basins. In river systems that are overallocated or deemed to be stressed, arrangements must provide a better balance in water resource use including appropriate allocations to the environment to enhance/restore the system's health.

Box B.1: Provision of water to the environment

Governments are to establish a sustainable balance between the environment and other uses, including formal provisions for the environment for surface water and groundwater systems.

In the 1994 CoAG water reform agreement, governments committed to determine environmental requirements using the best available scientific information wherever possible, and to have regard to the intertemporal and interspatial water needs required 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 resource use, including appropriate allocations to the environment to enhance/restore the health of river systems. Governments committed to consider environmental contingency allocations and review allocations five years after they have been initially determined.

The 1999 tripartite meeting clarified the commitment to provide water for the environment and timeframes:

For the second tranche [1999], jurisdictions submitted individual implementation programs, outlining a priority list of river systems and/or groundwater resources, including all river systems which have been over-allocated, or are deemed to be stressed, and detailed implementation actions and dates for allocations and trading to the NCC for agreement, and to Senior Officials for endorsement. This list is to be publicly available.

For the third tranche [2001], States and Territories will have to demonstrate substantial progress in implementing their agreed and endorsed implementation programs. Progress must include at least allocation to the environment in all river systems which have been over-allocated, or are deemed to be stressed.

By 2005, allocations and trading must be substantially completed for all river systems and groundwater resources identified in the agreed and endorsed individual implementation programs.

Reference: CoAG water reform agreement, clauses 4(b)–4(f); and 1999 tripartite meeting (CoAG endorsed the recommendations from this meeting)

Under the 1994 CoAG water reform agreement, governments undertook to allocate water to the environment having regard to the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) and Australian and New Zealand Environment and Conservation Council (ANZECC) National Principles for the Provision of Water for Ecosystems (box B.2). A key objective of the national principles is to sustain and, where necessary, restore ecological processes and the biodiversity of water-dependent ecosystems, recognising that appropriate water flow is critical for maintaining natural ecological processes and biodiversity.

Box B.2: ARMCANZ/ANZECC National Principles for the Provision of Water for Ecosystems

Principle 1: River regulation and/or consumptive use should be recognised as potentially impacting on ecological values.

Principle 2: Provision of water for ecosystems should be on the basis of the best scientific information available on the water regimes necessary to sustain the ecological values of water dependent ecosystems.

Principle 3: Environmental water provisions should be legally recognised.

Principle 4: In systems where there are existing users, provision of water for ecosystems should go as far as possible to meet the water regime necessary to sustain the ecological values of aquatic ecosystems whilst recognising the existing rights of other water users.

Principle 5: Where environmental water requirements cannot be met due to existing uses, action (including reallocation) should be taken to meet environmental needs.

Principle 6: Further allocation of water for any use should only be on the basis that natural ecological processes and biodiversity are sustained (that is, ecological values are sustained).

Principle 7: Accountabilities in all aspects of management of environmental water should be transparent and clearly defined.

Principle 8: Environmental water provisions should be responsive to monitoring and improvements in understanding of environmental water requirements.

Principle 9: All water uses should be managed in a manner which recognises ecological values.

Principle 10: Appropriate demand management and water pricing strategies should be used to assist in sustaining ecological values of water resources.

Principle 11: Strategic and applied research to improve understanding of environmental water requirements is essential.

Principle 12: All relevant environmental, social and economic stakeholders will be involved in water allocation planning and decision-making on environmental water provisions.

Under the Intergovernmental Agreement on a National Water Initiative signed in June 2004, signatory governments recognised a responsibility to ‘ensure that water is allocated and used to achieve socially and economically beneficial outcomes in a manner that is environmentally sustainable’ (CoAG 2004). Signatory governments committed to statutory provision of water access entitlements and planning frameworks to provide environmental and other public benefit outcomes, and to improve environmental management practices. They also undertook to complete the return of all

currently overallocated and overused systems to environmentally sustainable levels of extraction.¹ Signatory governments also committed to recognise connectivity between surface water and groundwater systems and to manage connected systems as a single resource, and to provide for the adaptive management of surface water and groundwater systems.

In considering governments' arrangements for allocating water to the environment, in the light of the guidance provided by the 1994 CoAG water reform agreement including the ARMCANZ/ANZECC national principles² and the National Water Initiative, the Council has looked for governments to establish arrangements that:

- are based on the best available science, wherever possible, and use strategic and applied research (principles 2 and 11)
- achieve a balance between environmental needs and human use that provides the water needed to sustain healthy aquatic ecosystems, while recognising, in systems where there are existing users, the existing rights of those users (principles 1, 4, 5, 6 and 9)
- involve monitoring and adaptive management where the regular assessment of ecosystem health guides water management processes (principle 8)
- involve stakeholder consultation and transparent processes that are robust, involve the timely provision of relevant information to all interested parties and allow wide public consultation (principles 7 and 12).

Best available science

The environmental water obligations in the 1994 CoAG water reform agreement and principle 2 of the ARMCANZ/ANZECC national principles state that the 'best available science' should be used wherever possible to determine environmental needs. Similarly, the National Water Initiative recognises that decisions between competing outcomes for water systems will need to involve judgments informed by, among other things, the best available science.

¹ Under the National Water Initiative, the environmentally sustainable level of extraction is defined as the level of extraction, which if exceeded, would compromise key environmental assets or ecosystem functions and the productive base of the resource.

² ARMCANZ/ANZECC national principles 3 and 10 are not directly relevant to governments' decisions on environmental allocations. The Council considers water pricing (national principle 10) in assessing progress with urban and rural pricing and the legal recognition of environmental water provisions (principle 3) in assessing governments' implementation of obligations on water access entitlements.

Early environmental water allocations were based on historical hydrological information and involved determination of a 'minimum flow' for a river or a specific reach. There have been recent advances in environmental flow methods, and holistic models such as the Best Practice Framework (Arthington *et al.* 1998), Land and Water Australia's recommended model (Schofield *et al.* 2003) and Victoria's FLOWS method are now recognised as more scientifically robust than minimum flows. These advances reflect scientific research that has concluded that the minimum flow approach is not sufficient for Australia, where variable flow regimes are common and native flora and fauna are adapted to, and in many cases reliant on, variability in water regimes.

While there are several different types of holistic methods, each typically:

- takes a multidisciplinary approach involving biologists, ecologists, geomorphologists, hydrologists and water quality specialists to ensure that all ecological and physical processes are considered
- considers all elements of the water system including: surface water, such as rivers, floodplain wetlands, receiving water bodies (for example, estuaries); groundwater; and terrestrial systems linked through the groundwater table
- uses data that are comprehensive, relevant, current and subject to quality control and quality assurance arrangements
- considers the entire water regime (that is, variability, duration, magnitude, frequency and timing), which is especially important in Australia where rainfall frequency and intensity are highly variable and native flora and fauna have adapted to variable flow environments
- considers human use constraints
- involves peer review of the recommended flow regime to ensure that sustainable conclusions are formed through a transparent process
- includes an ongoing monitoring phase that targets key ecological and physical performance indicators tied to adaptive management to allow for the evaluation of implemented water regimes and consequential improvements in system management.

The Council has used the above characteristics as indicators of the 'best available science' in considering governments' actions to provide water to the environment. In accord with ARMCANZ/ANZECC national principle 2, the Council has looked for governments to determine environmental water allocations using a holistic method establishing a water regime for the whole system. The Council has also looked for governments to continue to improve their scientific understanding of environmental water requirements. National principle 11 refers to the need for research into improving the methods of determining environmental water requirements and to committing resources into applying these methods to specific aquatic systems.

The Council accepts that existing scientific knowledge differs among jurisdictions and among aquatic systems and that in some systems there is likely to be considerable knowledge gained from managing and observing the system over many years that may be relevant to decisions on environmental flows. The Council also accepts that demands on governments' resources mean that it is not always possible to complete all-encompassing scientific studies for every system prior to determining allocation arrangements. The Council has looked, however, for governments to undertake strategic and applied research to determine the environmental water requirements of their more significant aquatic systems, particularly those deemed to be stressed or overallocated, and to transparently report the results of such research.

Balancing economic, environmental and other interests

CoAG's reference to the work of ARMCANZ/ANZECC in the section of the 1994 water reform agreement that deals with environmental allocations indicates that water management arrangements should aim to ensure the long term sustainability of aquatic ecosystems (national principle 2). This intent is also reflected in CoAG's objective of seeking to 'ensure ecosystem health by implementing regimes to protect environmental assets at a whole-of-basin, aquifer or catchment scale' (CoAG 2003). Within this objective of achieving a sustainable balance between environmental and human uses, the ARMCANZ/ANZECC national principles call for governments to adopt arrangements for providing water to the environment that recognise the existing rights of other water users.

The National Water Initiative acknowledges the need to ensure that water is allocated and used to achieve socially and economically beneficial outcomes in a manner that is environmentally sustainable. The initiative recognises the 'continuing national imperative to increase the productivity and efficiency of Australia's water use, the need to service rural and urban communities, and to ensure the health of river and groundwater systems by establishing clear pathways to return all systems to environmentally sustainable levels of extraction' (CoAG 2004, p. 1).

In some surface and groundwater systems, long term sustainability may be achieved by maintaining existing ecological values. In systems where there are existing users, however, there will generally have to be trade-offs between the needs of the environment and those of other (human) users. While a return to pristine or natural conditions is rarely feasible, improving the ecological health of stressed rivers is likely to require more water for environmental purposes, possibly obtained by reallocating water from existing users. Similarly, it may be necessary to reallocate water from entitlement holders to the environment in systems that are currently overallocated. The possibility that reallocation may be necessary is recognised in ARMCANZ/ANZECC national principle 5.

To determine whether water use is at a level that ensures the sustainable ecological health of aquatic systems, the Council considered the meaning of the term 'ecological health'. The ANZECC (2000a) National Water Quality Management Strategy and the National River Health Initiative (Department of Environment and Heritage 2002) adopt a definition of ecological health as follows:

the ability of an ecosystem to support and maintain key ecological processes and organisms so that their species compositions, diversity and functional organisations are as comparable as possible to those occurring in natural habitats within a region.

The phrase 'within a region' in the above definition recognises that Australia is a diverse continent with many different bioregions (EA 2000). Bioregions are large land areas characterised by broad, landscape-scale natural features and environmental processes that influence the functions of entire ecosystems. The bioregion concept recognises that ecosystems vary with topographic, climatic and geomorphic features, rather than political or social boundaries. Aquatic systems in different bioregions therefore have different ecological characteristics and needs (for example, river systems in the Australian Alps region will have different characteristics and needs from those of the Darwin Coast). As a consequence, assessment of environmental water requirements and water regimes needs to be considered from relevant bioregional contexts.

While the ANZECC (2000a) definition is useful, it relates only to the ecological health or integrity of an ecosystem in isolation from human use. It may therefore be important for determining a baseline condition, but less practical where there are human use constraints or where systems are highly modified and unlikely to be able to return to pristine condition. To this end, the Scientific Reference Panel established by The Living Murray Initiative (Cullen *et al.* 2003a) defined a 'healthy working river' as a river that is managed to provide a sustainable compromise between the condition of the river and the level of human use. A water regime based on the healthy working river approach would not return an aquatic system to pristine condition. It would, however, sustain ecological objectives indefinitely. The Living Murray Initiative advocates a holistic approach, with the water regime, condition of floodplain wetlands and in-channel habitats and water quality all considered. The end point will not be a pre-European flow regime. Rather, it will be one that meets the tests of long term ecological sustainability.

Environmental water may be obtained from a range of sources, including from reduced delivery losses achieved by upgrading infrastructure and pipelining, from increased on-farm water use efficiency and from changes in land use practices. In some systems, however there may be no alternative to obtain water for the environment other than by reallocating water from existing users. The Living Murray Initiative First Step decision, which is to provide an average of 500 gigalitres a year of 'new' water after five years for environmental purposes, recognises that this water could come from a range of sources, including reallocations. The National Water Initiative also

recognises a range of mechanisms for recovering water to achieve environmental and other public benefit outcomes. It acknowledges that the water available for consumptive uses may need to be reduced to address known overallocation. It also acknowledges that there may be a need to reduce the water available for consumption (additional to the reductions needed to address known overallocation and/or overuse) arising from, for example, seasonal or long term climate changes, natural events such as bushfires or improvements in the knowledge of water systems' capacities to sustain particular extraction levels.³

The essential point is that the CoAG agreements oblige governments to take action to achieve a sustainable balance in water use. Accordingly, the Council has considered whether governments are establishing allocation arrangements that are likely to achieve a sustainable balance. It has looked for governments' arrangements to demonstrate the following characteristics.

- Ecological sustainability objectives should be specific to individual systems and contextually consistent with the relevant bioregion.
- The allocation of environmental water in aquatic systems where there are existing users should be sufficient to achieve a 'healthy working river'.
- The allocation of environmental water in aquatic systems where ecological health is adequate should be at a level that at least maintains ecological health.

The Council accepts that it may not always be possible for governments to introduce arrangements that achieve a sustainable balance immediately, particularly in systems where the volume of water already allocated for consumptive use is significant. Notwithstanding this, in systems where there is identified overuse, the Council has looked for governments to introduce arrangements that substantially reduce overuse within a reasonable timeframe, taking account of socioeconomic and environmental benefits and costs. The Council notes that, under the National Water Initiative, signatory governments committed to substantial progress by 2010 toward adjusting all overallocated or overused systems.

³ The National Water Initiative contains arrangements that determine who should bear the risk of future reductions in the availability of water for consumptive use (additional to those identified to address known overallocation and/or overuse).

Monitoring and adaptive management

The 1994 CoAG water reform agreement states, in relation to work by governments on water allocations or entitlements, that:

4(e) in undertaking this work, jurisdictions would consider establishing environmental contingency allocations which provide for review of the allocations five years after they have been determined ...

Clause 4(e) indicates CoAG's intent that governments monitor the impact of environmental water allocations and amend management regimes on the basis of monitoring outcomes. In support of this, ARMCANZ/ANZECC national principle 8 advocates the use of monitoring and adaptive management in the development of environmental water provisions. The National Water Initiative commits signatory governments to the periodic independent audit, review and public reporting of environmental and other public benefit outcomes, and of the adequacy of the water provision and management arrangements in achieving those outcomes.

Ecological health is not a directly measurable parameter, and environmental managers must be careful to choose indicators that reflect the state of aquatic ecosystems. The Living Murray Initiative suggests that indicators should meet the criteria of relevance, responsiveness and repeatability. There are a number of systems and nationally recognised guidelines that aim to meet these requirements, such as:

- AusRIVAS (Australia wide Rivers Assessment Scheme) — developed under the National River Health Program to assess the biological health of rivers
- Australian guidelines for water quality monitoring and reporting (ANZECC 2000b) — national guidelines for the design of chemical, physical and biological monitoring programs for aquatic systems
- Index of Stream Condition — developed by the Victorian Government to assess river health by integrating biological, hydrological and chemical parameters.

The above guidelines tailor monitoring programs to meet the specific ecological objectives set for an aquatic system and monitor at intervals sufficient to detect ecological change. The guidelines also support an adaptive management (or Adaptive Environmental Assessment and Management) approach. Developed by a Canadian research facility in the 1970s, adaptive management recognises:

- the need for management decisions to examine economic, social and environmental values in an integrated way

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- the presence of many diverse stakeholders in environmental management issues
 - the uncertainty inherent in environmental processes (Holling 1978).

In assessing compliance with the CoAG obligations on environmental allocations, the Council has looked for governments to apply monitoring and adaptive management techniques that promote long term sustainability. In particular, the Council has looked for adaptive management that incorporates the results of monitoring as feedback leading to the adjustment (where necessary) of management regimes. In the context of environmental water regimes, this means using the results of monitoring to evaluate and, if necessary, adjust flow management at regular intervals (two to five years).

Stakeholder consultation and transparent processes

Both the 1994 CoAG water reform agreement and the National Water Initiative emphasise the need for robust public consultation processes. The 1994 agreement obliges governments to consult publicly on (particularly) pricing, allocation and trading. Under the National Water Initiative, governments agreed to engage water users and other stakeholders, to improve certainty and build confidence in reform, and to ensure transparent decision making. Regarding water management, the ARMCANZ/ANZECC national principles imply that processes should be transparent, consultative, include representative decision-making processes and be based on full and robust information and analysis.

The Council considers CoAG's emphasis on robust public processes to mean that governments' decisions on environmental allocations should be based, wherever possible, on comprehensive, relevant and rigorous information about the ecological requirements of ecosystems and the impacts of changes in management arrangements. Any analysis, whether of an ecological, economic or social nature, that is material to the allocation decision should be defensible and robust and, where possible, have been independently reviewed. Governments should ensure that interested stakeholders (including the affected community) have timely access to all relevant information, including scientific information on the water regime required to sustain ecological values (consistent with a healthy working river); information on the extent of any socioeconomic trade-offs and the rationales for the trade-offs; and science-based information on the expected impact of any trade-offs on ecological values.

Stakeholders should have the opportunity to provide input and feedback into the water management process. Decision-making bodies should be broadly representative of the interested stakeholders and the affected community. This may be achieved, for example, through balanced representation on

decision-making bodies or at least by ensuring that particular interest groups are not overrepresented.

C Submissions to the 2004 National Competition Policy water reform assessment

<i>Sub no.</i>	<i>Submitter</i>	<i>Date</i>
1	Murrumbidgee Horticulture Council Inc.	24 March 2004
2	Dorset Waterwatch Group Inc.	29 March 2004
3	Pioneer Valley Water Board	2 April 2004
4	Queensland Rural Water Boards	6 April 2004
5	Tasmanian Conservation Trust Inc.	8 April 2004
6	World Wide Fund for Nature	12 April 2004
7	Robert Rockefeller, Nekon Pty Ltd	12 April 2004
8	Anthony Hocking, EMRS Pty Ltd	13 April 2004
9	Queensland Conservation Council	14 April 2004
10	Geoffrey Cunningham and Fergus Duncan, Payne Butler Lang Solicitors	15 April 2004
11	Property Council of Australia	16 April 2004
12	New South Wales Irrigators' Council	16 April 2004
13	Nature Conservation Council of New South Wales Inc. and Inland Rivers Network	19 April 2004
14	Wide Bay Burnett Conservation Council Inc.	19 April 2004
15	Environment Victoria	23 April 2004
16	Arid Lands Environment Centre Inc.	22 July 2004

Note: The Council received a range of material from the East End Mine Action Group (Mount Larcom, Queensland) and information from the Gwydir Valley Irrigators Association (New South Wales), that it took into account in conducting the 2004 NCP assessment.

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