MURRAY–DARLING BASIN COMMISSION

ANNUAL REPORT 1998–99

to the Parliaments of the Commonwealth of Australia, New South Wales, Victoria, South Australia and Queensland; the Legislative Assembly of the Australian Capital Territory;

and to the Australian community

In reply please quote:
Your reference:

MURRAY-DARLING BASIN COMMISSION

13 October 1999

The Hon Warren Truss MP
Minister for Agriculture, Fisheries and Forestry
Parliament House
CANBERRA ACT 2600

Dear Minister

In accordance with clause 84(1) of the *Murray-Darling Basin Agreement 1992*, I submit our annual report and financial statements covering the year ended 30 June 1999 for tabling before the Parliaments of the Commonwealth, New South Wales, Victoria, South Australia and Queensland, and the Legislative Assembly of the Australian Capital Territory.

I commend the 1998-99 Annual Report to the five Parliaments and the Legislative Assembly, and I look forward to the Partner Governments continuing support of the Murray-Darling Basin *Initiative*.

Yours sincerely

MICHAEL TAYLOR
Acting President

Gas Industry House 7 Moore Street, Canberra ACT ◊ GPO Box 409 Canberra ACT 2601 ◊ Telephone: 02 6279 0100 ◊ Facsimile: 02 6248 8053

MURRAY-DARLING BASIN COMMISSION

ANNUAL REPORT 1998–99

including the annual report of the Community Advisory Committee

to the Parliaments of the Commonwealth of Australia, New South Wales, Victoria, South Australia and Queensland; the Legislative Assembly of the Australian Capital Territory;

and to the Australian community.

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ABOUT THIS REPORT

This report describes the objectives and significant achievements of the Murray-Darling Basin Commission during the financial year 1998–99. Through the Chairperson of the Murray-Darling Basin Ministerial Council, it is presented for tabling before the parliaments of the Commonwealth, New South Wales, Victoria, South Australia and Queensland and the Legislative Assembly of the Australian Capital Territory.

The report is tabled in this way because the Commission was established by a legal Agreement passed by each of the parliaments (the Australian Capital Territory's involvement is through a memorandum of understanding). The Commission is therefore a unique organisation, 'owned' by the six governments. It is an outcome of the intention of the partner governments to have an organisation that transcends the political boundaries between the Basin states and the Australian Capital Territory so that the far-reaching Murray-Darling river catchments may be managed as effectively as possible.

The Commission has a role in undertaking works and measures at the direction of the Ministerial Council and also in coordinating the efforts of the government partners to the *Initiative*. This annual report focuses primarily on those activities that the Commission has carried out on behalf of the Ministerial Council in 1998–99. Information on the 1998–99 activities of the partners to the *Initiative* will be coordinated through the states' annual reports to the Commission and the Ministerial Council, expected to be provided by early 2000.

This annual report also incorporates the annual report of the Ministerial Council's Community Advisory Committee, the primary community body advising the Ministerial Council on natural resources management issues in the Murray-Darling Basin.

CHIEF EXECUTIVE'S OVERVIEW

The year 1998–99 was a period of consolidation. All the activities identified in the Commission's re-engineering of its processes and structure were implemented and started to pay dividends. The Commission established 10 high level Project Boards to steer the major policy and program efforts of the *Initiative*. These are small Boards, usually of three members, and have proved both efficient and effective in driving the Commission's strategic agenda.

For the first time, the Commission obtained a complete picture of all of the investments in natural resources management in the Murray-Darling Basin. This was a significant task undertaken by partner governments with a view to providing the knowledge necessary to structure programs to address the priority issues for the Commission.

The Commission is now reaping the benefit of its 10 years of investment in research and development. At the forefront is the information on the extent of, and potential solutions to, the Basin's dryland salinity problem. Despite the high level of activity

and enhanced funding support through programs such as the Natural Heritage Trust, it is now apparent that addressing major natural resources management problems in dryland regions of the Basin, such as dryland salinity, will require long-term commitment that will go beyond current programs focused on volunteer effort.

Professor John Lovering retired as President of the Commission at the end of June 1999, following a six-month extension to his three-year term. Professor Lovering made an invaluable contribution to the Commission and was a persuasive advocate for important public policies, such as the Cap on water diversions, which have provided a firm basis for balancing economic, social and environmental issues in the future. Addressing the National Press Club just prior to his departure, Professor Lovering stressed the critical importance of sustained commitment and support by governments to address long-term natural resources management in the Basin, and suggested that the Murray-Darling Basin should be made a permanent, national project.

The Chair of the Community Advisory Committee also changed during the year, with Clive Thomas retiring and Leith Boully assuming the role. I would like to add my personal congratulations to Clive on his leadership during his time as Chair of the Committee. The Commission looks forward to working with Leith and her fellow community members in the future.

Specific issues that warrant mention during the year include:

- All governments have an ongoing commitment to implementing the Cap on water diversions. This is a significant policy issue as well as a difficult logistic exercise in putting in place management arrangements that are appropriate to the 21 river valleys in the Basin. Managing water as a scarce resource has brought to the surface a range of equity and environmental issues which are being worked through progressively with communities. While the debate in some areas has been robust, it is nevertheless a debate that was important for the communities of the Murray-Darling Basin to have.
- Interstate water trading commenced on a pilot level for the River Murray downstream of Nyah. A total of 3431 megalitres was permanently traded between States in accordance with specific conditions to ensure environmental protection. The water trading markets within States were extremely active during the year with approximately 800 000 megalitres traded.
- A major activity for the Commission and the Community Advisory Committee was a joint workshop in late 1998 focusing on the future of catchment management and the contribution of individual community members to this effort.

- The Commission's Basin Sustainability Program aggregated and then reviewed the level of activity necessary to implement the 207 natural resources management plans developed or being developed within the Basin. This assessment indicated that the auditable public and private investment required to fully implement these plans over the next three years would be $2.5 billion. Of this, more than one-third will be community investment.
- Work continued on the preparation of a Salinity Audit for the Basin. Preliminary information provided to the Prime Minister's Science, Engineering and Innovation Council in December indicated that the scale of the problem was far more significant than previously thought. The audit will be released in October 1999 with a strategy available in June 2000.
- The first environmental flows were released for Barmah-Millewa Forest in October. A total of 97 000 megalitres was released from Hume Dam to supplement watering of the forest. Evaluation showed that the flows produced significant environmental benefits and these will be actively pursued in the future.
- The Commission's intense effort in communications continued during the year. It was rewarding to see almost 40 000 primary school children participate in the *Special forever* writing competition in 1998.
- River Murray Water commenced as a totally ring-fenced entity during the year to ensure the accountability and costs associated with its operation were clearly separated from the other activities of the Commission.
- Major works continued at Hume Dam to ensure its long-term safety and integrity. This program is scheduled to be completed in a further two years and will ensure the long-term serviceability of this most important facility.
- At Lake Victoria, work continued to protect the cultural values of the lake while continuing to operate it as a water supply facility. I would like to thank the Lake Victoria Advisory Committee for their ongoing efforts in crafting a future in sometimes difficult circumstances. Lake Victoria was lowered over the winter of 1999 to enable a complete survey of all the archaeological material in its bed.
- Work commenced on examining how the navigation passes on the Commission's weirs could be modified to reduce the costs and improve the safety of the operation of these ageing assets, most of which are now more than 60 years old.

- On the water supply front it was indeed a year of contrast. The Murray continued below average flows resulting in significant draw downs of the Hume and Dartmouth Dams. The Darling, on the other hand, was in flood for much of the late winter and spring, resulting in Menindee Lakes filling and spilling over and significant surplus flows in the lower Murray. It was interesting to note that of the 10.6 million megalitres passing Bourke, only 5 million megalitres reached Menindee Lakes. The rest was used in meeting the natural environmental requirements for that reach of the river.
- The Murray mouth was again under stress as a result of prolonged periods of low flow. While the mouth did not close, it came close on a number of occasions and required mechanical intervention to ensure it remained opened. It will be a continuing issue for future management.
- In June, Commissioners reviewed integrated catchment management as the framework for tackling major natural resources issues in the Basin. They agreed integrated catchment management is still an appropriate philosophy and framework for the future, but identified the need for improved institutional arrangements and policy tools to ensure integrated catchment management is able to deliver the future landscape-scale changes needed.

Finally, I would like to formally thank the staff of the Murray-Darling Basin Commission for their ongoing effort and dedication in supporting the *Initiative* and the partner governments for their cooperation and support in delivering real and meaningful results to the Basin community.

Don Blackmore

Chief Executive

September 1999

1. THE MURRAY-DARLING BASIN INITIATIVE

The *Murray-Darling Basin Initiative* is the partnership between the governments and the community which has been established to give effect to the 1992 *Murray-Darling Basin Agreement*. The purpose of the *Agreement* is:

> *…to promote and coordinate effective planning and management for the equitable, efficient and sustainable use of the water, land and other environmental resources of the Murray-Darling Basin.*

In its early years the *Initiative* focused on promoting the principles of integrated catchment management and the development of joint community and government structures. These have remained key mechanisms for working to achieve sustainable use of the Basin's natural resources. More recently, emphasis has been placed on the development and implementation of strategic, large-scale integrated catchment management plans and concentrating resources in the areas of greatest need.

The *Initiative* brings together the community and the governments of the Commonwealth, New South Wales, Victoria, South Australia, Queensland and most recently the Australian Capital Territory. The overall governance of the *Initiative* is shown in figure 1 and described in the following sections.

1.1 THE MURRAY-DARLING BASIN MINISTERIAL COUNCIL

The Murray-Darling Basin Ministerial Council is the primary body responsible for providing the policy and direction needed to implement the *Murray-Darling Basin Initiative*. The Ministerial Council's main functions are to consider and determine major policy issues concerning the use of the Basin's land, water and other environmental resources and to develop, consider and authorise (as appropriate) measures to achieve the purpose of the *Agreement*.

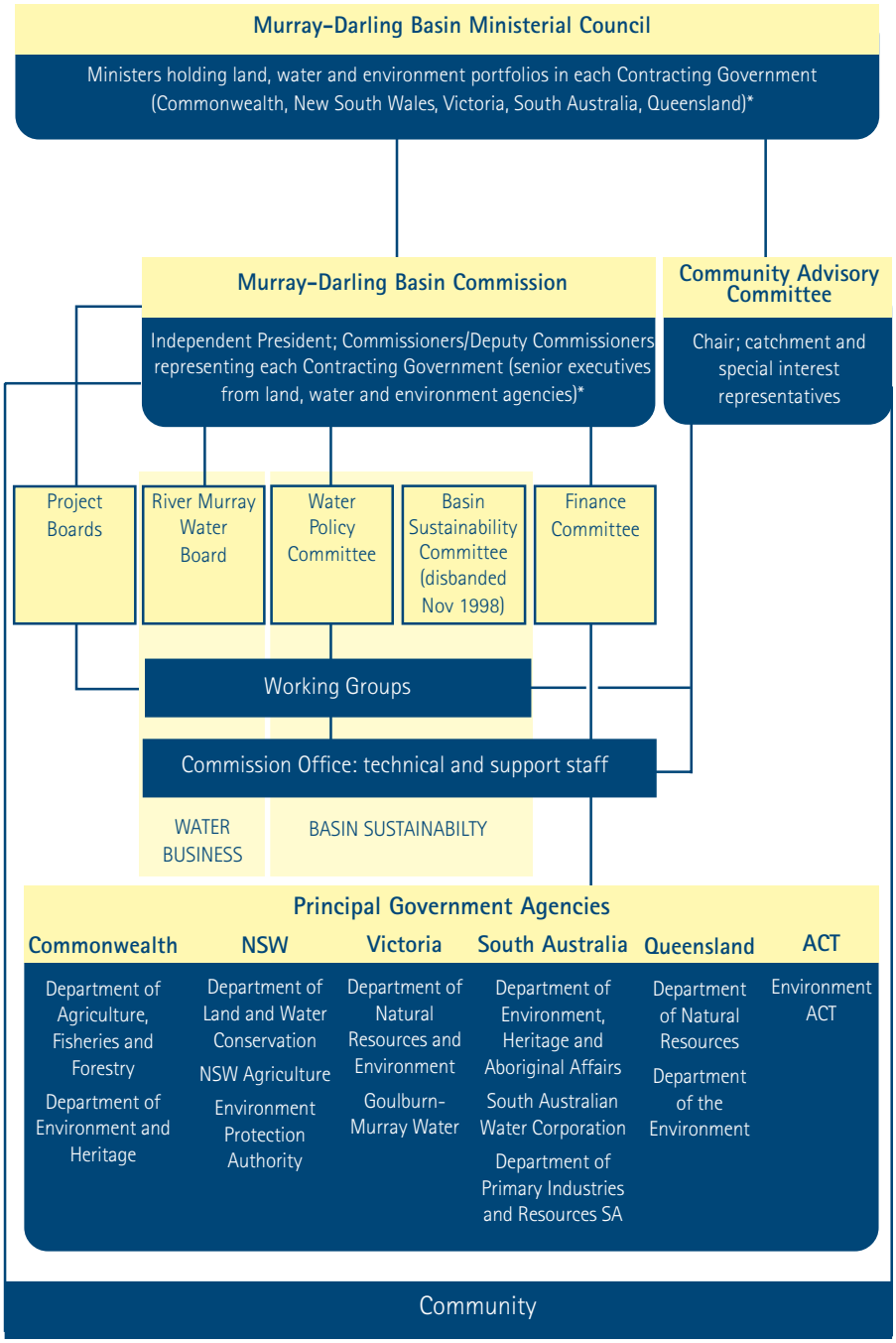
The Ministerial Council comprises the ministers holding land, water and environment portfolios within the governments of New South Wales, Victoria, South Australia, Queensland and the Commonwealth. Up to three ministers from each government may sit on the Ministerial Council. The Australian Capital Territory participates in the *Initiative* via a memorandum of understanding. The memorandum allows the Australian Capital Territory to take part in planning and management of Basin environmental resources, but not to be involved in water management of the River Murray system. The memorandum provides for an Australian Capital Territory Government minister to be a non-voting member of the Ministerial Council.

Names of members of the Ministerial Council are shown in appendix A.

1.2 THE COMMUNITY ADVISORY COMMITTEE

The Community Advisory Committee is an integral part of the *Initiative* and reflects the importance of the community-government partnership. At its first meeting in 1986, the Ministerial Council established the Committee to advise it and to provide a two-way channel of communication between the Ministerial Council and the Basin community. This decision was based on the ministers' earlier recognition of the need for 'effective community participation in the resolution of the water, land and environmental problems in the Basin'.

Figure 1 *Governance of the Murray-Darling Basin Initiative*



* Participation by the Australian Capital Territory is via a memorandum of understanding (see section 1.1).

The terms of reference of the Community Advisory Committee are to advise the Ministerial Council and the Commission on:

- natural resources management issues referred to the Committee by the Ministerial Council or the Commission; and
- the views of the Basin's communities on matters identified by the Committee as being of concern.

The Community Advisory Committee comprises a Chairman and 26 members. In January, Leith Boully was appointed as Chairman, following the completion of Clive Thomas's term of office (see chapter 2). Twenty-one members are state representatives chosen on a catchment or regional basis – seven from New South Wales, five from Victoria, four from South Australia, four from Queensland and one from the Australian Capital Territory. Additionally, there is a representative from each of four special interest 'peak organisations' and an appointee to provide an individual Aboriginal perspective on natural resources management issues.

The names of the members of the Community Advisory Committee during the year are listed in appendix B.

The Committee's contribution is reported in detail in chapter 2.

1.3 ROLE AND OPERATION OF THE COMMISSION

The Murray-Darling Basin Commission is the executive arm of the Ministerial Council and is responsible for managing the River Murray and the Menindee Lakes system of the lower Darling River and for advising the Ministerial Council on matters related to the use of the water, land and other environmental resources of the Murray-Darling Basin.

The functions of the Commission are:

- to advise the Ministerial Council in relation to the planning, development and management of the Basin's natural resources;
- to assist the Ministerial Council in developing measures for the equitable, efficient and sustainable use of the Basin's natural resources;
- to coordinate the implementation of, or, where directed by the Ministerial Council, to implement, those measures; and
- to give effect to any policy or decision of the Ministerial Council.

The Commission therefore has a role in undertaking works and measures at the direction of the Ministerial Council and also in coordinating the efforts of the government partners to the *Initiative*.

The Commission comprises an independent President, two Commissioners from each Contracting Government and a representative of the Australian Capital Territory Government. Apart from the President, Commissioners are normally chief executives and senior executives of the agencies responsible for stewardship of land, water and the environment. The memorandum of understanding for the participation of the Australian Capital Territory Government (see section 1.1) provides for a non-voting 'representative' from the Territory to participate in meetings of the Commission. The Chair of the Community Advisory Committee also attends all Commission meetings.

The names of the members of the Commission are shown in appendix C.

The Commission works cooperatively with the partner governments, committees and community groups to:

- develop and implement policies and programs aimed at the integrated management of the Murray-Darling catchment; and
- manage and distribute the water of the River Murray in accordance with the *Murray-Darling Basin Agreement*.

This cooperative approach reflects the importance placed on government-community partnerships and brings to participants and end-users the benefit of shared concerns and expertise and jointly developed and integrated solutions and avoids duplication of effort.

Commission activities associated with natural resources management in the Basin are outlined in chapter 3. All activities associated with managing and distributing River Murray and lower Darling River water to New South Wales, Victoria and South Australia consistent with the *Agreement* – that is, the operation of River Murray Water as a separate internal business division of the Commission – are set out in chapter 4.

1.3.1 Program support and administrative structures

During the latter part of 1998–99, the Commission was advised by 10 project boards, comprising Commissioners or Deputy Commissioners. This followed an earlier decision by the Commission for high-level boards to oversee projects contributing

to key strategic directions of the *Initiative*. Further details of these projects are provided in sections 3.2, 4.1.10 and 4.1.11. The names of the members of the Project Boards are shown in appendix D.

Throughout 1998–99 the Commission continued to be advised by four high-level committees as outlined below.

Natural resources management

- The Water Policy Committee provided policy advice on water issues, including implementation of the Council of Australian Governments' (COAG) water reform agenda, the Cap on growth in water diversions, water quantity, allocation and sharing and interstate trading.
- The Basin Sustainability Committee provided advice on policies and programs to achieve the natural resources management objectives of the Basin Sustainability Program, focusing on strategic investment by governments to best support on-ground actions. The Basin Sustainability Committee was disbanded in November 1998 and many of its duties devolved to the Basin Sustainability Program Working Group and the Finance Committee.

River Murray Water Business

- The River Murray Water Board provided advice for developing and operating a more commercially focused water business that will lead to improved operating efficiencies and will ensure effective long-term management of major infrastructure and of the River Murray. The Board was restructured on 1 June 1999, following the completion of its role to develop options on possible structures for the Water Business, to enable the Commission to be directly involved in the continued operation of River Murray Water as a ring-fenced internal business unit.

Finances

- The Finance Committee advised on budgetary and other financial issues.

The above committees were supported by 19 working groups that brought together technical and specialist expertise from agencies of the partner governments and representatives of the Community Advisory Committee. They included a new Issues Working Group, set up to advise the Basin Sustainability Program Working Group on communication, education and matters relating to the social and institutional context of the *Initiative*'s operating environment. Committees and working groups supporting the Commission are listed in appendix E.

The Office of the Commission provides the technical, policy formulation, secretariat and administrative services required to administer the *Agreement* and help deliver

the Commission's programs. It is responsible for coordinating the implementation of the Commission's Natural Resources Management Strategy and the Basin Sustainability Program. The Office includes River Murray Water, the management unit responsible for the Commission's River Murray Water Business (see also chapter 4).

On 8 September 1998, the Commission signed off the re-engineering process of the Office of the Commission, which it had initiated in April 1997. The purpose of the re-engineering was to revisit the Commission's objectives to ensure that they remained strategically focused and that its efforts were directed towards achieving outcomes linked to core activities.

The re-engineered Office of the Commission is described in the document *Our Plan for 1998–2001: A Foundation Document agreed by the Commission at Meeting No. 48, 8 September 1998*. It is an interim corporate plan which outlines the principles by which core business is identified along with the strategic directions for 1998–2001 and the project administration for this period.

Features of the reorganised Office of the Commission include:

- an expanded senior management team to more effectively support the Chief Executive in policy development and issues management and to administer the project management system;
- a principled and visible process for identifying priority business using a template of questions; and
- a project management system and methodology that gives Commissioners a more direct role in project development, delivery and evaluation.

At its meeting on 20 November 1998 the Ministerial Council resolved to operate River Murray Water as a 'ring-fenced internal business unit' with specific delegations to the General Manager. This decision complies with the intent of COAG's water reform agenda.

1.3.2 Policy and program implementation

Policies and programs of the Ministerial Council and the Commission are implemented by the Chief Executive of the Office of the Commission and by Commissioners representing the partner governments. In 1998–99 the Commission's programs were supported by funds from the Contracting Governments as shown in table 11. Funds are allocated to states for agreed *Initiative* programs in accordance with estimates approved by the Ministerial Council.

Natural resources management and administration

The Commission has delegated to the Chief Executive those expenditure, employment and contracting powers necessary to operate the Office of the Commission. Commissioners representing the partner governments have delegated powers from the Commission to approve expenditure of designated funds consistent with the *Murray-Darling Basin Agreement*.

The 1998–99 budget allocations for the sustainable management of the Basin's natural resources and administration and other support are shown in table 1.

Table 1 Natural resources management and administration 1998–99 budget allocations

Natural Resources Management	
	$'000
Strategic Program Development	2 009
Strategic Investigations and Education	7 800
Communications and community participation	821
Investigations and Construction	3 005
Administration and support	**4 077**
Total	**17 712**

Water resources and asset management (that is, River Murray Water Business)

The Commission has delegated to the General Manager of River Murray Water appropriate powers for water management and asset management functions assigned to River Murray Water under its Operating Authority. In exercising the delegated powers, the General Manager must consult with the River Murray Water Board, particularly in relation to policy matters.

The 1998–99 budget allocations for River Murray Water are shown in table 2.

Table 2 River Murray Water 1998–99 budget allocations

Recurrent expenditure	
	$'000
Water Storage and Supply	13 245
Salinity Mitigation	2 714
Navigation	1 081
Recreation, Tourism and Other	586
Investigations and Construction	**19 090**
Total	**36 716**

2. REPORT OF THE COMMUNITY ADVISORY COMMITTEE 1998–99

The Community Advisory Committee's vision is for a healthy, diverse and productive Murray-Darling Basin, managed through a cooperative partnership of communities, agencies and governments for all generations.

Clive Thomas completed his three-year term of office as Chairman of the Community Advisory Committee of the Murray-Darling Basin Ministerial Council on 31 December 1998. Mr Thomas provided leadership to the Committee through a period of considerable change in its membership and at an historic time for the *Murray-Darling Basin Initiative*, with the decision to cap diversions and to accelerate investment in natural resources management for the Basin. Mr Thomas was a strong advocate for the need for transparent principles for cost sharing, essential for investment of public money on private land, an important issue which remains to be fully implemented. His tenure also saw increased opportunities for the community to build its capacity to contribute to the community-government partnership of the *Initiative*.

Leith Boully was appointed as the new Chairperson on 1 January 1999. Mrs Boully has extensive experience working with community organisations and a wide range of government advisory committees and has a long-term involvement with the Murray-Darling Basin, having represented Queensland on the Community Advisory Committee from 1992 to 1997. Mrs Boully is a Board member of the Land and Water Resources Research and Development Corporation, an Australian Heritage Commissioner, a member of the Australian Landcare Council and is undertaking the Australian Rural Leadership Program sponsored by the Queensland Department of Primary Industries.

This has been a very successful year for the Committee and its participation in the *Murray-Darling Basin Initiative*. The Committee has focused on key strategic issues, made significant contributions to policy and program and participated in several workshops which have influenced the direction of the *Initiative*.

2.1 DIRECTION AND OPPORTUNITIES

Vision and Mission Statements and Community Advisory Committee Workplan

In July the Community Advisory Committee finalised Vision, Mission and Role Statements to reaffirm its direction as the peak community body providing advice on natural resources management issues in the Murray-Darling Basin. The Committee also identified the need for a formal Workplan in 1998–99 to target specific issues on which, consistent with the Committee's role (see section 1.2), the Ministerial Council and Commission wish to receive Committee advice. The Workplan was drafted by the new Committee Chairman and the President of the Commission, considered by the Committee and Commission in early 1999, and agreed to by the Ministerial Council in May 1999.

The Workplan focuses the Community Advisory Committee on strategic issues which will make a significant input to the future of the Murray-Darling Basin. It addresses the four key strategic issues of importance to the *Murray-Darling Basin Initiative*:

- the new Operating Environment Strategy (which includes the human dimension and vision for sustainable integrated catchment management);
- basin salinity management, including the review of the Salinity and Drainage Strategy;
- management of the Cap on diversions; and
- ongoing implementation of the Basin Sustainability Program.

Other issues identified in the Workplan are floodplain management, including cross-border issues; operational issues such as Community Advisory Committee involvement in the development and review of various Commission strategies; and involvement in relevant Commission Working Groups.

Orientation day

Following the very successful orientation day held in February 1998 for members of the Community Advisory Committee, a similar orientation day was organised in October 1998 for the Coordinators of the 21 catchments of the Basin and other interested persons. This '0 Day' was very well attended and provided a valuable networking opportunity for the Catchment Coordinators as well as a valuable opportunity for Commission staff on all major projects and Coordinators to exchange information and to network. Topics covered included: the Basin Sustainability Program (including integrated catchment management, Strategic Investigations and Education, and the Murray-Darling 2001 funding program); the Irrigation, Dryland, Riverine, and new Operating Environment (human dimension) subprograms; carp control; Geographic Information System; and the Cap. These capacity building opportunities are important for the Basin-wide perspective which is fundamental to achieving the goals of the *Initiative*.

2.2 PARTICIPATION

Murray-Darling Basin Commission processes

The community is actively involved in the *Murray-Darling Basin Initiative*. The Community Advisory Committee met three times in 1998–99, twice in formal meetings and on the third occasion at the Community Advisory Committee–Commission Workshop (see below). The Committee Chairman attended all Ministerial Council and Commission meetings during the year.

The Committee provided advice from a community perspective at a range of Murray-Darling Basin Commission forums, committees and working groups during 1998–99. It again expanded its representation on Commission working groups, responding to new directions, particularly in the *Initiative's* operating environment and all-important recognition of the human dimension. The Committee has two representatives (providing dryland and irrigation perspectives) on the Basin Salinity Management Working Group and participates at several levels in the new *Initiative* operating environment processes. Committee members also provided a community perspective in the following:

- The Water Policy Committee's consideration of the Hume and Dartmouth Dams operations review, the impact of corporatisation of the Snowy Scheme on the Basin, and ongoing implementation of the Cap on diversions including Schedule F to the *Murray-Darling Basin Agreement*.
- The Basin Sustainability Program Working Group's continued development of the catchment-based approach for integrated Action Plans, development of Three-Year Rolling Plans (see section 3.3.2) as the investment basis for the Basin, and the Strategic Investigations and Education program to support on-ground needs, including cross-sectoral issues beyond the Dryland, Irrigation and Riverine Issues Working Groups.
- The River Murray Flows Working Group representative sought a comprehensive tri-state consultation process to ensure informed participation by stakeholders as part of the establishment of environmental flows along the River Murray.

Joint Community Advisory Committee–Commission workshop

The Community Advisory Committee and the Commission held an inaugural joint workshop in September 1998 to consider natural resources management through the community-government partnership. The theme of the workshop was sustainability, impediments to sustainability, and actions to overcome them. The Committee held a planning session to prepare for this important workshop and to identify specific issues for joint development.

The joint workshop discussed four major issues: renewed commitment to a Vision for the Murray-Darling Basin; the *Initiative's* human dimension; development and implementation of a long-term strategy for investment in the Basin after the conclusion of current Natural Heritage Trust funding; and a protocol for the relationship between the Ministerial Council, Commission and the Community Advisory Committee. The Committee and Commission established a joint planning group to continue to progress outputs from the workshop. Tangible outcomes to date include the Committee's Workplan and development of a subprogram to investigate the social and institutional impediments as part of the *Initiative's* operating environment and human dimension (see below and section 3.2.10). The latter will provide a major new facet to policy implementation in the Basin.

Strategic Investigations and Education workshop

At the Ministerial Council meeting in March 1998 the Community Advisory Committee requested an opportunity for the full Committee to provide input into the priorities of the Strategic Investigations and Education program. In response, a

workshop was held in October of that year between the Committee and representatives of the Basin Sustainability Program, Riverine, Irrigation and Dryland Issues Working Groups. It is intended that these workshops be held triennially. The workshop allowed the Committee to participate in the planning process, the identification of future priorities (based on communities' needs from on-ground works) and identify any gaps in the current Strategic Investigations and Education program. The workshop identified six top priorities: soil management, documentation and accountability of the program, sustainable rangelands and drylands, water availability and quality, floodplain management and harvesting of overland flows and the human dimension (communication, partnerships and urban issues). These suggested priorities were considered by relevant working groups during the 1998–99 revision of the Strategic Investigations and Education Three-Year Rolling Plan (see section 3.3.2).

2.3 ISSUES

The Initiative Operating Environment

The Community Advisory Committee played a lead role in bringing attention to the importance of the 'human dimension' in managing natural resources, as part of the social and institutional operating environment for the *Initiative*. This operating environment has been recognised in the creation of a fourth subprogram and overarching management principles for the Basin Sustainability Program. As the ultimate 'user' of the outcomes of this operating environment, the community via the Committee is significantly involved in its development by membership of the Project Board, representation on the relevant Working Group and participation in subgroups and workshops. The Committee recognises the need for significant involvement in development of this area, based on experience from the past decade in bringing about on-ground change through the philosophical approach of integrated catchment management.

Dryland salinity

The dryland salinity hazard facing the Basin is a key issue currently being addressed by the Commission. The Community Advisory Committee recognised the importance of communication on this issue and sought information that could be provided to catchment communities. In its reports to the Ministerial Council, the Committee also emphasised it can play two major roles: communicating the hazard to communities; and providing a 'reality-check' perspective during the development and review of options for salinity management.

Implementation of the Cap on diversions

The Community Advisory Committee continued to be involved in implementation of the Cap, and in 1998–99 focused on providing a community perspective on the adequacy of monitoring for the Cap. The Committee held a workshop in July 1998 with the Chairman of the Independent Audit Group to discuss the detail of the Commission's annual 'Water Audit Monitoring Reports'. The Committee provided advice on the format, data and communication aspects of the report. This feedback received a positive response from the Commission and is reflected in the subsequent audit reports.

Basin Sustainability Program

The Community Advisory Committee participated in the Commission's current review of the Basin Sustainability Program, primarily recommending the addition of a Key Result Area on Cultural Heritage (see below). The Committee and its members expressed their concern to the Natural Heritage Trust Board regarding the reduction of Commonwealth funding to the Murray-Darling 2001 program by the use of those funds for capital works within the Basin. It also emphasised the importance of investment in natural resources management beyond 2001, based on a long-term strategy rather than short-term grant programs. The community, via its Catchment Committees, plays an integral role in preparation of the Community–State Three-Year Rolling Plans which outline investment priorities and catchment-based activities for the development and implementation of Action Plans to address the future sustainability of the Basin (see section 3.3.2). The Committee also considered issues relevant to delivery of the Irrigation, Dryland and Riverine subprograms of the Basin Sustainability Program.

Given the ongoing importance of investigations, research, planning and education, the Committee actively supported establishment of the northern laboratory of the Cooperative Research Centre for Freshwater Ecology, the continuation of that centre, and the directions of the Commission's Strategic Investigations and Education program.

Cultural heritage

The Community Advisory Committee continued its consideration of issues relating to Aboriginal involvement in natural resources management and recognition of cultural heritage in the Basin and has identified and considered a range of possible ways to advance these issues. The Committee worked with the Commission and advised the Ministerial Council on the need to include a Key Result Area in the

Basin Sustainability Program on cultural heritage to recognise this important element of the Basin. At its meeting in May 1999 the Ministerial Council agreed that this is a high priority strategic issue and that the Commission needs to invest resources in evaluation and understanding of issues and practices in relation to Aboriginal involvement and cultural heritage. The Committee has also urged states, through the Ministerial Council, to include Aboriginal representatives on Catchment Committees, but recognises that for this to be beneficial there must be support mechanisms.

Floodplain management

The Community Advisory Committee considered issues relating to floodplain management during the year. Both the northern and southern communities of the Basin recognise the importance of floodplain management but for differing reasons: overland flow and water sharing between landholders and the environment, and levee protection and the impact of levee banks. There is common understanding about the human impact on flooding and drainage patterns and about management of the floodplain as a legitimate element of the river system. The Committee is supportive of community involvement in wetlands rehabilitation and recognises the importance of this work for the health of the Basin's wetlands and its relevance to the ongoing need for water-use efficiencies with benefits for both consumptive uses and the environment. However, the Committee recognises that work needs to be finalised on measurement of water savings and associated accounting procedures, on principles for treating water savings, and on ownership of water savings prior to any water trading occurring.

National Natural Resource Management Statement

In September 1998 the Commonwealth Government announced a major initiative to prepare a National Natural Resource Management Statement which will articulate a long-term vision and policy framework for natural resources management and sustainable agriculture within the economic and social dimension of rural and regional Australia. The Community Advisory Committee was identified as a stakeholder group in this process and actively participated in meetings and workshops to make an important contribution to the development of this statement. The community of the Basin recognises that sustainable agriculture can no longer be considered in isolation from broader natural resource, social and economic issues. The statement should provide a broad philosophical approach to managing natural resources and thereby the implications and opportunities for managing agriculture.

2.4 COMMUNICATION

Newscan

During the year, the Community Advisory Committee continued to prepare a weekly press clipping service, *Newscan*, which provides wide-ranging perspectives on natural resources management issues across the Basin, as a free awareness-raising activity. The effectiveness of this popular service in achieving its aim was reviewed during the year. In response, *Newscan* has attempted to extend its coverage of issues in the north-west of the Basin and to provide articles on an increased range of relevant topics. A majority of readers thought *Newscan* had definitely given them a greater understanding of how issues are interwoven in the regions of the Basin and provided other considerable positive feedback.

Curlew

Three editions of the Community Advisory Committee newsletter *Curlew* were produced and distributed widely throughout the Basin. Each edition varied in its content between issues relevant to the various catchments in the Basin, Commission programs and recent publications and information on Committee members so the community is aware of its representatives.

Internet

The Community Advisory Committee has a page on the Commission's website, and increasing numbers of Committee members have obtained Internet connections, particularly valuing the Farmwide Satellite Trial being run by the National Farmers' Federation. Electronic communication is proving to be a valuable and rapid additional method of communication amongst Committee members and Basin communities.

3. NATURAL RESOURCES MANAGEMENT

In working to help achieve the purpose of the *Murray-Darling Basin Agreement*, the Commission's objective is:

> *To foster joint action to achieve the sustainable use of water, land and other environmental resources of the Basin for the national benefit of present and future generations.*

The Natural Resources Management Strategy, endorsed by the Ministerial Council in 1990, remains the foundation document providing the strategic framework for the community-government partnership to develop strategies for integrated management of the Basin's natural resources on a catchment basis.

3.1 VISION FOR THE BASIN

The Murray-Darling Basin Commission was formed in 1988 and, after a decade of operation, revisited some of its high-level strategies during 1998–99. In June 1999 Commissioners and Deputy Commissioners participated in a workshop to do a 'stocktake' of integrated catchment management in recognition of the evolutionary change that had occurred under the Natural Resources Management Strategy.

Commissioners reaffirmed their commitment to integrated catchment management and the partner governments have supported in principle a strengthened role for the Commission in setting water quality targets for major catchments, negotiating the trade-offs in natural resources outcomes across catchments and administering accountability at the catchment level. The philosophy for integrated catchment management will be further refined and the institutional framework further developed in 1999–2000.

In 1997–98 the Commission reviewed the strategic priorities required for natural resources management in the Basin over the next decade. These priorities are being met through a series of key projects which are being implemented by Project Managers located in the Office of the Commission. Most projects are overseen by high-level Project Boards, comprising Commissioners or Deputy Commissioners, which report directly to the Commission.

Among these strategic priorities and projects, two stand out as crucial to advancing the Commission's objective. Through its administration of the Ministerial Council's Cap on diversions, the Commission is at the forefront of national policy for natural resources management. The Cap is the cornerstone of a number of policies and strategies designed to manage water resources for scarcity: water trading, environmental flows and security of property rights. In response to preliminary indications that rising salinity in dryland catchments is a serious threat to the Basin's water, environmental and infrastructure assets, the Ministerial Council decided in 1998–99 to prepare a comprehensive new salinity management strategy that would incorporate a revised Salinity and Drainage Strategy. It is likely that this strategy will drive change in land uses in the Basin's catchments.

On the other hand, the Commission has the Basin Sustainability Program in place to guide and evaluate longer-term investment in sustainable natural resources use. In reviewing the Basin Sustainability Program and catchment management generally in 1998–99, the Commission was able to estimate the level of planning and commitment for the *Initiative* and will be better able to advise the Ministerial Council on future options.

3.2 MAJOR ACTIVITIES CONTRIBUTING TO THE INITIATIVE

Ten high-level Project Boards were set up during the year (see box 1) to help target projects and ensure their outcomes address the key natural resources management issues in the Basin in an integrated way. Progress achieved for major projects during the year are outlined below. Two projects associated with water resource management (Lake Victoria and Mitta Mitta) are described in chapter 4.

Box 1 Murray–Darling Basin Commission Project Boards

- Auditing and Managing Implementation of the Cap
- Pilot Interstate Water Trading
- Environmental Flow Management and Water Quality Objectives for the River Murray
- Basin Salinity Management Strategy
- River Murray Floodplain Management
- Murray-Darling Basin Fish Management
- Communication Strategy; Initiative Operating Environment Strategy
- Monitoring and Evaluation Strategy
- Lake Victoria Cultural Heritage
- Mitta Mitta Ex-Gratia Payments

3.2.1 The Cap

In 1995 the Ministerial Council decided to Cap diversions in the Murray-Darling Basin (see box 2). This decision, now called 'the Cap', was one of Council's most important initiatives. In 1996 the Ministerial Council directed that the Cap be reviewed by June 2000.

Implementing the Council's decision requires considerable input from the *Initiative*'s state government partners. Progress has been made over 1998–99 in all the areas outlined in box 2, although it is expected that finalising the details of the definition of the Cap in each river valley will not be completed before June 2000. A major component of this outstanding work is to complete and obtain Commission approval for the models which will be run at the end of each season to calculate the climate-adjusted Cap targets for each river valley. These Cap targets will be compared with the measured diversions to determine whether the river valley is complying with the Cap.

Box 2 What is the Cap?

The Cap is the balance struck by the Ministerial Council between the significant economic and social benefits that have been obtained from the development and diversion of the Basin's water resources on the one hand, and the environmental requirements for water in the rivers on the other.

The Cap is the volume of water that would have been diverted under 1993–94 levels of development. In unregulated rivers this Cap may be expressed as an end-of-valley flow regime.

By limiting future growth in consumptive water use, the Cap promotes the sustainable use of the Basin's resources by:

- preserving the existing security of supply for water users within river valleys;
- helping maintain water quality;
- encouraging the efficient use of water which reduces waterlogging and land salinisation; and
- preventing further deterioration of the flow regime for the environment.

The key tasks in each state in implementing the Cap are:

- defining and monitoring all diversions;
- determining in detail the development conditions such as crop areas, irrigation infrastructure and management rules that define the Cap in each river valley;
- developing and calibrating the models which will be used to calculate the Cap target in each river valley at the end of each water season;
- obtaining Commission endorsement that the calibrated river valley models are fair and accurate representations of the approved Cap;
- streamlining the processes for collecting and collating diversion data and producing annual reports on diversions and compliance with the Cap; and
- fine-tuning water allocation rules to ensure that diversions stay within the Cap in all designated river valleys as required.

In September 1998, the Independent Audit Group once again audited compliance with the Cap during the 1997–98 water year and progress with the Queensland Water Allocation and Management Planning process. The Independent Audit Group's report was published in November 1998.

The Audit Group concluded that diversions in South Australia and Victoria were within the Cap.

In New South Wales, diversions were within the Cap in the Murray, Namoi, Gwydir, and Macquarie river valleys and at the upper end of the Cap confidence limit on the Murrumbidgee. On the Barwon-Darling and Border Rivers, diversions were unlikely to be within the Cap, while on the Lachlan, diversions had exceeded the Cap. In response to these findings, New South Wales replied that the environmental flow rules it implemented in July 1998 would act to ensure that long-term average diversions stayed below the Cap in the future.

In Queensland, the Independent Audit Group found diversions were at record levels. Water Allocation Management Plans were unlikely to be completed until June 2000 and the Queensland Cap would not be finalised before then. The Audit Group considered that diversions by individual Queensland licence holders should be capped at 1997–98 levels until the process is completed. In response to the Audit Group report, Queensland replied that introducing a regulatory approach to managing total extractions was inappropriate at this advanced stage of its highly consultative planning exercise for the Water Allocation Management Plans.

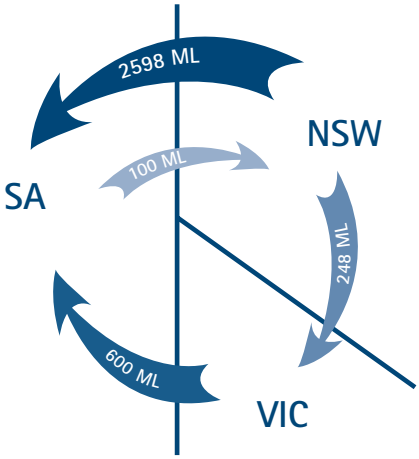
The Project Board managing the review of the operation of the Cap commenced planning during the year. The review will focus on the issues of equity, sustainability, compliance and regional development. The Board will report to the Ministerial Council on the review findings in June 2000.

3.2.2 Pilot interstate water trading

In November 1997, the Murray-Darling Basin Ministerial Council approved the establishment of a pilot project that would introduce permanent interstate water property rights trade in the Mallee region of the Basin. The aim of the pilot project was to facilitate the permanent interstate trade of water within the Murray-Darling Basin and so promote increased water-use efficiency. It would also assist the irrigation industry to become more economically sustainable by facilitating the movement of water from current irrigation activities to higher value irrigation developments that are subject to rigorous environmental clearances.

The Pilot Interstate Water Trading Project commenced in January 1998 with trade limited to the buying and selling of high security water between private diverters in the Mallee region of Victoria, New South Wales and South Australia (from Nyah to the Barrages). This arrangement avoided complications such as those that can arise from trading water of different levels of security. The first trade took place in September 1998, and another 18 occurred by the end of June 1999. A total of 3431 megalitres of water was traded across state borders during 1998–99 (see figure 2).

Figure 2 *Volumes of water (megalitres) permanently traded between states*



An improved system of water trading, particularly across state borders, will enable the water to be traded to high-value enterprises such as horticulture and viticulture where it can generate greater economic and environmental benefits.

Administrative and legal procedures have been established to facilitate permanent interstate trade, occurring under the auspices of the Pilot Project. Arrangements are also being put in place to monitor the economic and environmental impacts of the Pilot Project to ensure that the trade is achieving the desired economic outcomes without compromising the environment. Already, the information related to the permanent interstate trades indicates that water is moving from low-value uses to higher-value irrigation developments. A 1999 review of the environmental clearances that apply to new irrigation developments showed that new enterprises are being developed in suitable sites and largely managed in accordance with the environmental standards required by the states.

Work also commenced in late 1998 on examining impediments to a more widespread permanent interstate water market. One aspect of this work was to examine the potential for different water delivery charges within irrigation districts to distort the interstate water market. This work found that such charges would not distort the interstate water market and, as a result, the Pilot Project was expanded on 14 May 1999 to include individuals holding high security water entitlements within pumped irrigation districts in the Mallee region.

The project will be reviewed in the year 2000 and, if considered successful, will be further extended to include other water users and regions within the Murray-Darling Basin. While the Pilot Project is currently only small in its geographic coverage and volume of trade, it has provided an effective means to investigate impediments to more widespread trade (including temporary and intrastate trade) and to develop principled solutions to overcome these impediments. The Pilot Project therefore has direct relevance to the expansion of both intrastate and temporary trade in the future.

3.2.3 Environmental flows for the River Murray

Increased demand for water continues to emphasise the need to manage river flows in the Basin in a way that protects and enhances riverine environments. All states are managing water resources in a way that recognises the need to provide water for the environment. The Commission has undertaken to work with the governments and communities of New South Wales, Victoria, the Australian Capital Territory and South Australia to implement environmental flows specific to the River Murray.

During the year, the Project Board developed a comprehensive plan of action that will lead to the development of revised flow rules that balance existing demand for water with the needs of the environment of the River Murray. Proposed key elements of the project include:

- establishment and facilitation of a Working Group and community reference group(s) to review and assess recommendations of reports (including Scientific Panel, Hume and Dartmouth Dams Operational Review Final Report, Barmah-Millewa Forest watering report);
- development of the Decision Support System to assist in the determination of alternative river operating regimes;
- review and consideration by the Project Board of responses from participating groups;
- review of constraints and rules impinging on existing and future river operations;
- enhanced modelling capabilities for the testing of alternative river operation and goal-seeking scenarios; and
- development of proposals for modification and/or optimisation of river operations to meet the environmental needs of riverine habitats.

During the year, the Commission concluded the Environmental Flows Decision Support Program. A successful trial of the Decision Support System software in the Border Rivers was completed in conjunction with CSIRO. Other works nearing completion include the Ecology Flows Handbook, to support the Decision Support System, and publication of Scientific Panel reports presenting environmental flow options for the River Murray, the Barrages and lower Darling River.

In October 1998, the Commission released 97 gigalitres of water from the Hume Dam to achieve important environmental benefits in the Barmah-Millewa forest. The forest, which extends along either side of the River Murray upstream of Echuca and covers some 70 000 hectares, contains a unique range of wetlands habitats

which are of very high environmental value. The Barmah section of the forest has been declared a Ramsar wetlands site of international significance.

The special-purpose release in October was the first of its type and was used to supplement flows from the Ovens River to maximise the potential for bird and fish breeding and tree growth. The environmental allocation was supported by a wide range of community groups, land managers and government agencies. The allocation achieved important environmental benefits while having minimal impact on the security or size of the water allocations made available to irrigators during the summer.

A detailed assessment of the October 1998 flooding will be published by the Barmah-Millewa Forest Annual Forum in the 1999–2000 financial year.

Box 3 Environmental water allocation for the Barmah–Millewa forest

Allocation of water for environmental purposes in the Barmah-Millewa forest was first approved by the Murray-Darling Basin Ministerial Council in 1993. The Ministerial Council approved an annual environmental allocation of 100 gigalitres (100 billion litres) to the forest, comprised of 50 gigalitres each from New South Wales and Victoria.

This followed extensive public consultation undertaken as part of the process of preparing a Water Management Strategy, a Business Plan and an Annual Operating Plan for the forest. Implementation of the Water Management Strategy and Business and Operating Plans is being carried out in consultation with the Barmah-Millewa Forest Annual Forum and Advisory Committee, which has government and community representatives.

3.2.4 Salinity and Drainage Strategy

The Salinity and Drainage Strategy of the Murray-Darling Basin came into effect on 1 January 1988 and was formally adopted by the Ministerial Council in April 1989. The strategy provides a framework for joint action by the New South Wales, Victorian, South Australian and Commonwealth governments to effectively manage the pressing problems of waterlogging and land salinisation in the irrigation districts of the Murray Valley in New South Wales and Victoria and river salinity in the lower Murray. The strategy is based on a balance between engineering (salt interception schemes) and non-engineering (land and water management) solutions, which tackle both river salinity and land salinisation.

Under the strategy, no state is to construct works or approve any proposal that will have an adverse impact on the salinity of the River Murray, unless it has previously earned 'salinity credits' by contributing to salinity mitigation works. The Commission maintains a register of various actions undertaken that increase or decrease river salinity, and determines the net salinity credits available to New South Wales and Victoria.

At the end of June 1999, New South Wales had a credit on the register equivalent to an average salinity change at Morgan, South Australia, of 2.46 EC. Victoria's credit was equivalent to 6.66 EC. The total reduction in salinity at Morgan achieved by the joint works undertaken since implementation of the strategy is 61.06 EC.

The changes made to the register in 1998–99 were:

- Salinity debits for New South Wales Land and Water Management Plans were changed to reflect the 5.0 EC credits allocated to these plans by the New South Wales Government.
- Salinity credits for Psyche Bend Scheme near Mildura, Victoria, were changed based on revised assessment of the salinity benefits from the scheme.
- Salinity credits for Barr Creek Catchment Management Plan near Kerang, Victoria, were changed to account for increased uptake of on-farm works within the plan.
- Salinity debits for Koondrook Murrabit drains were changed to reflect the 0.1 EC credit allocated by the Victorian Government.
- Various schemes assessed during 1998–99 and found to have insignificant salinity impact were included in the footnotes to the Register.

A review of the Salinity and Drainage Strategy's performance was begun in October 1997. As part of the review, the Commission collaborated with state agencies to prepare an audit of the potential salinity regimes of both the land and the rivers in each subcatchment across the Basin. This study has become known as the Basin Salinity Audit. The audit involves making predictions of the extent of future salt loads mobilised through groundwater movements and the consequent projected salinity regimes in the main rivers for the years 2020, 2050 and 2100 (see box 4). Preliminary results of the salinity audit became available in November 1998.

Box 4 Salinity in the Murray–Darling Basin

Over the past decade, the Commission's response to salinity has been focused on the drainage of saline water from irrigation districts in the riverine plains and the rising salinity levels in the lower reaches of the River Murray. Today it is recognised that the broad-scale rise of water tables beneath cleared dryland areas across the catchment, resulting in shallow water tables and salinisation of land and streams, is a more intractable problem. An audit of the salinity hazards across the Basin, begun in 1997, has revealed that without further intervention, dryland salinity poses a rising threat to the rivers of the Basin. Dryland salinity also threatens ecological values and causes expensive damage to public and private infrastructure such as roads and buildings. This threat is more widespread and severe than previously recognised.

The Basin Salinity Audit will provide:

- more accurate estimate of trends and future damage;
- improved understanding of the impact of current investments; and
- opportunity to adjust policies and programs.

Basin salinity

At this stage, the Basin Salinity Audit is being undertaken on the basis of hydrogeologic predictions for each river valley based on the observed rate of rise of the groundwater, the current depth to the groundwater and its salinity concentration. These predicted estimates are being checked against current estimates of shallow water tables and discharges.

It is not only agriculturally productive land that is at risk; urban infrastructure and environmentally sensitive areas are also suffering. Early results of the audit also indicate that water logging could extend over 5 to 10 million hectares within 50 to 100 years and that a significant proportion of this will become salinised. The audit will attempt to draw together all current information and predictions for these issues.

An estimate of dryland salinity occurrences in the Basin in 1996 is shown in the map below. Maps of current and potential salinity hazards have been prepared by the Commission and, after validation, will be available in October 1999.

River salinity

The Commission's salt trends report of 1997 confirmed the increasing salinity trend in most of the rivers of the Basin. The Basin Salinity Audit is projecting salinity levels 20, 50 and 100 years into the future.

Preliminary data from the audit suggest that salinity levels at Morgan, a benchmark station on the River Murray, will rise by around 40 per cent over the coming 50 years and by 2100 its average salinity will exceed an international benchmark for desirable drinking water quality.

For key rivers in New South Wales – the Macquarie, Namoi, Lachlan, Castlereagh and Bogan rivers – and in Queensland – the Condamine, Balonne, Warrego and Border rivers – the river salinities will exceed the desirable drinking water quality benchmark in as little as 20 years. Most importantly, however, the audit predicts variability in salinity and duration of exceedance for water quality benchmarks for reaches of rivers. For reaches of the rivers named above, crop and environmental impacts will occur.

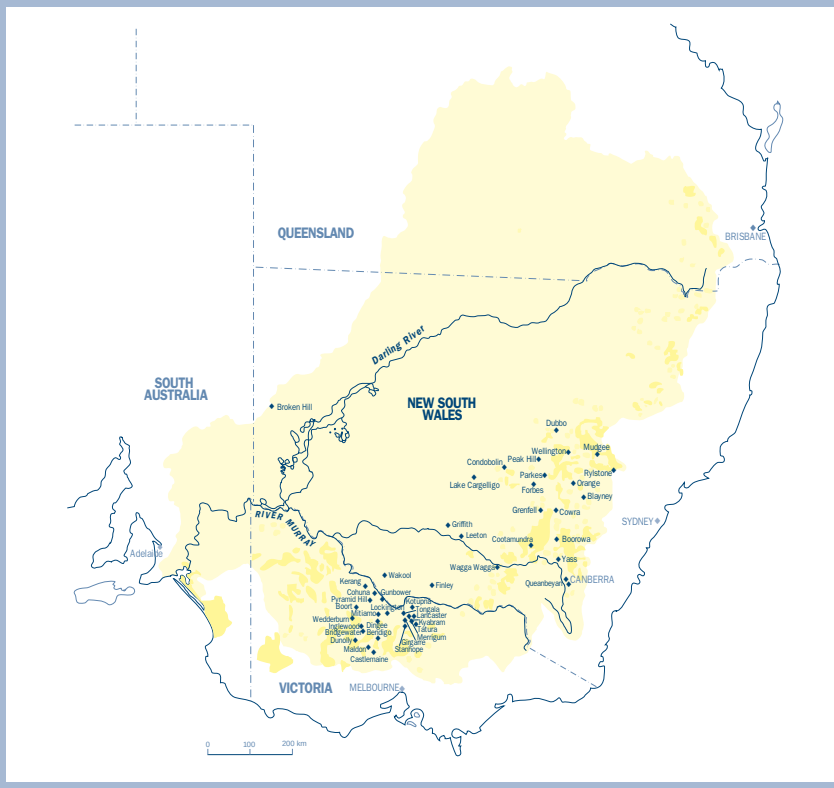
Land salinity

On the other hand the estimates for land salinity are not so precise. It is confidently predicted that if no new management interventions occur then salt-affected land is likely to rise to 1.2 million hectares in Victoria and 130 000 hectares in South Australia. For New South Wales and Queensland, reliable predictions are not possible but areas of risk are 3 to 4 million hectares and up to 600 000 hectares respectively.

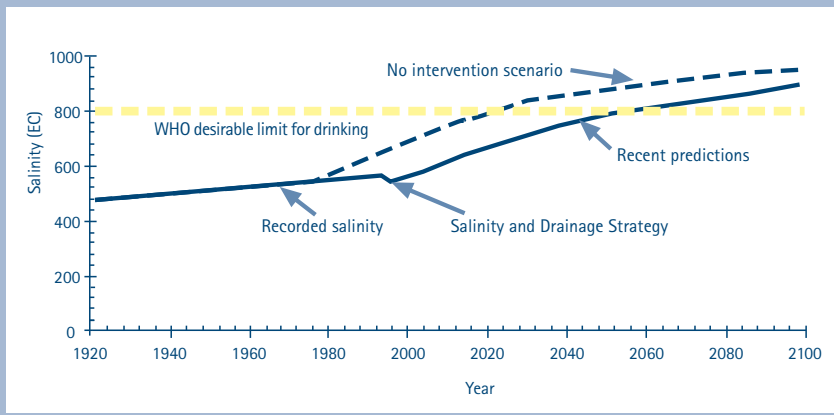
Implications of the Basin Salinity Audit

- There is now a good understanding of the salinity processes.
- The extent of the problems caused by salinity is more serious than previously recognised, but still difficult to assess accurately.
- Recent investment has been in the right direction but insufficient to stabilise salinity at current levels.
- The scale of the problem, the interaction between causes and effects, and the prospects of off-site impacts reinforce the importance of the integrated catchment management approach.
- A future Basin Salinity Management Strategy will need to provide policy and management elements which vary regionally to accommodate the local variations in impacts and costs, and the capacity of communities and governments to respond.
- Current agricultural systems, including current best practices, are inadequate to address the emerging salinity problems.
- There is time to address the sleeping giant of salinity.

Dryland salinity occurrences in the Murray-Darling Basin



Salinity at Morgan, forecast by the Basin Salinity Review



In addition to this audit of salt loads and salinisation hazards, the Commission initiated studies into the economic implications of high salinities in rivers. A consultancy to review the cost functions used for assessment of salinity credits and debits for the Salinity and Drainage Register was completed during 1998–99. Work has commenced on assessing the implications of the study's findings on the register and future schemes and incorporation of these results in the Commission's models.

Other studies initiated during the year included an examination of the effectiveness of the salinity mitigation works and their integrated management and a review of the salinity impacts of various land, water and salinity management plans across the Basin.

The above package of studies will be brought together during 1999–2000 as a major part of investigations for the Basin Salinity Management Strategy (see following section).

3.2.5 Basin Salinity Management Strategy

In November 1998, the preliminary results of the Basin Salinity Audit (see section 3.2.4) highlighted significant emerging salinity issues around the Murray-Darling Basin (see box 4). Following briefings to the Commission and the Ministerial Council, the Council requested the Commission prepare, by June 2000, a draft Basin Salinity Management Strategy (see box 5) as the key means of addressing the significant threats posed by salinity.

Development of the draft strategy commenced through a Project Board and will draw extensively on the results of the Salinity and Drainage Strategy Review (see section 3.2.4), including the Basin Salinity Audit and other significant studies supported through the Commission's Strategic Investigations and Education program.

The project will include both new initiatives and the acceleration of existing Strategic Investigations and Education studies, and will be undertaken in the context of the Commission's participation in the national water agendas of COAG, the National Dryland Salinity Program and the National Land and Water Resources Audit. This approach recognises that addressing the salinity issue will involve collaboration across a range of disciplines, and that considerable effort has already been put into these problems, both in irrigation and dryland regions.

During the year a major workshop was held to lay the framework for the strategy. The workshop emphasised:

- the need to deal with four key aspects, that is, water quality, environment, productive capacity of land and water, and impacts upon built infrastructure; and
- the need to establish local obligations and targets for adoption through the integrated catchment management approach.

Box 5 Proposed Murray-Darling Basin Salinity Management Strategy

The strategy will:

- build upon the principles of accountability in the existing Murray-Darling Basin Commission Salinity and Drainage Strategy;
- incorporate a wider range of outcomes, including water quality, dryland salinity, infrastructure and environmental impacts;
- describe the long-term aspirations of the Ministerial Council for salinity management in the Basin; and
- include responsibility, accountability and an indicative investment framework for all stakeholders, not just governments, in addressing salinity within the Basin.

The draft strategy will articulate:

- physical trends in salinity for both water and land;
- the need to optimise the productive capacity of land while protecting water quality and the environment;
- changing market trends; and
- the need for regional development.

3.2.6 Algal management

The Ministerial Council approved an Algal Management Strategy for the Murray-Darling Basin in October 1994. In accordance with the strategy the Commission initiated a project in August 1998 to collate information and report on algal management activity in the Basin. A report on this project will be available towards the end of 1999.

Despite the significant efforts made to reduce the frequency and intensity of blue-green algal blooms in the Basin's rivers, such problems were still common during 1998–99 (for example, see section 4.2.2). This is not surprising considering the time it takes to convert knowledge to action and for such action to change the environmental conditions that promote the growth of blue-green algae.

The extent to which algal blooms are occurring – and the overall impact they are having – are the subjects of concurrent reviews being undertaken during the second half of 1999. The results of these projects will give a better picture about the extent, frequency and consequence of blue-green algal blooms in the Basin.

Under the provisions of the Murray-Darling Basin Agreement, the Commission should be informed of any proposal that may affect the water quality of the River Murray. During 1998–99, the Commission provided comment on a number of proposals to ensure Council's water quality policy was not compromised as a result of any development adjacent to the river.

3.2.7 Floodplain Wetlands Management Strategy

Floodplain wetlands are essential to the maintenance of the hydrological, physical and ecological health of the riverine environment and provide economic, social and cultural benefits to the broader community. Despite their importance, however, wetlands have been one of the least valued and most abused of Australia's natural resources. Of particular concern is the degradation of wetlands on river floodplains – the most predominant type in terms of numbers and area – within the Murray-Darling Basin.

On 2 February 1999 – World Wetlands Day – the Chairman of the Murray-Darling Basin Ministerial Council, the Hon. Mark Vaile MP, launched the Floodplain Wetlands Management Strategy for the Basin. The strategy aims to guide and support investment in on-ground action and research to enhance the condition of floodplain wetlands in the Murray-Darling Basin.

The development of the Floodplain Wetlands Management Strategy for the Murray-Darling Basin commenced in 1992, when a national Floodplain Wetlands Management Workshop was convened. Problems and solutions identified at the workshop have been comprehensively developed into the strategy. Through an extensive process of collaboration and consultation on draft documents, the strategy essentially incorporates the desires and views of the Basin's natural resources management, scientific and wider communities.

One of the most important intentions of the strategy is to encourage close cooperation between policy-makers, agency staff, researchers and the community. In this regard, implementation of the strategy is being pursued through a range of existing and future policies and programs. These include:

- implementation of the Ministerial Council's Cap on water diversions in the Basin (see section 3.2.1) which arrests the continuing decline in river health associated with increasing diversions;
- the allocation of 100 gigalitres each year for the watering of the Barmah Millewa Forest Wetlands – the world's largest River Red Gum forest system (see section 3.2.3);
- the development of a flow management plan for the entire River Murray; and
- the funding of investigations of wetland systems.

The Basin Sustainability Program (see section 3.3) will provide the vehicle for the planning, evaluating and reporting on activities deriving from this strategy.

3.2.8 Fish management

Native fish species in the Murray-Darling Basin have suffered serious decline in both distribution and abundance since European settlement. Although there are a variety of factors contributing to this situation, including competition from exotic fish, water pollution and g/eneral habitat deterioration, it has long been recognised that a major factor is the construction and operation of dams and weirs. As such, the Murray-Darling Basin Commission has assigned a high priority to native fish regeneration in the Basin.

A Project Board is directing the development and implementation of a strategic framework for fish management in the Basin, to provide advice on progress and outcomes and to ensure that these outcomes are consistent with the overarching strategic framework.

The strategic framework for the project will be a Fish Management Strategy for the Murray-Darling Basin, which will guide decisions on priority activities, inputs and outcomes. The strategy's progressive implementation will be the core of the project. The strategy will update and extend the integrated framework developed by the 1991 Fish Management Plan for the River Murray across the entire Basin. Preparation of the strategy is well under way and is expected to be finalised by about August 1999. Work also started on a discussion paper outlining a strategic Basin-wide approach to fish passages, a final version of which is also expected in August 1999.

Following an earlier agreement with the Murray-Darling Basin Ministerial Council that the Commission would take a leading role in the coordination of appropriate action for the control of carp, in September 1998 a Carp Control Coordination Group was formed. The Commission convenes the group and will provide secretariat support over its two-year tenure. The role of the group is to coordinate the management and control of carp at a national level, with a special focus on the Murray-Darling Basin.

The Carp Control Coordination Group commenced the preparation of a National Management Strategy for Carp Control and a Strategic Research Plan. It is envisaged that after the draft strategy is considered by the relevant Ministerial Councils, it will be subject to a public comment phase, with a view to it being finalised by March 2000. The research plan will be used to direct investigation of critical knowledge gaps and closely integrate these with the information requirements of the strategy. During the year, to assist in its work, the group also initiated the development of a national database of carp research projects and a spreadsheet of Commonwealth, State and Territory legislation relating to carp.

Key findings from the work of the group during 1998–99 include:

- carp are both a symptom and a cause of degraded riverine environments;
- eradication of carp across the continent is unachievable with current technology; and
- critical goals must include controlling the spread of the species and reducing its impact to acceptable levels.

3.2.9 Initiative Communication Strategy

All aspects of the Murray-Darling Basin Commission's work as part of the *Initiative* involve communication. The need to develop a comprehensive new Communication Strategy for the Commission was identified as a priority issue at all levels of the Commission in 1998–99.

In November 1998 the Project Board overseeing the development of the strategy approved its strategic focus. The strategy will focus on:

- delivery of education products and networks;
- technology transfer and adoption;
- partnership building and community participation; and
- marketing and networking around agreed public policies that relate to the *Murray-Darling Basin Initiative*.

Community consultation to underpin the development of the strategy was carried out during the first half of 1999 to determine the communication needs of key stakeholders. Information was obtained through responses to a questionnaire, from telephone interviews with key individuals and from 30 focus groups held in six locations across the Basin and in the capital cities of the partner governments. The Communication and Operating Environment Issues Working Group will use information obtained from the consultation process to start developing the strategy in a workshop planned for July 1999.

It is intended the new Communication Strategy will be presented to the Community Advisory Committee and to the Commission for endorsement in the first quarter of 1999–2000.

To support the development of the new strategy, reviews were completed during the year of four Commission communication projects: the audio newstape *Basin Talk*, the video series *Tributaries*, the primary school writing project *Special forever* and the Algal and Dryland Salinity Adult Study Circle kits. Following the reviews, the Project Board for the Communication Strategy gave in-principle support for *Special forever* to continue for another three years, with some modifications to further improve the program. Review recommendations for the other programs will be used to help determine their future direction in the context of the new Communication Strategy.

Box 6 Special forever

Special forever is a Murray-Darling Basin Commission program for primary schools in the Murray-Darling Basin. Initiated by the Commission in 1993, it is jointly managed with the Primary English Teaching Association. The essence of *Special forever* is for children to write and produce artwork about their own areas to share with each other and the wider community. The program has been an effective way to create a picture of the Basin and establish links and empathy between different parts.

In 1998 almost 40 000 primary school children participated in the sixth year of the program, covering most areas of the Basin.

The 1998 *Special forever* anthology, *Our Place Our future*, was short-listed in The Australian Excellence in Publishing Awards.

In September 1998 the Commission launched its web site – the Basin Sustainability Information System. The site was further consolidated during the year as a source of information about the Murray-Darling Basin and key activities undertaken by

the Commission and the Ministerial Council. A review of the site's structure and content commenced in June 1999 to identify changes needed to ensure it supports a wide range of Commission activities.

3.2.10 Initiative Operating Environment Strategy

During 1998 the Community Advisory Committee discussed a range of issues relating to the skills and training needs of communities and, more broadly, the role of communities in natural resources management. At a workshop in September 1998, members of the Community Advisory Committee and Commissioners discussed the need for a common vision for the future of the Murray-Darling Basin's community-government partnership and explored the nature and importance of the human dimension of natural resources management.

Three major priorities were agreed to by Commissioners and the Community Advisory Committee members at the September workshop:

- The assumptions underpinning nearly a decade of a community-government partnership in integrated catchment management should be regularly tested to ensure that they are still relevant.
- The ideal integrated catchment management model for the Murray-Darling Basin should reflect a community development approach.
- Given the long-term horizons of sustainable natural resources management objectives, the partner governments' funding commitments should also be long-term rather than the current short-term cycles.

In response to the workshop outcomes the Commission agreed to give new emphasis to the human dimension of natural resources management as part of the *Initiative*. This was progressed through increasing the focus on the human dimension in the Basin Sustainability Program as part of an existing review (see section 3.3.1) and the inclusion of an objective in the program which will help ensure there is a better understanding of the social, institutional and economic contexts – at regional, national and global scales – that are relevant to achieving the purpose of the *Initiative*.

Key Commission activities in this area will be undertaken through the development and implementation of the *Initiative* Operating Environment Strategy for investigating the social and institutional context of the *Initiative's* operating environment. Development of this strategy commenced in late 1998 as a project overseen by the same Project Board responsible for the Commission's Communication Strategy.

Central to the draft Operating Environment Strategy is the proposal that the Commission undertake research into the social and institutional aspects of natural resources management. The Project Board endorsed six themes as the focus for future investigations: external factors or drivers; understanding the nature of change; the *Initiative*'s planning cycles, program delivery and implementation; linking biophysical, social and institutional elements; the structures and processes of integrated catchment management; and regional development. Investigations arising from the Commission's Integrated Catchment Management Workshop in June 1999 (see section 3.1) will be incorporated into the strategy and addressed as a high priority.

The strategy is being developed with input from the Communication and Operating Environment Issues Working Group and is planned to be finalised in July 1999 for endorsement by the Community Advisory Committee and the Commission in the first quarter of 1999–2000.

3.2.11 Monitoring and Evaluation Strategy

The Commission established a Project Board to oversee the development of a Monitoring and Evaluation Strategy for the Basin. The strategy will provide a blueprint for undertaking the following activities and closely linking the two:

- monitoring and reporting the condition of the Basin's natural resources and pressures associated with their use; and
- evaluating and reporting on investments in natural resources planning and management activities and the outcomes of those investments.

The Board approved a project brief in February 1999, and will consider a plan for developing the strategy in July 1999. The project plan will build on the existing planning, evaluation and reporting framework for the Basin Sustainability Program (see section 3.3.2) and on the review of the program's performance indicators (see section 3.3.1).

It is expected the strategy will benefit the *Initiative* by:

- improving the confidence of public and private investors that their efforts can make a difference in working towards sustainable natural resources management in the Basin;
- helping to target investments which give the greatest overall social, economic and environmental returns;

- providing accountability for public investment in natural resources management; and
- furthering a culture of integrated catchment management in the Basin.

3.3 DELIVERING THE NATURAL RESOURCES MANAGEMENT STRATEGY THROUGH THE BASIN SUSTAINABILITY PROGRAM

In 1996 the Ministerial Council established the Basin Sustainability Program as the planning, evaluation and reporting framework for the Natural Resources Management Strategy. The program has clearly defined objectives, key result areas and performance indicators – agreed in principle by the partner governments – to guide and report on all natural resources investments in the Basin.

The Basin Sustainability Program is not a funding program; rather it is the means for focusing government activity and community investment within the Basin on common objectives. These objectives aim to achieve significant improvements in the key result areas of:

- sustainable agricultural productivity;
- water quality; and
- nature conservation.

Box 7 Why is the Basin Sustainability Program important?

The Basin Sustainability Program is a critical aspect of the *Murray-Darling Basin Initiative*.

- It promotes integrated catchment management, providing a framework for stable, targeted investment in sustainable natural resources management and for evaluating outcomes of investment.
- It applies to all integrated natural resources management programs in the Basin – whether under the Commission's auspices, spanning many jurisdictions, or under the natural resources management responsibilities of individual States and the Australian Capital Territory, or through programs of the Commonwealth.
- It allows the Commission to 'value-add' through its unique role in 'brokering' collaborative arrangements for investment in investigations, communication and technology transfer, promotion and education, and coordinating and advising on resources for on-ground action.

The Basin Sustainability Program is implemented through three subprograms that encompass the variety of regions found within the Basin:

- the Riverine Environment Management Subprogram, covering the thousands of kilometres of biologically rich corridors that dissect the Basin's catchments;
- the Irrigated Regions Management Subprogram, covering areas of intensive irrigated land use in the Basin; and
- the Dryland Regions Management Subprogram, covering the Basin's most extensive areas incorporating dryland agriculture, rangelands and forests.

The Basin Sustainability Program also provides management implementation objectives to ensure the arrangements for natural resources management enhance the partnership between community and government, and help the managers of the Basin's land and water to protect its catchments.

The three subprograms interact significantly with each other and with the management implementation objectives. Design, implementation and reporting of their performance recognises this interaction and the need for integrated management of Basin-wide issues.

The main functions of the program are to plan, evaluate and report on investments to achieve outcomes in the key result areas through:

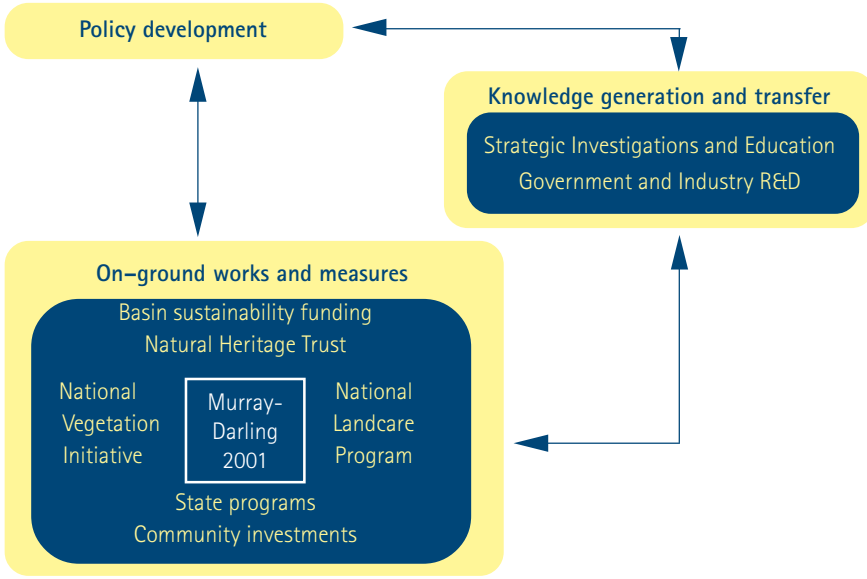
- policy development
- generation and transfer of knowledge
- implementation of on-ground works and measures.

The relationships between these three functions, and sources of government and community investments, are shown in figure 3.

3.3.1 Review of the Basin Sustainability Program

A stakeholder review of the Basin Sustainability Program objectives was commenced in 1998–99 to ensure that the program addresses the future needs of stakeholders and covers all relevant natural resources objectives to significantly improve the health of the Basin. The Community Advisory Committee, partner governments, and catchment management bodies were asked to advise whether the program objectives agreed by the Ministerial Council in 1996 addressed the major concerns facing the Basin.

Figure 3 *Principal functions of the Natural Resources Management Strategy and their relation to investment and management programs*



Outcomes of the review include a proposed greater emphasis on the social and institutional context for, and human elements of, natural resources management (see section 3.2.10), and on the inclusion of a cultural heritage key result area for the program (see section 2.3). The revised objectives are due for consideration by the Ministerial Council in October 1999.

Progress towards achieving the Basin Sustainability Program objectives will be measured through the use of performance indicators for short-term outputs (empowerment indicators), medium-term outputs (implementation indicators) and long-term outcomes (resource condition indicators). All the indicators were reviewed and tested for feasibility during 1998–99. The draft indicators were compared with other relevant indicators (for example, Natural Heritage Trust, State of the Environment, Standing Committee on Agriculture and Resource Management), and the most feasible were chosen for the program. Partners to the *Initiative* were then asked to advise for which indicators they had data and, on the basis of their responses, it was decided to test the feasibility of collating data for 30 of the indicators to obtain a Basin-wide picture. This trial raised a number of practical issues associated with data collection, collation and analysis for the purposes of monitoring resource condition and evaluating the outcomes of management responses across the Basin. A key issue was the need for compatibility of data across different regions.

3.3.2 Planning, evaluation and reporting frameworks

Effective management of the Basin's natural resources requires long-term planning and evaluation of outputs and outcomes and clear, concise reporting to support adaptive management. The Commission has established a range of planning, evaluation and reporting frameworks for *Initiative* activities. These frameworks are outlined below; the outcomes of activities in each area are outlined in section 3.5.

Policy development

The Commission is actively involved in policy aspects of the *Initiative*. It needs flexibility to react to issues of the day and to proactively direct those actions needed to support policy changes or develop new policies to address emerging issues (such as dryland salinity). The Commission's policy development activities are carried out primarily through its Strategic Program Development program.

In 1998–99 the Commission adopted a more rigorous approach to Strategic Program Development activities through the use of Project Boards (see section 3.2) and the implementation of a formal project management system which provides a transparent, controlled process for planning projects and reporting on them at Commission meetings.

Generation and transfer of knowledge

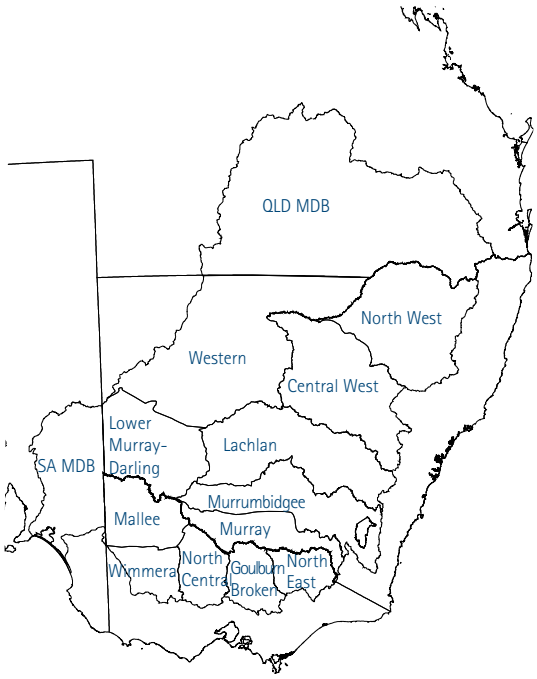
The Commission's generation and transfer of knowledge is aimed at the equitable, efficient and sustainable use of the Basin's natural resources and is implemented primarily through its Strategic Investigations and Education program. A Three-Year Rolling Plan provides the planning framework for Strategic Investigations and Education investment and is reviewed annually by the Basin Sustainability Program Working Group for the Commission. Issues Working Groups oversee the Riverine, Irrigation and Dryland investments under the Strategic Investigations and Education program. Each subprogram will be evaluated once every three years. In 1999–2000 a reporting framework will also be developed for the program.

Other investigations and education activities carried out by the partner governments also contribute to the overall generation and transfer of knowledge relevant to the Basin Sustainability Program. These activities are not, however, covered in this report.

On-ground works and measures

The planning, evaluation and reporting frameworks for on-ground works and measures are implemented primarily through the catchment management systems of the partner governments. The Basin consists of 14 regions each with a catchment management committee comprising community and government representatives. These regions are primarily based on catchment boundaries (see figure 4).

Figure 4 *Catchment management regions of the Murray-Darling Basin*



Every year, each State Contracting Government develops a Three-Year Rolling Plan outlining the outcomes to be achieved against Basin Sustainability Program objectives in each management region of the Basin for the proposed level of investment. These plans – based on regional, State and Basin priorities – help direct investment to activities with the best economic, environmental and social outcomes.

A consolidated Three-Year Rolling Investment Plan, based on the state plans, provides a strategic summary of government and community investment across the Basin and the outcomes sought from that investment to meet the objectives of the Basin Sustainability Program. It represents a summary of community aspirations for their regions over the next three years and the expected investment required to achieve those aspirations. The year 1998–99 was the first in which information was gathered in a consistent format to provide a Basin-wide summary (see section 3.4).

The Commission is developing a strategy to monitor and evaluate natural resources management investment in the Basin and the condition of the Basin's natural resources (see section 3.2.11). Until this strategy is implemented, annual reports prepared by the State Contracting Governments against their Three-Year Rolling Plans will allow some evaluation of progress towards achieving the Basin Sustainability Program objectives.

3.4 RESOURCING THE NATURAL RESOURCES MANAGEMENT STRATEGY

Funding to address the objectives of the Basin Sustainability Program and the Natural Resources Management Strategy is provided by a range of government programs and community efforts.

The 1998–99 summary of State Three-Year Rolling Plans showed that, over the next three years, more than 200 Regional Strategies and local Action Plans across the Basin (see table 3) will direct the delivery of an anticipated $2.5 billion of public and private investment to maintain agricultural productivity, protect the quality of water in the Basin's rivers and streams and protect the Basin's biodiversity (see tables 4 and 5). As part of this total investment the Commission supports funding programs under the *Initiative* as shown in table 6.

Table 3 Number of major strategies and plans identified in the Basin regions

NSW – Central West	13	Vic – Mallee	14
Lachlan	21	Wimmera	20
Lower Murray-Darling	8	North Central	22
Murray	10	Goulburn-Broken	17
Murrumbidgee	19	North East	14
North West	16	Qld Murray-Darling Basin	5
Western	5	SA Murray-Darling Basin	23
		Total	207

Table 4 Total proposed Basin Sustainability Program investment by subprogram, 1999–2000 to 2001–02

	$m
Riverine Environment Management	829
Irrigated Regions Management	836
Dryland Regions Management	617
Management Implementation	218
Total	2 500

Table 5 Total proposed Basin Sustainability Program investment by key result area, 1999–2000 to 2001–02

	$m
Sustainable Agricultural Productivity	801
Water Quality	945
Nature Conservation	536
Management Implementation	218
Total	2 500

Table 6 Murray-Darling Basin Commission funding programs in 1998–99

Murray-Darling Basin Commission Program	Funding allocation ($m)
Strategic Program Development	2.0
Strategic Investigations and Education	7.8
Murray-Darling 2001 (includes Irrigation Water Management)	80.73
Total	90.53

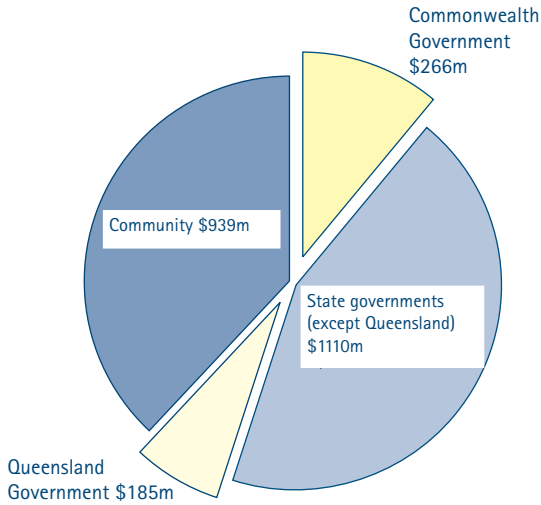
Note: The totals for Strategic Investigations and Education and Murray-Darling 2001/Irrigation Water Management exclude carry-over funds from 1997–98.

The proposed cost sharing arrangements between the community and government (see figure 5) relate only to costs that can be clearly tracked through an auditing process. Total community commitment is likely to be much higher than shown. The Three-Year Rolling Plans indicate the scale of government commitment to the Basin's needs and the extent to which the communities respond to that commitment. Governments can now have confidence that their involvement is clearly engaging the community.

Strategic Program Development

Strategic Program Development investment provides for the development and implementation of policies for natural resources management in the Basin, primarily through high-level projects (see section 3.2) and also to carry out statutory obligations of the *Murray-Darling Basin Agreement*. In 1998–99 $2.0 million was allocated to Strategic Program Development.

Figure 5 *Expected investments by governments and communities in Basin objectives, 1999–2000 to 2001–02*



Strategic Investigations and Education

The Strategic Investigations and Education investment supports knowledge generation and transfer (see section 3.3.2). The objectives of the program are to:

- support on-ground investments;
- assist policy development;
- report on the condition, trends and management status of resources, impediments to effective management, the most appropriate investments and performance; and
- transfer results to decision makers.

Strategic Investigations and Education investments in subprograms in 1998–99 are shown in table 7.

Murray-Darling 2001

Murray-Darling 2001 is a multi-partner program established principally to improve the health of the Basin's river systems through integrated catchment management of its land and water resources. It is delivered through the Natural Heritage Trust one-stop-shop. The Commonwealth contributes 50 per cent; the State governments provide matching funding.

Table 7 Strategic Investigations and Education investment in 1998–99

	Ongoing projects		New projects		Total projects	
Subprogram area	No.	$m	No.	$m	No.	$m
Riverine Environment	21	2.0	1	0.1	22	2.1
Irrigated Regions	32	2.0	2	0.3	34	2.3
Dryland Regions	15	1.7	8	1.0	23	2.7
Management Implementation	11	0.7	6	0.2	17	0.9
Total	**79**	**6.4**	**17**	**1.6**	**96**	**8.0**

Note: The above figures are total investment, representing $7.8 million contributed by Contracting Governments in 1998–99 and carry-over of unspent funds from 1997–98. Actual subprogram expenditure does not always match the initial allocation.

Murray-Darling 2001 aims to:

- improve water quality;
- restore riparian land systems, wetlands and floodplains;
- improve the health of key river systems; and
- encourage ecologically and economically sustainable land use.

In 1998–99, the combined Commonwealth and State investments under Murray-Darling 2001 contributed to Basin Sustainability Program subprograms as shown in table 8.

Table 8 Allocations under the Murray-Darling 2001 Program in 1998–99

Subprogram area	Funding allocation ($m)
Riverine Environment	24.8
Irrigated Regions	31.2
Dryland Regions	15.7
Management Implementation	0.5
Total	**72.2**
plus Commonwealth unmatched	4.6
Total	**76.8**

Note: These figures are allocations. Actual expenditure does not always match the initial subprogram allocation.

3.5 OUTCOMES OF THE BASIN SUSTAINABILITY PROGRAM

Although progress was made during 1998–99 in developing appropriate reporting frameworks for the Basin Sustainability Program, it is not yet feasible to provide a comprehensive report against the program's objectives, performance indicators and key result areas.

During 1998–99 the Basin states were requested to provide annual reports for on-ground works and measures carried out in 1997–98. This was the first attempt to report total investment in the Basin's natural resources and outcomes of management activities in a consistent manner across state boundaries. It proved impossible to achieve consistent reporting across the Basin due to the absence of a consistent planning framework in 1997–98.

Considerable work was done during the year to establish an improved planning framework; this was used in revising the State Three-Year Rolling Plans on which future annual reports will be prepared. The Commission is currently analysing the 1998–99 annual reports prepared by the States to improve the reporting processes for the future.

In the absence of appropriate performance measurement information, the three Basin Sustainability Program subprograms are reported in terms of outcomes from the program's main functions – policy development, knowledge generation and on-ground works.

An overview of ongoing and recently completed Strategic Investigations and Education projects funded solely by the *Initiative* or in collaboration with other organisations can be found in the proceedings of the 1998 Strategic Investigations and Education annual forums, which are available from the Commission.

3.5.1 Riverine environment

The aim of the Riverine Environment Subprogram is to achieve ecologically sustainable management of the rivers and riverine environments of the Basin. Progress towards this aim was made during 1998–99 through the achievement of the following key outcomes.

Policy development

Policy development during 1998–99 was focused on environmental flows, wetlands management, the control of carp, management of aquatic habitats to sustain native fish communities and algal management.

Key achievements during the year (see sections 3.2.3, 3.2.6–3.2.8) were:

- approval of an Action Plan to develop revised flow rules for the River Murray;
- the release of the Floodplain Wetlands Management Strategy;
- formation of the Carp Control Coordination Group;
- preparation of a draft National Management Strategy for Carp Control;
- the adoption of an Action Plan to develop a Fish Management Strategy for the Murray-Darling Basin; and
- the commencement of a review of algal management activity in the Basin.

The Carp Control Coordination Group has provided an effective national forum for progressing carp control and developing a measured approach to the issue. In June 1999 the draft National Management Strategy for Carp Control prepared by the group was provided to the standing committees of the relevant Ministerial Councils (Ministerial Council for Forestry, Fisheries and Aquaculture; Murray-Darling Basin Ministerial Council; Agricultural Resources Ministerial Council of Australia and New Zealand; Australia and New Zealand Environment and Conservation Council) for their consideration.

Knowledge generation and transfer

The focus and relevance of future Strategic Investigations and Education riverine projects was increased through the commissioning of a review of riverine management and rehabilitation needs. New priority areas for investigation were recommended and adopted in the areas of integrated river rehabilitation, flow management and floodplain and wetland management. Improved methods were developed for synthesising existing information, value-adding to current projects and integrating between subprogram areas.

End users of the knowledge generated by the Strategic Investigations and Education program were assisted through the Riverine Environment Research Forum, held at Hahndorf in October 1998, and the subsequent publication and distribution of the proceedings.

To ensure wider community access to riverine Geographic Information System information, during 1998–99 the Commission has been developing the Second Edition of River Murray Mapping. This product will consist of detailed colour infrared aerial orthophotos for the entire River Murray floodplain, flown between March and May 1996, plus spatial data on floods, wetlands, vegetation and geomorphology, and software to readily access the data. By June 1999, all the data and related documentation was complete. The material is being packaged in CD-ROM format for a planned release in September 1999.

Integration of investigations with partner funding organisations was enhanced by the Commission's participation in the development of the National Rivers Consortium, an initiative of the Land and Water Resources Research and Development Corporation in association with Commonwealth and state agencies.

The Commission renewed its funding support for the Murray-Darling Freshwater Centre in recognition of the expert knowledge and advice it generates, and its in-kind contribution to the Cooperative Research Centre for Freshwater Ecology which also received Commonwealth funding for a further seven years.

On-ground action

The ongoing management of the riverine environment was enhanced by continuing investment under the Murray-Darling 2001 initiative within the framework of the Basin Sustainability Program. A range of integrated management plans were supported by Murray-Darling 2001 to identify problems and implement solutions for on-ground outcomes, including waterway Action Plans, floodplain and wetland management plans and water quality and nutrient control strategies.

A significant example of on-ground outcomes occurred in the Natural Heritage Trust-funded 'Strategic Wetland Management in River Murray LAP Areas' project, which was undertaken by Wetland Care Australia. Eleven wetland management plans were completed, a number of which have commenced implementation, including the construction of earthworks, water level manipulation and monitoring and evaluation. Other plans completed during the year included the Murray Catchment Management Committee's Water Quality Improvement Plan. This plan, which incorporated the Nutrient Plan and the Water Quality Marketing Strategy, covers a suite of activities targeted at improving the water quality of the River Murray.

3.5.2 Irrigation regions

The aim of the Irrigation Regions Subprogram is to achieve ecologically sustainable development of the irrigated regions of the Murray-Darling Basin in the key result areas of Sustainable Agricultural Productivity, Water Quality and Nature Conservation of the Commission's Basin Sustainability Program. Progress towards this aim was made during 1998–99 through the achievement of the following key outcomes.

Policy development

Policy development during 1998–99 was focused on interstate water trade through the Interstate Pilot Water Trading project. Key achievements during the year were the establishment of administrative and legal procedures for interstate trade, putting

in place arrangements to monitor the impacts of the pilot project, commencing work to examine impediments to widespread and permanent interstate water trade and the completion of investigations which showed that differing delivery charges within irrigation districts do not distort the interstate water market (see section 3.2.2).

As a result of the investigations into delivery charges, at its meeting in May 1999 the Ministerial Council agreed to the extension of the pilot project to include individuals holding high-security water entitlements within pumped districts in the Mallee region of Victoria, New South Wales and South Australia.

The Commission's review of the Salinity and Drainage Strategy led to the need for a Basin Salinity Management Strategy (see section 3.2.5) and will have significant policy implications in the irrigation regions. These ramifications will be a priority policy issue in 1999–2000.

Knowledge generation and transfer

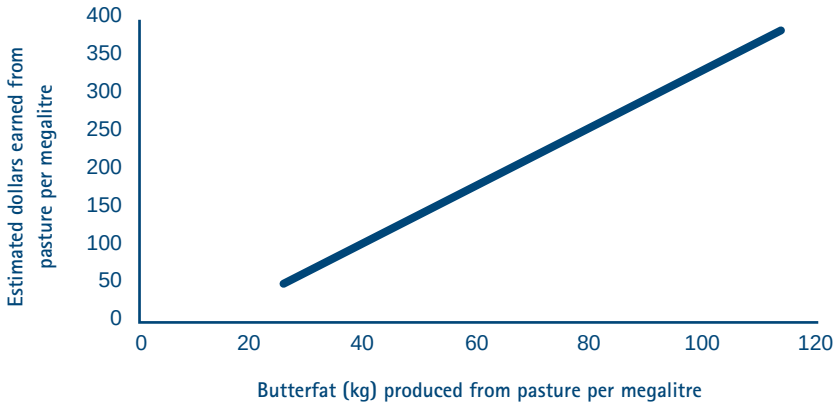
During 1998–99 a high priority continued to be given to the problems associated with increasing broader adoption of improved on-farm practices than currently occurs through existing extension practices.

This included the completion of a significant project aimed at improving on-farm practices in the dairy industry, particularly in the area of water-use efficiency. This project resulted in the development of a practical framework for use by farmers to substantially improve their water-use efficiency through improved management of key components of farm operations. The framework was distributed to 3000 dairy farmers on the riverine plain of northern Victoria and southern New South Wales towards the end of 1998. The project clearly demonstrated that actions taken by farmers to increase milk production per megalitre of water will lead to a higher margin per megalitre as illustrated in figure 6.

Figure 6 shows that there is a large range in the amount of butterfat produced from pasture per megalitre, with some farms producing about four times as much butterfat per megalitre than other farms. This range was also reflected in the estimated dollars earned from pasture per megalitre with farms earning between $50 and $400 per megalitre. This indicates that the farms achieving high pasture-based milk production received higher returns per megalitre. Therefore practices associated with high-production water-use efficiency are generally associated with high economic water-use efficiency.

The large difference shown between farms also indicates that there is potential for many farms to improve the amount of milk they are producing from pasture per megalitre, thereby also improving the amount of dollars earned from pasture per

Figure 6 *Margin ($) per megalitre by water-use efficiency*



megalitre. Those farms already producing the highest amount of butterfat per hectare have adopted existing research findings and now new research findings are needed to further increase their performance.

A report commissioned during the year, to guide the Program's future investment in developing pathways to implement best management practices, has resulted in the development of three major areas of investigation which will be undertaken in 1999–2000. These include assessing the feasibility of two main implementation program delivery models for key irrigation industries in the Basin (cotton, dairy, rice and viticulture) and on a number of regionally based models. In addition, an industry-based implementation case study for another of the models has been developed for the dairy industry, building on the water-use efficiency project outlined above.

Over the year there was increased emphasis on developing improved coordination arrangements with key industry groups and other research and development organisations. This has resulted in the majority of new projects developed in 1998–99 involving significant contributions from several key organisations towards the project design and project budget. Outcomes of industry-based consultation processes through organisations such as the Australian National Committee on Irrigation and Drainage and Riverlink have provided the basis for important work in effective irrigation water use.

To help support the Commission's statutory requirement to monitor irrigation drainage (relative to its 1988 status), the Commission has been developing an irrigation infrastructure Geographic Information System according to an agreed standard across the participating states. In 1998–99 New South Wales successfully completed a pilot application of the standard in the Barwon River region. Victoria completed implementing the standard in the Wimmera-Mallee area and newly

acquired water authority areas and continued work in the Sunraysia area. South Australia completed corresponding work in most of its irrigation areas along the Murray except the lower Murray near Lake Alexandrina.

On-ground action

The range and extent of regional and on-farm activities to address resource management issues in irrigation regions within the Basin vary significantly across the Basin. However, there are some common key priority areas that are actively supported across the Basin through various funding sources.

All states are seeking to improve or further develop their irrigation areas to ensure the most effective use of water available to the irrigation industry in conjunction with improved on-farm practices which will underpin the regions as viable long-term investments. As a result, a high level of investment has continued to be directed to developing and implementing integrated land and water management plans across the Basin as an appropriate framework for improved regional and local activity. In South Australia, 15 new Land and Water Management plans were initiated under the auspices of the Murray-Darling 2001 program and the recently created River Murray Catchment Water Management Board. Associated with this process is the establishment of community-based regional authorities, backed by legislation, which are responsible for the implementation of the plans. In New South Wales, the Murrumbidgee and Coleambally irrigation regions were corporatised and similar processes are in train for Qualco-Sunlands in South Australia.

In three of the four Basin states new initiatives have been funded over the past year by the respective governments which will benefit irrigation regions in the Basin. These initiatives are providing targeted assistance for farmers to improve their water-use efficiency and for investors to develop new irrigation areas without compromising natural resources management goals.

3.5.3 Dryland regions

The aim of the Dryland Regions Subprogram is to achieve ecologically sustainable development of the dryland areas of the Murray-Darling Basin in the key result areas of Sustainable Agricultural Productivity, Water Quality and Nature Conservation of the Commission's Basin Sustainability Program. Progress towards this aim was made during 1998–99 through the achievement of the following key outcomes.

Policy development

Policy development during 1998–99 was focused on the management of salinity in the Basin. This was given an added impetus with the predicted large increases in dryland water quality in many areas of the Basin over the next 50 years (see box 4). Salinity is an issue which previously has been considered as mainly relevant to salinity in the lower Murray with particular emphasis on the irrigation regions. The review of the Salinity and Drainage Strategy (see section 3.2.4) has reinforced the need for urgent action in the dryland regions. It is now apparent that major policy and institutional change will be necessary in the dryland regions to minimise salinity damage to water quality in tertiary streams, infrastructure, environmental assets and farmland. The Murray-Darling Basin Ministerial Council requested a draft Basin Salinity Management Strategy be prepared by June 2000.

Key achievements during 1998–99 were the completion of the salt loads study that forms the basis of an audit of salinity in the Basin, endorsement of an Action Plan to develop a Basin Salinity Management Strategy and preparation of a communication plan to accompany the audit's public release and the Strategy's development (see section 3.2.5). Preliminary results of the salinity audit (see box 4) were used in the first half of 1999 during briefings on the implications of the salinity predictions. Briefings were provided to the Murray-Darling Basin Commission and Ministerial Council, the Prime Minister's Science, Engineering and Innovations Council, the Basin's Federal Members of Parliament, and other key decision makers. State members and others will be briefed from July 1999 onwards.

Key policy decisions of the State partner governments during the year which will assist in achieving the dryland region Basin Sustainability Program objectives include the revised native vegetation management legislation in New South Wales and the introduction of catchment management levies in Victoria.

Knowledge generation and transfer

It has become evident that tackling the major natural resources management issues in dryland regions will in some areas require substantial changes to land use and social attitudes. Given the large capital investment and potential social change involved, it is imperative that policies and programs to facilitate land-use change are based on a rigorous application of knowledge and understanding about the effects of the changes. Knowledge generation in the Dryland Regions Subprogram thus continued to focus strongly on activities for evidence-based policy and program development.

Considerable achievement was made during the year in leveraging public and industry investment in sustainability research and development through modest Commission contributions to:

- the National Dryland Salinity Research, Development and Extension Program Stage II, led by the Land and Water Resources Research and Development Corporation;
- the Sustainable Grazing Systems Program led by Meat and Livestock Australia; and
- the Joint Venture Agroforestry Program led by the Rural Industries Research and Development Corporation.

Joint ventures with these industry research and development bodies are providing the Commission with industry pathways for transfer of products and outcomes from dryland investigations.

Additional Commonwealth investment was also leveraged through the National Land and Water Resources Audit to support investigations into natural resources management issues including dryland salinity.

The Commission renewed its funding support for the Cooperative Research Centre for Catchment Hydrology which received Commonwealth approval for a seven-year program of research to improve understanding of water-driven processes at a catchment scale.

Increased community access to significant natural resources spatial data sets for dryland regions is being facilitated through the development of a Basin-wide CD-ROM product, known as 'Basin-in-a-Box'. In 1998–99 spatial data and related documentation were prepared for final processing and packaging prior to release early in 1999–2000. The CDs will include Geographic Information System data on groundwater for the Murray hydrogeological basin and Darling River catchment; woody vegetation; climate; soils; geology and relief. Other products and outcomes of the first five years of the Dryland Strategic Investigations and Education program were summarised during the year to assist transfer and adoption.

New three-to-five-year Strategic Investigations and Education Dryland projects commenced during the year, focusing on research and development for dryland salinity management (including farm forestry) and long-term sustainable futures for the key broadacre farming and grazing industries. Key components include:

- industry, community and government participation;
- documenting best management practice systems for key broadacre dryland land uses;

- testing best management practice systems for long-term sustainability; and
- developing methods to cost-effectively map and monitor land-use change and uptake of best management practice systems.

To support information needs related to key dryland salinity issues, a series of projects were commenced including: development and application of a method to quantify the full range of costs of dryland salinity; development of a decision framework for investigating, planning and managing dryland salinity; and characterisation of the hydrogeology of salinised catchments.

On-ground action

There is still a lot of enthusiasm and commitment to integrated catchment management in dryland regions of the Basin despite the worsening social and economic situation in many areas.

On-ground action in dryland regions continued to be supported through Commonwealth programs such as the Natural Heritage Trust and a range of state programs. On-ground funding was directed through regional strategies and local Action Plans in dryland regions of the Basin. The funds supported a range of activities including vegetation management for salinity and biodiversity, erosion control, and nutrient management. Other activities were related to improved management practices for farming such as water-use efficiency, and minimisation of off-site impacts of nutrients, salt, and pesticides.

4. WATER RESOURCES AND ASSET MANAGEMENT

The Commission has specific responsibilities for the River Murray system (see box 8) which include:

- managing and distributing the water resources of the River Murray system in accordance with the *Murray-Darling Basin Agreement*;
- managing and maintaining infrastructure to an appropriate standard through the Contracting Governments; and
- protecting and, where appropriate, improving the physical and biological environment.

The principal responsibility is to obtain the highest achievable quality and efficiency of use of River Murray system water resources, in a manner that reflects environmental and social priorities.

The major issues faced in meeting these responsibilities are:

- the need to protect water quality;
- the impact of water consumption on river health;
- competing demands for water resources;
- conflicting objectives for storage operations;
- ageing infrastructure requiring major investment to maintain or replace;
- environmental issues and river management;
- access by the community to the Commission's decision making and management; and
- the need to develop uniform policies for development and management of the floodplain.

The Commission addresses these responsibilities through its commercially focused internal business unit, River Murray Water (see section 4.1.1). Budget allocations to River Murray Water are shown in table 2 in section 1.3.2.

Box 8 Scope of the River Murray system

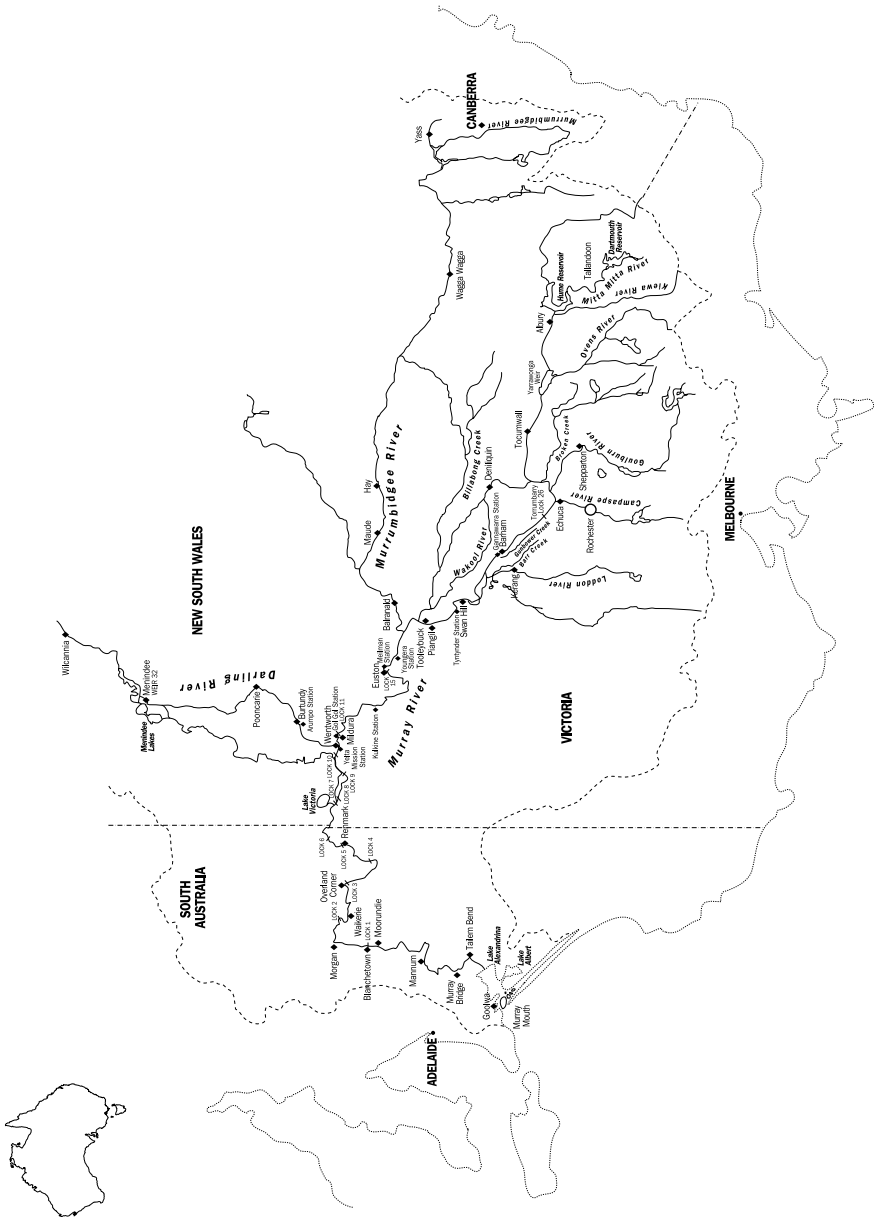
The 'River Murray system' is:

- the main course of the River Murray and all its effluents and anabranches;
- tributaries entering the River Murray upstream of Albury;
- the Darling River downstream of the Menindee Lakes storage;
- Commission works – Dartmouth Dam, Hume Dam, Yarrawonga Weir, Lake Victoria storage, weirs and locks along the River Murray and lower Murrumbidgee, the Barrages near the mouth of the River Murray and salinity mitigation works;
- the Menindee Lakes storage, which the New South Wales Government has leased to the Commission in perpetuity; and
- numerous flow regulating structures along the River Murray in the Barmah-Millewa Forest.

The locations of these features are shown in figure 7.

The Commission's powers are limited to the main stem of the River Murray. Tributary inflows and the Darling River upstream of Menindee Lakes are vested in the governments of New South Wales, Queensland and Victoria.

Figure 7 *The River Murray System*



4.1 STRATEGIC DIRECTIONS AND MAJOR ACTIVITIES

The Murray-Darling Basin Ministerial Council has established a distinct water business by the creation of River Murray Water as an internal business division of the Murray-Darling Basin Commission. This results in a clear distinction between the service delivery functions of the Commission and its resource management and policy setting functions.

These developments have been achieved within the existing *Murray-Darling Basin Agreement*, while retaining the essential Basin-wide integration values that lie at the heart of the *Murray-Darling Basin Initiative*. Achieving appropriate distinction between functions in order to clarify roles and accountabilities, while still preserving the commitment to joint action within the context of Basin-wide values, continues to be a critical objective.

4.1.1 Development of River Murray Water

During 1998–99 the Ministerial Council examined a wide range of options for further development of the above initiatives, including changes to the *Murray-Darling Basin Agreement*. While these matters are still under detailed consideration, by the end of the year the governments had effectively implemented the essential internal distinctions to enable clarity of focus on service delivery functions and on resource management functions.

In June 1999, the Commission restructured the River Murray Board, which had been established in 1998 to develop proposals for the future structure of the Commission's water business as well as advising on the direct management of the business. The restructuring is intended to provide a Board, including relevant Commissioners or Deputy Commissioners under the Chairmanship of the President, which will focus on the operational and financial management of River Murray Water as a ring-fenced business division of the Commission.

River Murray Water has introduced significant asset management reforms in exercising its role in directing state authorities which are exercising their powers to operate, maintain and renew the works of the River Murray and lower Darling system. The Ministerial Council approved for 1998–99 and again for 1999–2000 revised cost sharing arrangements between the Commonwealth, New South Wales, Victoria and South Australia for costs incurred under the *Murray-Darling Basin Agreement*.

These specific provisions ensure that the costs borne by the States are related more closely to the level of services provided by River Murray Water within the terms of

the *Agreement*. To that extent the revised arrangements match a price-for-service concept based on full cost recovery principles. This is as far as the present *Agreement* allows but is a positive and direct step toward fulfilling the requirement specified in the 1994 COAG resolution that the Ministerial Council put in place arrangements to charge for water to fund the future maintenance, refurbishment and/or upgrading of the headworks and other structures under the Commission's control.

Recognition of the full range of costs required to ensure the long-term sustainability of the works under the control of the Commission represents a significant step in the implementation by states of effective pricing policies.

Major strategic activities carried out by River Murray Water during 1998–99 were focused on responding to changing community standards in the management of water conservation works, including river systems, and also in ensuring effective and sustainable management of assets. These activities are outlined in the following sections.

4.1.2 River Murray structural audit

During the year a structural audit and preliminary risk assessment was completed for the locks and weirs, Lake Victoria and the Barrages. The audit confirmed that the structures are in generally sound structural condition. However, underfloor drainage of lock chambers and the continuing effectiveness of steel sheet-piling cut-offs under the structures were identified as critical to ongoing structural stability. Investigation programs are in place for these elements, with priority being given to Lock and Weir No. 15 at Euston, which not only has the highest water head, but has the poorest condition of concrete elements.

The audit also identified occupational and public safety issues at some sites, the most critical of which was the Barrages. An active program of improvement was commenced in 1998–99.

A key project for River Murray Water is addressing the shortcomings of obsolete navigable passes at the Boule panel type weirs. The passes were built to cater for river traffic for short periods of high rivers when the locks become inoperative. This purpose largely disappeared when major river trade ceased in the early part of the century. Today the navigable passes represent a piece of 19th century technology that is very expensive to maintain and no longer acceptable in terms of modern standards of occupational safety. A start has been made on studying options to address the matter and the budget plan for 1999–2000 provides for a determined remedial program.

4.1.3 Portfolio risk assessment

A major requirement for an efficient and effective water business is to set priorities in both maintenance and capital budgets from a business risk-based perspective and in a consistent way across the entire asset portfolio. To this end, work started late in the year to rank the potential business risks arising from failure of each of the assets and their individual components. The project includes assessment of failure probabilities and a failure modes, effects and criticality analysis. However, unlike the Hume and Dartmouth Dams' preliminary risk assessment, this project is aimed primarily at empirical risk ranking rather than analysis of absolute values of risk. The project builds on the many condition assessments, design reviews and risk studies of the past two years.

4.1.4 Occupational Health and Safety activities

River Murray Water has identified occupational and public safety as requiring specific focus in the context of a business-oriented approach to management of its responsibilities. A broadly based analysis of operations has identified a number of aspects that will require attention. Significant among these are navigable pass operations at the weirs, access across the Barrages, access for operational purposes at locks and weirs and storage of flammable liquids and chemicals. An immediate program to address these matters has started and the approved budget plan for 1999–2000 gives priority to completion of safety improvement at all structures.

4.1.5 Information Technology strategies

The Board of River Murray Water recognised, at an early stage of strategic planning for the development of the business, that effective utilisation of information technology was essential if River Murray Water was to achieve the full potential of its establishment. Accordingly, it was agreed that an Information Technology Strategic Plan should be developed and external expertise was engaged to assist with its preparation. The plan was adopted by the Board in February 1999.

An Information Technology Steering Committee, comprising senior executives of River Murray Water together with the Commission's Director of Corporate Services and Information Services Manager, has been established to monitor implementation of the strategy.

The plan identified asset management and river operations as two areas of activity that would benefit most from the utilisation of modern information technology

and action was initiated to put this into effect. As a result, River Murray Water has acquired and implemented a new Asset Management System and commissioned a scoping exercise to identify opportunities to enhance the collection and management of data and the planning and control of river operations.

The plan also provides that in the short to medium term the most cost-effective means of obtaining information services support for River Murray Water is through a service level agreement with the Commission. The Information Technology Steering Committee is overseeing the development of this agreement.

4.1.6 Hume Dam remedial works and risk evaluation

In April 1995 the Commission commenced a comprehensive program of remedial works to bring Hume Dam to contemporary standards. This followed a dam safety review and subsequent geotechnical investigations. The program addresses normal operating loading and extreme seismic loadings of the various embankments, extreme flood capacity, spillway gate reliability, and replacement of the obsolete emergency closure gates on the outlet works.

The improvement works are being implemented in a priority order which is designed to achieve progressive risk reduction in the most effective manner. Progress achieved during 1998–99 is described in section 4.3.1. Expenditure on the works for 1998–99 was $9.9 million, bringing total expenditure to date to $46.1 million.

To supplement the existing structural investigations, hydrology studies and design reviews, a preliminary risk assessment of Hume and Dartmouth Dams commenced in 1997. The assessment continued during 1998–99 and will be completed in 1999. The assessment is assisting River Murray Water to ensure that all failure modes are identified and that the investments for progressive risk reduction and long-term integrity are being planned and implemented in the most effective priority order.

4.1.7 Snowy Scheme corporatisation

In 1998–99, the New South Wales, Victorian and Commonwealth Governments adopted legislation to enable the establishment of a corporation to manage the Snowy Mountains Hydro-Electric Scheme.

During the year, the Commission provided governments and the Snowy Mountains Hydro-Electric Authority with information on the required water release rules to ensure continuation of the entitlements currently existing. These discussions, which include extensive modelling and analysis of water management options, are continuing.

4.1.8 Snowy Water Inquiry

The governments' proclamation of legislation to establish the new corporation (see section 4.1.7) is subject to the completion of the Snowy Water Inquiry into the environmental condition of the Snowy River and the other streams within the Scheme. The inquiry commenced work in April 1998. Commission staff provided technical assistance in assessing the impacts on River Murray water users arising from the alternative environmental flow options for the Snowy River and for the streams in the Murray and Murrumbidgee catchments that are part of the scheme. The Snowy Water Inquiry submitted its report in October 1998 and nominated a preferred option that included that flow in the Snowy River downstream of Jindabyne be increased to 15 per cent of the natural flow. That report is currently being considered by the New South Wales, Victorian and Commonwealth Governments.

4.1.9 Hume Dam operation review

A comprehensive review of operating strategies for the Hume and Dartmouth Dams, started in January 1997, was completed during 1998–99.

The review was steered by the Hume and Dartmouth Dams Reference Panel consisting of community, industry stakeholder and government agency groups. Its task was to review dam operations in the light of a range of competing objectives dominated by water use, environmental sustainability, and floodplain use.

The panel built its work around as much quantified information as could be reasonably generated, along with comprehensive interaction with the Murray Valley community. This interaction culminated in a widely circulated Options Paper in November 1998 followed by a Final Report to the Commission in May 1999. The report showed the worth of community ownership of issues involving trade-offs in natural resources management, demonstrated that improvements to dam operations were possible and recommended a package of options. The Commission agreed generally with the package and reached a series of firm decisions which were published in June 1999.

Among the key decisions, the Commission:

- supports the need for well-structured communication – in particular, arrangements for community consultation in flood management will be reviewed before the end of 1999;
- agreed the Dartmouth release rules would be refined, with local involvement, over the next year;

- will negotiate the necessary rights to operate to existing nominal channel capacities below Hume and Dartmouth, by the acquisition of easements as necessary;
- agreed in principle with the recommendations on coordinated waterway management between Hume and Yarrawonga. An advisory committee is to be formed to progress the issue and recommend a more permanent institutional arrangement;
- will fund investigation of the possibility of higher pre-release and environmental release rates from Hume; and
- will adopt the Reference Panel's views on environmental flow packages for reference to the existing River Murray Environmental Flows investigation.

4.1.10 Lake Victoria cultural heritage

The Murray-Darling Basin Commission remains committed to the protection of the cultural heritage at Lake Victoria and continues to manage the project to achieve a balance between maintaining cultural heritage values and operating the lake as a water storage. Major achievements during 1998–99 are outlined below.

Section 90 Consent

In late August 1998, the New South Wales National Parks and Wildlife Service granted an eight-year Consent under section 90 of the New South Wales *National Parks and Wildlife Act 1974* for the continued operation of Lake Victoria as a water storage. The Consent contained a series of detailed conditions pertaining to the operation of the lake and the monitoring and mitigation of impacts on cultural and natural heritage, both on the lake bed and within the surrounding landscape. The conditions include requirements for the development of a Cultural Landscape Conservation Management Plan which will guide the future operation of the lake.

The Murray-Darling Basin Commission agreed in principle with the intent of the numerous conditions, which were aimed at minimising erosion and physical damage to priority cultural heritage areas by establishing vegetation cover. However, the wording and scope of some conditions was contradictory to existing jurisdictional responsibilities, making the Consent unacceptable to the Commission. The Commission and New South Wales National Parks and Wildlife Service worked closely over the year to renegotiate the conditions to enable better management of the heritage values and landscape of the lake.

Lake Victoria Advisory Committee

Community involvement in the planning process continued through the Lake Victoria Advisory Committee. The committee, originally formed in 1996, was expanded and formalised in November 1998 to include a broader spectrum of stakeholders, including representatives from the irrigation industry, the regional Catchment Management Committee, the local Aboriginal Land Council, the Aboriginal Heritage Division within the New South Wales National Parks and Wildlife Service and an outside expert in cultural landscape conservation planning. The role of the advisory committee is to provide advice to the Murray-Darling Basin Commission on aspects of the management of Lake Victoria which are relevant to the protection of cultural heritage. Committee meetings, workshops and field trips, at a frequency of about once per month, allowed stakeholders to be closely involved in decisions affecting the protection of cultural and natural heritage values at the lake.

Lake operation

A strategy was developed to operate the lake in accordance with the Consent conditions for the 1998–99 water year; these operations are outlined in section 4.2.1. A key aspect of the operations was drawing the water down to low levels to permit the completion of the archaeological survey of the lake bed as required under the consent conditions.

Initial constraints on the operating capacity of the lake early in 1998–99 had a potential impact on the availability of water resources for New South Wales and Victoria. However, as the lake was subsequently filled there was no actual impact on the availability of water resources to these states. South Australia received its entitlement flow throughout 1998–99 and there was a considerable volume of above-entitlement flow (see section 4.2.1).

Monitoring and protection of cultural and natural heritage values

Protection of the major burial grounds was completed in August 1998. Monitoring of the protection works over the year indicated that the burials have not been affected by the raising and lowering of the lake as part of normal operation. Monitoring of the flora and fauna communities around the lake shore has also indicated a healthy response to the creation of a wetland habitat as a result of the lake level being raised. Results of the monitoring programs are being used in the development of the Cultural Landscape Conservation Management Plan which will address the operation of the lake to maximise the protection of cultural and natural heritage values. The development of the plan commenced during the year through a working group of the Lake Victoria Advisory Committee.

4.1.11 Mitta Mitta ex gratia payment

In November 1998 the Ministerial Council approved in principle, on the application of the Victorian Government, ex gratia payments to eligible landowners in the Mitta Mitta Valley to offset pasture productivity losses arising from the operation of Dartmouth Dam. The proposal was endorsed for inclusion in budget estimates for 1999–2000 and subsequently approved by the Ministerial Council for implementation in that year.

A Project Board chaired by the General Manager of River Murray Water, and including representatives from New South Wales, Victoria, South Australia and the Commonwealth, has been formed to develop detailed eligibility criteria for the approval of the Commission. The Project Board will also direct the implementation of the initiative.

To assist in the development of eligibility criteria, the Project Board engaged consultants to provide expert advice. It also appointed a reference group comprising local representatives and independent experts to assist in the development of eligibility criteria.

4.2 WATER RESOURCES MANAGEMENT

The water resources of the River Murray system (see figure 7) are used for a wide range of beneficial purposes. In addition to its inherent natural value to riverine, floodplain and estuarine ecosystems, other uses include irrigation, industrial and domestic water supplies, recreation and hydro-electric generation. River Murray Water manages the river system to ensure that the available water is *shared* and *supplied* to South Australia, Victoria and New South Wales in accordance with the *Murray-Darling Basin Agreement*.

River Murray Water undertakes the tasks of sharing and supplying water through three main processes:

- *assessing* future availability of water;
- *accounting* for actual use of water; and
- *regulating* river flows to meet environmental and user needs.

A system of continuous water accounts is used as specified by the *Agreement*. Assessments of the future availability of water are based on the status of these accounts and estimates of future system inflows. River Murray Water uses these

assessments to advise the states of their available shares of water for the remainder of the irrigation season. The states then announce water allocations based on these shares and the states' own plans for water management.

The following sections summarise the availability of water in 1998–99, quantities supplied and diverted and key issues related to the delivery of that water.

4.2.1 Water availability

Following serious drought in 1997–98, conditions at the beginning of 1998–99 were initially dry but conditions in Murray catchments improved in August 1998. Inflows to the upper Murray were above median for the period August to November, and this led to improvements in stored water volumes. Near median conditions were recorded in December and January, but dry conditions again prevailed from February to May 1999.

Significant rainfall in the Darling River system in July 1998 brought increased inflow to Menindee Lakes. Further heavy rainfall in September and October 1998 produced flood inflows to, and substantial spill from, Menindee Lakes.

At the beginning of July 1998, water resources available to New South Wales and Victoria remained lower than they would otherwise have been as a result of:

- the effects of the special release from Hume Reservoir in late 1996; and
- ongoing restrictions on the operating capacity of Lake Victoria (however, the restriction was lifted in late 1998 and the lake filled to capacity).

The share of water available to New South Wales at the start of 1998–99 was 890 gigalitres less than that available to Victoria, due mainly to the greater consumption of water by New South Wales over the previous two irrigation seasons. During 1998–99, New South Wales and Victorian resources improved by 620 gigalitres and 1020 gigalitres respectively. However, the New South Wales reserve at the end of June 1999 was relatively low at 1620 gigalitres and its outlook for the 1999–2000 season was for very low water resources availability in the event of continuing dry conditions. Victoria's reserve at the end of the year was 2913 gigalitres and, consequently, it has a better resource availability than New South Wales in 1999–2000. Water availability at the beginning and end of 1998–99 is detailed in table 9.

Table 9 Water accounts for New South Wales and Victoria 1998–99 (gigalitres)

Storage location	Storage at 30 June 1998				Storage at 30 June 1999			
	NSW	Vic	Total	Out-of balance	NSW	Vic	Total	Out-of balance
Dartmouth Reservoir	271	1 194	1 465	923	262	1 509	1 771	1 247
Hume Reservoir	226	226	452	0	322	388	710	66
Menindee Lakes	302	267	569	-35	973	949	1 922	-24
Lake Victoria	204	204	408	0	68	68	136	0
Total	**1 003**	**1 891**	**2 894**	**888**	**1 625**	**2 914**	**4 539**	**1 289**

Notes: Accounts are based on operational data. Data relates to gross storage. The 'out-of-balance' figure reflects the volume of stored water accounted to Victoria, minus the volume of stored water accounted to New South Wales.

Initiatives taken to improve water availability during the year included the following:

- Menindee Lakes operation was adjusted to maximise availability of water resources.
- Additional releases were arranged by New South Wales from the Snowy Mountains Scheme given the prospect of low water availability for New South Wales under very dry conditions. The additional releases were cancelled when the New South Wales Murray allocation reached an agreed level.

State irrigation allocations

At 1 July 1998, South Australia had a high likelihood of receiving its full water entitlement in 1998–99. Following improvement in inflows along the Murray and Darling Rivers, South Australia's annual entitlement became assured by August 1998.

Victoria's initial irrigation allocation announcement in 1998–99 was 95 per cent water right and nil 'sales' water. This was increased to 100 per cent water right in mid-September 1998, and further extended to 100 per cent 'sales' by mid-October 1998.

New South Wales maximised water availability in 1998–99 by adopting the minimum reserve available under the *Murray-Darling Basin Agreement*. The initial allocation announcement was zero individual entitlement, which was the lowest initial allocation ever recorded. Subsequent improvements in inflows permitted the New South Wales allocation to be progressively increased to 93 per cent by mid-February 1999, including a provision for users to carry-over up to 20 per cent of entitlement into the following season.

State water diversions

State diversions from the River Murray and lower Darling River are detailed in table 10.

Table 10 State diversions† (gigalitres)

	River Murray				Darling≠
Water Year	NSW	Vic	SA	Total	NSW
1982–83	1 640	1 590	*700	3 930	88
1983–84	1 795	1 316	483	3 594	*475
1984–85	2 211	1 747	521	4 479	286
1985–86	1 985	1 577	481	4 043	78
1986–87	1 795	1 472	490	3 757	77
1987–88	2 156	1 842	506	4 504	185
1988–89	1 500	1 335	537	3 372	444
1989–90	2 077	1 649	577	4 303	152
1990–91	2 308	1 853	630	4 791	204
1991–92	*2 431	1 824	573	*4 828	96
1992–93	1 633	1 144	466	3 243	77
1993–94	1 902	1 406	596	3 904	156
1994–95	2 254	*1 988	643	4 885	66
1995–96	1 935	1 741	549	4 225	181
1996–97	2 311	1 744	580	4 635	224
1997–98	1 863	1 694	631	4 188	48
1998–99#	**2 022**	**1 742**	**666**	**4 430**	**153**

† These data are based upon the official Commission record for the reporting requirements of Cap implementation. * Record high diversion. # The data presented for 1998–99 are estimates, being those provided to the Independent Audit Group during their annual review of Cap implementation. ≠ Includes releases from the Cawndillo outlet to the Great AnaBranch of the Darling River.

Water trade

In November 1997, the Murray-Darling Basin Ministerial Council approved a pilot scheme for permanent interstate trade of water entitlements between private diverters in the reaches of the River Murray between Nyah and the Barrages (see section 3.2.2). A small volume of permanent interstate trade occurred in 1998–99 (see figure 2). Adjustment of flow to South Australia to reflect interstate trade to and from this State is made in the irrigation season following the season of the trade, hence the necessary flow adjustments will be made in 1999–2000.

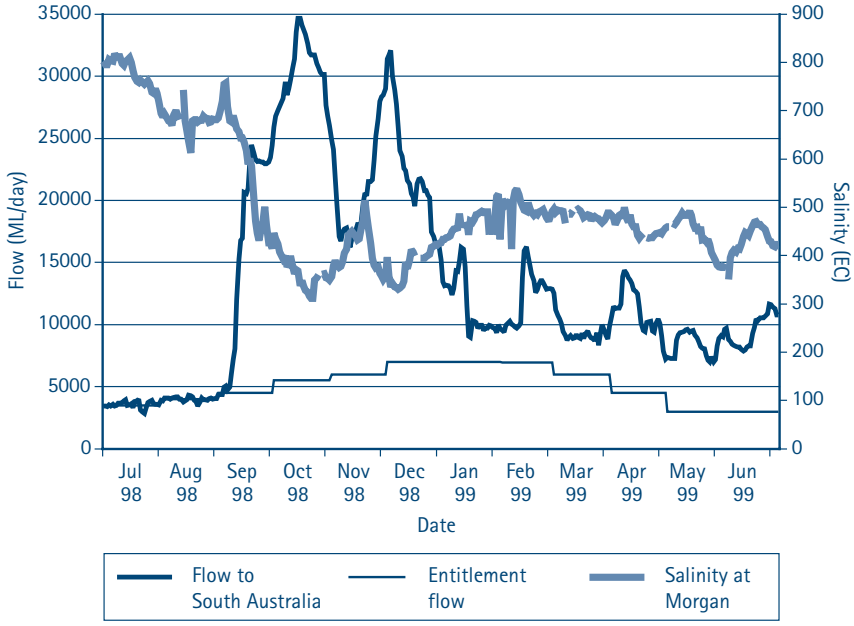
While significant temporary water trade occurred within states during 1998–99 (approximately 800 gigalitres), relatively small volumes of temporary interstate water trade occurred. During 1998–99, the Commission agreed to procedures for adjustment of flow to South Australia in response to temporary interstate trade in the same manner which applies to permanent trade. Consequently, in response to temporary net interstate trade of about 16 400 megalitres in 1997–98 from South Australia to the upper states of New South Wales and Victoria, flow to South Australia was accordingly reduced throughout the period September 1998 to April 1999 inclusive.

Flow to South Australia

Flow to South Australia was maintained at the entitlement rate until early September 1998. Additional dilution flow to South Australia (that is, 3000 megalitres per day flow above the entitlement, for the purposes of achieving further dilution of river salinity) was provided from mid-January 1999 until the end of June 1999 between periods of above-entitlement flow in accordance with the Salinity and Drainage Strategy.

There were several periods of above-entitlement flow as a result of rain and the inability to store water in Lake Victoria at some occasions during the year. Total flow to South Australia for the year was 4840 gigalitres, which is well above the annual entitlement of 1850 gigalitres, but below the long-term average of 6200 gigalitres. Flow and salinity behaviour is shown in figure 8.

Figure 8 *Flow to South Australia 1998–99*



Operation of storages

Total Commission storage at the start of July 1998 was very low at only 26 per cent of active capacity following significant drawdown of storage in the previous dry season of 1997–98. Storage steadily improved in the period July to December 1998 following substantial winter and spring inflows to upper Murray storages and flood inflows to Menindee Lakes. Total storage peaked at 73 per cent in early December 1998 and was then steadily drawn down to a minimum of 40 per cent in mid-April 1999. Storage then recovered to 45 per cent by 30 June 1999.

Storage in Hume Reservoir, the Commission's main regulating storage for irrigation and water supply, was very low at 15 per cent of capacity at 1 July 1998. Storage in Hume peaked at 67 per cent of capacity in mid-November 1999, and was then drawn down to a minimum of 14 per cent in mid-May 1999 prior to recovering to 23 per cent by the end of June 1999.

Water transfers from Dartmouth Reservoir, to augment storage in Hume Reservoir to meet downstream requirements, commenced in early December 1998 and continued until early April 1999; a volume of about 600 gigalitres was transferred. Slightly greater than minimum flows were maintained in late April and early May 1999 in response to low tributary inflows to the Mitta Mitta River. Consequently, storage in Dartmouth, which peaked at 58 per cent of capacity in early December 1998, was drawn down to a minimum of 44 per cent in early May 1999.

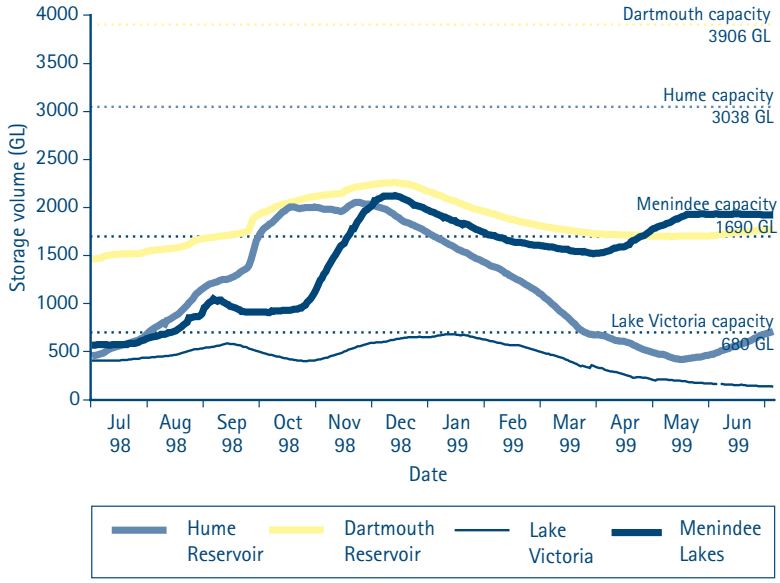
Storage in Menindee Lakes was low at 1 July 1998, and there was only 90 gigalitres of Commission storage available above the New South Wales reserve of 480 gigalitres. Darling River system flood inflows to Menindee Lakes in July and August 1998 and, more significantly, in October and November 1998 raised storage to a peak of 126 per cent of nominal capacity in early December 1998, and was temporarily surcharged slightly above the current surcharge capacity of 1 999 gigalitres. This was subsequently drawn down to 91 per cent in late March 1999, but further inflows occurred and the storage finished at 114 per cent by the end of June 1999.

Storage in Lake Victoria was increased to a peak of 85 per cent of capacity in early September 1998 in accordance with consent conditions applied by the New South Wales National Parks and Wildlife Service (see section 4.1.10). Storage was then drawn down to 60 per cent of capacity by late October 1998 prior to the arrival of floodwater from the River Murray and Darling River. The floodwater was used to fill the storage to capacity by early January 1999. The water level was subsequently drawn down to assist in meeting the flow requirement for South Australia. Additional releases were made from the lake after March 1999 in order to draw the water level down to allow an archaeological survey (see section 4.1.10). These additional releases produced flow to South Australia in excess of its flow requirement.

At the end of June 1999, most of the Commission's reserve storage was retained in Dartmouth Reservoir and Menindee Lakes.

Storage behaviour resulting from River Murray Water's operation of the Commission's four major storages is shown in figure 9.

Figure 9 *Behaviour of major storages 1998–99*



Hydro-electric power stations

Operation of power stations at Hume Dam and Yarrawonga Weir continued throughout the 1998–99 year according to downstream flow requirements and generation capacity. At Dartmouth Dam, Southern Hydro utilised some of its water entitlement to generate additional electricity during periods of high electricity demand.

The Snowy Mountains Scheme

Storage in the Snowy Scheme was high at the beginning of 1998–99, and the Snowy Mountains Council approved the release of up to 1816 gigalitres from Murray 1 Power Station for the period 1 July 1998 to 30 June 1999 – significantly above the 'minimum notification' release volume of 1062 gigalitres for the 12 months to the end of April. The actual release from Murray 1 Power Station for the 12 months to 30 April 1999 was 1118 gigalitres.

Following a request by New South Wales, the Commission endorsed in September 1998 an arrangement for an additional 200 gigalitres release in total from the Snowy Scheme to provide additional water resources for New South Wales in the Murray and Murrumbidgee valleys. This arrangement, however, was cancelled in late November 1998 when New South Wales Murray allocation reached the limits agreed as part of the arrangement.

4.2.2 Environmental report

Water quality

Following the dry conditions of 1997–98, upper Murray inflow conditions in July 1998 were less than median. However, conditions improved in the period August to November 1998 when inflows were slightly higher than median. Drier conditions, but not extremely dry, returned in the period December 1998 to May 1999 when inflows were slightly lower than median. Near-median conditions returned in June 1999.

Although Hume Reservoir did not fill, significant floods were recorded in the Kiewa and Ovens Rivers in late September 1998. This led to a sharp peak flood downstream of Yarrawonga Weir. Following this flood, the opportunity was taken in consultation with natural resource agencies in mid-October 1998 to make a special release of water from Hume Reservoir from the Barmah-Millewa forest water allocation (see section 3.2.3). Of the 100 gigalitre allocation, 97 gigalitres was released from Hume Reservoir.

For the remainder of 1998–99, flows in the River Murray immediately downstream of Yarrawonga Weir were generally fully regulated apart from minor floods in late July and mid-November, and a 'rain-rejection' of irrigation orders in late March 1999 leading to flow above channel capacity in some downstream river reaches.

Blue-green algal blooms at high alert levels were recorded in the River Murray in the Mildura and Wentworth Weir pools in mid-to-late January 1999. River Murray Water arranged additional flows from Hume Dam and the Murrumbidgee River aimed at suppression of the algal blooms. Algal counts in this reach declined to low alert levels by mid-February 1999 as a result of cooler conditions, rain and the higher river flows.

Blue-green algal counts in the lower Darling and lower Murray were generally low, partly due to the relatively high turbidity of the waters of the Darling River and the high flow rates which occurred during most of the warmer months.

Salinity mitigation schemes

Victoria

Victorian salinity mitigation schemes continued to operate over 1998–99 to mitigate salinity levels in the River Murray.

The performance of the Mildura-Merbein Scheme was further improved in 1998–99 to 87 per cent of its long-term performance target following redesign and repair work in part of the scheme. Equipment was installed to enable remote operation and surveillance.

Pumping at the Barr Creek Scheme continued to be effective in reducing the salt load reaching the River Murray throughout the year, apart from a high flow period following heavy rain in mid-November 1998 when pumping was not possible due to back-up of water by the River Murray. As summer and autumn were generally dry, low flows in Barr Creek could be largely prevented from entering the River Murray, resulting in reduced salinity in the river for most of the year. Within the constraints of 'airspace' in the saline disposal areas of the scheme, pumping resulted in a 31 per cent reduction in salt load from Barr Creek entering the River Murray.

There was only limited opportunity to make controlled releases of saline water from Lake Hawthorn to the River Murray as there was limited duration of high flows in the river in the Sunraysia region. These small releases had little impact on salinity in the River Murray.

New South Wales

At the Mallee Cliffs Scheme, equipment was installed to enable remote monitoring of its performance. Pumping rates from bores were monitored in conjunction with flows in the River Murray and pumping rates were adjusted accordingly. Pumps and bores affected by fouling by iron bacteria were cleaned and serviced.

At the Buronga Scheme, fouling by iron bacteria occurred and further work for reduction of the iron bacteria fouling was identified. A review of operation and performance of the scheme over its 20-year life was undertaken during the year. A report will be available in 1999–2000 to identify requirements for improved performance and maintenance.

South Australia

The Woolpunda and Waikerie Schemes continue to be effective in reducing salinity levels in the River Murray; groundwater pumping at these schemes led to a 76 per cent and 81 per cent reduction respectively in local salt load entering the River Murray. A review of both schemes has commenced with the objective of optimising performance in reducing saline input to the River Murray.

Upgrading of the Rufus River Scheme continued to overcome the detrimental effects of fouling of pipelines by iron bacteria.

Murray mouth

At the beginning of July 1998, the Murray mouth remained relatively narrow following a prolonged period of regulated flow to South Australia. In the period October 1998 to January 1999, increased flow to South Australia occurred (mainly as a result of flood flows from the Darling River) which assisted in keeping the mouth open. However, the peak flow rate of 34 000 megalitres per day was insufficient to produce a substantial flushing of sand from the mouth and gave only a temporary respite.

A number of measures were undertaken by South Australia in conjunction with River Murray Water during the year aimed at assisting in maintaining a flow path to the mouth. On several occasions, water surcharged in the lower lakes was released quickly to flush the mouth to assist in maintaining a viable flow path. In addition, in December 1998, works undertaken to cut a channel through sand on the Coorong side of the mouth led to successful temporary improvements in its cross-sectional area.

The Murray-Mouth Advisory Committee met regularly throughout the year to:

- monitor conditions at the mouth
- coordinate Barrage operation aimed at maintaining a flow path at the mouth and preventing it from closing
- arrange for further monitoring and investigations aimed at identifying a long-term solution. This included arrangements for modelling of the area of the Barrages, mouth and Coorong.

By late June 1999, however, relatively low river flows and ocean conditions had combined and led to yet another reduction in the size of the opening of the Murray mouth. Without further significant high flow to South Australia in the winter and spring of 1999, there is an ongoing risk of mouth closure.

River management activities

Mitta Mitta River downstream of Dartmouth Dam

In response to ongoing stream stability and other stream management issues along the Mitta Mitta River downstream of Dartmouth Dam, a Draft Waterway Management Strategy was released by the North East Catchment Management Authority of Victoria in March 1999. The draft strategy was prepared under the direction of the Mitta Mitta River Catchment Coordination Group established by the authority. The group has wide representation from relevant community and government agencies including River Murray Water, which participated in the development of the strategy.

The existing works program (funded by River Murray Water and implemented by the authority) is targeted mainly at willow management, to secure channel capacity, and rock armouring of critical erosion sites. River Murray Water contributed $104 000 to the works program in 1998–99. However, the draft strategy includes a works program with priorities, as well as a draft framework for funding, and represents a more comprehensive program of remedial works and revegetation. Proposed works under the strategy are consistent with contemporary waterway management practice. Importantly, the strategy seeks to achieve an improvement in the health of the Mitta Mitta River. Following approval, the strategy is expected to be implemented over a three-year period commencing in 1999–2000.

River Murray between Hume Dam and Lake Mulwala

The New South Wales Department of Land and Water Conservation undertakes ongoing river channel remedial and maintenance works on behalf of the Commission. River Murray Water and the New South Wales Fisheries Service participated in the

annual inspection of the River Murray between Hume Dam and the upstream extent of Lake Mulwala by the department in early May 1999. This inspection is an essential component of identifying and setting priorities for waterway management activities within the annual works program for this reach.

An outcome of the Commission's Hume and Dartmouth Dams Operations Review (see section 4.1.9) was a recommendation for the development of a comprehensive River Management Plan as a strategic approach to future management of the Hume Dam to Lake Mulwala reach of the River Murray. It is expected that a committee comprising state water and natural resources agencies will be established in 1999–2000. River Murray Water was directed by the Commission to play a lead role in coordinating and guiding the activities of this committee.

4.3 ASSET MANAGEMENT

4.3.1 Hume Dam

In response to an earlier dam safety review (see section 4.1.6) major remedial works continued during 1998–99, as outlined below.

Embankments

By December 1998, Phase One of the Embankment Improvement Works was completed at a total cost of $33.8 million. These works are essentially aimed at providing dam safety to contemporary standards under normal operating, or static loading, conditions. 'Normal' is a comparative term and for Hume Dam includes seismic events larger than the Newcastle earthquake of 1989 and floods with a return period of 50 000 years. The works comprised:

- addition of a downstream filter zone and berm to Embankment No. 1 at the highest point of the foundations (known as 'the Bend') together with a foundation grout curtain;
- addition of a downstream filter zone and berm to Embankment No. 1A at the Junction together with foundation improvements and enhanced downstream drainage;
- addition of a malleable seal upstream of the concrete core-wall at the Junction;
- addition of a downstream filter zone and berm to Embankment No. 1B;
- addition of a downstream filter zone and berm to Embankment No. 2; and
- strengthening of the upstream northern training wall supporting Embankment No. 4.

During the initial embankment works in 1995–96 it was found that margins of safety in the vicinity of the junction with the concrete dam were inadequate and in October 1996 the operating full supply level of the reservoir was temporarily lowered by five metres. Although works to allow restoration of normal operations were completed by November 1997, to date there have been insufficient inflows to fill the reservoir and prove the performance of the remedial work.

In March 1999, Phase Two of the Embankment Improvement Works was commenced. These works, which are essentially aimed at providing dam safety under extreme earthquake loadings, are estimated to cost $15 million and comprise:

- extension of the filters and berm to the crest on Embankment No. 1B;
- extension of the filters and berm to the crest at the Junction;
- addition of a downstream filter and berm to the balance of Embankment No. 1A, plus foundation strengthening through the addition of stone columns; and
- improved foundation monitoring at Embankment No. 2.

At year's end, the Phase Two work on Embankment No. 1B was nearing completion.

Spillway gates

By the end of June 1999 reliability investigations on the spillway gates were virtually completed. The expected improvement program for 1999–2000 will include: commencement of replacement of electrical reticulation, switchgear and hoist motors; reliability and efficiency enhancements through further redundancy in power sources; and addition of modern control technology.

Emergency closure gates on outlets

Work began in June 1997 on replacement of obsolete emergency closure gates on the irrigation and hydro-electric outlet conduits. The task is complex and includes specialist diving work. Generally only one gate can be taken out of service at a time in order to maintain availability of adequate discharge capacity. The program is jointly funded by River Murray Water and Pacific Power. By the end of 1998–99 one irrigation gate was complete, one partially complete, and one hydro-electric gate virtually complete.

Future work

Further expenditure of $9.4 million is programmed for 1999–2000 including completion of the Phase Two embankment improvement works, continuation of the emergency closure gates program, and commencement of refurbishment and improvement of the spillway gates operating mechanisms.

4.3.2 Other major activities

Planned routine and cyclical maintenance was carried out across the asset portfolio during 1998–99. Major non-cyclical maintenance projects included:

- a refurbishment of the approach channel and downstream erosion control works at the Lake Victoria Storage control regulator;
- a complete rebuild of the Edward River Offtake including provision for remote operations;
- replacement of protective coatings on Menindee Lakes Storages regulator gates;
- a start on the first ever re-paint of the high level outlet tunnel at Dartmouth Dam; and
- replacement of protective coatings on Maude Weir.

This latter project is significant both as a precursor to a projected hand-over of Maude and Redbank Weirs to New South Wales and for the innovative use of sprayed metallic zinc coatings (also used at Menindee Lakes), which are expected to more than double maintenance intervals.

4.3.3 Long term asset management

A major business focus for River Murray Water is the implementation of integrated asset management to ensure long-term sustainability of the asset base at lowest possible cost. This has involved many projects ranging from condition assessments, through structural audits and risk assessments, to the building of a modern asset register with assets revalued to optimised depreciated replacement values in accord with COAG principles. It is planned that all of these component projects will be completed by the end of 1999.

By June 1999, a modern asset management system had been acquired and was being loaded onto the Commission's Information Technology platform. This will operate locally in Canberra at first, but is planned to link with service providers through the Internet in the next year or so. It will collect all asset information, including risk assessments, and enable determination of priorities of recurrent and capital expenditure, along with the development of a soundly based asset renewals strategy.

5. FINANCE AND HUMAN RESOURCES

5.1 THE 1998–99 BUDGET

The Ministerial Council approved the 1998–99 budget of $54.4 million with provision for aggregate expenditure as follows:

	$million
River Murray Water	36.7
Basin Sustainability/Natural Resources Management	17.7
Total	**54.4**

Contracting Government contributions to expenditure during the year are shown in Table 11.

Table 11 Contributions of Contracting Governments

Government	$million
Commonwealth	9.2
New South Wales	16.4
Victoria	15.1
South Australia	11.5
Queensland	0.5
Australian Capital Territory	0.2
Total Contracting Governments	**52.9**
Other income	1.5
Total Commission funding	**54.4**

5.2 FINANCIAL STATEMENTS

The Australian National Audit Office continued as the Commission's external auditor whilst internal audit services were provided by Deloitte Touche Tohmatsu.

Financial statements for 1998–99 have been prepared on an accruals basis. The statements, preceded by the auditor's report and a statement on behalf of the Commission, appear on the following pages.

5.3 THE 1999–2000 BUDGET

The Ministerial Council approved the Commission's 1999–2000 budget of $57.1 million, summarised as follows:

	$million
River Murray Water	35.8
Basin Sustainability/Natural Resources Management	21.3
Total	57.1

5.4 STAFF OF THE COMMISSION

Staff engaged by the Commission provide advice to the Commission on policy, strategy and investment programs, and arrange and coordinate implementation of programs. The Commission also employs management and operational staff of River Murray Water.

Staff are employed in accordance with the Commission's Workplace Agreement. During the year negotiations commenced between management and staff to develop a new agreement. The new agreement will be implemented in the first half of 1999–2000 following its acceptance by staff. The Commission records its appreciation of the role of the Staff Consultative Committee and the cooperation of all staff in making the existing agreement work and in helping to develop the new agreement.

At 30 June 1999 the Commission employed a total of 67 staff on a variety of bases, including continuing, fixed-term, casual and part time. Other officers are seconded from State and Commonwealth agencies.

Table 12 Staff structure

	Male	Female	Total
Senior Executive	6	1	7
Senior officer	20	6	26
Sciences/technical	–	3	3
Administrative	12	19	31
Total	38	29	67

The skills base of the Commission (Table 13) reflects the strategic role of the Commission in the formulation, coordination and implementation of policies.

Table 13 Academic qualifications

Highest qualification	Sciences	Engineering	Business/ other	Total
Doctorate	3	2	–	5
Masters	3	3	1	7
Bachelor	15	8	9	32
Other tertiary	–	–	17	17
Total	**21**	**13**	**27**	**61**

During the year a staff member, Dr Ben Dyer, commenced a Churchill Fellowship to study river modelling practices.

With Commission approval, the Chief Executive, Don Blackmore, continued as a member of the World Commission on Dams.

FINANCIAL ST ATEMENTS

Australian National
Audit Office

INDEPENDENT AUDIT REPORT

To the Murray-Darling Basin Ministerial Council

Scope

I have audited the financial statements of the Murray-Darling Basin Commission for the year ended 30 June 1999. The statements comprise:

- Statement by the President and the Chief Executive Officer of the Commission
- Operating Statement
- Statement of Assets and Liabilities
- Statement of Cash Flows
- Schedule of Commitments
- Schedule of Contingencies; and
- Notes to and forming part of the Financial Statements.

The President and the Chief Executive Officer of the Commission are responsible for the preparation and presentation of the financial statements and the information they contain. I have conducted an independent audit of the financial statements in order to express an opinion on them to the Ministerial Council of the Murray-Darling Basin Commission.

The audit has been conducted in accordance with Australian National Audit Office Auditing Standards, which incorporate the Australian Auditing Standards, to provide reasonable assurance as to whether the financial statements are free of material misstatement. Audit procedures included examination, on a test basis, of evidence supporting the amounts and other disclosures in the financial statements, and the evaluation of accounting policies and significant accounting estimates. These procedures have been undertaken to form an opinion whether, in all material respects, the financial statements are presented fairly in accordance with Australian Accounting Standards, other mandatory professional reporting requirements and statutory requirements so as to present a view of the entity which is consistent with my understanding of its financial position, the results of its operations and its cash flows.

The audit opinion expressed in this report has been formed on the above basis.

GPO Box 707 CANBERRA ACT 2601
Centenary House 19 National Circuit
BARTON ACT
Phone (02) 6203 7300 Fax (02) 6203 7777

Audit Opinion

In accordance with sub-clause 84(4) of the *Murray-Darling Basin Agreement 1992,* I now report that the financial statements are in agreement with the accounts and records of the Murray-Darling Basin Commission and in my opinion,

(i) the financial statements are based on proper accounts and records

(ii) the receipt, expenditure and investment of moneys, and the acquisition and disposal of assets by the Commission during the year have been in accordance with the *Murray-Darling Basin Agreement 1992*, and

(iii) the financial statements give a true and fair view, in accordance with applicable Accounting Standards and other mandatory professional reporting requirements, of the financial position of the Murray-Darling Basin Commission as at 30 June 1999 and the results of its operations and its cash flows for the year then ended.

Australian National Audit Office

Puspa Dash

Puspa Dash
Senior Director

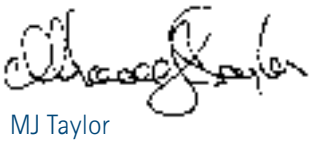
Delegate of the Auditor-General

Canberra

13 October 1999

STATEMENT ON BEHALF OF THE COMMISSION

In our opinion, the attached financial statements present fairly the financial position and transactions of the Murray-Darling Basin Commission for the year ended 30 June 1999.



MJ Taylor
Acting President
12 October 1999

DJ Blackmore
Chief Executive Officer
12 October 1999

OPERATING STATEMENT
FOR THE PERIOD 1 JULY 1998 – 30 JUNE 1999

	Notes	1999 $'000	1998 $'000
NET COST OF SERVICES			
Operating expenses			
Employees	2A	3,923	4,160
Suppliers	2B	41,399	49,664
Depreciation	2C	285	287
Net loss from sales of assets	2D	6	56
Total operating expenses		**45,613**	**54,167**
Operating revenues from independent sources			
Sale of goods and services	3A	800	2,125
Interest	3B	1,136	1,008
Other		23	1
Total operating revenues from independent sources		**1,959**	**3,134**
Net cost of services		**43,654**	**51,033**
REVENUES FROM GOVERNMENTS			
Contributions by governments	4	42,688	54,342
Surplus of revenues from governments over net cost of Services		(966)	3,309
TOTAL AVAILABLE FOR APPROPRIATION			
Surplus 1998-99		(966)	3,309
Accumulated funds at beginning of reporting period		5,137	1,828
Accumulated funds at end of reporting period		**4,171**	**5,137**

The accompanying notes and schedules form part of these financial statements.

STATEMENT OF ASSETS AND LIABILITIES
AS AT 30 JUNE 1999

	Notes	1999 $'000	1998 $'000
PROVISIONS AND PAYABLES			
Employees	5A	805	841
Suppliers	5B	9,201	4,192
Total provisions and payables		**10,006**	**5,033**
REVENUE IN ADVANCE	5C	10,419	3,285
Total revenue in advance		**10,419**	**3,285**
Total liabilities		**20,425**	**8,318**
EQUITY			
Accumulated funds at beginning of reporting period		5,581	1,828
Contributions by Contracting Governments for purchase of assets		268	444
Operating surplus/(loss)		(966)	3,309
Total equity		**4,883**	**5,581**
Total liabilities and equity		**25,308**	**13,899**
FINANCIAL ASSETS			
Cash	6A	12,743	11,676
Investments	6C	10,500	-
Receivables	6B	98	554
Other	6D	1,377	979
Total financial assets		**24,718**	**13,209**
NON-FINANCIAL ASSETS			
Property, plant and equipment	7A	582	678
Inventories	7B	8	12
Total non-financial assets		**590**	**690**
Total assets		**25,308**	**13,899**
Current liabilities		20,001	7,783
Non-current liabilities		424	535
Current assets		24,726	13,221
Non-current assets		582	678

The accompanying notes and schedules form part of these financial statements.

STATEMENT OF CASH FLOWS
FOR THE PERIOD 1 JULY 1998 TO 30 JUNE 1999

	Notes	1999 $'000	1998 $'000
CASH FLOWS FROM OPERATING ACTIVITIES			
Cash received			
Contributions by governments		50,048	54,192
Sale of goods and services		1,848	2,457
Interest		1,139	938
Total cash received		**53,035**	**57,587**
Cash used:			
Employees		(3,858)	(4,023)
Suppliers		(37,683)	(46,226)
Total cash used		**(41,541)**	**(50,249)**
Net cash from operating activities	18	**11,494**	**7,338**
CASH FLOWS FROM INVESTING ACTIVITIES			
Cash received			
Proceeds from sale of property, plant and equipment		73	1
Contributions by Contracting Governments for purchase of assets		268	444
Total cash received		**341**	**445**
Cash used:			
Payments for property, plant and equipment		(268)	(368)
Investments		(10,500)	-
Total cash used		**(10,768)**	**(368)**
Net cash from investing activities		**(10,427)**	**77**
Net increase in cash held		1,067	7,415
Cash at 1 July 1998		11,676	4,261
Cash at 30 June 1999		**12,743**	**11,676**

The accompanying notes and schedules form part of these financial statements.

SCHEDULE OF COMMITMENTS AS AT 30 JUNE 1999

BY TYPE	1999 $'000	1998 $'000
CAPITAL COMMITMENTS		
Total capital commitments	-	-
OTHER COMMITMENTS		
Operating leases*	440	1,002
Total commitments payable	**440**	**1,002**
BY MATURITY		
One year or less	388	573
From one to two years	26	383
From two to five years	26	46
Total commitments	**440**	**1,002**

* The Commission has entered into an agreement to lease office accommodation at Fujitsu House, 7 Moore Street, Canberra City, that expires on 25 February 2000. Operating leases exist for photocopier and plotter equipment and for two vehicles.

SCHEDULE OF CONTINGENCIES AS AT 30 JUNE 1999

	1999 $'000	1998 $'000
CONTINGENT LOSSES	-	-
CONTINGENT GAINS	-	-
Net contingencies	**-**	**-**

SCHEDULE OF UNQUANTIFIABLE CONTINGENCIES

As at 30 June 1999 the Commission was joined as a party to a matter before the courts related to land rights. It is not possible to estimate the amounts of any payments that may eventually be required in relation to this case.

The accompanying notes and schedules form part of these financial statements.

1. *Summary of significant accounting policies*

1.1 Basis of accounting

The financial statements are general purpose financial reports on the financial position and transactions of the Commission. As indicated in Note 1.5, these statements do not incorporate assets and related depreciation for infrastructure considered to be held in trust by State Constructing Authorities on behalf of the Commission.

The financial statements have been prepared in accordance with Australian Accounting Standards and Accounting Guidance Releases issued by the Australian Accounting Research Foundation, Consensus Views of the Urgent Issues Group and having regard to Statements of Accounting Concepts. Financial statements have been prepared on an accrual basis in accordance with historical cost conventions. No allowance is made for the effect of changing prices on the results or financial position.

1.2 Taxation

The Commission is exempt from all forms of taxation except fringe benefits tax and wholesale sales tax in respect of motor vehicles available for private use.

1.3 Inventories held for sale

Inventories comprise publications and videos held for sale or free distribution as part of the Commission's communications program. Inventories are stated at the lower of cost and net realisable value.

1.4 Property plant and equipment held by the Commission

All property plant and equipment with a cost equal to or in excess of $600 is capitalised in the year of acquisition and is reported at cost value. All depreciable non-current assets are written off to their estimated realisable value over their estimated useful lives using the straight line method of depreciation. The following useful lives and depreciation rates have been assumed for each category of asset.

Motor Vehicles	6.67 years	(15% p.a.)
Computers and IT equipment	3.00 years	(33.3% p.a.)
Office Equipment	5.88 years	(17% p,a.)
Furniture, Fixtures and Fittings	7.69 years	(13% p.a.)

Leasehold improvements are amortised over the estimated life of the improvements or the unexpired portion of the lease whichever is the lesser.

Under the provisions of the Murray-Darling Basin Agreement, Contracting Governments are required to contribute to the operating and capital expenditure of the Commission on an annual basis. Contributions by Contracting Governments for the purchase of assets are treated as a contribution of equity.

1.5 Assets held by Constructing Authorities but acquired with Commission funds

Infrastructure assets used for the storage and distribution of bulk water and for related activities have been constructed with funds provided by the Commission. These assets are located in the states and operated by employees of state government agencies.

Although such assets are considered to be held in trust by state constructing authorities on behalf of the Commission, they have not been incorporated into these financial statements, nor has depreciation of these assets been taken into account in determining the operating profit / loss for the year. This position will be reviewed as progress is made in the establishment of the water business unit (River Murray Water) within the Commission and the introduction of a user-pays pricing regime for services provided by River Murray Water.

The Murray-Darling Basin Agreement requires each Contracting Government to account to the Commission for all moneys received from the Commission under the Agreement. The Commission must cause a list to be kept of both the assets it acquires and the assets Constructing Authorities acquire with funds made available by the Commission. To meet these requirements, assets acquired by the Commission are included in the Commission's asset registers and accounts (see note 1.4) and each of the State Constructing Authorities is required by the Commission to prepare an asset register which is to be made available to the Commission on request. The Commission is in the process of developing a consolidated register of all assets acquired with funds provided by the Commission.

1.6 Employee entitlements

All vesting employee entitlements (including salaries, employer superannuation contributions, recreation leave, and long service leave) are recognised as liabilities. Liabilities for recreation leave, employer superannuation contributions, and salaries are measured at current remuneration rates at 30 June 1999 (nominal value). The

provision for long service leave at 30 June 1999 is measured as the present value of estimated cash outflows attaching to the nominal value at 30 June 1999. Estimated cash outflows are calculated by adjusting the nominal value for each employee for potential remuneration increases and applying a probability factor related to years of service to estimate expected payout and year of payment. The present value of each payout is calculated by applying discount factors derived from current yields of long term government debt maturing in the expected year of payment.

The classification of recreation and long service leave liabilities into current and non-current is based on the past history of payments. No provision has been made for sick leave as all sick leave is non-vesting and the average sick leave taken by employees is less than the annual entitlement for sick leave.

1.7 Leases

A distinction is made between finance leases which effectively transfer from the lessor to the lessee substantially all the risks and benefits incidental to ownership of leased assets and operating leases under which the lessor effectively retains all such risks and benefits. Operating lease payments are charged to the Operating Statement on a basis which is representative of the pattern of benefits derived from the leased assets.

1.8 Lease incentives

Lease incentives are recognised as liabilities on receipt of the incentive. The amount of liability is reduced by allocating lease payments between rental expense and reduction of liability.

1.9 Revenue received in advance

In accordance with accrual accounting principles expenditures during the year are matched with revenues provided by governments and others to fund them. Amounts received in advance to fund projects in future years and unspent funds provided for the current year that have been authorised to be carried-over to the following year in accordance with clause 75 of the *Murray-Darling Basin Agreement* are treated as revenue received in advance.

1.10 Cash

For the purpose of the statement of cash flows, cash includes cash on hand and on call at the bank.

1.11 Rounding

Amounts, including totals and sub-totals are rounded to the nearest $1,000 except in relation to:

- remuneration of commissioners
- remuneration of officers
- remuneration of auditors.

Rounding may give rise to apparent minor discrepancies in additions.

1.12 Resources received free of charge

The Commission receives no resources free of charge.

2. Goods and services expenses

	1999 $'000	1998 $'000
2A Employee expenses		
Salaries	3,890	3,772
Increase in provision for annual leave	63	(36)
Decrease in provision for long service leave	(124)	191
Separation and redundancy	94	233
	3,923	**4,160**
2B Supplier expenses		
Expenditure by State Constructing Authorities	30,937	34,341
Project expenditure	7,296	12,881
Supply of goods and services	3,166	2,442
	41,399	**49,664**
2C Depreciation		
Depreciation of motor vehicles	24	18
Depreciation of office equipment	37	36
Depreciation of computers	201	217
Depreciation of furniture, fixtures and fittings	23	16
	285	**287**
2D Net loss from sales of assets		
Property plant and equipment	6	56
	6	**56**

3. *Operating revenues from independent sources*

	1999 $'000	1998 $'000
3A Sale of goods and services		
Hydro generation and land and cottage rents	784	2,110
Sale of publications and videos	16	15
	800	**2,125**
3B Interest		
Interest from bank and investments	1,136	1,008
	1,136	**1,008**

4. *Revenues from government*

Contributions by contracting governments:		
Commonwealth	8,572	9,864
New South Wales	15,698	14,635
Victoria	14,482	14,635
South Australia	10,834	14,810
Queensland	601	428
Australian Capital Territory	218	30
Add carry-over of funds from 1997-98	2,899	3,373
Less unearned revenue payments for 1999–2000 in advance	(130)	–
Less unearned revenue payments for 1998–99 in advance	–	(90)
Less revenue carried forward to 1999-2000	(10,218)	(2,899)
Less Equity contribution for purchase of assets	(268)	(444)
Total	**42,688**	**54,342**

5. *Provisions and payables*

	1999 $'000	1998 $'000
5A Liabilities for employee entitlements		
Salaries and wages	66	43
Annual leave	315	251
Long service leave	424	547
	805	**841**
Current	381	306
Non-current	424	535
Total liabilities for employee entitlements	**805**	**841**
5B Suppliers		
Project expenditure payable	432	139
Constructing Authority claims payable	8,515	3,998
Other creditors	254	55
Total suppliers	**9,201**	**4,192**
5C Revenue received in advance		
Queensland 1999-2000 contributions received in advance	130	60
ACT 1998-99 contribution received in advance	-	30
Carry-over of 1998-99 contributions to 1999-2000	10,218	2,899
Unamortised balance of lease incentive	71	181
Australian Arts Council – Rural Partnership Program	-	50
Barmah-Millewa	-	25
MD2001 Fish Rehabilitation	-	40
Total revenue received in advance	**10,419**	**3,285**

6. *Financial assets*

	1999 $'000	1998 $'000
6A Cash		
Cash on call at bank	12,740	11,673
Cash on hand	3	3
	12,743	**11,676**
6B Receivables		
Interest	65	70
Other debtors	33	484
	98	**554**
6C Investments		
Term deposits	10,500	-
	10,500	**-**
6D Other assets		
Prepaid contracts	489	91
Advances to Constructing Authorities	888	888
	1,377	**979**

7. *Non-financial assets ($'000)*

	Balance 1 Jul 98	Retire-ment	Acqui-sitions	Balance 30 Jun 99	Balance 30 Jun 98
7A Property, plant and equipment					
Motor vehicles (cost)	149	88	83	144	149
Accumulated depreciation	(19)			(23)	(19)
	130	**88**	**83**	**121**	**130**
Office equipment (cost)	306	42	6	270	306
Accumulated depreciation	(172)			(174)	(172)
	134	**42**	**6**	**96**	**134**
Furniture, fixtures and fittings (cost)	150	-	4	154	150
Accumulated depreciation	(68)			(91)	(68)
	82	**-**	**4**	**63**	**82**
Computers and IT equipment (cost)	912	119	175	968	912
Accumulated depreciation	(580)			(666)	(580)
	332	**119**	**175**	**302**	**332**
Net property plant and equipment	**678**			**582**	**678**
Totals retirements / acquisitions		**249**	**268**		

	1999 $'000	1998 $'000
7B Inventories		
Inventory of publications and videos held for sale and distribution (at cost)	8	12

8. *Unrecognised Liabilities*

The Commission is not aware of any significant unrecognised liabilities at 30 June 1999 other than those recorded in the schedule of commitments.

9. *Liabilities assumed by governments*

Except as indicated by these statements no liabilities have been assumed by governments

10. Remuneration of officers

	1999 $	1998 $
Income received or due and receivable by Officers	692,584	435,122

The number of officers included in these figures are shown below in the relevant income bands

	Number	Number
$100,000 - $109,999	1	-
$110,000 - $119,999	1	-
$120,000 - $129,999	-	1
$130,000 - $139,999	1	1
$150,000 - $159,999	1	-
$170,000 - $179,999	-	1
$180,000 - $189,999	1	-

'Remuneration' refers to salary, employer superannuation, estimated cost of motor vehicles provided as part of a remuneration package, spouse travel entitlements and related fringe benefits tax, paid during 1998-99 for officers concerned with the management of the Office of the Commission where the total paid in respect of an individual exceeded $100,000.

11. Remuneration of Members of the Commission

Remuneration is paid to one executive member. No remuneration is paid to non-executive members who are State or Commonwealth public servants or officers of State agencies:

Number of members in the relevant income band		
$110,000 - $119,999	–	1

12. Auditors' Remuneration

	1999	1998
Remuneration to be paid to Commonwealth Auditor General for auditing financial statements for the reporting period. No other services were provided by the Auditor-General.	$23,000	$23,000
Remuneration paid to Deloitte Touche Tohmatsu for internal auditing services during the reporting period (includes assistance in preparation of accrual accounts).	$30,870	$29,644

13. Related Party Disclosures

Members of the Commission

Members of the Commission during 1998-1999 were:

Professor J. Lovering (President)(to 30 June 99)

Mr. G. Gorrie (to 17 March 99)	Mr. M. Taylor
Mr. B. Wonder (from 17 March 99)	Mr. D. Flett
Dr. B. Smith	Mr. E. Phipps (to 12 February 99)
Dr. K. Sheridan	Mr. J. Scanlon
Mr. T. Fenwick	Mr D. Mutton (from 27 May 99)
Dr. C. Adrian	Mr. S. Hunter

Loans to Members and Officers

No loans were made to members or officers of the Commission.

Transactions with Related Entities

The Murray-Darling Basin Commission is the executive arm of the Ministerial Council established by the 1992 Murray Darling Basin Agreement. As a partnership between the States and Commonwealth funds for activities under the direction of the Commission are paid into the Commission's account and disbursed according to Commission priorities. The bulk of Commission funded activity is undertaken by State agencies as constructing authorities. All transactions are at arm's length and in accordance with budgets and programs approved by the Ministerial Council.

14. Economic Dependency

The Commission is dependent on contributions by contracting governments to carry out its normal activities.

15. Location of Business

With the exception of assistance provided to the Mekong River Commission under AusAid funding the Commission operates solely in Australia.

16. Subsequent Events

The Commission is aware of no events subsequent to 30 June 1999 that may affect these financial statements.

17. Grants

The Commission is responsible for administering a number of grant programs on behalf of Commonwealth and state governments. Funding for these programs and responsibility for the programs rests with the various individual government bodies, consequently no disclosures have been made in relation to grant programs.
Grants received during the year were for the Mekong Delta and Fish Rehabilitation projects. Details of revenue and expenditure in relation to grant programs are as follows:

Grants Program

	1999 $'000	1998 $'000
Cash available, 1 July	523	572
Contributions by Government agencies	518	513
Total receipts	1 041	1 085
Payments	418	562
Cash available, 30 June	**623**	**523**

18. *Cash Flow Reconciliation*

	1999 $'000	1998 $'000
Reconciliation of the net cash flows used by operating activities to the Net Cost of Services		
Total Operating Expenses	45,613	54,167
less		
Revenues from governments	(42,688)	(54,342)
Interest	(1,136)	(1,008)
Other Revenue	(823)	(2,126)
Operating Surplus	**(966)**	**3,309**
Add:		
Depreciation	285	287
Repayment of Advances	-	263
Increase/(Decrease) in unearned revenue	7,134	(378)
Increase in payables	5,010	4,192
(Increase)/Decrease in receivables	455	(454)
Loss on sale of assets	6	-
Increase in inventories	5	(7)
Deduct:		
(Decrease)/Increase in employee entitlements	(37)	166
Increase in prepayments	(398)	(40)
Net Cash Provided by Operating Activities	**11,494**	**7,338**

19. Additional Financial Instruments Disclosure

a) Interest Rate Risk

The Commission's exposure to interest rate risk and the effective weighted average interest rate for classes of financial assets and financial liabilities is set out below:

	Note	Floating Interest Rate		Fixed Interest Rate 1 year or less		Non-Interest Bearing		Total	
		1999	1998	1999	1998	1999	1998	1999	1998
		$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Financial Assets									
Cash at Bank	6A	12,740	11,673	-	-	-	-	12,740	11,673
Cash on Hand	6A	-	-	-	-	3	3	3	3
Receivables	6B	-	-	-	-	98	554	98	554
Investments	6C	-	-	10,500	-	-	-	10,500	-
Weighted Average interest rate		4.5%	5%(est)	4.88%	n/a				
Financial Liabilities									
Accounts Payable	5B	-	-	-	-	9,201	4,192	9,201	4,192

b) Foreign Exchange Risk

The Commission has not entered into any foreign currency transactions.

c) Credit Risk Exposure

Credit risk represents the loss that would be recognised if counterparties failed to perform as contracted.

The credit risk on financial assets of the Commission which have been recognised on the statement of assets and liabilities, is the carrying amount, net of any provision for doubtful debts. Due to the nature of the majority of the Commission's clients such risk is considered by the Commission to be low.

d) Net Fair Values of Financial Assets and Liabilities

The net fair value of investments have been valued at net realisable value at balance date. For other assets and liabilities, the net fair value approximates their carrying value. No financial assets and financial liabilities are readily traded on organised markets in standardised form other than investments. The aggregate net fair values and carrying amounts of financial assets and financial liabilities are disclosed in the statement of assets and liabilities and in the notes to and forming part of the accounts.

APPENDIX A: MEMBERSHIP OF THE MINISTERIAL COUNCIL

MEMBERS FROM 1 JULY 1998 TO 30 JUNE 1999

Commonwealth

The Hon. Mark Vaile, MP	Minister for Agriculture, Fisheries & Forestry (Chair) (from 21 October 1998)
The Hon. John Anderson, MP	Minister for Primary Industries and Energy (Chair) (to 21 October 1998)
Senator the Hon. Robert Hill	Minister for the Environment and Heritage
The Hon. Wilson Tuckey, MP	Minister for Forestry and Conservation (from 21 October 1998)

New South Wales

The Hon. Richard Amery, MP	Minister for Agriculture and Minister for Land and Water Conservation
The Hon. Bob Debus, MP	Minister for the Environment (from 8 April 1999)
The Hon. Pam Allan, MP	Minister for the Environment (to 8 April 1999)

Victoria

The Hon. Pat McNamara, MP	Deputy Premier and Minister for Agriculture and Natural Resources
The Hon. Marie Tehan, MP	Minister for Conservation and Land Management

South Australia

The Hon. Dorothy Kotz, MP	Minister for Environment and Heritage and Minister for Aboriginal Affairs
The Hon. Rob Kerin, MP	Minister for Primary Industries, Natural Resources and Regional Development
The Hon. Michael Armitage, MP	Minister for Government Enterprises

Queensland

The Hon. Rod Welford, MLA	Minister for Environment and Heritage and Minister for Natural Resources

Australian Capital Territory

Mr Brendan Smyth, MLA	Minister for Urban Services

Australian Capital Territory participation is via a memorandum of understanding, 27 March 1998.

APPENDIX B: MEMBERSHIP OF THE COMMUNITY ADVISORY COMMITTEE

MEMBERS FROM 1 JULY 1998 TO 30 JUNE 1999

Chairperson

Mrs Leith Boully	(from 1 January 1999)
Mr Clive Thomas	(to 31 December 1998)

Regional Representatives

New South Wales

Mrs Michele Simpson	Central West	(from 7 July 1998)
Mr Bob McFarland	Lachlan	
Mr Jim Wilton	Lower Murray-Darling	(from 7 July 1998)
Mr Adrian Wells	Murray	(from 7 July 1998)
Mr Tom Stacy	Murrumbidgee	
Mr Alan Sinclair	North West	
Mrs Jenny McLellan	Western	

Victoria

Mr Jeremy Gaylard	Goulburn
Mr Rodney Hayden	Mallee
Mr Drew English	North Central
Mrs Noelene Wallace	North East
Mr Lance Netherway	Wimmera

South Australia

Mr Leon Broster	Adelaide	
Mr John Berger	Lower Mallee	(from 1 July 1998)
Mrs Joanne Pfeiffer	Lower Murray	
Dr Peter Haslett	Riverland	

Queensland

Mr Hugh Gloster	Border Rivers	
Mrs Bobbie Brazil	Condamine	(from 12 November 1998)
Mr Ken Stallman	Condamine	(to 11 November 1998)
Mr Lloyd Harth	Maranoa/Balonne	
Ms Anne Bredhauer	Warrego/Paroo	

Australian Capital Territory

Professor Peter Cullen	ACT Environment Advisory Committee

Peak Organisation Representatives

Mr Tim Fisher	Australian Conservation Foundation
Mr Bruce Lloyd	Australian Landcare Council
Mr Ian Mann	Australian Local Government Association
Mr Greg Brown	National Farmers' Federation
Mr Ian Woods	Aboriginal representative

APPENDIX C: MEMBERSHIP OF THE COMMISSION

MEMBERS FROM 1 JULY 1998 TO 30 JUNE 1999

Professor John Lovering	Independent President (to 30 June 1999)

Commonwealth

Mr Bernard Wonder	Executive Director, Competitiveness and Sustainability Group Department of Agriculture, Fisheries and Forestry (from 17 March 1999)
Mr Geoff Gorrie	Executive Director, Agfor Group Department of Primary Industries and Energy (to 17 March 1999)
Mr Stephen Hunter	Head, Biodiversity Group Environment Australia

New South Wales

Dr Bob Smith	Director-General Department of Land and Water Conservation
Dr Kevin Sheridan	Director-General New South Wales Department of Agriculture

Victoria

Mr Michael Taylor	Secretary Department of Natural Resources and Environment
Mr Denis Flett	General Manager Goulburn-Murray Water

South Australia

Mr John Scanlon	Chief Executive Department of Environment, Heritage and Aboriginal Affairs
Mr Dennis Mutton	Chief Executive Department of Primary Industries and Resources SA (from 27 May 1999)
Mr Edward Phipps	Chief Executive South Australian Water Corporation (to 12 February 1999)

Queensland

Mr Tom Fenwick	Director-General Department of Natural Resources

Australian Capital Territory

Dr Colin Adrian	Executive Director Environment ACT

Australian Capital Territory participation is via a memorandum of understanding, 27 March 1998.

APPENDIX D: MEMBERSHIP OF THE PROJECT BOARDS

	Projects	Boards*			Commission
A	**Issues-Based Boards**	**Chair**			
1	Lake Victoria Cultural Heritage	Scanlon (Comm)	Harriss (DepComm), Early (DepComm), Flett (Comm)		Blackmore
2	Mitta Mitta Valley Ex-gratia Payments	Dole (RMW)	Flett (Comm), Harriss (DepComm), Hoey (DepComm), Rhodes		Dole (RMW)
B	**Long-term Strategy Development Boards**	**Executive**	**Senior User**	**Senior Supplier**	**MDBC Senior Officer**
3	Five Year Review of the Operation of the Cap	Gorrie/Wonder (Comm)	Leece (DepComm) Fenwick (Comm)	Fitzpatrick (DepComm)	Blackmore
4	Pilot Interstate Water Trading	Flett (Comm)	Early (DepComm)	Harriss (DepComm)	Keyworth
5	Murray-Darling Basin Fish Management	Pearce (DepComm)	Taylor (Comm)	Lee	Goss
6a	Environmental Flow Management for the River Murray	Hoey (DepComm)	Leece (DepComm) Fitzpatrick (DepComm)	Hunter (Comm)	Blackmore
6b	Water Quality Objectives for the River Murray	Hoey (DepComm)	Leece (DepComm) Fitzpatrick (DepComm)	Hunter (Comm)	Blackmore
7	Basin Salinity Management Strategy	Smith (Comm)	Sutherland (DepComm)	Schonfeldt	Goss
8a	Communication Strategy	Mutton (DepComm)	Spencer (DepComm)	Boully (CAC) English (CAC)	Purdie
8b	Operating Environment Strategy	Mutton (DepComm)	Spencer (DepComm)	Boully (CAC) English (CAC)	Purdie
9	Monitoring and Evaluation Strategy	Pearce (DepComm)	Sutherland (DepComm)	Spencer (DepComm)	Purdie
10	River Murray Floodplain Management	vacant	vacant	vacant	Keyworth

* Comm = Commissioner; DepComm = Deputy Commissioner; CAC = Community Advisory Committee

APPENDIX E: COMMITTEES AND WORKING GROUPS

Basin Salinity Working Group
Basin Sustainability Committee (disbanded November 1998)
Basin Sustainability Program Working Group
Carp Control Co-ordination Group
Communication and Initiative Operating Environment Issues Working Group
Dryland Issues Working Group
Finance Committee
Fish Working Group
Floodplain Planning Working Group
Groundwater Working Group
Hume and Dartmouth Dams Operations Review Reference Panel
Irrigated Infrastructure GIS Working Group
Irrigation Issues Working Group
Legislation Working Group
Operations and Maintenance Working Group
River Murray Flows Working Group
River Murray Water Board
Riverine Issues Working Group
Salinity and Drainage Strategy Assessment Working Group
Salt Interception Working Group
Water Audit Working Group
Water Liaison Committee
Water Market Reform Working Group
Water Policy Committee
Water Quality and River Health Working Group

APPENDIX F: INFORMATION AVAILABLE FROM THE MURRAY-DARLING BASIN COMMISSION

PUBLICATIONS

Information sheets

Murray-Darling Basin Information Sheet
The River Murray: a multi-use resource
The River Murray series: The Upper Murray, The Riverine Plains, The Sunraysia Region, The Lower Murray
Inland Shipping
River Murray Navigation
'Setting the Cap' Summary
Hume and Dartmouth Dam Backgrounder
The River Murray System
Eutrophication
Hume Dam Fact Sheets 1–4
Murray-Darling Basin Commission Drainage Program 1996–97
River Murray Mapping 1993
Dryland Salinity: The Salt of the Earth
Tools to Investigate and Plan for Improved Management of Dryland Salinity
The Pilot Interstate Water Trading Projects

Posters, maps and wall charts

The Murray-Darling Basin B1
The Murray-Darling Basin 1902 B1
River Murray from mountains to sea A1
Waterfowl of the Murray-Darling Basin A1
Frogs of the Murray-Darling Basin A1
Give Murray Cray a Fair Go! B3
Towards Sustainable Rivers
Native Fish of the Murray-Darling Basin A1
Carp – Villians or Victims

Watercolour Prints

Trout Cod
Purple Spotted Gudgeon
Macquarie Perch
Murray Cray

Stickers

Squirrel Glider
Pink Cockatoo
Corroboree Frog
Black Cockatoo
Regent Honeyeater

Booklets – A4

Murray-Darling Basin Transport Facilities and Services
'A Changing People in a Changing Land'
River Murray Landscape Guidelines 1 – 4
River Murray Floodplain Plan Guidelines 1 and 2
Guidelines for the Preparation of River Management Plans No. 2
Hume and Dartmouth Dams: Options paper 1998
Hume and Dartmouth Dams: Final Report 1999
Curlew – Newsletter of the Community Advisory Committee

School resource material

Blue-Green Algae – the Story So Far
Paddle Steamer game

Books

The Murray – History at a Glance
The Emergence of Bioregionalism in the MDB
Historic Shipping on the River Murray
Murray-Darling Basin Resources
Reading the Land – Workshop Proceedings
Special Forever – Our Places, Our Future 1998
– Links with the land 1997
– Special Together 1996
– Special People 1995
– Special Places 1994
The Pilliga by Eric Rolls
The Coorong by Colin Thiele

Newsletters

Wetlands Australia

Videos (available from School Support/Resource Centres; fliers also available)

Discovering the Murray-Darling Basin
Tributaries video newsletter series 10 to 15
Salt
Fish for the Future
Water: Inland Rivers – Lifelines or Polluted Pools?

River Regulation
Irrigation – Just Add Water
Special People
Blooming Algae
Links with the Land
SBS TV *Special Forever* interview
Portraits of our land

Technical Reports

An Audit of Water Use in the Murray-Darling Basin 1995
Water Audit Monitoring Report 1996–97
Water Audit Monitoring Report 1997–98
Setting the Cap – Report of the Independent Audit Group – November 1996
- Report of the Independent Audit Group (Executive Summary 1996)
Review of Cap Implementation 1996–97
Review of Cap Implementation 1997–98
Murray-Darling Basin Cap on Diversions – 'Striking the Balance'
The Cap – Brochure
Floodplains Wetlands Management Strategy – Nov 1998
Algal Management Strategy 1994
Drainage Program Technical Reports 1 to 7
GIS and Irrigation: An inventory of Projects in the Murray-Darling Basin June 1998
Irrigation Forum 1998
Riverine Environment Research Forum 1995, 1998
Dryland Forum 1998
National Principles for the Provision of Water for ecosystems 1996
Groundwater – A Resource for the Future
Status of Groundwater in the Murray-Darling Basin
Salt Trends 1997
Significant Wetland for Water Birds in the Murray-Darling Basin 1997
Cost Sharing for On-ground Works
Natural Resources Management Strategy – Murray-Darling Basin
Salinity and Drainage Strategy
Managing Saltland into the 21st Century
Chowilla Resource Management Plan – Community Consultation Program 1991
Chowilla Resource Management Plan – Final Report

GLOSSARY

1998–99	The financial year 1998–99, namely 1 July 1998 to 30 June 1999. See also *water year*.
Agreement	See *Murray-Darling Basin Agreement*.
anabranch	A branch of a river that leaves the main stream and rejoins it further downstream.
Basin	When shown with an initial capital, refers to the Murray-Darling Basin.
Basin states	The four states in which the Murray-Darling Basin is located – namely New South Wales, Victoria, South Australia and Queensland. When the Australian Capital Territory is included, the term 'Basin states and the Australian Capital Territory' is used.
blue-green algae	See *cyanobacteria.*
Basin Sustainability Program	The framework for planning, evaluating and reporting on natural resources management in the Basin, described in section 3.3.
channel capacity	Flow-carrying capacity of a stream or channel, above which water flows over the bank.
Commission, the	The Murray-Darling Basin Commission, see section 1.3.
Constructing Authorities	See *State Constructing Authorities*.
Contracting Governments	The Contracting Governments to the *Murray-Darling Basin Agreement 1992*, namely the Commonwealth Government and the 'State Contracting Governments' of New South Wales, Victoria, South Australia and Queensland. As the Australian Capital Territory's participation in the Murray-Darling Basin *Initiative* is by memorandum of understanding (described in section 1.1), it is not a Contracting Government: see *partner governments*.
Council, the	See *Murray-Darling Basin Ministerial Council*.
cyanobacteria	A group of bacteria containing photosynthetic pigments, often forming problematic toxic blooms. Commonly referred to as 'blue-green algae'.

dozer licence	An allocation of water to a user that has only been partially used in the past. See *sleeper licence*.
during the year	During the financial year 1998–99, namely between 1 July 1998 and 30 June 1999.
EC (unit)	Electrical conductivity unit. 1 EC = 1 micro-Siemen per centimetre, measured at 25˚ Celsius. Commonly used to indicate the salinity of water.
ecologically sustainable	Related to using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained and the total quality of life – now and in the future – can be increased.
entitlement flows	Minimum monthly River Murray flows to South Australia, as detailed in the *Agreement*.
GL	Gigalitre: one thousand million or 10^9 litres.
groundwater	The water in the saturated pores of soil or rock below the watertable.
Initiative	When the word *Initiative* is italicised, see *Murray-Darling Basin Initiative*.
integrated catchment management	A philosophy that considers the total long-term effect of land management practices on the soils, water, plants and animals of an entire catchment, from production and environmental viewpoints.
irrigation season	The period in which major irrigation diversions occur, usually starting in August–September and ending in April–May.
Murray-Darling 2001	A multi-partner funding program delivered through the Natural Heritage Trust. Details are in section 3.4.
MDBC	The Murray-Darling Basin Commission: see section 1.3.
ML	Megalitre: one million or 10^6 litres, about half the volume of an Olympic-sized swimming pool.
Murray-Darling Basin Agreement	Short form: the *Agreement*. The agreement between the Contracting Governments: see the introduction to section 1. The current *Agreement* is known as the *1992 Agreement*.
Murray-Darling Basin Initiative	Short form: the *Initiative*. Essentially, the partnership of governments and the community formed to enhance the environmental resources of the Murray-Darling Basin; defined more fully in the introduction to section 1.

Murray-Darling Basin Ministerial Council	Ministers holding land, water and environment portfolios in each Contracting Government. A minister of the Australian Capital Territory Government also participates under the terms of a memorandum of understanding described in section 1.1.
Natural Heritage Trust	The Commonwealth Government's Natural Heritage Trust was established by the Commonwealth Government in 1997 to fund environmental protection, sustainable agriculture and natural resource management.
Natural Resource Management Strategy	The over-arching strategy of the Murray-Darling Basin *Initiative*. See section 3.
off-allocation	Usage, or a period of usage, of water by irrigators when the usage is not counted against an irrigator's allocation. Periods of off-allocation for a given reach of a waterway are sometimes declared by a regional water authority when unregulated tributary flows or spills from storages produce a flow which is above the total downstream requirements for that reach.
out-of-balance	A term used in tables describing water held in storage by Victoria and New South Wales. It describes the difference in the volumes of water held in reserve in the Commission's storages for later use by those two states. Traditionally, because of Victoria's greater involvement in irrigation activities such as horticulture and dairying – as opposed to annual crops – Victoria has held more water in reserve than New South Wales.
overdraw	Borrowing next season's water from reserves, for use during the current season.
partner governments	The governments involved in the Murray-Darling Basin *Initiative*, namely the Governments of the Commonwealth, New South Wales, Victoria, South Australia, Queensland and the Australian Capital Territory. See *Contracting Governments*.
rain-rejection flows	It takes a number of days for water released from storage to travel to the point of use by irrigators. If rain occurs in this period, irrigators may not use all or part of the water which has been ordered. The unused water, termed a 'rain rejection', can result in an increase of streamflow downstream.

riparian	Of, inhabiting or situated on the bank and floodplain of a river.
River Murray System	The river system defined in the introduction to section 4.
River Murray Water	An internal business unit of the Commission responsible by specific delegation for exercising the Commission's functions for water management and asset management.
salinity	The concentration of dissolved salts in groundwater or river water, usually expressed in EC units or milligrams of total dissolved solids per litre. The conversion factor is 0.6 milligrams per litre = 1 EC unit (but variable).
sales water	An allocation of water beyond the basic water allocation (or water right), which is available at a different price from the basic water allocation.
salinity credits	Accounting units for the Salinity and Drainage Strategy. Credits are obtained through measures that reduce the salinity of the River Murray.
Strategic Investigations and Education program	The Commission's funding program to support knowledge generation. Details are in sections 3.3 and 3.4.
sleeper licence	An allocation of water to a user that has not been used in the past. See *dozer licence*.
State Constructing Authorities	The New South Wales Department of Land and Water Conservation, Goulburn-Murray Water, and the South Australian Water Corporation.
surcharge	Water in a lake or reservoir above the nominal full supply level of the storage.
water right	The basic water entitlement or allocation to an individual water user.
water table	The surface below which the pores and fissures of the soil or rock are saturated with water.
water year	In relation to the Snowy Mountains Scheme, the 12 months from 1 May to 30 April. In relation to the River Murray system, the 12 months from 1 June to 31 May.

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