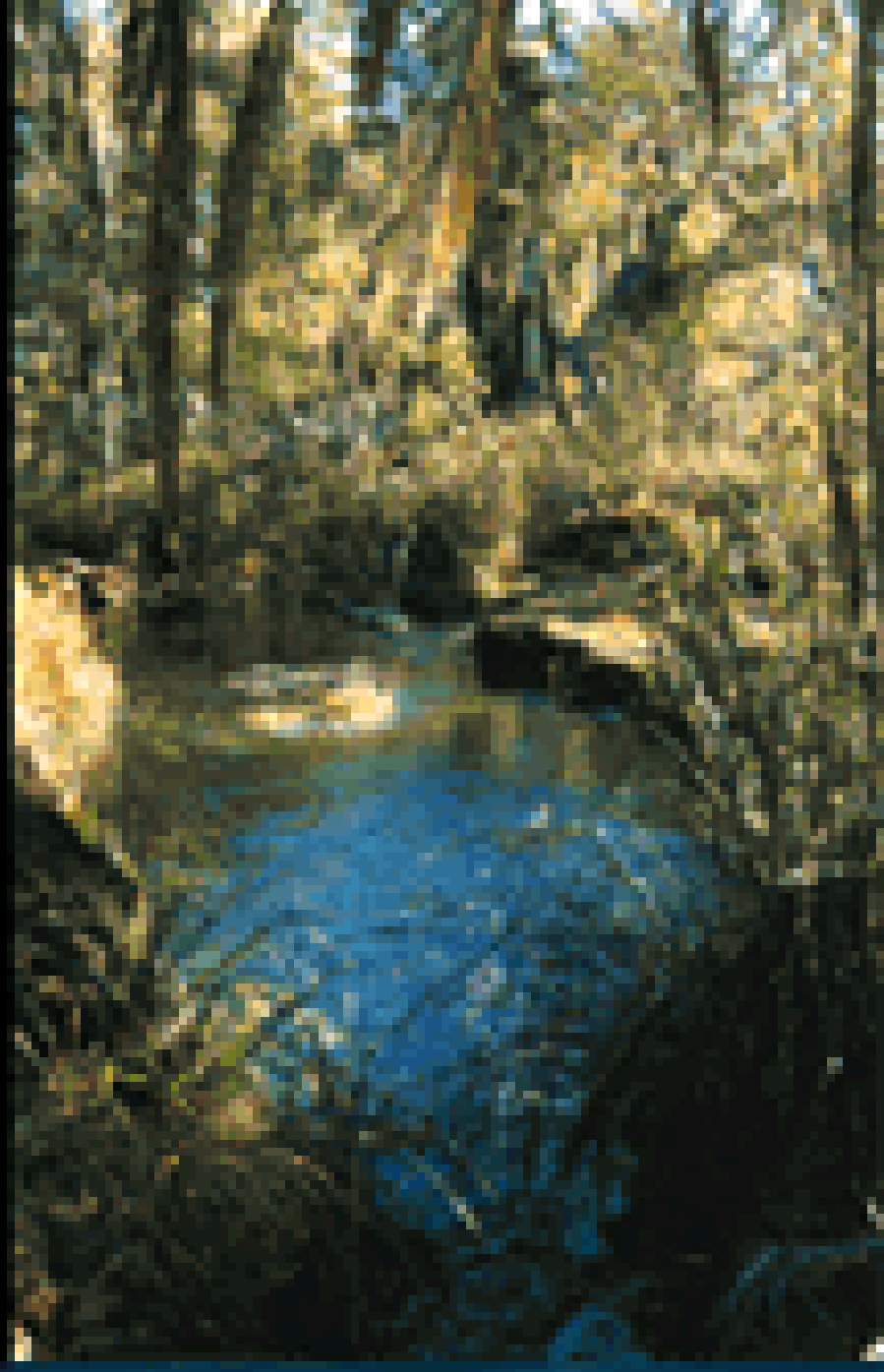

annual report

1998.99

The Honourable Dr Kim Hames MB, BS, JP, MLA, Minister for Housing; Aboriginal Affairs; Water Resources.

Letter to the Minister

On behalf of the Board and in accordance with Section 65A of the *Financial Administration and Audit Act 1985*, we have pleasure in submitting for presentation to Parliament, the Annual Report of the Water and Rivers Commission. This report outlines the performance and achievements of the Commission for the period 1 July 1998 to 30 June 1999.

Ken Webster Chairman of the Board

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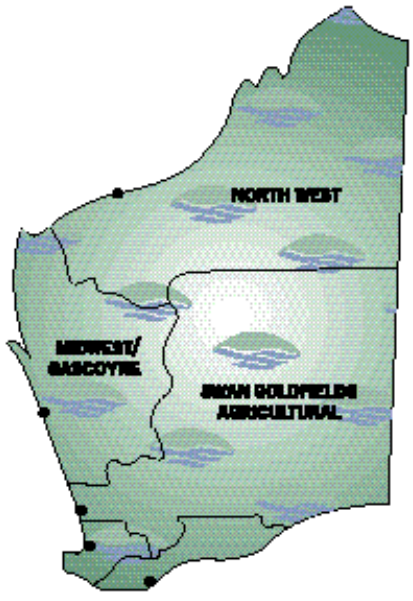

This Annual Report was released in November 1999 at a print cost of $6.88 per copy.
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Abbreviations

AgWA	Agriculture Western Australia
CALM	Department of Conservation and Land Management
COAG	Council of Australian Governments
EPA	Environmental Protection Authority
EPP	Environmental Protection Policy
ICM	Integrated Catchment Management
LCDC	Land Conservation District Committee
MRS	Metropolitan Region Scheme
NHT	Natural Heritage Trust
OWR	Office of Water Regulation
SCCP	Swan-Canning Cleanup Program
SCULP	Swan-Canning Urban Landcare Program
WA	Western Australia
WC	Water Corporation
WRC	Water and Rivers Commission

Water Terms

We are aware that articles on water resource management sometimes contain geographic, biological and other water resource terminology, and abbreviations for organisations. We have tried to keep such terminology to a minimum; abbreviations are defined the first time they are used.

Commonly used terminology and abbreviations are defined here to help the reader. More comprehensive definitions can be found on our website (www.wrc.wa.gov.au.waterwords) and in Water Facts 1, Water Words, available free of charge from our offices.

Algal bloom – Rapid excessive growth of algae, generally caused by high nutrient levels and favourable conditions.

Bore – A narrow lined hole drilled to monitor or withdraw groundwater.

Floodplain – The portion of a river valley next to the river channel which is, or has been, periodically covered with water during flooding.

Groundwater – Water which occupies pores or crevices of rock or soil.

Integrated Catchment Management – The coordinated planning, use and management of water, land, vegetation and other natural resources on a river or groundwater catchment basis.

Salinity – The measure of total soluble (or dissolved) salt (i.e. mineral constituent) in water.

Salinisation – An increase in salinity levels in soils or waters which impairs quality.

Stormwater – Rain water which has run off the ground surface, roads, roofs, paved areas etc. and is usually carried away by drains.

Water resources – All inland surface water, including rivers, wetlands and estuaries, and all underground water including that below near-coastal marine waters.

About this report

A feedback form has been included at the back of this Annual Report. We welcome your suggestions to make future reports more useful to you

This annual report of the Water and Rivers Commission has been prepared to satisfy the Commission's accountability to Parliament and the requirements of the *Financial Administration and Audit Act 1985*. It is also designed to communicate the Commission's work and enhance the understanding of the Commission's activities in the wider community. The Commission is keen to improve the presentation and usefulness of the Annual Report. This year staff, Board members and the Stakeholder Council were invited to provide feedback. Many of their suggestions have been incorporated in this report. Recommendations of the Lonnie Awards judging panel also provided a basis for reviewing our reporting standards.

Water and Rivers Commission overview

Vision

'to excel in water resource management by ensuring that water and rivers are used wisely for the whole community.'

Mission

'to manage the water resources of Western Australia for the benefit of present and future generations in partnership with the community.'

Role

The role of the Water and Rivers Commission is to ensure that Western Australia's water resources are managed to support sustainable development and conservation of the environment, for the long-term benefit of the community.

Managing and protecting Western Australia's most vital resource

The Commission provides services to the community which are delivered through three broad sub-program areas:

- Water resource investigations - the investigation of the quality, quantity and location of ground and surface water resources.
- Water resource allocation and management - the allocation and management of the efficient use of water resources.
- Water quality and conservation - the conservation, protection and enhancement of water quality for public, private and environmental uses or values.

It is the Commission's responsibility to:

- allocate water resources between competing interests to ensure sustainable use and conservation through mechanisms including licensing and education;
- protect water quality;
- conserve and manage the State's rivers and waterways through maintaining or enhancing their public amenity;
- investigate the health and extent of groundwater resources;
- measure water flow and quality;
- investigate, measure and assess the State's water resources.

Act

Water and Rivers Commission Act 1995

Outcomes

Allocation:

Water is used efficiently within sustainable limits to ensure sustainable development and maintenance of environmental values.

Protection and enhancement:

Water resources are protected and restored enabling sustainable development and maintenance of environmental values.

Strategic context:

Completion of water industry reform and the development of a position of leadership in water resource management in the State.

There were no major changes to the functions of the Commission in 1998-99

Water information:

The community has a clear understanding and the best information on the quantity, quality, location and environmental interactions of surface and groundwater.

Strategic priorities

Seeing improvements in water environments

- Sustainable allocation and management of surface water and groundwater.
- Reverse the decline in waterways health and move towards potable water in recovery catchments.
- Improve protection of water resources and minimise risk of degradation, contamination and pollution.
- Better understand the conditions, demands and impacts on water resources.

Key issues

Jointly leading planning for development

- Lead State planning for development and support strategic regional development.
- Plan for the future (for State development and a healthy environment).

Developing partnerships

- Develop and enhance strategic partnerships with key government agencies and industry (Department of Environmental Protection, Ministry for Planning, CALM, Agriculture Western Australia).
- Build and keep positive productive relationships with the community and key stakeholders.
- Lead and encourage people to act in a way suited to catchment-scale resource management.

report from the board

Chairman's report

Ken Webster,
Chairman

The achievements of the Water and Rivers Commission over the past year are set out in the 1998-1999 Annual Report. It is a year in which the Commission has continued with the development of procedures and processes to ensure that the State's water resources along with the rivers and estuaries are managed on a sustainable basis for the overall benefit of the community.

During the year the Commission has undertaken a comprehensive review of the inter-active relationships between land, water and the environment and set the strategic priorities that are required to guide it during the coming years.

The Commission will continue to develop working relationships with community groups and appropriate Government departments on dedicated catchments to reverse the degradation that is occurring to the land and water resources. Water will be allocated on a sustainable basis that meets both the environmental and economic needs of the community.

The Board members acknowledge and thank the staff of the Commission for the assistance and professional briefings it received over the past year.

Several changes to the Board membership took place during the year. Ian Burston and Dennis Gee resigned because of other commitments. The two vacancies have been filled by Des Kelly, former chief executive of the Department of Resources Development, and Rod Willox, former Deputy Mayor at the City of Stirling. Jos Chatfield was appointed Deputy Chairman.

The Commission has set the strategic priorities that are required to guide it during the coming years

Ken Webster
CHAIRMAN

Role of the Board

The Board is the governing body of the Water and Rivers Commission with legislative authority to perform the functions, determine the policies and control the affairs of the Commission. They approve Corporate goals, direction, performance targets, operating and capital budgets, and ensure proper risk management processes are in place. They monitor operating, financial, environmental and safety performance through monthly reports and ensure legal compliance and ethical behaviour. The Chief Executive is responsible for day-to-day operations.

The composition of the Board reflects diversity with members having a variety of backgrounds, ages, and a mix of gender. Board meetings are normally held once a month in the Commission's Board Room in Perth.

The Board approves Corporate goals, direction performance targets, operating and capital budgets and ensures proper risk management processes are in place

Board members

Membership

The Board comprises seven members:

- the Chairman of the Water and Rivers Commission Board;
- the Deputy Chairman of the Water and Rivers Commission Board;
- the Chief Executive of the Water and Rivers Commission;
- four representatives appointed by the Minister.

Non-executive Board members are appointed by the Minister for Water Resources. They hold office for up to three years, with initial appointments staggered to ensure approximately a third retire each year. Non-executive Board members are eligible for reappointment and their duties are not full time. There is no limit on the time a Board member may serve on the Board. The Chairman and Deputy Chairman are also appointed by the Minister.

The Minister may at any time remove a Board member from office. The Minister is not required to give any reason for doing so.

Dennis Gee

Changes to the Board

There were two resignations, and subsequently two appointments to the Board in 1998-99.

- Dr Dennis Gee resigned as member on 28 August 1998.
- Mr Ian Burston resigned as Chairman on 28 February 1999.

Dr Des Kelly and Mr Rod Willox were appointed to the Board on 1 March 1999 for three year terms.

On 1 March 1999, Mr Ken Webster was appointed Chairman for one year, and Mrs Jos Chatfield was appointed Deputy Chairman for the remainder of her current term.

Ian Burston,
former Chairman

Ian Burston was the inaugural chairman of the Water and Rivers Commission and served from 1 January 1996 to 28 February 1999. Mr Burston played a key role in helping to establish the Commission in 1996 and in guiding it through the early days of a newly structured West Australian water industry. Ian Burston brought tremendous knowledge and credibility to the Commission as lead manager of the State's water resources. In particular, his knowledge and experience of the mining and development sector and in business management was invaluable in maintaining the Commission's role in guiding State development through responsible water resources management.

Profile of Board members

Ken Webster / Chairman

Mr Webster was Chairman of the Water Authority of Western Australia from July 1990, presiding over several major studies involving community consultation and a significant increase in the environmental awareness and commitment of the Authority. Previously he was Director of Water Resources with the Authority for five years. For 17 years before that he was Chief Engineer, Water Resources, with the Public Works Department. Mr Webster has comprehensive experience and expertise in management of natural resources, particularly in respect to land/water interactions and in planning and policy making for sustainable use of water resources, including membership of the WAWater Resources Council. He is a member in the General Division of the Order of Australia (AM) for his service to water resources.

Jos Chatfield / Deputy Chairman

Mrs Chatfield is a farmer and nursery proprietor from Tammin. She has practical experience in large scale revegetation, rural resource management and nature conservation. She has been involved at local, state and national levels through her special interest in Landcare and salinity issues, having served on the National Soil Conservation Advisory Committee to the Federal Minister for Resources and Board of Greening Australia. Mrs Chatfield is a Commissioner of the Australian Heritage Commission, member of State Salinity Council, Advisory Council to the EPA, Gordon Reid Foundation for Conservation, CSIRO Regional Consultative Committee and currently chairs the Commission's State Water Reform Council.

Graham Slessar

Mr Slessar is Environmental Manager WA Operations, Alcoa of Australia Limited. For 10 years Mr Slessar has coordinated the environmental management function across Alcoa's WA operations and supervised the central Environmental Department. As Alcoa's Environmental Research Superintendent he supervised a multidisciplinary research team whose main priority was development of improved environmental management systems and procedures for the company's Darling Range mines. Alcoa has won international recognition for its environmental efforts.

Noel Robins

Mr Robins was Commissioner for Waterways (Western Australian Waterways Commission) from 1979 to 1995. He has had a distinguished career in business and sailing administration, including as Executive Director of the Royal Perth Yacht Club's administration of the 1987 America's Cup Challenge. Extensive experience in river and estuary management has included chairing the Canal Development Steering Committee, and playing a lead role in creation of the Swan River Trust and community-based Management Authorities to tackle environmental problems in the Albany waterways, Wilson Inlet and the Avon River.

Des Kelly

Dr Kelly has over 40 years' experience in the State Government and recently retired from the position of Chief Executive Officer, Department of Resources Development. He graduated from the University of Western Australia in 1955 with a Bachelor of Engineering with First Class Honours in Civil Engineering and was awarded a PhD from the University of London in 1963. His early work was on construction projects with the

Harbours and Rivers Branch of the Public Works Department. Subsequently, he was involved on behalf of the State in the establishment of major resource developments and their associated infrastructure. In 1980 Dr Kelly was appointed Under Secretary of the Department of Minerals and Energy. His service with that agency was acknowledged in 1992 when he was made a Member in the General Division of the Order of Australia (AM) for his service to mining.

Rod Willox

Mr Willox is a former medical scientist and army officer (Colonel), now retired. He was educated in Melbourne and Adelaide and is a graduate of the University of Western Australia and Curtin University in pathology and biological sciences. Mr Willox also has a Diploma in Occupational Health and Safety and is a graduate from the Joint Services Staff College, Canberra. Mr Willox has been very active in community affairs and was Deputy Mayor, City of Stirling 1997-99. He also served on the State Executive of the Local Government Association. In addition Mr Willox is a member of the Local Government Advisory Board, the Board of Management – RSL War Veterans Homes (WA) and Board of the Fire and Emergency Services Authority of WA.

Roger Payne / Chief Executive

Mr Payne has over 30 years' experience in the water industry gained through the Melbourne Water Corporation and its predecessors, and the consulting industry. This experience has ranged from technical engineering through to customer service provision, community and political negotiations, commercial innovation, and on to corporate strategy development and major change implementation.

Board meetings

The number of meetings of the Board and committees and number of meetings attended by each member, during the 12 months ended 30 June 1999 are as follows:

	Water and Rivers Commission Board Meetings	Audit Committee	Rivers and Estuaries Council	Water Resources Allocation Committee	Swan River Trust	Swan River Trust – Assessment and Policy Committee	State Salinity Council	State Water Reform Council
Meetings Held	11	2	6	4	12	11	4	6
Member								
Mr I F Burston (Board Chairman to 28/2/99)	5	-	-	-	-	-	2	
Mr K C Webster (Board Chairman from 1/3/99)	10	1*	-	3*	-	-		6
Dr R D Gee (Resigned 28/8/99)	2	-	-	-	-	-	-	
Mr D N Robins	8	-	6*	-	11	11	-	
Mrs J Chatfield	10	-	-	-	-	-	4	6*
Mr G C Slessar	8	-	-	-	-	-	-	
Dr D R Kelly (Member from 1/3/99	4			1*				
Mr R M Willox (Member from 1/3/99)	4	1*						
Mr R F Payne	9	2	5	-	-	-	4	-

* Chairman of Committee

Board report

Accountability and independence

The Board operates within the guidelines of the *Water and Rivers Commission Act 1995.* The Board also operates in accordance with the *Public Sector Management Act 1995* and the Commission's Code of Conduct. The Board is currently developing a Code of Conduct for all Boards and Committees of the Commission.

Performance monitoring and reporting

The Commission provides written monthly reports on its activities and financial statements to the Board. Additionally, performance is evaluated at 31 December and 30 June each year. Annual performance is reported to the Minister and Parliament in the Commission's Annual Report.

Ethical standards

The Commission requires all Board members, employees and contractors to exercise high standards of ethical behaviour in the performance of their duties, as set out in the Commission's Code of Conduct.

There was one reported breach of the code of conduct for the year. This related to an employee.

Conflict of interest

The Commission has procedures for identifying, preventing or resolving conflicts of interest. These procedures are outlined in the Code of Conduct.

All Commission personnel with duties related to the negotiation of a contract must disclose current or prospective interests to their immediate supervisor. The interest of members of their immediate family are also required to be disclosed, if they are known. Where a person possesses such an interest, then either the basis of that interest should be discontinued, or the person should cease the duties involved or obtain management permission to continue.

Board members also declare conflicts of interest.

Freedom of information

The Commission received five applications for information under the provisions of the *Freedom of Information Act*. Of these, three were given edited information, one was withdrawn and one is in process. Fees and charges totalling $394.40 were received for the processing of these applications.

Ministerial directions

Under Section 14 of the *Water and Rivers Commission Act 1995* the Minister may give directions in writing to the Commission, generally with respect to the performance of its functions. The Commission is to give effect to any such direction. No direction was given by the Minister during the period under review.

Committees and other bodies

Stakeholder Council

A Stakeholder Council advises the Board on the Commission's performance and key issues. Its terms of reference are to advise on the way the Commission delivers its service against the following criteria:

- adequacy for relevant client/stakeholder groups
- timeliness
- flexibility
- responsiveness

The Stakeholder Council has broad representation from the farming community, conservation interests, industry and State and local government.

Stakeholder Council.
From left: *Peter Kent (WRC), Marcus Holla (Gascoyne Development Commission), Don McFarlane (AgWest), Eric Phillips (WA Farmers Federation), Bevan Carter (WA Municipal Association), Harry Butler (Community representative), Keith Barrett (Water Corporation).*
Absent: *Joan Payne (Conservation Council, Rob Sippe (DEP), Frank McKinnell (CALM), Lawry Pitman (Pastoralists & Graziers Association), Dan Norton (WAFarmers Federation), Gary Meyer (WMC Resources Ltd), David Reid (ICM/Catchment Groups), Steve Fitzpatrick (Wesfarmers CSBP Ltd), James Shaw (BHP Iron Ore).*

Rivers and Estuaries Council

The Rivers and Estuaries Council advises the Board on the development, implementation and monitoring of Statewide policies and strategies to promote the management and protection of rivers and estuaries. The Council is made up of the chairs of each Waterways Management Authority and GeoCatch, and a member representing the north of the State (see over). In 1998-99 the Council was chaired by Noel Robins.

Waterways Management Authorities

For proper resource management to occur it is critical that the policy directions and strategic initiatives of the Commission are delivered effectively at a local level. Community-based management authorities were conceived under the *Waterways Conservation Act 1976* as a mechanism to achieve this. Under the Act, any waterway in need of coordinated management may be declared a Management Area, with defined boundaries. The powers under the Act then apply to these Management Areas so that conservation and management can be achieved. At 30 June 1999, five management areas had been declared under section 10 of the Act. Each management area has a locally based management authority. The management authorities are strongly community-based, representing local interests and relevant expertise. Each management authority consists of a chairman and five to eleven people from the local community or who represent State or local government.

The Geographe Catchment Council, known as GeoCatch, is a community-based council supported by the Commission and is founded on partnerships between the community and government management agencies. The approach taken for the Geographe catchment and adjacent marine environment may provide a model for the Commission's community interface in other areas of the State.

Rivers and Estuaries Council.
From left: *Barry Oates (GeoCatch), Graeme Edwards (LIMA), Bill Mitchell (north WA), John Hamblin (PIMA), Noel Robins (Chairman), Brian Hudson (deputy chair, PIMA).*
Absent: *Matt Stephens (AWMA, WIMA), Doug Morgan (ARMA), Geoff Totterdell (Swan River Trust), Roger Payne (WRC).*

	Chairman/representative	Region/management body
	Mr Noel Robins	Rivers and Estuaries Council
	Mr Graeme Edwards	Leschenault Inlet Management Authority (LIMA)
	Professor John Hamblin, replacing Mr Owen Tuckey from January 1999	Peel Inlet Management Authority (PIMA)
	Mr Matt Stephens	Albany Waterways Management Authority (AWMA) Wilson Inlet Management Authority (WIMA)
	Mr Doug Morgan	Avon River Management Authority (ARMA)
	Mr Barry Oates	Geographe Catchment Council (GeoCatch)
	Mr Bill Mitchell	Northern Rivers and Estuaries

Audit Committee

The Board has established an Audit Committee with responsibility to:

- Give strategic direction to the Commission's internal audit program.
- Review and approve internal audit plans and monitor the activities of the internal audit function.
- Periodically review the internal audit charter and internal and external audit reports.
- Review risk management and compliance with law and other requirements.

The Audit Committee is chaired by Mr Rod Willox and also comprises Graham Slessar (Board Member), Roger Payne (Chief Executive), Peter Kent (Director Business Development and Integration) and Paul Jost (Office of the Auditor General) as an observer.

The Audit Committee met twice during 1998-99 and considered:

- Risk management and integration with the Commission's business planning process.
- Project management system implementation.
- Contract management and accreditation.
- Interim report from the Office of the Auditor General.

Water Resources Allocation Committee

Underpinning development across the State is the critical function of water allocation. A Water Resources Allocation Committee has been established to broaden the Board's capacity to advise on policy development, planning and management for surface and groundwater resources. Chaired by Board member Ken Webster, the committee advises the Board on ways to equitably balance water allocation among the environment, private self-supply users and larger scheme supply systems such as those managed by the Water Corporation. The committee has a Statewide role which encompasses 10 advisory committees, 52 groundwater management areas and 20 surface water management areas. The structure provides an excellent avenue for communication between the Commission and water users across the State and is being further refined and developed as part of general water law reforms covered elsewhere in this report.

Water Resources Advisory Committees

Ten advisory committees advise the Commission on all matters relating to the drawing of surface and groundwater in specified areas.

- Broome Groundwater Advisory Committee
- Canning-Wungong-Southern Rivers Advisory Committee
- Cockburn Groundwater Advisory Committee
- Gingin Water Resources Advisory Committee
- Serpentine-Dandalup-Murray Rivers Advisory Committee
- South West Coastal Groundwater Advisory Committee
- Stakehill Groundwater Advisory Committee
- Swan Groundwater Advisory Committee
- Wanneroo Groundwater Advisory Committee
- Warren Water Management Area Advisory Committee

State Water Reform Council

The State Water Reform Council was set up in May 1998, and ran for a year. The Council had 17 members representing:

- Water Corporation
- Greenhouse Growers Association of WA
- Conservation Council of WA
- WA Farmers Federation
- Chamber of Commerce and Industry
- Western Australian Municipal Association
- WAWater Users Coalition
- WA Fruit Growers Association
- Carnarvon Irrigators
- Chamber of Minerals and Energy
- WAVegetable Growers Association
- Wine Industry Association of WA.

The Council was formed to help the Commission with the process of legislative change, ensuring the Commission had direct access to the views of major stakeholder groups and guidance in resolving conflicting community requirements. Major issues considered by the Council in 1999 included a process for the review of the appeal system under the *Rights in Water and Irrigation Act 1914*, and reform-related issues such as capital gains tax, membership of local committees, management of springs and compensation.

Swan River Trust

SWAN RIVER TRUST

The Commission has a very close relationship with the Swan River Trust which was established under the *Swan River Trust Act 1988* to manage the Swan-Canning river system. The philosophies of the Commission and Trust are very similar and their functions complementary. The Swan River Trust is a separate legal entity and requires separate accounting and reporting. The staff of the Trust was provided by the Water and Rivers Commission.

The Water and Rivers Commission Board

From left: Roger Payne, Des Kelly, Noel Robins, Jos Chatfield, Ken Webster, Rod Willox.
Absent: Graham Slessar

Chief Executive's review

I am very pleased to present a report that highlights some significant achievements made by the Water and Rivers Commission working with our stakeholders during the past year. Through our many interactions with our customers and stakeholders, I believe we have continued to build our reputation as an honest broker and a negotiating organisation.

Salinity

Included in this report are details of our continuing effort to tackle salinity. The Commission is one of the four key natural resource management agencies responsible for the Salinity Action Plan, and provides secretariat support to the State Salinity Council on behalf of the agencies. We are very fortunate to have former Water and Rivers Commission Board member Alex Campbell as chairman of the State Salinity Council and his dedication and guidance over the past year have been invaluable. The Salinity Action Plan has been updated and released for public comment and we hope this will lead, in the next few months, to the development of a more robust and inclusive document that will give rise to a real commitment from all the players. The year saw some debate in the media about the State's salinity problem and our chances of reducing the environmental impacts caused by salinity. Clearly the task is a very difficult one, but I am encouraged by the support shown by landowners in adopting new research ideas.

Water allocation

Other articles in this report feature the Commission's involvement in water allocation plans for the Harvey Basin and the Kimberley region. These projects highlight the Commission's critical role in guiding State development through the sensible allocation of water resources. Not surprisingly, proposals that deal with issues such as building dams or other major water infrastructure and sharing water among competing uses have the potential to raise concerns and strong emotions. The Commission has invested considerable effort in identifying stakeholders and their concerns and dealing with them openly and honestly. The result has been some highly successful interactions with interested people who have helped the Commission tremendously in its business.

Water law reform

The foundation of the Commission's approach to water allocation is set in the *Rights in Water and Irrigation Act 1914*. This legislation and the water allocation practices that have grown up around it, have served the State well for many decades. It is time to bring these laws up to date and this year the Commission achieved the major milestone of preparing legislation to amend the Act. This has involved a very intensive consultation program over the last two years. At the time of reporting, the legislation was still to make its passage through Parliament, but I believe the proposed changes provide the way for Western Australia to have one of the best water management systems in the country.

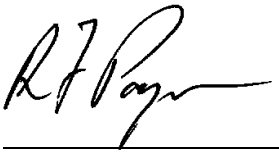
Swan-Canning Cleanup Program

The Commission has continued to make a major contribution to the Swan-Canning Cleanup Program (SCCP). The Action Plan was released by the Minister for Water Resources the Hon. Dr Kim Hames in June 1999. It marked a critical point in a project which began in 1994 when the Government established the SCCP program in response to algae blooms in the Swan and Canning rivers. The plan was developed with the aid of community, industry and government representatives and outlines an ambitious and comprehensive blueprint to secure the future of these precious rivers. The challenge is for the Commission and its partner, the Swan River Trust, to now implement this plan to achieve real outcomes.

Improved financial reporting

With the introduction of accrual accounting the Commission bought an Oracle Financials package which was the first year-2000 compliant Oracle package installed in Western Australia. It delivers timely, informative and accurate reports, allowing managers to better manage their projects and the agency to deliver outputs and outcomes to meet our statutory obligations.

I acknowledge our stakeholders for their dealings with us during the past year, I thank the Board of the Commission for its support and leadership and I particularly thank the staff of the Commission for their continuing professionalism and dedication.



Roger F Payne

CHIEF EXECUTIVE

The year in brief — summary of planned

Outcome	Outputs	Planned achievements
ALLOCATION Water is used efficiently within sustainable limits to ensure sustainable development and maintenance of environmental values	• Water Allocation framework, policy, principles and procedures • Water Allocation management plans • Implementation of allocation plans through licensing, education and pricing • Promotion and regulation of efficient use of water resources • Strategic water use plans	1. Development of surface water allocation plans. Harvey Basin, Swan-Canning and Warren Lefroy catchments. 2. Groundwater licensing is to be maintained throughout the State. 3. The Commission will continue to provide planning advice to support State development. 4. Land and water management plans for Ord Stage II.
PROTECTION AND ENHANCEMENT Water resources are protected and restored enabling sustainable development and maintenance of environmental values	• Wetland protection through land use planning and management • Waterways protection through land use planning and management • Protection of public water supplies through land use planning and management • Protection of private water supplies through land use planning and management • Remediation of land and water affected by salinity • Strategic protection policies	5. Implementation of the State Wetland Conservation Policy will be staged over the next three years. 6. Swan Coastal Plain urbanisation water balance and drainage strategies. 7. Ongoing planning, management and restoration of the Peel, Wilson, and Leschenault estuaries together with the Avon River and Albany Harbour waterways. 8. Working in partnership with local government, Agriculture WA and the community to develop a management framework for Moore River Catchment. 9. Policy and plans for increasing waterways management to a Statewide scale. 10. Environmental water requirements are being developed for key water resource areas such as Gnangara Mound and Millstream. 11. Implementation of relevant parts of the State Salinity Action Plan, particularly the establishment of incentive schemes for farmers to improve remnant vegetation management. 12. Improving community support for restoration of stream salinity in key catchments. 13. Ongoing advice and information is provided to land planning through statutory referrals.
STRATEGIC CONTEXT Completion of water industry reform and the development of a position of leadership in water resource management in the State	• Implementation of Council of Australia Government (COAG) requirements • Water law reform • Research and development • Corporate positioning	14. The Commission will continue to develop water industry frameworks, standards and targets to meet COAG requirements and run a major Statewide consultation program to ensure any legislative change meets community expectations. 15. Legislation for a water trading system is to be brought before Parliament this year.
WATER INFORMATION The community has a clear understanding and the best information on the quantity, quality, location and environmental interactions of surface and groundwater	• Data collection and management • Priority investigations • Regional and catchment assessments	16. A strategic State Surface Water Reference Network is supported and maintained. Information is used for water resources planning, flood warning development planning and state of water resources reporting. 17. Regional appraisal of the availability of surface and groundwater to support planning for development pressures within existing water supply areas. 18. Inventories and assessment of groundwater and surface water resources are being compiled for regional development and large catchment initiatives in easily accessible format. 19. More contaminated sites which affect groundwater are being discovered, increasing the demand on the Commission to respond. 20. The Commission will compile an inventory of the status and condition of the State's estuaries as an aid to setting management priorities. 21. A Ministerial Taskforce is reviewing the roles and responsibilities, funding and legislation with respect to floodplain management and flood warning.

and actual achievements for 1998-99

	Actual achievements	Impact on outcomes	Pages
	1. A management plan for Exmouth was finalised. Plans for Harvey, Cockburn and Esperance groundwater areas and Murray surface water areas were progressed. Environmental water provision plans were developed for the Leschenault and Canning river systems. The Minister for Environment approved the Environmental Water Provisions plan for East Gnangara. 2. Ongoing management of about 22 000 water allocation licences. 3. Development of a strategic drought management strategy for Perth. Produced regional water use efficiency programs for North West, Midwest Gascoyne, South West and South Coast regions. 4. Began consultation with community groups on issues in the Kimberley region and La Grange groundwater area.	• The plans specify the availability of water for withdrawal and the conditions that should apply to any licensing of withdrawals. • Sustainable management of abstraction and protection of high environmental values dependent on surface water. Process for achieving sustainable management of abstraction and protection of high environmental values dependent on groundwater. • Establishment of a joint agreement between the Commission and the Water Corporation to develop a deep aquifer model to manage drought. • Encouraging the efficient use of groundwater. • Information to developers on their prospects and consideration of water use efficiencies • Regulating water use to achieve sustainable limits.	52-58
	5. Successfully negotiated for many of Perth's wetlands to be recognised for protection within Perth Bushplan sites. Provided foundations for further protection in the 1999 review of the Swan Coastal Plain (policy lakes) EPP. Successfully negotiated for several Perth wetlands to be protected as a condition of development approval. 6. Foreshore assessments carried out on Bennett, Bannister, Canning, Southern Wood, Wright, Ellen and Breera brooks in the Perth metropolitan area. Full community involvement. 7. Two River Restoration Workshops carried out in South West Region - training in stream ecology and in river assessment, surveying, planning and rehabilitation techniques. (Financial support from NHT). 8. Rivercare Program delivered 24 new projects in 1998, value $1.5 million. 9. Development of a Waterways WA Strategy. 10. Forty-seven permits were issued for potentially contaminating activities on the Gnangara and Jandakot mounds. Gnangara Land Use and Water Management Strategy completed for public comment. Developed the Gnangara Park Concept Plan under the coordination of CALM. Thirteen water source protection plans were published. A further 14 were released for stakeholder comment. Twenty-nine water quality protection notes were prepared and included on the Commission's Internet site. 11. Preparation of the WRC Salinity Management Program. 12. Initiated Recovery Teams for the Kent/Denmark, Warren and Collie River Recovery Catchments. 13. Worked with local government to incorporate Jandakot Metropolitan Region Scheme (MRS) amendment into Town Planning Schemes. Released policy and guidelines on Sand Mining and 11 guidelines on mining and mineral processing for public comment.	• Wetlands protected in Public Open Space. • Preliminary identification of regionally significant wetlands. • Training for 50 people from a variety of backgrounds related to waterways management, including local government, community groups, other State agencies and business to improve land and water management. • The Commission will use this decision-making framework to develop its priorities for management, data collection, and responses to issues and identification of suitable health indicators. • Major funding program for community on-ground restoration projects in Swan-Canning catchment. • Information and advice for landowners, catchment managers and community groups to ensure better management of waterways. • Further reinforcement of water quality protection principles in land planning process. • Increased community awareness of the impacts of development on groundwater quality. Increased community understanding of the importance of public water source protection. • Secured the long-term protection of the Gnangara Mound from contamination. • Effective communication for management with community. • Significant on-ground work.	36-50
	14. Progress of the Water Reform Program. 15. Proposed amendments to *Rights in Water and Irrigation Act* introduced to Parliament June 1999.	• Modernised water management legislation. • Water markets may be implemented where appropriate. Local rules for implementation will be a key aspect of water allocation management in future and allow for direct community involvement in water resource management.	58
	16. Draft report on State of Water Resources prepared for discussion with community. 17. A major appraisal of the water resources of the Northern Goldfields, an area extending from Laverton to Wiluna has been finalised. 18. Trends and status of stream salinity for major rivers in the south west have been developed. Mapping for Collie and Warren River catchments completed. Catchment models of the Kent and Collie catchments were updated to show the effects of recent tree plantations. 19. Investigations were carried out and advice on contaminated sites and contamination was provided to other government agencies, industry and the community as required. 20. Understanding of the sources of nutrients and algal response has been improved so that action can now be taken. New remediation techniques are ready for large scale application and trial. 21. Flood management options have been developed for Busselton. Flood warnings have been provided for Carnarvon and Moore River.	• An overall view of the condition of and pressure on the State's water resources. • A comprehensive report and a set of hydrogeological maps detailing groundwater occurrence in the Northern Goldfields will enable the Commission to manage and protect the water resources more efficiently and effectively, as well as provide more reliable advice and assistance for water resources planning. • Information on the contribution of recent plantations to reduction of salinity is available to assist catchment planning in the Kent and Collie catchments. • Recommendations have been incorporated into an ambitious remediation program, which will continue to provide innovative solutions to nutrient reduction. Much of the process understanding and the remediation solutions are applicable to other areas of the State. • Effective management of floodplains to minimise damage and loss from flooding.	60-70

We recognise that our water resources are used for consumption/water supply, for recreation, and maintenance of ecosystems/natural resources.

For water supply we will ensure:

- existing supplies are managed in the best way to protect the water
- water supplies for the future will be identified and protected so WA has adequate good quality water for future generations
- all water supplies are clean and of high quality
- water resources will not be overused and will be sustainably managed unless there are very special circumstances

For our rivers, groundwater, wetlands and estuaries we will ensure:

- they are healthy, clean and not polluted
- they are well managed and available when appropriate for swimming, fishing, picnicking and boating
- valued natural systems are managed and protected to maintain diverse populations of vegetation and wildlife (flora and fauna)
- special systems are set aside and protected for their natural values as heritage, conservation, wild or scenic areas

our operating environment

The environment and water resources

Western Australia is fortunate because our water sources are generally unpolluted and not over allocated. The majority of our waterways and wetlands remain clean and healthy ecosystems, although many are under pressure from salinity, nutrient enrichment and loss of vegetation. Increasing salinity is the greatest threat to our water resources.

However the State faces other special challenges because of our environment, particularly with respect to allocating water supplies while protecting the environment.

The State faces other special challenges because of our environment, particularly with respect to allocating water supplies while protecting the environment

For example, rivers are generally ephemeral and slow flowing. We have relatively few rivers suitable for water supply and so groundwater has played a critical role as a source of potable water. In some parts of the State, groundwater is the only source of water available to allow development to occur.

Water supply systems have been developed to suit West Australian conditions. For example, in Perth less than half of the water used by the community is supplied by the water utility (the Water Corporation) under licence from the Water and Rivers Commission. The rest is sourced directly by users, such as horticulturalists, under allocation licences issued by the Water and Rivers Commission. These licences are designed to give a level of security to industry and developers while ensuring the resource is protected. This is based on a system of allocating water provisions to the environment before human demands are met. This approach has been in place for many years and means that Western Australia has avoided the system stress being experienced in other parts of the country where water allocations are being clawed back.

Significant issues and trends

- About 5 per cent of areas depending on groundwater have allocations close to, or at the level of sustainability. Others are approaching that threshold and need closer management to ensure sustainability.
- An estimated 1.8 million hectares of farmland are already salt-affected in Western Australia, and this area is predicted to increase to 6.1 million hectares before new water balance is reached, if catchment management to control salinity is ineffective.
- WA has 208 recognised rivers totalling some 25 000 kilometres in length. More than 80 per cent (by length) of stream riparian zones in the south west agricultural area are seriously degraded by salinity. This poses a threat to remaining vegetation, wetlands, species and ecosystems. WA has also 45 estuaries covering 440 square kilometres. In the south west of WA, only seven estuaries out of 22 have low nutrient levels.
- More contaminated sites which affect groundwater are being discovered, increasing the demand on the Commission to respond.
- Recent flooding has highlighted the need for increased consideration for flood and drainage management.
- There are increasing development pressures in the Perth, Kimberley, South West and semi-arid Pilbara and Gascoyne regions, which require careful management of water resources.

Stakeholders and the wider community

The Commission works closely with stakeholders to meet its obligations as custodian of the State's water resources. Key stakeholder groups include planning and development, mining, horticulture, irrigation, pastoral and agricultural industries and the conservation movement. An increasing focus on local licensing and on cooperative catchment-scale management linked to Integrated Catchment Management and Natural Resource Management initiatives means that the Commission often works at a local level with catchment and landcare groups, landowners and Aboriginal people.

Key stakeholder groups include planning and development, mining, horticulture, irrigation, pastoral and agricultural industries and the conservation movement

Significant issues and trends

- There is generally high interest in water issues but a lack of understanding of how water is shared in a democracy and how to look after the resources. However, understanding and commitment to water resources is growing in areas where natural resource management actions are being implemented.
- Growing community involvement is increasing pressure to increase funding to support local and regional on-the-ground initiatives.
- The Commission's profile within the wider community remains relatively low.

Policy and funding issues

The Commission is funded from Consolidated Revenue and by federally funded programs including Waterwatch, Rivercare and Coasts and Clean Seas which provide a significant funding source for waterways protection and enhancement projects. The modernisation of water law under the Council of Australian Governments (COAG) agreements is a significant factor for the Commission.

The modernisation of water law under the Council of Australian Governments (COAG) agreements is a significant factor for the Commission

Significant issues and trends

- The COAG 'National Competition Policy Agreement' of April 1995 requires full implementation of the 'Water Agreement'by 2001.
- Government initiatives that will impact on the Commission include rationalisation of assets and reducing leave liabilities.
- The Commission's capital replacement program and contingent liabilities remain a significant funding challenge.
- An alternative to Natural Heritage Trust (NHT) / Federal funding sources beyond 2001 is yet to be determined by the Federal Government.
- Fixed costs associated with building leases and whole-of-government contracts on vehicles and services continue to significantly increase.

The water industry in Western Australia

Since 1996, Western Australia has had independent oversight and regulation of the water industry to ensure the long-term future of water resources and quality of water supply services to water users.

Under the Water Resources Portfolio, the **Water and Rivers Commission** is the custodian of all of the State's water. The Commission's role is to ensure the State's water resources are managed to support sustainable development and conservation of the environment for the long-term benefit of the community.

Western Australia's most vital resource needs to be protected and well managed. Our water resources are worth over $1 billion per year based on current extraction of water for public and private use, and the potential value if all the available water was used is considerably higher. The river, estuary and wetland environments they support are priceless.

Protecting these resources requires a long-term, independent custodian to guide decisions to allow responsible development to occur while protecting the environment.

The Water and Rivers Commission fulfils this role as the custodian of our water resources.

The **Office of Water Regulation** was also formed in 1996 as the regulator of service providers in the water industry. Under the *Water Services Coordination Act 1995,* the Office of Water Regulation has authority to:

- Regulate and license the provision of water services
- Coordinate and advise on water services policy

Water utilities and sewerage and drainage operators — such as the **Water Corporation, Aqwest and Busselton Water Board and local government** — form the other main part of the water industry.

The utilities have licences to operate from the Office of Water Regulation, and Water and Rivers Commission licences to extract water from identified sources.

Discharges to water resources are controlled by conditions included in **Department of Environmental Protection** licences.

The Commission works closely with the community and a wide range of key stakeholders to plan and manage water resources

River restoration workshop

Organisations	Focus	Role	Minister
• **Water and Rivers Commission**	Water resource management and protection	• Allocation of surface and groundwater • Water use licensing • Water resource monitoring and measurement • Resource and waterways protection	Water Resources
• **Office of Water Regulation**	Water industry advice and regulation	• Regulating and licensing service and infrastructure provision • Promotion of competition • Issue of technical standards • Promotion of customer service charters • Water industry policy and planning	Water Resources
• **Water Corporation** • **Water, drainage and sewerage utilities (water boards)** • **Local government** • **Private sector**	Water service provision	• Water supply and wastewater services to customers • Water services infrastructure • Developing competitive strategies	Water Resources Local Government
• **Department of Environmental Protection** • **Environmental Protection Authority**	Environmental protection	• Environmental impact assessment of infrastructure • Licensing discharges	Environment
• **Health Department of WA**	Water quality	• Monitoring drinking water quality • Public health warnings	Health

about the water and rivers commission

Our Vision

to excel in water resource management by ensuring water and rivers are used wisely for the whole community.

Our Mission

to manage the water resources of Western Australia for the benefit of present and future generations in partnership with the community.

Organisation profile

Legislation

The Commission has water resource conservation, protection and management functions vested in it by various Acts, or parts of Acts, including:

- *Water and Rivers Commission Act 1995*
- *Country Areas Water Supply Act 1947*
- *Metropolitan Water Authority Act 1982*
- *Metropolitan Water Supply, Sewerage and Drainage Act 1909*
- *Rights in Water and Irrigation Act 1914*
- *Waterways Conservation Act 1976*
- *Water Boards Act 1904*

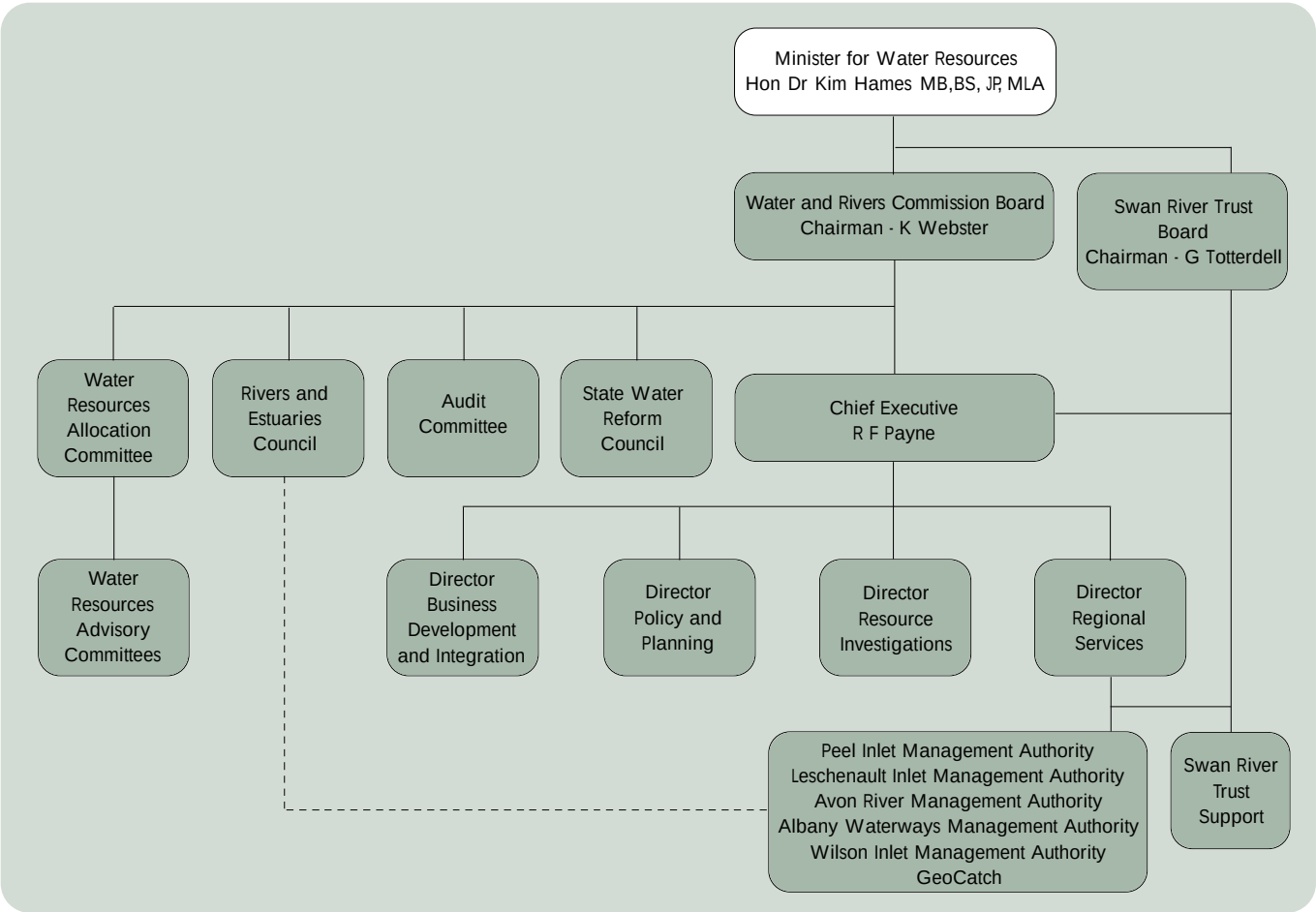
See Statement of Compliance with Written Law (p126) for a more detailed statement of relevant legislation.

There were no changes to the *Water and Rivers Commission Act 1995* in 1998-99.

Minister responsible

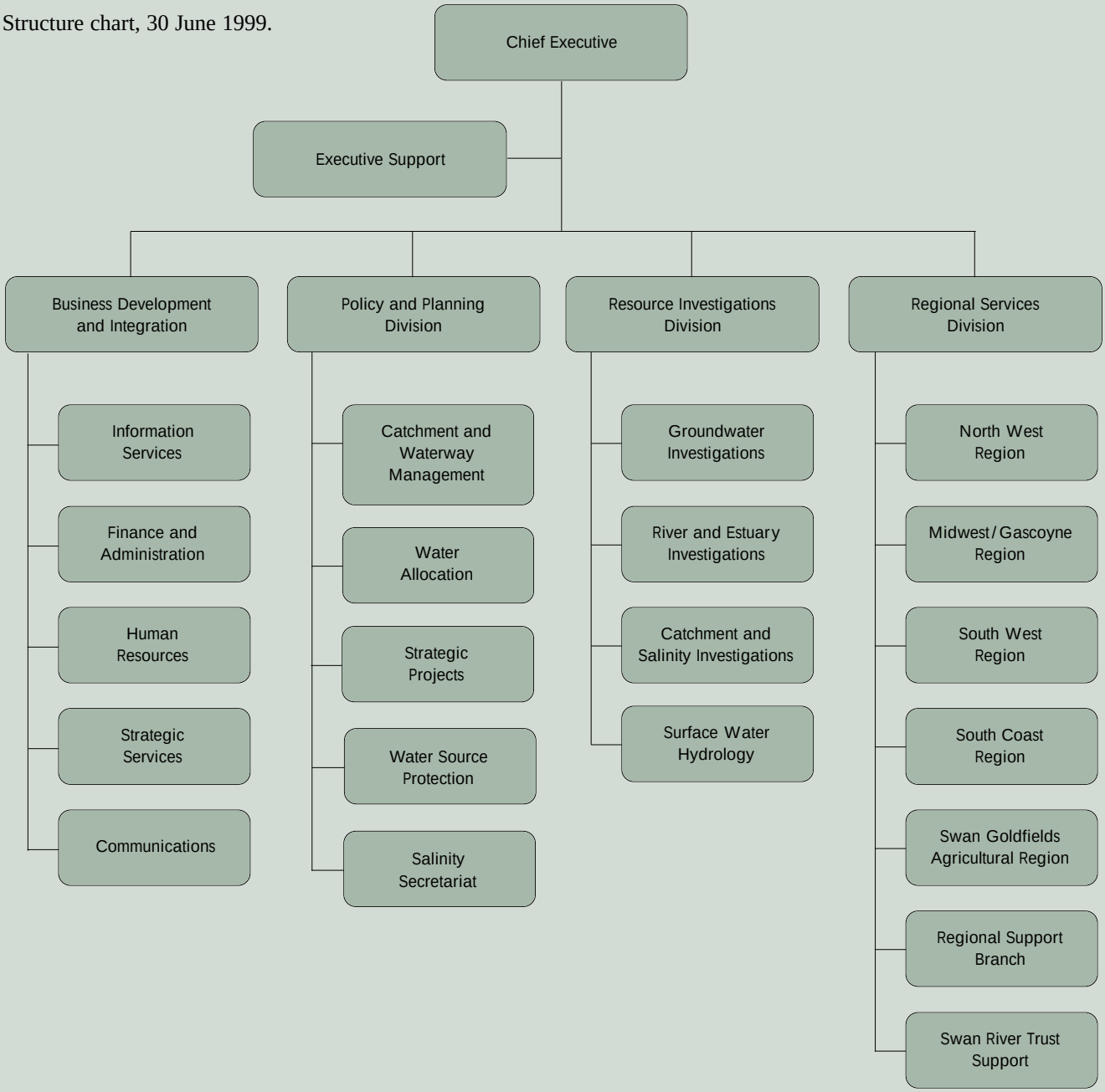
The Water and Rivers Commission's primary responsibility is to the Minister for Water Resources who exercises authority under the *Water and Rivers Commission Act 1995.*

Operating governance structure



Organisation structure

Structure chart, 30 June 1999.



Principal officers

Chief Executive

Roger Payne
Dip. CE, BE

Director,
Business Development and Integration

Peter Kent
Grad. Dip. Bus. MBA

Director,
Policy and Planning

Tim McAuliffe
B App. Sc, MSc.

Director,
Resource Investigations

Bruce Hamilton
B Sc. (Hons) PhD, Grad. Dip. Admin.

Director,
Regional Services

Harry Ventriss
BE

Divisions

Business Development and Integration Division

The Business Development and Integration Division is responsible for providing support services to the Commission's management and employees.

The Division's objective is to provide quality services to the Commission which support the provision of suitable policies, processes, systems, information and skills in accordance with agreed corporate needs, priorities and objectives.

The Division ensures that the community is fully aware of the issues affecting water resources in Western Australia by developing a range of information and awareness programs as well as developing strategies for community involvement in water resources management and decision making.

- Budget and finance administration
- Human resource management
- Information systems
- Community support and communication
- Organisation development
- Media relations
- Business development

Policy and Planning Division

The Policy and Planning Division is responsible for the coordination and preparation of strategic plans for water resources management, protection, assessment and utilisation.

It develops State policies, plans, administrative frameworks and legislation for water resources management through processes involving industry, business and the community.

This valuable role helps Western Australia to properly plan for its water resources needs, both now and in the future.

- Water industry/law reform
- Water resources allocation
- Water use conservation
- Waterways management
- Catchment management
- Water quality protection
- Drainage and floodplain management advice

Resource Investigations Division

The Resource Investigations Division provides high quality scientific and technical expertise on a range of water resources issues. This role provides the scientific basis for the development of comprehensive strategies to tackle the problems affecting Western Australia's water resources and to ensure sustainable management.

The Division is responsible for investigation of and reporting on the condition of rivers and estuaries, in particular the loss of nutrients from catchments and their enrichment of rivers and estuaries, and their effect on algal growth. Investigations also include assessing the effects of agriculture, forestry and mining on the quality of surface water, and development of strategies for the prevention and treatment of salinity and land degradation.

The Division works closely with the Policy and Planning Division and the Regional Services Division to ensure a coordinated approach to the assessment and management of the State's water resources. At the same time, it provides sound scientific advice and information for a wide range of clients within government and the private sector.

- Information for planning and management
- Catchment and salinity investigations
- Groundwater exploration, mapping and management
- River and estuary investigations
- Surface water hydrology
- Groundwater resource appraisal
- Hydrogeological mapping and advice

Regional Services Division

The Regional Services Division works directly with the State's water users, whether they are landowners with a groundwater licence or people using the rivers for recreational purposes. This Statewide service ensures that the community will have access to advice and assistance on the management and protection of our precious water resources from one central organisation.

- ~ Licensing of surface and groundwater extraction
- ~ Measurement, analysis and dissemination of water resources information
- ~ Advice / assistance for waterways and wetlands management and catchment protection
- ~ Support for Waterways Management Authorities

There are five regions with regional and district offices covering the State:
South West: Bunbury / Mandurah / Manjimup / Busselton
Midwest/Gascoyne: Geraldton / Carnarvon
North West: Karratha / Kununurra
South Coast: Albany / Denmark
Swan Goldfields Agricultural: Victoria Park / Northam

The major regional offices provide a range of services including:

- advice on the allocation of water for various uses — in particular the withdrawal of water from streams or groundwater;
- practical advice and help to community groups and local government on repairing damage to streams, rivers, estuaries, wetlands and the protection of groundwater resources;
- the identification of areas which require research into water quality and quantity;
- measurement of water flows, groundwater levels and water quality;
- involvement of the community and groups in water resources management.

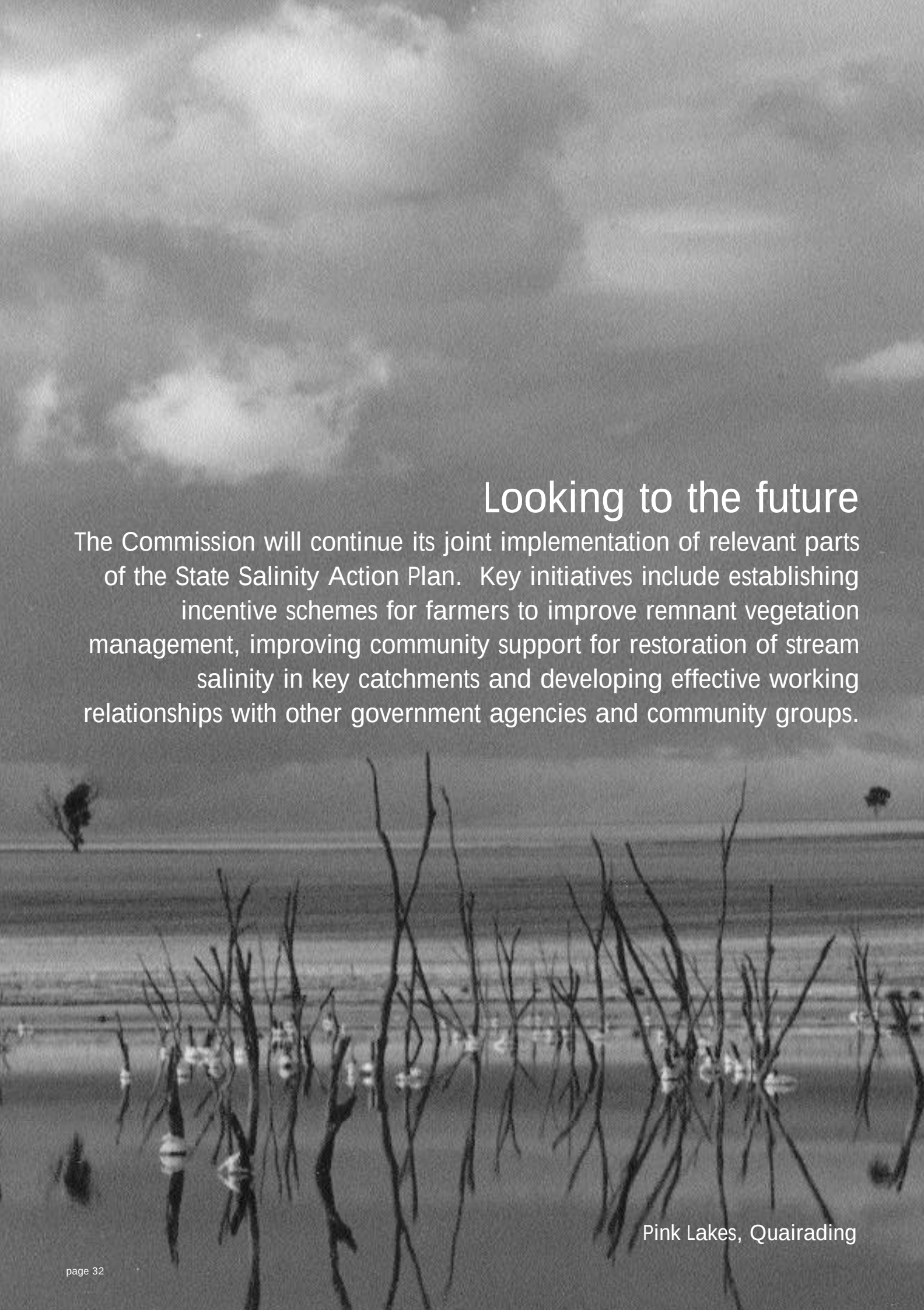
The Division ensures that plans and policies relating to water resources are properly implemented and that people use licences in an environmentally safe and responsible way.

The Division also provides professional, technical and administration support to the Swan River Trust.

The Regional Support Branch provides professional and technical support to regions, other branches and the Swan River Trust. The services provided include the development and maintenance of water resource information systems, standards and guidelines, and the provision of related training and education.

state of the water resources

Gascoyne River in flood



Looking to the future

The Commission will continue its joint implementation of relevant parts of the State Salinity Action Plan. Key initiatives include establishing incentive schemes for farmers to improve remnant vegetation management, improving community support for restoration of stream salinity in key catchments and developing effective working relationships with other government agencies and community groups.

Pink Lakes, Quairading

Management of Western Australia's water resources is a complex task. Population increase leads to increased demand for water while at the same time it is necessary to protect water quality for the sake of ecosystem health. We are also confronted with increasing salinity levels in a large number of our streams and are still experiencing high phosphorus levels in some waterways, especially in the Peel-Harvey area.

Below is a summary of the current state of the water resources in Western Australia.

The year in review

Rainfall in the South West over the past year was generally below average. In the Pilbara, rainfall was very much above average with some sites recording the highest rainfall on record. The Kimberley also recorded above average (to very much above average) rainfall.

Flooding was experienced in the Moora, Busselton, Esperance, Goldfields and Pilbara areas causing significant river erosion in the Dalyup, Moore and Fortescue rivers. A more detailed explanation of this is provided in the issue statement on floodplain management. (See page 68).

Salinity levels in south west streams were generally above average due to lower than average rainfall and river flows

Salinity levels in south west streams were generally above average due to lower than average rainfall and river flows. Following these low rainfalls, the Water and Rivers Commission worked with the Water Corporation to develop strategies to manage the abstraction of water for Perth to meet water use and environmental objectives.

Management of water resources

An increase in Western Australia's population, combined with increased economic development, has resulted in a greater demand on the State's water resources. The pressure exerted on the State's water resources varies with the availability of suitable water in each region.

The south west and the Ord have a large quantity of water available but the Goldfields region has relatively limited supplies of fresh water

The regions of Western Australia with the greatest allocation of fresh and marginal water (as a percentage of the available sustainable resource) are the South West, Goldfields and the Kimberley. The south west and the Ord have a large quantity of water available but the Goldfields region has relatively limited supplies of fresh water. Limiting the 'per capita' consumption is an efficient method of managing the available resources. As the demand for water increases, it is important to ensure that the environment does not suffer as a result of development. Subregional allocation plans ensure that environmental water provision requirements are allowed for in the management process.

Salinity

Results from salinity research suggest that salinity levels in cleared, south west rivers are still increasing. However, in forested areas and where remedial catchment works have occurred, there are signs of a stabilisation in salinity levels

The salinisation of waterways caused by the clearing of land in Western Australia is a large problem, particularly in the lower rainfall areas of the State. High salinity leads to a loss of agricultural production, a reduction in habitat and consequently a loss of biodiversity along waterways as well as threatening future drinking water supplies. Results from salinity research suggest that salinity levels in cleared, south west rivers are still increasing. However, in forested areas and where remedial catchment works have occurred, there are signs of a stabilisation in salinity levels.

Nutrient enrichment

In the Peel-Harvey estuary, phosphorus levels are continuing to rise while those in the Swan-Canning estuary are steady or reducing

The most common consequences of nutrient enrichment of waterways are algal blooms and fish deaths. One of the primary causes of nutrient enrichment is the use of fertilisers in water catchment areas. In the Peel-Harvey estuary, phosphorus levels are continuing to rise while those in the Swan-Canning estuary are steady or reducing. Unfortunately, there is no indication of a significant decrease in fertiliser application rates around these estuaries.

Riverside vegetation

The Commission is the lead agency for delivery of the Rivercare Program which aims to better manage and restore riparian vegetation

Riverside or riparian vegetation is important in maintaining channel stability, minimising erosion, providing habitat and reducing nutrient and sediment concentrations in a waterway. In many areas where riparian vegetation has been degraded, it is important that it is restored and maintained. In general, riparian vegetation levels have continued to decline. The Commission is the lead agency for delivery of the Rivercare Program which aims to better manage and restore riparian vegetation.

Erosion and sedimentation

Little information is available to quantify erosion and its consequences in Western Australia

The extent of erosion and sedimentation of waterways is strongly linked to the loss of fringing vegetation. The consequences of erosion and sedimentation are major and can lead to reduced water quality, loss of habitat and increased transportation of nutrients from catchments to water bodies. However, little information is available to quantify erosion and its consequences in Western Australia.

Flood risk

The potential for extreme flooding in Western Australia is still present, as demonstrated by the recent flooding in Moora, Busselton and Esperance

The potential for extreme flooding in Western Australia is still present, as demonstrated by the recent flooding in Moora, Busselton and Esperance. Flooding of rivers, where the river level exceeds the channel bank level, is an important process in river and near-river ecology. Flooding carries organic material from upper catchment areas to the plains to help in the development of the riverine environment. However, the average annual cost of flooding to society in Western Australia is estimated to be $20 million.

Climate variability

For an extended period, the annual rainfall in the south west of Western Australia has been below the long-term mean

The climate of Western Australia is an extremely complex system. Interactions between large-scale circulation currents and variations in sea surface temperatures in the Indian Ocean are believed to have a role in inter-annual climate variations. While climate variability, as opposed to climate change through human impacts, is not an issue that can be influenced by changes in behaviour, it does typically require a consolidated response to minimise its impact.

For example, for an extended period, the annual rainfall in the south west of Western Australia has been below the long-term mean. This has resulted in lower streamflows and shorter flow seasons than those recorded historically. The impact of the reduced rainfall on water resources includes reduced recharge of groundwater aquifers and reduced short-term sustainable yields from water storages. The reduced short-term sustainable yield combined with increased water demand have resulted in restrictions on supply in the Perth metropolitan region in recent years.

report on operations

Protecting and enhancing water resources

Outcome:

Water resources are protected and restored enabling sustainable development and maintenance of environmental values

The protection and enhancement business

Output 1: Wetland protection
To develop and implement policies, standards and guidelines which protect and enhance the State's wetlands, including foothills drainage and urban water drainage.

Output 2: Waterways protection
To develop and implement policies, standards and guidelines which protect and enhance the State's rivers and estuaries.

Output 3: Protection of public and private water supplies
To develop and implement policies, standards and guidelines for the protection of the State's public and private water supplies and to reduce pollution sources and contamination of the State's water resources.

Output 4: Strategic water resource protection policies
To develop and implement policies which provide a framework for the development of plans and strategies for the protection of the State's water resources.

Output 5: Salinity management
To develop and implement policies, standards and guidelines for the effective management of salinity, and to provide technical, financial and administrative support to enable regional initiatives to reduce salinity.

Overview of 1998-1999

The business of Protection and Enhancement encourages the sustainable use of the State's water resources. In this context, sustainable means finding the balance between economic, environmental and social uses of water. In other words, allowing for commercial and public use of rivers, streams, wetlands and groundwater without significant detrimental impact on important environmental and social values. This is a core function of the Water and Rivers Commission and represents an area in which the public and government expect the Commission to show leadership and sound decision making based on modern principles of environmental management.

The Protection and Enhancement business is also responsible for the rehabilitation of degraded water systems. While Western Australia retains many examples of natural diversity, the effects of clearing, salinity and pollution are apparent in many parts of the State. Reversing this decline in key areas is an important part of this business.

Key achievements in several areas are featured in this annual report.

During the 1998-99 financial year the Protection and Enhancement business directed more than $3 million into understanding and reducing the impacts of salinity on Western

Australian waterways. The State's south west remains the main area threatened by salinity, with stream and groundwater salinities destined to continue to rise before the problem can be brought under control. The Commission's approach is multi-faceted, involving on-ground works, catchment planning and research. It is an aim of this business that as planning initiatives advance and research nears completion, an increasing proportion of available funds will be directed towards the control of salinity at the on-ground level.

Salinity

The 1998-99 year also saw the launch of the Swan-Canning Cleanup Program Action Plan. This $14 million initiative aims to reduce the impacts of nutrient enrichment and other forms of pollution on the Swan and Canning rivers, two of Perth's most notable scenic and environmental features. The program combines on-ground rehabilitation works, planning, education and catchment management initiatives at an unprecedented scale. The Commission, in partnership with the Swan River Trust, has played a leading role in developing the Action Plan and will continue to have a large part to play in its implementation. Much of the Protection and Enhancement focus is on supporting Integrated Catchment Management in priority catchments including Ellen Brook.

Swan-Canning Cleanup Program

The Gnangara Land Use and Water Management Strategy was released for public comment in June 1999. This is the culmination of many years'work to model, understand and manage Perth's most important water source. The management strategy specifies land use controls to protect the Gnangara drinking water supply well into the next millennium. It has been a cooperative arrangement between the Commission and the main State agencies for water supply, environmental management and planning.

Gnangara Mound

Other achievements featured in this Annual Report are the release of a manual for Managing Urban Stormwater Quality in Western Australia, and the Waterways WA Program which has been initiated to provide a long-term (20 years) framework for waterways protection, on-the-ground works and links to other programs such as the State Salinity Action Plan.

A summary of achievements in the Protection and Enhancement business in 1998-99 is presented in Appendix 1 page 130.

Looking ahead — major initiatives for 1999-2000

- The Commission will continue its joint implementation of relevant parts of the State Salinity Action Plan.
- Ongoing planning, management and restoration of the State's rivers and estuaries.
- Increasing efforts in floodplain management and flood warning.
- Continued implementation of the State Wetland Conservation Policy.
- The Commission must continue to be proactive and seek to influence the land planning processes to minimise potential risks of pollution.

Protection and enhancement

Issue 1

Dealing with salinity

Salinity is the most significant threat to natural resources in Western Australia

Impacts of salinity

Salinity has significantly affected over 80 per cent of waterways in the south west of Western Australia, including our divertible water resources (that is, surface water that has potential for domestic or commercial supply). Thirty-six per cent of the State's divertible water resources are brackish or saline, and a further 16 per cent are of marginal quality. Most of our major rivers in the south west have high increases in salinity each year.

Major rivers currently supplying public water, or having the potential to be used for this purpose in the future, are affected. The Helena, Collie and Denmark rivers each contribute to existing water supply reservoirs and the Kent and Warren rivers are considered to be potential future public water resources.

Water resource recovery catchments

Concern about salinity led to statutory control of clearing in catchments of these rivers during the late 1970s. More recently, the Salinity Action Plan has identified these water resource catchments as requiring priority management. They are termed Water Resource Recovery Catchments. The Water and Rivers Commission has the responsibility for coordinating the required salinity management. The approach is based on a strong partnership between local rural communities and government. Recovery Teams with strong local community representation have been formed.

Warren and Collie River Recovery Team members visit a tree trial established by CALM.

Emphasis is on effective property and catchment planning based on robust salinity risk assessments. Land management decisions are made on 'best management practice' information endorsed by the Recovery Team. Proposals for works, such as establishing trees and other perennials or surface water management, are assessed using water-use and groundwater models. Cost-sharing arrangements are then negotiated based on a private : public benefit ratio.

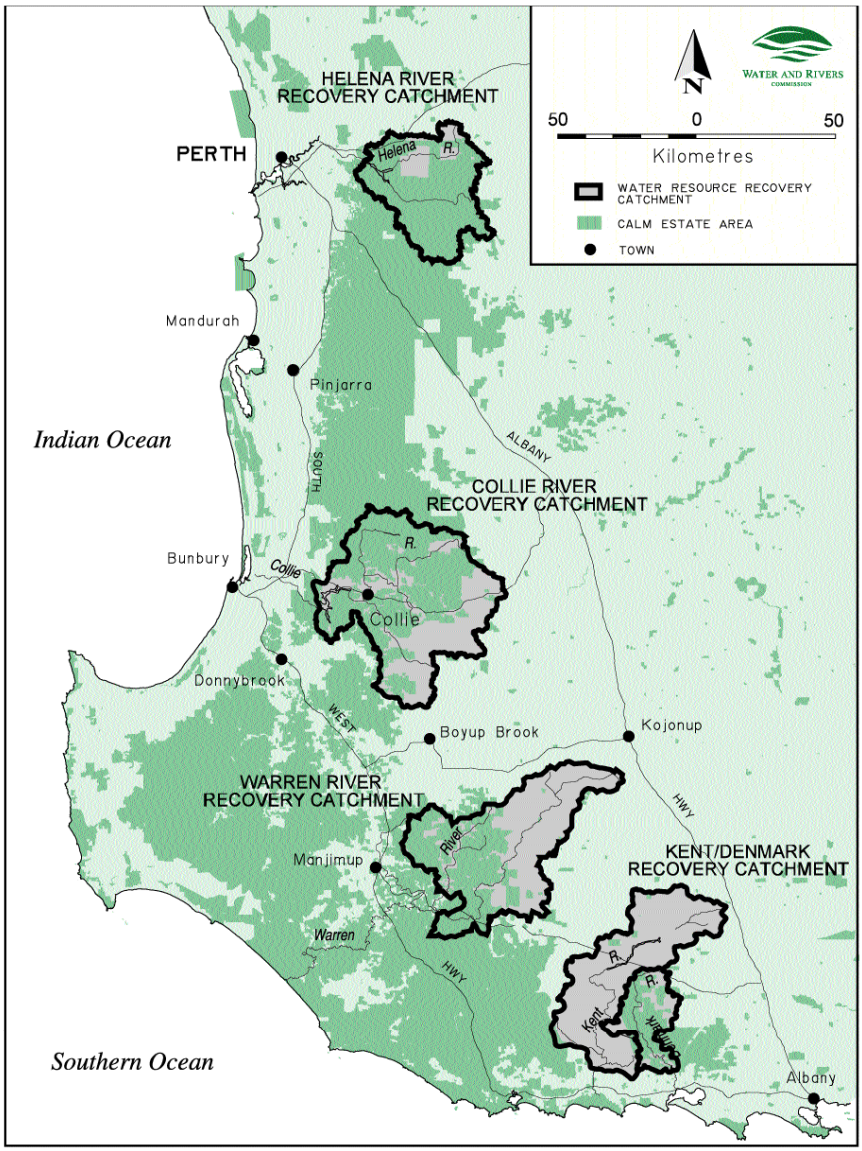
Salinity management teams

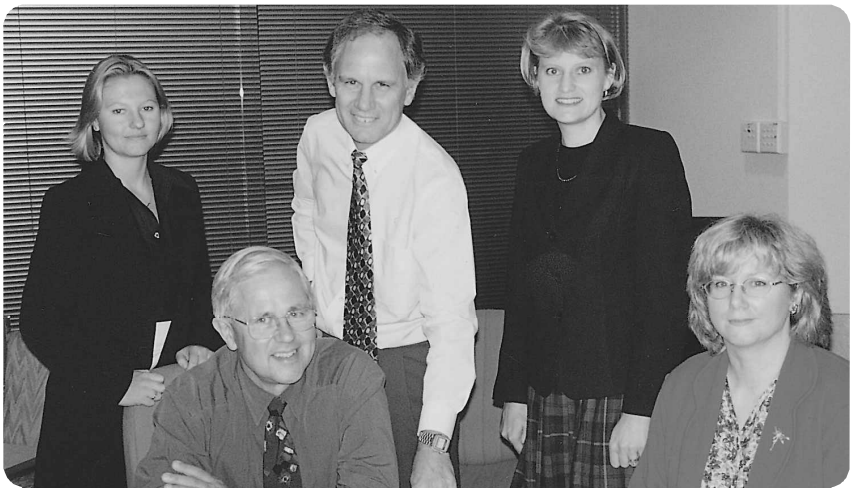
The Commission has established Salinity Management Teams in the south west and the south coast regions. These teams are doing significant on-ground work, in accordance with local Recovery Team strategies. They have achieved the protection of over 2500 hectares of remnant natural vegetation in addition to the establishment of 300 hectares of non-commercial vegetation and 400 hectares of deep-rooted perennials. Major fencing and revegetation work in the Kent River riparian zone is also nearing completion.

Catchment plans

Twenty-five catchment plans are being prepared to determine specific requirements for ground and surface water management, including drainage. This will involve detailed salinity risk assessments through drilling and the use of geophysical survey techniques. A plan for the Mobrup catchment, in the Warren River Recovery Catchment, is the first to be completed.

The Salinity Management Program aims to achieve potable water quality in each of the Recovery Catchment rivers within 20 to 30 years. In addition, rural communities will be brought together and empowered through involvement in the management process.





Working together to update the Salinity Action Plan.
From left: Mara Vlaar (WRC), Alex Campbell (Chairman, Salinity Council), Don Crawford (WRC, Executive Officer to Salinity Council), Christine Wardell - Johnson (Agriculture Western Australia), Caris Bailey (CALM)

The Salinity Action Plan, first published in 1996, was updated and released for public comment in March 1999. The final plan will be released later in 1999. The Water and Rivers Commission was a lead agency, working with Agriculture Western Australia, the Department of Environmental Protection and CALM to develop a vision and coordinated response to tackling salinity.

Protection and enhancement

Issue 2

Protecting drinking water

The Commission has built on major initiatives from last year to improve the protection of our public and private water supplies. The key to success has been to further develop partnerships with other government agencies, local government, industry and the community in all aspects of water quality protection.

State Water Quality Management Strategy

During the year, the Commission began the development of a State Water Quality Management Strategy. The strategy will provide a consistent framework for water quality protection in Western Australia. It will outline water quality management objectives, principles, and strategies and provide a framework for implementation. An integral part of the strategy is recognition that the management of water quality is a responsibility shared by all levels of government, industry and the community.

A Senior Review Panel has been set up to coordinate the development of the Water Quality Management Strategy within government agencies. The strategy proposes the establishment of a Community and Industry Advisory Committee to ensure involvement of the community and industry at a strategic level.

The State Water Quality Management Strategy will lead to greater consultation with the community in the development of water quality protection policies, plans and guidelines. A primary benefit to the community and other stakeholders will be consolidation of work outputs across government agencies.

Protection of the Gnangara groundwater mound

Perth's groundwater resources are vital to the city's future and their protection is economically and socially preferable to treating the impacts of inappropriate development

The Gnangara Mound is the largest shallow groundwater resource near Perth. It supports wetlands, caves, springs and groundwater-dependent vegetation. It is also the major groundwater source for Perth's drinking water and thousands of private groundwater users.

In December 1994, a Parliamentary Select Committee released a report entitled Metropolitan Development and Groundwater Supplies. The committee concluded that Perth's groundwater resources are vital to the city's future and their protection is economically and socially preferable to treating the impacts of inappropriate development.

The completion of the Gnangara Land Use and Water Management Strategy for public comment has been an important achievement for 1998-99. The strategy is a coordinated response by local and State government and the community to the Select Committee's recommendations. The Commission has been a key agency in the development of the strategy.

The aim of the Gnangara Land Use and Water Management Strategy is to protect the important groundwater and environmental features of the Gnangara Mound while maximising development opportunities. It recommends zonings and reservations in the Metropolitan Region Scheme to bring groundwater protection to the forefront of land use planning.

The Commission has also had a key role in preparing a preliminary concept plan for the proposed Gnangara Park in consultation with CALM. The plan has been prepared in parallel with the Gnangara Land Use and Water Management Strategy and the State Water Quality Management Strategy. It outlines a planning framework to maximise nature conservation, water source protection and the heritage values of Gnangara Mound and highlights the value of the area as a community asset.

Protection of public water supplies in country areas

The Commission is continuing to prepare Water Source Protection Plans for public water supplies in country areas. These plans outline management strategies for the protection of public water supplies from known contamination risks. An important part of the planning process is the integration of the principles concerned with source protection with the process of land planning. The Commission has finalised several plans this year including sources used for public water supply in the Pilbara and small wheatbelt towns. Consultation with stakeholders was an important part of developing the plans.

Information on protecting water quality

The Commission has developed a series of Water Quality Protection Notes that provide guidance on water quality issues. The notes help the community and other government agencies to understand water quality issues associated with various land uses. A key development has been the inclusion of the notes on the Commission's Internet site (www.wrc.wa.gov.au) to meet the needs of an increasingly web-literate community.

The Commission is working with other government agencies and industry to develop 'best management practice' guidelines for several land uses. These include policy and guidelines for construction and silica-sand mining in areas where public drinking water is sourced as well as guidelines for the protection of water quality in mining and mineral processing. These guidelines encourage environmentally sound management practices including waste minimisation and the adoption of more efficient processes. Implementation of these guidelines will ensure protection of public and private water supplies for current and future generations of Western Australians.

Submersible pump near mining sand tailings, Gascoyne

An important part of the planning process is the integration of the principles concerned with source protection with the process of land planning

See the website www.wrc.wa.gov.au for a complete list of Water Quality Protection Notes

Protection and enhancement

Issue 3

The Swan-Canning Cleanup Program

In April 1999 the Premier announced funding of $14 million over five years for the implementation phase of the Swan-Canning Cleanup Program. The Action Plan, detailing a comprehensive package of actions to reduce the frequency and intensity of algal blooms in the Swan-Canning river system, was launched by the Minister for Water Resources Dr Kim Hames in June. This was the culmination of three years of intensive work by the Commission in partnership with the Swan River Trust. Much of the technical support to the Swan River Trust has been provided by staff of the Commission. It is also the start of a challenging five years of concerted effort to realise the Action Plan.

The Swan-Canning Cleanup Program Action Plan was launched in June 1999

Progress on the SCCPAction Plan over the past year, and major directions of the Action Plan, are detailed in the Swan River Trust Annual Report 1998-99. Copies of the Action Plan are available from the Swan River Trust. What follows is a summary of the major input to the Program by the Water and Rivers Commission.

Identifying the problem

The problems in the Swan River and especially the Canning River today are caused by phytoplankton blooms rather than the large algae (macroalgae) accumulations that were evident in the late 1940s. Consequently, much of the Commission's effort has been to understand what triggers phytoplankton blooms and identify what causes a succession from one algal species to the next.

At the forefront of this work has been the Commission's Phytoplankton Ecology Unit (PEU) whose staff identify phytoplankton and provide advice on potential health risks and environmental effects. This service is provided Statewide and the PEU is nationally recognised for their understanding of the taxonomy of brackish to marine species of phytoplankton. The PEU staff also work with CSIRO and other agencies to build up an understanding of the toxicity of different algal species.

Understanding the cause

The Swan and Canning river systems have been sampled weekly by Commission and Swan River Trust staff since 1994 to determine how changes in rainfall and water chemistry affect phytoplankton numbers and density.

This work and collaborative projects between the Commission and CSIRO have led to the understanding that phytoplankton activity is sometimes limited by the supply of nitrogen as well as phosphorus. Phytoplankton will grow until they run out of either light or a nutrient such as phosphorus, nitrogen or carbon. What this means for the Swan and Canning rivers is that we will not be able to control algal blooms unless we reduce the supply of phosphorus as well as nitrogen and organic matter.

Studies of the flux of nutrients from the catchment to the estuary have shown that much of the nitrogen delivered in the peak of the winter rains is exported direct to the ocean but that much of the phosphorus is deposited in the sediments of the upper Swan. Nutrients, especially nitrogen, that are introduced from spring rains are available to support the algal blooms which occur later in summer. In addition, drain discharges during summer, especially in the Canning River, are a major source of nutrients and organic matter for algal growth. Perhaps because of these conditions, the Canning has seen the only major blue-green blooms in the Swan-Canning system in 1994 and again in 1998.

The Commission and the Water Corporation operate flow-gauging stations in the Swan and Canning catchments to provide streamflow information. Weekly samples are collected by Commission and Swan River Trust staff for nutrient analysis. From these data an understanding of nutrient sources, delivery rates, changes with rainfall and season, and changes from previous years have been gained. Water quality targets have been derived following Australian and New Zealand Environment and Conservation Council guidelines as a guide to cleanup activities. Future sampling and data analysis by Commission staff will track trends in nutrient concentration with time and performance against targets.

Installing groundwater monitoring bores in the Canning River

Developing and implementing remedial strategies

A major focus has been to reduce the continuing discharge of nutrients from the catchment and to develop remedial strategies for nutrients already stored in river and estuarine sediment. Contaminants that originate from diffuse sources, such as agricultural runoff, stormwater discharges, urban drains and groundwater are much more difficult to control than 'point sources' such as industrial discharges. The Swan-Canning Cleanup Program includes strategies to control contaminants from these diffuse sources. More than half the funding allocated to SCCPis taken up in finding ways to reduce the amount of nutrients entering the rivers from various sources through improving land use planning and catchment management. The Commission is very active in catchment management throughout the State, and lessons learnt in the Swan-Canning system will have application elsewhere.

Surprisingly, given the prevalence of algal blooms around the world, few solutions exist once a bloom has developed and most of these involve the addition of chemicals with undesirable environmental consequences. Intervening to cut off the supply of nutrients before a bloom develops widens the options available. The Commission has focused on techniques that enhance natural processes and that have low environmental impacts.

The Canning River is the main focus of remedial actions such as the use of oxygenation and modified clay applications because of the occurrence of blue-green blooms and its separation from estuarine waters during the summer. Following a promising trial of an oxygenation technique on the Canning River in early 1998, a pilot plant was built and operated from October 1998 to May 1999. More efficient oxygen dissolution was achieved and about one kilometre of the river was treated. A very clear suppression of nutrient release from the bottom sediments was demonstrated and odours were substantially reduced.

Another technique investigated was to bind the nutrient in the sediment to make it unavailable to feed algae. After extensive reviews of national and international experience it was found that almost no material existed to bind phosphorus in a permanent form especially under low-oxygen and brackish to marine conditions. The CSIRO Division of Land and Water, together with the Commission and Swan River Trust, have developed a modified clay now patented under the name of PhosLock that effectively binds phosphorus under low to zero oxygen conditions and in marine to freshwater systems. Extensive trials in the Swan and Canning rivers and in Lake Monger have demonstrated the effectiveness of the clay in binding phosphorus under a range of typical uses. Large scale application to the Canning River is planned, in conjunction with oxygenation in the summer of 1999-2000. Remedial techniques such as oxygenation and the use of modified clays are being, or soon will be, trialed in other parts of the State.

Commission staff will be heavily involved in the implementation of the Swan-Canning Cleanup Program Action Plan. Much of the understanding of the estuarine and catchment environment is yet to be reported in a form accessible to the community and this will be a major focus over the next year. A new phase of environmental monitoring to report against targets and progress of the planned strategies will be developed.

Protection and enhancement

Issue 4

Water sensitive urban design

Encouraging modern drainage methods

Water Sensitive Urban Design encourages developers to implement modern drainage methods that reduce the level of pollutants in stormwater. Historically, stormwater has been drained directly into the environment, carrying with it any contaminants it may have collected from industrial, agricultural and domestic activities in catchment areas. In contrast, Water Sensitive Urban Design encourages the use of drainage methods that conserve and treat stormwater to reduce the level of pollutants reaching wetlands, rivers and estuaries. The maintenance and, in many cases, the improvement of stormwater quality is essential to ensure the protection of the natural environment and the long-term sustainability of urban areas in Western Australia.

Water Sensitive Urban Design encourages the use of drainage methods that conserve and treat stormwater to reduce the level of pollutants reaching wetlands, rivers and estuaries

Innovative approaches to stormwater management are needed in Western Australia because of the predominance of diffuse pollution (coming from many sources over a wide area) and the unique geomorphology of the landscape. Materials such as animal waste, oil and grease, heavy metals, fertilisers and pesticides are carried by stormwater to wetlands and waterways causing serious pollution and nutrient-enrichment problems in waterways and possibly even affecting groundwater quality.

Retaining and treatment versus disposal

The emphasis of Water Sensitive Urban Design on the retention and treatment of stormwater and its subsequent use in water features in the urban environment enable a usually ‘disposable’ resource to provide environmental and recreational benefits to the community. In this way the objectives of Water Sensitive Urban Design are in line with the broader water resource management objectives of the Commission to:

- manage water balance;
- maintain and where possible enhance water quality;
- encourage water conservation;
- maintain and improve water-related environmental values and maintain recreational and cultural values.

Best management practices

Water Sensitive Urban Design entails the use of ‘best management practices’. A ‘best management practice’ is defined as the best practicable method of meeting water resource management objectives at the current time. They can be viewed as tools to help developers, consultants and managers meet water sensitive design and other water resource management objectives. The purpose of these management practices is to retain, detain and influence stormwater runoff sufficiently to allow pollutants to filter and settle or be taken up by natural processes before discharging into the receiving waterways. There is considerable opportunity for this approach to become established practice in all landscapes as part of the urban planning and renewal process, providing appropriate encouragement and legislative coercion are used.

The purpose of these management practices is to retain, detain and influence stormwater runoff sufficiently to allow pollutants to filter and settle or be taken up by natural processes before discharging into the receiving waterways

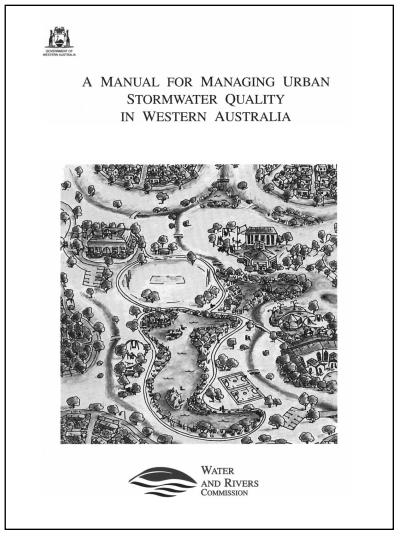
Examples of ‘best management practices’ for managing urban stormwater include catchment-based planning and management, integrated urban land use planning, stormwater management plans, treatment trains and multiple use corridors, as well as engineered structures, chemical treatments and changes to ongoing management.

Treatment trains involve a number of water quality management practices located throughout a catchment. For example, for small flows in the upper catchment, flush kerbing, swale drains and infiltration basins are recommended. For larger flows in the lower catchment, constructed wetlands and extended wet detention are appropriate. These landscape water features can form part of the public open space allocation for a development. Several recent urban developments in Perth have incorporated the use of multiple use corridors for stormwater treatment and public amenity. These corridors are passages of land designed to include an integrated range of stormwater management practices while incorporating a range of public amenity features.

The Commission encourages development of best practices and their adoption in planning and development approval processes.

New manual released

The Commission's manual for Managing Urban Stormwater Quality in Western Australia, released in August 1998, was produced to help developers, engineers, planners, and scientists to meet the requirements for pollutant management of stormwater in Perth. The manual was designed to complement the existing Planning and Management Guidelines for Water Sensitive Urban Design, which have a primarily philosophical and conceptual basis. The study was funded by the National Landcare Program, Swan River Trust and Water and Rivers Commission and was undertaken with the Swan Avon Integrated Catchment Management Coordinating Group under the guidance of a steering committee with community representation.



Successful implementation of 'best management practices' for pollutant removal will involve a range of disciplines including biological and environmental sciences, aquatic chemistry, engineering hydrology and flow hydraulics, as well as landscape architecture and urban planning. The new manual will enable the next step toward practical application of 'best management practices'that form the basis of an integrated approach for residential design. This approach seeks to meet water sensitive design criteria, minimise costs and blend facilities into the landscape.

Best stormwater practices can become attractive features of the urban landscape

Protection and enhancement

Issue 5

Working with catchment groups for better catchment management - the Ellen Brook experience

Catchment management to reduce algal blooms

The Swan and Canning rivers suffer from recurrent algal blooms that pose a threat to public health and severely limit swimming, fishing and other recreational uses of the estuary (see Issue 3). Algal blooms are being fuelled by high concentrations of nitrogen and phosphorus entering the rivers from the Swan and Canning river catchments as well as subcatchments such as Ellen Brook, Brockman River, Canning River, Southern River and Wungong Brook. The major sources of this nitrogen and phosphorus are the leached fertilisers and animal wastes from horticultural and agricultural enterprises in the catchment areas.

To reduce the amount of nitrogen and phosphorus entering water catchments, data relating to groundwater levels, groundwater quality, geology, topography and land use are required by the catchment managers. Unfortunately, this type of information is often not available in a form that is of immediate use to the managers of catchment areas.

To reduce the amount of nitrogen and phosphorus entering water catchments, data relating to groundwater levels, groundwater quality, geology, topography and land use are required by the catchment managers

Making information available — the Hydrogeological Resource Data Base

To address this lack of appropriate information for catchment management, the Commission began a project in September 1997 to integrate current data sets and add to these with new information to form the Swan Hydrogeological Resource Data Base. Information contained within the data base will form the base from which catchment groups can make decisions regarding the management of catchment areas.

A notable feature of the project has been the involvement of catchment groups in determining the type and form of information contained within the data base. The data base continues to evolve with feedback from catchment groups on its relevance to current management problems. By interacting directly with catchment groups the Commission is ensuring that the most up-to-date catchment information reaches the ‘ground level’ quickly and is able to be adopted for immediate use. In addition, catchment groups are able to communicate their need for specific information required from the Commission’s research staff.

By interacting directly with catchment groups the Commission is ensuring that the most up-to-date catchment information reaches the ‘ground level’ quickly and is able to be adopted for immediate use

Information packages for key catchments

An information package consisting of maps, diagrams, explanatory notes, overlays, leaflets and digital data will be prepared for each of Ellen Brook, Brockman River and Upper Canning-Southern-Wungong subcatchments. The subcatchment maps and diagrams will show variable geology, watertable contours, the direction of groundwater movement, variation in groundwater quality and areas of surface-water flow. The maps will identify areas prone to rising watertables, waterlogging and salinisation due to inappropriate land management. Areas where groundwater is vulnerable to nutrient enrichment, and conversely areas where nutrients can be reduced in the groundwater system, will be identified. Maps will also help to identify the ‘capture zone’of wetlands. Data will be presented digitally as GIS spatial information, compatible with the software of shires and other agencies so that planners can integrate this information with other

resource information when developing catchment management plans. Landowners will be able to use the information to adopt revised land practices that will not adversely affect water resources.

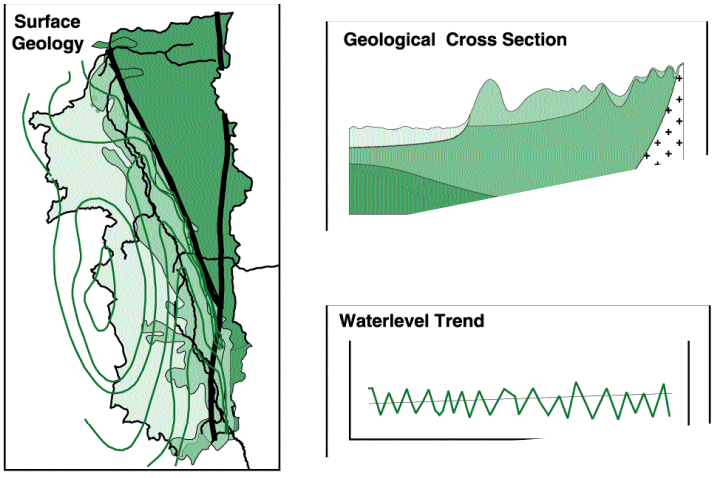
Piloting the package in Ellen Brook

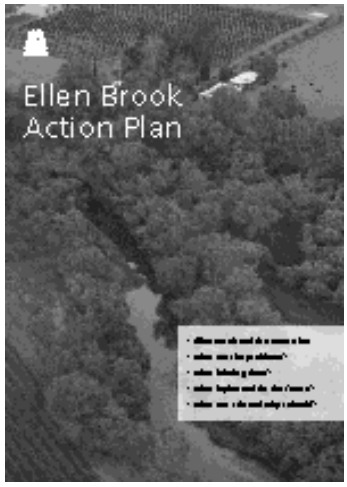
Draft components of the information package relating to subcatchments are being presented at meetings, seminars and workshops. The information package for the Ellen Brook subcatchment is closest to completion. Draft maps showing geology, watertable configuration, groundwater flow directions and land salinisation in the Ellen Brook subcatchment were presented at a workshop in 1998 and have been given to key stakeholders. Feedback on the usefulness of the maps is being collected and the suggestions incorporated when updating the data set.

Liaison with the Swan Catchment Council and catchment groups operating in the subcatchments on matters relating to the project will continue until the end of the project. The Swan Advisory Committee, representing community groups and agencies including Agriculture Western Australia, Swan River Trust, CSIRO, Ministry for Planning, Department of Conservation and Land Management, Department of Environmental Protection and Local Government Association, provide support and advice on the project. All of these groups have access to the information packages and can seek help from the Water and Rivers Commission in their use.

The Ellen Brook Action Plan was released by the Minister for Water Resources in October 1998, outlining action in the Ellen Brook catchment

Information Package - Ellen Brook Catchment





Recipients of Information
- Catchment Groups
- Swan River Trust
- Shires
- State Government Agencies
- Consultants
- Community

Protection and enhancement

Issue 6

Waterways WA program

Waterways WA is Western Australia's first Statewide waterways program. It provides support for on-ground action for the protection and enhancement of rivers, streams, estuaries and associated wetlands.

Pressures on waterways

Western Australia has some 208 major rivers extending over more than 25 000 kilometres. Rivers are valuable, not just for the water they carry, but also for the important habitat they provide for numerous plant and animal species. Rivers also provide a focus for recreation and are an integral part of our heritage. Many rivers are becoming degraded as a result of human activity in their catchment areas and along watercourses. Water quality is declining and many rivers carry excessive loads of nutrients, sediments, pesticides and other pollutants. In addition, an increasing number of rivers are becoming saline.

Some of the major management issues are:

~ loss of fringing vegetation
~ stream salinisation
~ weed infestations
~ channel instability
~ degradation of river pools
~ eutrophication
~ pollution and contamination
~ regulation and allocation of rivers
~ conflicting and unsustainable use of rivers
~ feral animals
~ floodplain management

One of the aims of the program is to work on these issues with other agencies and the community so that stakeholders will have the opportunity to be involved in the decision-making process.

A greater focus on conservation and restoration in the management of catchment areas will contribute to improved water quality and the health of ecosystems. It will also reduce environmental problems associated with estuaries and coastal areas and as a consequence, productivity and land value may increase.

Building on existing activities

The Waterways WA program builds on activities already being undertaken by community groups, landholders, local government and State agencies. The program helps these and other groups by supporting on-ground actions and disseminating information and advice that will support the implementation of river restoration activities. In 1998-99 considerable effort focused on briefing stakeholders about Waterways WA and consulting with them to design an approach to developing a policy and strategy for the program.

Links with other programs

Waterways WA is not the only major State program involved in addressing these issues. Links are being developed with the Salinity Action Plan, Ribbons of Blue, State Weed Strategy, Natural Resource Management Policy, State Wetlands Policy, Swan-Canning Cleanup Program, State of Environment/Water Resources Reporting, and other Federal programs such as Bushcare.

Case Study 1: A Local RiverAction Plan — protecting the creeks, wetlands and rivers of the Oldfield catchment (South Coast Region)

To help protect the waterways of the Oldfield catchment, the Water and Rivers Commission has been working with the Oldfield Catchment Group, west of Esperance, to develop and implement a Local River Action Plan. The project is funded through the Natural Heritage Trust. The federally funded project is designed to ensure an integrated and coordinated approach towards the management, rehabilitation and conservation of the waterways.

The Oldfield River begins about 95 km inland, about 100 km west of Esperance on the south coast of Western Australia. The river begins in gently undulating and often saline country, then shallow valleys are cut through sandstone to exposed granite, before dissecting deep valleys of siltstone as it descends to the Coastal Plain. The river consists of many interconnected river pools that form an important refuge for birds, aquatic flora and fauna and support unique vegetation communities around these pools. The river also has wide vegetation corridors that form important links between inland and coastal reserves.

In 1998, the Oldfield Landcare Group recognised that the degradation of tributaries in the catchment was a major issue for the subcatchment. In particular, landholders were concerned that stock access, salinisation, waterlogging and weed invasion were causing the deterioration of foreshore vegetation. Furthermore, the streams were showing signs of in-stream erosion where the vegetation was degraded. The landholders agreed that fencing to protect the waterways was essential. This formed the basis of the Local River Action Plan. In January 1999, the landholders worked together to map related management requirements to improve the state of these tributaries, using the catchment survey as the basis for these decisions. In addition, the farmers established five demonstration sites to promote various restoration techniques to protect the waterways. The sites also demonstrated that protecting creeklines requires a whole-of-catchment approach, and farmers are trying perennial species such as lucerne and oil mallees next to the fenced waterways.

The sense of community ownership of the Local River Action Plan in the Oldfield catchment is high. This is due to the community's involvement in the development and implementation of the action plan and the group's desire to protect their local waterways

The demonstration sites plus other on-ground works in the catchment are being monitored by the farmers to gauge their success. The monitoring program will record the condition of vegetation, success of different planted species, amount of erosion, reduction in the area of salt scald and improvements in water quality. Groundwater bores will monitor groundwater levels. Across the catchment, landholders will record the number of kilometres of creeklines fenced, seedlings planted and hectares revegetated and protected.

In the Oldfield catchment, increasing community awareness of waterways has been an important component of the Local River Action Plan. In 1998, four field walks, a canoe trip of the Oldfield estuary, two river walks and two bus tours were held.

Finally, to ensure that the protection of the waterways in the catchment is sustainable, the Water and Rivers Commission and the Oldfield Landcare Group have been working closely with Agriculture WA. The Oldfield catchment is a focus catchment under the Salinity Action Plan. The focus of the catchment support team is on incorporating waterways management into catchment and farm planning, taking into account the condition of the whole catchment. This will ensure that issues such as waterlogging and salinisation are addressed on a catchment scale.

Case Study 2: Sediment excavation at Burlong Pool (Swan Goldfields Agricultural Region)

Burlong Pool is a short reach of the Avon River near Northam that was once a deep, freshwater pool during periods when the rest of the river was dry. Although the pool is still a prominent feature of Northam town life, it continues to present a management challenge to the Water and Rivers Commission because of sediment build up and salinisation.

In the 1890s, the pool served as an extremely important source of fresh water for the variety of works associated with the construction of the rail link to the Goldfields. During World War II, the army set up a training camp on the banks of Burlong Pool and through the 1940s and 1950s the pool served as the swimming centre for the Town of Northam and regularly hosted swimming carnivals, with changeroom facilities provided on land next to its eastern bank.

However, by the mid 1950s, the water in Burlong Pool had become noticeably salty and alluvial sediment had begun to fill the pool from the upstream end. These changes are likely to have resulted from the extensive land clearing brought about by the expansion of agriculture throughout the Avon catchment. Further land degradation resulted from the rabbit plagues of the 1940s and 1950s. In addition, the transportation of sediments is likely to have substantially increased following the River Training Scheme upstream of Northam, to Brookton, throughout the mid to late sixties. Through the 1960s, it is believed that Burlong Pool steadily filled with alluvial sediment, predominantly medium to coarse sand. This process began upstream at the sand bar and steadily moved downstream after each winter flow. It is not known precisely when Burlong Pool became completely filled with sand but is believed to have occurred some time in the early 1970s. Since then, this sand source has been utilised by several parties for a variety of uses.

Burlong Pool, upstream, first winter flow 1998

The Northam office of the Water and Rivers Commission has a project at Burlong Pool that aims to create and maintain sediment traps to minimise sand movement toward Northam, and ultimately, to recreate Burlong Pool. To achieve these aims, a sediment management plan for the pool was commissioned in 1996.

Following the recommendations of the plan, sediment traps were created at the upstream and downstream reaches of the pool. A dredging contractor, licensed by the Water and Rivers Commission, excavated these traps and about 10 000 cubic metres of sand was removed during 1996 and 1997. The licence specifications are designed to protect vegetation growing on the banks of the river and to minimise environmental impact in and next to the pool.

Before the winter flows of 1998, a low rock weir known as a riffle was built immediately upstream of Burlong Pool. The riffle has proved successful in slowing water velocity and trapping sediment upstream of the structure, where it may be easily skimmed off by light earthmoving equipment. By the summer of 1998-99, a permanent body of water was once again apparent at Burlong Pool. Birds and fish are returning to the area, and the long-necked tortoise has been observed at the pool after an absence of many years.

Dredging is expected to continue for several years. More riffles have been built upstream and native species have been planted to stabilise the river bed. Through the project at Burlong Pool, the Water and Rivers Commission is demonstrating to the community that the health of the Avon River can and will be improved.

River Restoration Workshop, Station Gully, May 1999

Allocating water

The allocation business

Outcome:

Water is used efficiently within sustainable limits to ensure sustainable development and maintenance of environmental values

Output 1: Water allocation policies

To develop and administer a system for the administration of the Commission's role in water allocation including the development of policies, standards and targets for public and private allocations, including irrigation distribution agencies.

Output 2: Water allocation management plans

To develop management plans which provide public information on the resource in terms of its water resource values for all uses, define sustainable levels of use and associated management criteria, and provide the policy basis for administration of allocation licensing at a local level.

Output 3: Regulation/licensing and community awareness

To license individual utilities and users of the State's surface and groundwater, and to educate and encourage the community in the wise use of water resources.

Output 4: State strategic planning

To support sustainable development of the State through strategic level planning for the use of water resources.

Overview of 1998-99

In some parts of Western Australia, water is being taken at levels that are close to the limits of the resource and consequently close management is needed to make sure that we can meet future demands. The environmental impacts of developing additional sources of water must also be well managed to ensure that the ecology, social, cultural and heritage values of the water resources are not compromised.

Licensing

Surface and groundwater resources are allocated primarily to water supply and environmental needs. Licences to allow water to be taken from wells or streams in declared licensing areas under the *Rights in Water and Irrigation Act 1914* are the primary means of ensuring that the taking of water is kept within sustainable limits. Licensing is undertaken in 52 groundwater areas and 20 surface water areas in the State. The Statewide licensing of artesian wells complements this.

Stream disputes

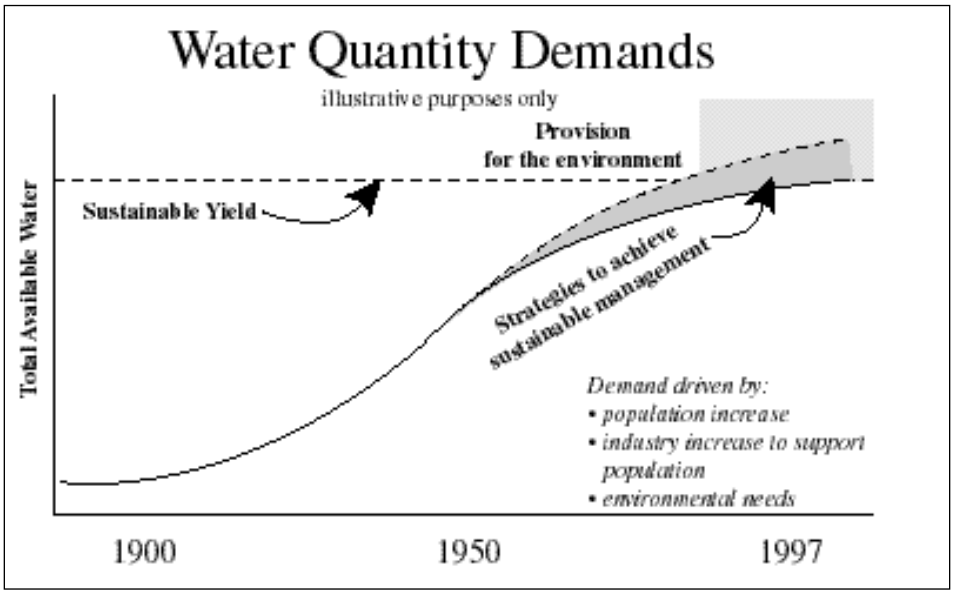
Increasing use of surface water, particularly in the south west, is creating an increasing demand for management and dispute resolution. Disputes between neighbours regarding water access on small streams have increased as drier conditions have been experienced in recent years. There have been about 40 stream disputes in the south west this year. They require inspections, assessment and negotiation and occasionally escalate to Ministerial level. Intervention is both difficult and costly. The Commission is working with local communities to develop arrangements for self-management in these situations.

Planning water resource development

The orderly development of our water resources to support regional economic development requires planning that matches future water demands with potential water sources. Important areas for such planning are the Kimberley, Pilbara, eastern Goldfields and the coastal south west, including Perth. The recently completed Harvey Basin Allocation Plan is a major planning study to provide for Perth's future water supply. The Kimberley Allocation Plan is a major planning study to accommodate future decision making on major water resource developments being planned in the area.

Water law reform

The process of reforming our water laws culminated this year in the tabling of a Bill in Parliament in June 1999. The modernising of legislation has involved considerable community consultation and will provide a framework for the Commission's Allocation business in the future.



Some of the major issues in 1998-99 follow. A summary of achievements in the Allocation business is presented in Appendix 2, page 135.

Looking ahead — major initiatives for 1999-2000

- Implementation of the water reform initiatives will be a major thrust of the water allocation business. In particular, the development of 'local rules' through community-based groups will be a priority initiative in key management areas such as Wanneroo.
- Surface and groundwater allocation plans will continue to be developed.
- Surface and groundwater licensing activities are to be improved through increased compliance surveillance and field contact with water users.
- The Commission will continue to encourage the wise and efficient use of water.
- The Commission will continue to provide planning advice to support State development.
- In 1999-2000 the Commission needs to move away from providing reactive assessments of planning proposals towards developing policies and guidelines for implementation into town planning schemes and regional planning strategies.

Allocation Issue 1

Harvey Basin Allocation Plan

Allocation plan finalised

In November 1998 the Water and Rivers Commission finalised a major surface water allocation plan for the Harvey Basin south of Perth, following endorsement of the plan by the Environmental Protection Authority.

The plan, which will be used as a model for future water allocation decisions, also established a landmark principle of compensation for water resource development.

The Commission's aim in developing the allocation plan was to balance the needs of water for the environment and social values with the need for water use. The plan successfully achieves this and has also been used to assess the acceptability of a proposed major new dam on the Harvey River. The plan outlines how the Commission intends to allocate the basin's surface water resources in an ecologically sustainable way while providing water for a variety of uses including irrigation, recreation, public water supply and the environment.

Working with the community

Development of the allocation plan was started in a climate of considerable local concern resulting from proposals for a new Harvey dam. However, due to the openness of the Commission's approach and the high degree of community involvement in developing the plan, much of the early concern was addressed.

By working closely with the community and addressing the issues raised during extensive public consultation, the Commission was able to reach an outcome that was acceptable to the majority of those concerned with the Harvey Basin. In supporting the Commission's plan, the EPA reported that the Harvey Basin allocation plan could be implemented without compromising environmental objectives.

Requirements for a new dam on the Harvey River

Having received the EPA's endorsement, the Commission informed the Water Corporation, which is acting as the proponent for the new Harvey dam, that additional water for public supply was available, subject to certain conditions. These conditions included a requirement that the Water Corporation gains environmental approval from the EPA for the construction of the dam.

Also included in the conditions was a requirement for the Water Corporation to provide compensation in the form of 'river credits' for any habitat losses due to inundation. Money would be paid by the Corporation into a trust fund to be used for rehabilitation of the river system.

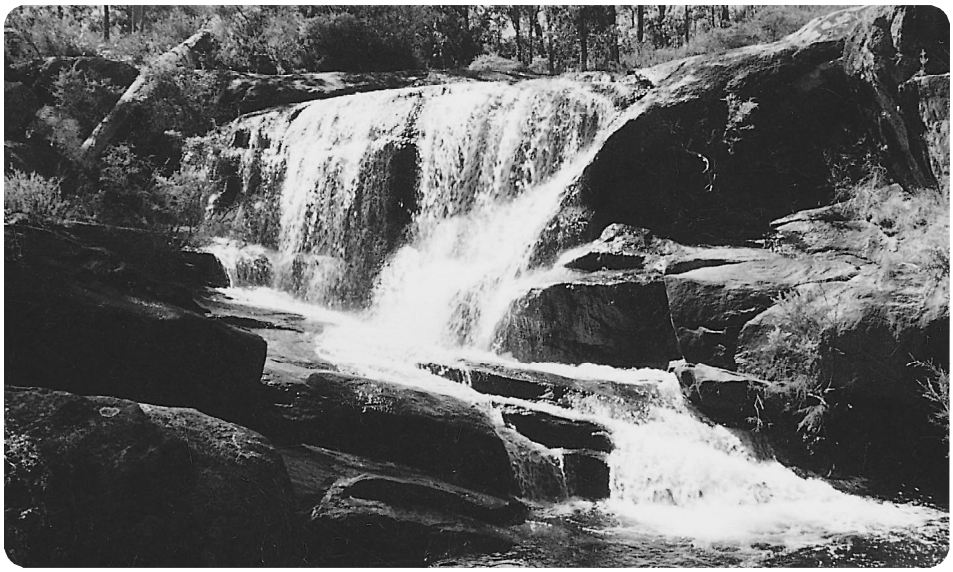
Harvey Basin Stream Restoration Trust

The Commission is establishing the Harvey Basin Stream Restoration Trust as a vehicle for managing the funds for rehabilitation work. The Water Corporation has agreed to contribute $750 000 towards river credits to the trust, should the dam go ahead. The trust will provide financial support for river and stream restoration projects proposed by community groups. It will build on and extend existing community-based river restoration projects in the Harvey Basin. A community panel will be set up to administer the trust and two local Land Conservation District Committees will help allocate the funds for stream restoration activities.

By successfully applying the concept of ‘no net loss’to the basin, implemented through the river credits scheme, the allocation plan has established an important principle in water resource development. This innovative concept requires water service providers to return sufficient benefits to a basin to offset losses caused by source development.

The Water Corporation has prepared an Environmental Impact Assessment on the dam, for consideration by the EPA. The Commission expects to be able to grant the Water Corporation a licence to draw water from the basin, subject to the Corporation gaining approval for the dam.

The Water Corporation has indicated that it considers the new Harvey Dam a strategically significant water source for the Perth-Mandurah supply system. If granted a licence, the Water Corporation expects to have the new dam on line within three years.



The falls, Falls Brook Nature Reserve. The full supply level of the proposed dam was constrained to prevent adverse impact on the reserve.

Allocation Issue 2

Kimberley rivers — finding the balance

The Kimberley rivers

The Kimberley region is one of many contrasts and includes the greatest number of wild rivers in Western Australia. Even those rivers that have been significantly altered through human intervention (most notably the Fitzroy and Ord rivers) still retain important ecological, social and conservation values. It is estimated that the region has 80 per cent of the State's total, potentially divertible, surface water and 29 per cent of its potentially divertible groundwater. However, the water resources and the ecosystems that depend on them are not well understood.

The region has a tropical climate with highly variable rainfall and high evaporation rates and is prone to both flooding caused by cyclones and other intense rain events as well as periods of drought. While all the major rivers flow at some time during the year, only a few flow all year round.

Allocating water — regional allocation plan

The Water and Rivers Commission has an important role in deciding the future of the Kimberley. Through its allocation planning process, the Commission strives to balance the competing needs of the environment and the social and cultural requirements of the region, with the increasing demands to harvest the Kimberley's vast water resources.

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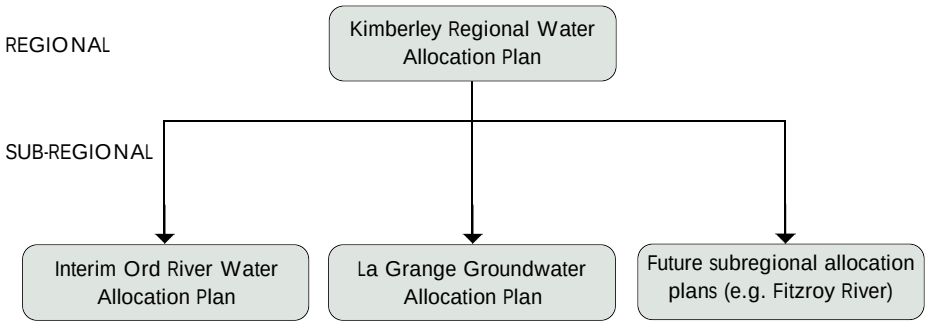
In late 1998, the Commission began work on developing a Kimberley regional water allocation plan. This is a broad strategic plan that will establish a Kimberley-wide framework to guide water allocation decisions and licensing across the whole of the Kimberley. It will provide a regional overview of a sustainable balance between environmental and social values and the potential consumptive uses of the region's water resources.

Regional allocation plans provide the framework for subsequent, more detailed investigations of subregions and specific groundwater and/or surface water resources. The figure below highlights the relationship between the Kimberley regional water allocation plan and the more detailed subregional allocation plans.

Water allocation planning hierarchy



Allocating water — subregional allocation plans for Ord River and La Grange

The Water and Rivers Commission is preparing two subregional water allocation planning studies for the Kimberley region. Both allocation studies are in response to large-scale, source development proposals involving irrigated agriculture. The first subregional allocation study in the Kimberley was started several years ago in response to a proposal to significantly increase the scale of the Ord Irrigation Area. The Commission worked with local stakeholders to prepare an Interim Water Allocation Plan for the Ord River system, a draft of which was released for public comment in mid 1999.

Groundwater pumping trial, Ord River Irrigation Area

A second subregional allocation study has just begun, focusing on the La Grange groundwater resource. Located south of Broome and including part of the Canning Basin, this groundwater resource is currently the subject of feasibility studies by Western Agricultural Industries which is interested in developing a large-scale, irrigated agriculture industry. The Water and Rivers Commission has a critical role to play in assessing the feasibility of the West Kimberley Irrigation Project through its water allocation planning process.

As the first step in the regional water allocation process, the Commission conducted a successful issue-scoping exercise with Kimberley stakeholders. Stakeholders were informed of the Commission's allocation planning process and issues to be addressed in the regional and subregional allocation plans were identified. The scope of technical studies required to address the issues was also refined and the most appropriate means for further community involvement were assessed. The outcomes of the exercise were released in two papers — one for the Kimberley region as a whole and one focusing on the La Grange subregion.

The La Grange subregional groundwater allocation plan will look at a wide range of issues, including the ecological, social and economic values of the La Grange groundwater resource. It will establish scientific criteria for assessing the ecological water requirements of water-dependent ecosystems and determine what environmental provisions will be made to protect those ecosystems and cultural values. It will estimate the amount of water available for consumptive uses such as irrigation and will establish monitoring requirements to ensure compliance with environmental conditions.

Community consultation

The Commission regards community consultation as an integral part of the development of the allocation plan and Aboriginal people have a key role to play in this. The Commission will keep all stakeholders informed on the progress of the plan and the resolution or otherwise of the issues raised. Regular newsletters will help in this process and reports will be available to the public.

The Commission regards community consultation as an integral part of the development of the allocation plan and Aboriginal people have a key role to play in this

Following completion, the subregional plan will be sent to the Environmental Protection Authority for review. The Water and Rivers Commission will then advise the State Government on the acceptability of the Western Agricultural Industries proposal from a water resources perspective.

Allocation

Issue 3

Water law reform program

Modernising water law

New laws covering how water is managed to protect the resource, users' rights and the environment were introduced in State Parliament in June 1999, after a comprehensive Statewide consultation program lasting almost two years. The proposed amendments to the *Rights in Water and Irrigation Act 1914* were designed to give West Australians the opportunity to be more productive and innovative in using rivers and groundwater systems. The amendments are aimed at modernising the State's water resource management laws and providing the tools to protect these precious resources and the environment that depends on them.

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The reforms clarify many confusing or ambiguous laws, giving greater certainty and security to all water users, and set an objective of sustainable management of water resources. The changes update and specify the licensing and environmental protection processes to be followed by the Water and Rivers Commission, as well as the Commission's power in relation to private drainage, water collection and flood control. The amendments provide a process for local community involvement in managing water resources with the capacity to match management action to local needs.

Allocating water to the environment first

A critical factor of Western Australia's water management is allocating to the environment first. This has been increasingly adopted over the past 20 years and the Bill formalises this system of allocating environmental water provisions.

Provisions to sell water entitlements

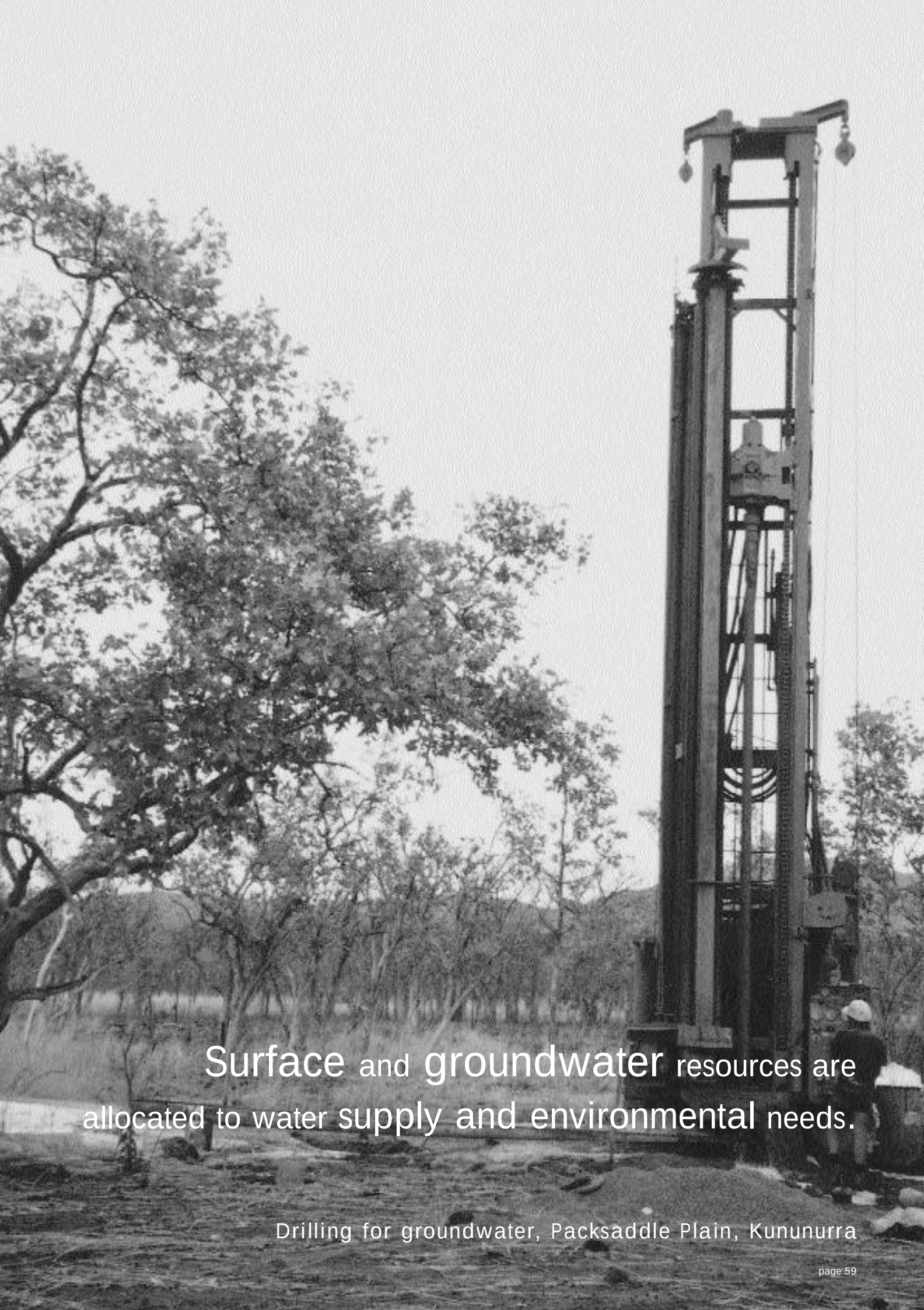
Another important feature of the legislation is that it will allow, but not force, people with a licensed water allocation to sell or lease their licences. This is being proposed because Western Australia is now facing an increasing number of areas of full water allocation in areas such as Carnarvon, Wanneroo and Jindong where irrigators cannot develop their businesses because no more water is available. In these areas the transfer of licences between water users opens up opportunities for restructure of the irrigation industry, allowing the most profitable and productive uses to grow and others to be phased out without any burden on the taxpayer. It is arguably the only fair way of helping people with development aspirations to gain access to water.

Another important feature of the legislation is that it will allow, but not force, people with a licensed water allocation to sell or lease their licences

Implementing the Water Reform Agreement

The Bill also recognised Western Australia's obligations under the Council of Australian Governments (COAG) Water Reform Framework Agreement. That Agreement, signed by the Premier on behalf of Western Australia, gave the State a double benefit: a modern plan for its water resource management systems and substantial payments that come to the State.

The Water and Rivers Commission has, since 1996, developed a proposal for implementing the COAG Agreement in a way that suits the legal systems and needs of Western Australia. A wide-ranging and comprehensive public consultation program began in August 1997 and the Bill reflects many of the ideas and issues raised by interested community members. The Commission believes the water management system adopted over the past century has served Western Australia well. It is now time to bring the State's water laws in line with the needs of a modern democracy.



Surface and groundwater resources are allocated to water supply and environmental needs.

Drilling for groundwater, Packsaddle Plain, Kununurra

Water information

The water information business

Outcome:

The community has a clear understanding and the best information on the quantity, quality, location and environmental interactions of surface and groundwater

Output 1: Measure and monitor water quantity and quality

To collect, store and provide access to data and information to support the understanding of the State's water resources. This will assist other agencies, private industry and community groups to manage water resource related issues.

Output 2: Assess environmental impacts on water resources

Investigations are undertaken to provide information essential for successful project and environmental planning within the State.

Output 3: Water resource appraisal for resource development

To provide advice and assessments on the availability, distribution and quality of the groundwater and surface water resources of the State to support sustainable development.

Overview of 1998-99

It is essential that the Commission has a sound base of information to guide its policies and management decisions, and allocation of future water supplies for towns, agriculture, horticulture and mining. The collection of data, their collation and subsequent dissemination as information is the function of the Water Information Business. This information must be in a form that can be readily used, not only by the other businesses of the Commission, but also by its stakeholders and most importantly by the community. This year has seen the start of a program to combine all of the current data bases into a single Commission-wide data base that will provide more effective management of data and more efficient dissemination of information to the Commission and its stakeholders.

Data, maps and modelling

In 1998-99 considerable work has been done to provide information that will help the development of management plans to deal with land and water degradation. Hydrogeological data sets and maps have been prepared that will enable catchment and community groups to understand the occurrence of groundwater and how its presence and movement contribute to salinisation. Modelling of conditions in water supply catchments to better manage salinity has continued, airborne geophysics has been evaluated as a tool to assist in salinity management, and mapping of remnant vegetation has progressed.

Flood management

The damaging floods in Esperance and the Moore River this year drew community attention to the need for accurate flood forecasting and floodplain management to protect communities. The Commission has continued its commitment to upgrading the flood forecasting networks throughout the State, and to working with other agencies to implement the floodplain management strategy developed by the Ministerial Task Force.

Ord groundwater management

In the Ord River Irrigation Area hydrogeological monitoring is providing a basis for groundwater management as Stage 2 of the irrigation scheme expands. Monitoring the impact of mining and groundwater draws on the Collie River pools will help to develop strategies to maintain the pools. Both of these projects are highlighted in this Annual Report.

Water quality

A sophisticated statistical package has been developed that will enable the Commission and the community to set targets for water quality and establish benchmarks for the management of waterways and wetlands. This package is receiving considerable attention from elsewhere in Australia, and may be used in the future by the Murray-Darling Basin Commission. In the south west, a detailed study into the occurrence of nutrients in groundwater from fertiliser application and its potential effect on adjacent wetlands, rivers and estuaries will lead to the development of a nutrient transport model that will have relevance to other areas of the State and help the Commission and the community to better manage this problem.

Contamination

The Commission has also been reactive in its assessment of groundwater and surface water contamination incidents. Fish kills and algal blooms continue to cause problems in our waterways. The Commission is internationally acknowledged for its expertise in understanding, evaluating and responding to these problems. The potential for groundwater contamination from a wide variety of land uses in the Albany region, and the possibility of contamination of the town's water supply wellfields, have also been assessed and linked to the modelling that has been carried out to better define the wellfield protection areas. Development of a new contaminated site database is featured in this Annual Report.

A summary of achievements in the Water Information business in 1998-99 is presented in Appendix 3 page 137.

Looking ahead — major initiatives for 1999-2000

- As part of the business planning process for the Commission for 1999-2000 there has been significant refocusing of measurement and monitoring activities. While this may impact on some of the Commission's current suite of activities, the clear intention is to focus on the Commission's immediate and future needs, with emphasis on high priority areas such as real time flood forecasting.

Water information Issue 1

Groundwater constraints on irrigation in the Ord River Irrigation Area

Harnessing the Ord for irrigation

The potential for harnessing the water supply from Australia's northern rivers has been recognised since the 1920s. In 1941 the Western Australian Government established a small experimental farm on the Ord River and by 1958 was confident that irrigation of this tropical region was viable. In 1963 the Kununurra Diversion Dam was built and by 1966, 31 farms were being irrigated in the Stage 1 irrigation area. In 1972 the dam at Lake Argyle was completed, enabling irrigation of up to 79 000 hectares in Western Australia and the Northern Territory.

Despite initial setbacks, the vision to convert the entire area from cattle grazing to higher-value irrigated agriculture is becoming a reality. Stage 2 improvements are now under way to increase its irrigated area from about 15 000 hectares to 77 000 hectares.

Rising groundwater

Monitoring studies by the Water and Rivers Commission have indicated that groundwater levels are rising under the Stage 1 irrigation area and approaching the ground surface at some sites. This has been caused by the raised level in the diversion dam, infiltration below the furrow irrigation and leakage from water supply channels and drains.

Management of the rising groundwater is required to minimise environmental degradation and avoid an increase in soil salinity and waterlogging that can cause significant reductions in crop yields. The rising groundwater has implications for the areas already under irrigation and those for which irrigation expansion has been planned.

Management of the rising groundwater is required to minimise environmental degradation and avoid an increase in soil salinity and waterlogging that can cause significant reductions in crop yields

The Water and Rivers Commission has been working closely with Agriculture WA, Department of Resources Development, the farming community and Stage 2 developers to overcome the threat to farming that is posed by rising groundwater.

Managing groundwater

Selection of methods that can be applied for controlling groundwater levels is largely determined by local hydrogeological conditions. Preventative measures might include lining water supply channels and optimising the application of irrigation water with surface drainage. Groundwater levels could also be controlled using plants that tap groundwater or gravity drainage with sub-surface field drains. The most effective method, however, is pumping groundwater from bores.

A highly permeable water-bearing material must underlie a drainable soil profile for water bores to be economically feasible in draining soils. Pumping the highly permeable layer causes a reduction in groundwater levels over a large area and this induces vertical drainage from the overlying, less permeable formations, keeping groundwater levels below the root zone.

Test pumping discharge, Ord River Irrigation Area

Drilling investigations have shown that extensive areas of permeable gravels underlie both Stages 1 and 2 of the irrigation area. Two test bores, with associated monitoring bores, were installed and pumping tests run to assess their ability to control groundwater levels. The long-term pumping test program was completed in 1998 and included 115 days of intensive monitoring by Agriculture WA. Analysis and modelling of the results indicated that pumping from a bore in the underlying gravel could control groundwater levels in the soil column over several hundred hectares.

In the Stage 1 irrigation area, the Ord River provides a natural groundwater drain that slows down the rate at which groundwater levels rise. Drilling investigations have confirmed that large areas in Stage 2 have no nearby natural groundwater discharge zones that would aid in curbing the groundwater rise. Studies demonstrate that the viability of Stage 2 hinges on the use of pumping bores for managing rising groundwater levels. This also provides a means of diminishing the salt accumulation caused by irrigation.

On the margins of Stages 1 and 2, only material of low permeability is present and the installation of large diameter bores would not be appropriate. In these areas the management options for controlling the rate of groundwater rise might include growing crops with deep root systems, installing shallow field drains and using alternative irrigation methods.

All the investigation work carried out over the past 30 years is being compiled into a comprehensive report on the hydrogeology of the Stage 1 and 2 areas to give a firm basis for groundwater management and control. The report will be published during 1999-2000.

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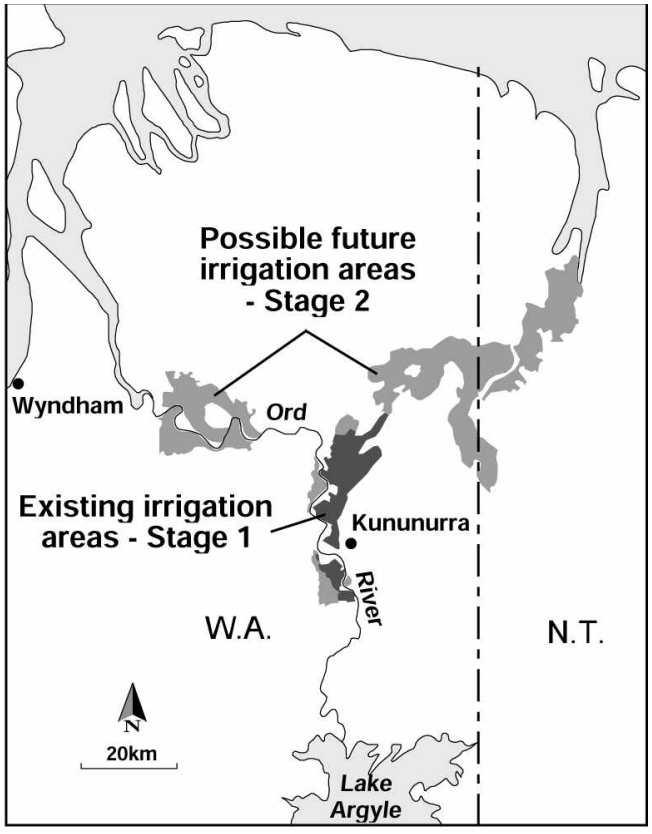
The Ord River Irrigation Area



Drilling monitoring bores, Ord River Irrigation Area

Water information Issue 2

Impact of mining and groundwater abstraction on the environment in Collie Basin

River pools fed by groundwater

Collie Basin, in the south west of Western Australia, contains large resources of coal that have been mined since 1898. Much of the coal is used for the generation of electricity. Coal mined in the Collie Basin provides 70 per cent of the total electricity required in the south west of WA. Collie Basin also contains large resources of fresh groundwater that are primarily used for power generation.

Groundwater discharges into the Collie River maintain numerous river pools and wetlands. The river pools provide recreational opportunities for the community, serve as stock water supplies on several farms, and provide a habitat for aquatic wildlife. However, pools in the south branch of the Collie River that previously contained water throughout the year, have been drying annually during the past few years.

As mining in Collie Basin extends below the watertable, dewatering of aquifers has been necessary to control inflows to the mines. A basin-wide, bore drilling program was undertaken in 1998, to obtain a better understanding of the hydrogeology of the Collie Basin. It helped establish regional and local groundwater flow patterns, better estimates of recharge and discharge in the basin, and an assessment of the impact of groundwater abstraction on the environment. A study to determine the effect of groundwater abstraction on the south branch of the Collie River, with particular reference to the river pools, showed that the watertable near the pools is significantly depressed.

Collie River

Impacts of mine dewatering

In the past, annual groundwater abstraction to dewater the mines and supply water for power generation in the Collie Basin has been in excess of the natural recharge to the aquifers. However, since 1995 abstraction has been less than the estimated recharge. It is estimated that the net loss within those aquifers underlying the river pools of the south branch is about seven million kilolitres a year. As a result, in the area directly overlying the underground mines, the watertable is generally depressed. The maximum depth to the watertable below the pools of the south branch is about 10 metres at the end of summer and rises about one and a half metres following the winter rains.

Groundwater levels remain below the floor of the river pools throughout the year at four of the seven significant pools along the south branch. Only Chinaman's Pool overflows as a result of natural groundwater discharge.

Hydrographs of monitoring bores near the south branch indicate recovery of water levels in the deeper aquifers of the Muja Coal Measures. However, water levels in the shallow aquifers continue to decline at rates of half to one metre each year. This decline is caused by leakage to underlying aquifers from which large volumes of groundwater have been abstracted.

It is estimated that if no further abstraction occurs from the underground mines, it will take about 30 years for the watertable to recover so that the pools are maintained by groundwater discharge throughout the year. However, if abstraction continues to occur at the current rate, recovery will take up to 100 years.

Strategies to protect river pools

The State Government has initiated development of long-term strategies for artificial supplementation of the river pools until such time as groundwater levels recover sufficiently to maintain the water in the pools.

Most pools will require supplementation during the summer months to maintain their water levels. The volume of water required to do this has been calculated and the Commission is investigating different water sources from which to supplement the pools and the potential impact that these options may have on the ecology of the south branch of Collie River.

The State Government has initiated development of long-term strategies for artificial supplementation of the river pools until such time as groundwater levels recover sufficiently to maintain the water in the pools

Water information Issue 3

The value of water resource streamflow measurement

Improving stream gauging methods

The first stream gauging in Western Australia took place on the Helena and Canning rivers in 1897 as part of investigations for the Goldfields Water Supply Scheme. In the early years of the century, additional gauging stations were established on rivers draining the hills near Perth, while monitoring of the large rivers of the south west began in 1939. The quality of the early data was poor and characterised by long periods of missing records, often at important times of high flow. Stations were often located at convenient road and rail crossings, sites not necessarily appropriate for accurate flow measurement.

The Water and Rivers Commission has focused on adapting new communications technologies to serve water resource managers better, developing more efficient data-collection technologies, and expanding partnerships with other data collectors and users

Over time, the stream gauging network has changed as new needs for streamflow data have emerged and new technologies for data collection, analysis and dissemination have evolved. In recent years, the Water and Rivers Commission has focused on adapting new communications technologies to serve water resource managers better, developing more efficient data-collection technologies, and expanding partnerships with other data collectors and users.

The stream gauging program run by the Water and Rivers Commission provides a continuous, well-documented, well-archived, unbiased, and broad-based source of reliable water data. This hydrologic information is essential to help define, use and manage the State's water resources.

Uses of streamflow data

Uses for the streamflow data include:

- enhancing public safety by providing data for forecasting and managing floods;
- determining input rates of various pollutants into lakes, reservoirs, and estuaries;
- designing water supply or irrigation reservoirs;
- setting permit requirements for discharge of treated wastewater;
- designing highway bridges and culverts;
- scheduling power production;
- allocating water for domestic, industrial, and irrigation uses;
- evaluating surface- and groundwater interaction;
- investigating long-term changes in the hydrologic cycle.

Streamflow data are needed for immediate decision making and for future planning and project design

Data for one or more of these purposes are or will be needed at many locations in the state, and a data-collection system is needed to help provide this information. The general objective of the stream gauging program is to provide information on, or to develop estimates of, flow characteristics for as many locations as practical. Streamflow data are needed for immediate decision making and for future planning and project design. Data, such as that needed to issue and update flood forecasts, are referred to as 'data for current needs'. Other data, such as that needed for the design of a future, but currently unplanned, bridge or reservoir are referred to as 'data for future or long-term needs'. Some data, of course, fit into both classifications; for example, data for flood forecasting can also be used to calculate long-term trends.

Flood forecasting

The stream gauging network serves the day-to-day needs of decision makers who want data that are current. The Water and Rivers Commission has responded to these needs by expanding the use of satellite telemetry to relay data from stream gauging stations to Commission offices with nearly 20 per cent of stations now equipped with this facility.

Future directions

A few decades ago the information needs for stream gauging focused on water supply and flood estimation. Those needs continue today, but they have been expanded to include water quality, environmental water requirements and river health. The challenge for the Water and Rivers Commission is to meet the increasing demands for information from both the users of the more traditional water supply and flood estimation data and the new users such as those who require data to evaluate environmental water quality. The Commission is meeting this challenge by continually evaluating the stream gauging network, achieving significant productivity improvements in data collection, applying new technologies and working with other collectors and users of stream gauging data.

One of the most important uses of real-time streamflow data is that of flood forecasting and warning, in the provision of which the Water and Rivers Commission works closely with the Bureau of Meteorology

Gauging station

Water information Issue 4

Floodplain management

Minimising flood risk

The Water and Rivers Commission aims to minimise flood risk and damage by providing advice and building guidelines for development on floodplains. Floodplain mapping, floodplain management advice and flood forecasting, are provided to State and local governments and the community.

The report by the Ministerial Taskforce into floodplain management was distributed for public comment. Most comments were very supportive of the new approach to floodplain management proposed for Western Australia. The Water and Rivers Commission is now working with other government agencies in developing an implementation strategy.

Gascoyne River following Cyclone Vance

Flooding in Western Australia during 1998-99

On 5 January 1999, significant rainfall occurred in the Esperance area, concentrating on the town itself with 210 mm falling over two days. The prolonged heavy rainfall led to widespread flooding in the Esperance area. The South Coastal Highway bridges over the east and west branches of the Dalyup River and numerous smaller roads in the area were damaged by floodwaters. Other roads were made impassable to all but four wheel drive vehicles.

In late March 1999, more than 200 mm of rainfall fell in the Moore River catchment over three days, an event with an estimated recurrence interval of one in 100 to 200 years. The annual, average rainfall for the area is 450 mm. The Moore River peaked at Moora town site on 21 March 1999, forcing the evacuation of more than 600 people with 320 houses affected and two thirds of the town being inundated. Again in late May 1999 105mm of rainfall fell in the Moore River catchment near Moora over a three-day period. The level of flooding in Moora was generally 0.4 metres below that of the March 1999 flooding. The relatively high level of flooding based on the rainfall can be attributed to the very wet catchment from the March 1999 rainfall. One hundred houses were affected by flooding.

Tropical Cyclone Vance brought significant rainfall to the Gascoyne River catchment, causing minor flooding to Carnarvon and cutting off the North West Coastal Highway. Rain from the decaying cyclone also caused flooding in the southern Goldfields with the main highway and rail link to the eastern states being made impassable.

Busselton flood management

Following the August 1997 flooding in Busselton, the Commission initiated a detailed flood management study. This included assessment of flood damage and evaluation of flood mitigation measures that would provide Busselton with ‘one in 100 year’ flood protection. The flood management study confirmed that the level of flood protection for Busselton is not adequate and evaluated the various flood mitigation options that have been recommended. A public meeting was held to allow the local landowners to have input into a selection of possible options for flood management. These options include upgrading the Vasse River Diversion and constructing detention banks in the upper catchment. The next step involves decisions on preferred flood mitigation works, funding arrangements, detailed design and construction of works.

Moore River flood management

The Bennies Road area of the Moore River is the centre of an ongoing dispute between various landowners as the result of levees on private land significantly changing the natural flooding regime of the river. A consultant has provided an independent assessment of floodplain issues and possible solutions for the area. It shows that equity, the health and protection of the whole river, erosion, siltation and flooding are all important issues. Commission officers have subsequently met with all landowners in the area to discuss the consultant's report and their particular concerns and issues.

The Commission has now developed an action plan that will provide a viable solution to the management of all issues affecting the Moore River floodplain. The plan has been forwarded to all affected landowners for their comment and there has been general support for the works needed.

Major flooding in the Moore River in March and May 1999 again highlighted that the system of levee banks does not only severely damage the environmental health of the river but also provides landowners with a false sense of flood protection. Landowners in the area need to accept that river flooding will significantly impact their properties as the present system of levees throughout the area will not provide protection against extreme flooding.

Upgrading flood forecasting

The Water and Rivers Commission is continuing its commitment to upgrade flood forecasting networks throughout the State in conjunction with the Bureau of Meteorology. Real-time information from rainfall and river level stations is vital to enable accurate and timely flood forecasts for flood prone areas throughout the State. Flood forecasting networks are now in place for the Swan-Avon and Murray rivers. Flood forecasting networks are nearing completion for the Fitzroy, Collie-Preston and Greenough rivers. As a consequence of the March and May 1999 floods in Moora, an interim flood forecasting system was also established for timely flood warnings for the Moora community.

The Water and Rivers Commission is continuing its commitment to upgrade flood forecasting networks throughout the State in conjunction with the Bureau of Meteorology

Flood forecasting models have been developed for the Swan-Avon and Fitzroy river catchments. This will enable improved forecasts for Perth, Northam, York, Beverley, Toodyay, Fitzroy Crossing and Willare.

Moore River catchment in flood, March 1999

Water information Issue 5

Tracking groundwater contamination

Groundwater contamination database

The Water and Rivers Commission has recently established Australia's first publicly funded database dealing with groundwater contamination. The project is important because most of Perth is underlain by sandy soils that, together with a relatively shallow watertable, make groundwater vulnerable to contamination from surface land use. Agricultural, horticultural and industrial activities all have the potential to contaminate groundwater supplies particularly when located on or near water catchment areas.

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Until recently, areas with the potential to contaminate groundwater supplies had not been fully identified. It was with this in mind that the Water and Rivers Commission and a local consulting firm developed a 'contaminated site' database called 'Site LEGACI' (Land Encumbrance, Groundwater and Contamination Investigations). The main objectives are to collect and manage data relating to contaminated sites, to provide a systematic approach to groundwater contamination investigations and to provide information to government agencies and the wider community.

Sites at risk

Detailed data relating to contaminated sites in Western Australia have been entered into 'Site LEGACI'. In addition, the location of 200 sites identified by the Geological Survey of Western Australia as being at risk of contamination have been incorporated into the database. This information will allow 'at risk'sites to be monitored carefully as well as providing valuable information to land users around the sites.

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'Site LEGACI' has a novel structure that allows the Commission to distribute a set of data management tools to relevant stakeholders and other government agencies. Much interest has been generated among government agencies, environmental consultants, developers, and individuals since the publication of 'Site LEGACI' at conferences in Melbourne (1998) and Perth (1999). It has also been acknowledged as a significant groundwater data base in a national review of databases carried out by the Australian Geographical Survey Organisation. This has improved the Commission's business profile in managing and investigating contaminated sites in WA.

Supporting the Commission

The corporate support business

The Corporate Support business is based around the concept that to be successful the Commission must optimise its people, information and assets. That is achieved through human resource management, financial and asset management, information management, communications, corporate development, executive services and strategic support.

Each of these areas is responsible for developing strategies and tools which enable all staff of the Commission to undertake work in their core activities. Traditionally this was done by staff in Corporate Services but with the Commission's approach, outcomes are improved by all staff taking responsibility for all of the activities associated with their parts of the business.

Overview of 1998-99

During the year the Commission completed its third and most successful round of business planning. The process has now been refined to be completed over a six-week period which includes strategic priority setting, project development, assigning project priorities, divisional impacts and budget setting.

A major external review of corporate development and human resource initiatives over the Commission's three years was completed. The review concluded that the Commission was undertaking productive and leading edge initiatives which supported its agreed goals of cultural and people development.

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Asset management and contract management were areas of considerable effort during the year. The final module of the Commission's financial management system is assets which has been run in a test environment during the year and will move to production on 1 June this year. During the year the Commission gained Contract and Management Services approval to manage contracts up to the value of $250 000.

The Commission has continued to develop its computer-based systems for an Intranet environment to ensure widespread adoption and ease of use for all staff, in particular in regional offices. This will lead to a fully integrated E-commerce system over the following financial year.

Much of the contribution to the Corporate Support Business comes from the Corporate Services Division. During the year the division changed its title to Business Development and Integration. The change of title is specifically to signal a move away from the traditionally held view of Corporate Services.

Looking ahead — major initiatives for 1999-2000

- The continued development of the Commission's public profile remains imperative to achieving long-term success.
- Developing people and maintaining a core workforce will continue during the year.
- The Commission has developed and will continue to maintain information sources and systems that are essential to the delivery of its core business and operation.

People

The Commission draws on a wide range of expertise, information and skills to develop comprehensive strategies to protect our groundwater, wetlands, waterways and the surrounding environment

Core values of the Commission are to recognise and value the people in our business and to be honest and fair in all our dealings with people. These values apply in a special way to the work of the Human Resources Branch in working in partnership with managers to provide strategic direction in people management and organisational development.

In the past year we have put a high priority on developing management capability in a 'Negotiating Organisation'framework. The outcome of this will be seen in the building of a performance ethos in the organisation based on open and mutually supportive relationships which value the contribution of staff to achieve our goals.

To this end specific initiatives have been completed or are in development to ensure the right mix and supply of capability is achieved, that management effort is focused, that ethical standards are upheld, that individual performance and contribution is maximised, and that our people develop within an organisation which values their performance and contribution.

Disability services

The Commission aims to have a work environment that values diversity and respects the personal rights of individuals

An updated Disability Services Plan was completed during the year, with positive feedback from the Disability Services Commission regarding the development of the plan and how it addresses desired outcomes at the Water and Rivers Commission.

Desired outcomes of the plan include the adaptation of existing services to ensure they meet the needs of people with disabilities and the improvement of access to buildings and facilities. Improving staff awareness and understanding of the needs of people with disabilities are also planned. Information about services and programs is to be presented in alternative formats that highlight the communication needs of people with disabilities and opportunities are to be provided for people with disabilities to participate in public consultations, grievance mechanisms and decision making.

The Commission's draft Disability Services Plan was communicated to all staff via branch meetings, the Intranet and displays on notice boards, and a morning tea was held to encourage staff to discuss issues. This has resulted in greater staff awareness of issues and procedures, as well as feedback to improve the plan. Progress toward implementing the plan has already been made with the completion of an access audit. Planning is under way to improve building access and facilities for the disabled, including services for the hearing impaired.

Further improvements to facilities are planned for next year and continuing efforts will be made to raise awareness among people with disabilities of the special services available to them. Selected officers will also be trained in interacting with those with disabilities.

Equal Employment Opportunity

The Commission is committed to providing staff members and potential staff members with equal opportunity in employment and complying with all the provisions of equal opportunity legislation.

The Commission aims to have a work environment that values diversity and respects the personal rights of individuals. To facilitate this, an Equal Employment Opportunity (EEO) Management Plan was developed during the year based on an ‘outcome standards’framework. The draft EEO Management Plan was circulated to all offices and made available on the Intranet, briefings were provided, and staff were encouraged to provide input. Staff consultation resulted in several changes to the final plan and greater staff awareness of EEO issues and procedures.

An EEO Working Group was formed to address EEO and Disability Services issues and to implement the EEO Management Plan. The EEO Working Group has also sought to actively promote EEO issues by introducing quarterly reporting to Corporate Executive, providing updates to staff and displaying EEO prints and posters. The first in a planned series of ‘EEO breakfasts’with an invited speaker was organised. A new EEO site was developed on the Intranet, and training by the Equal Opportunity Commission was arranged for working group members and managers later in 1999. Further training will be offered as part of the Commission’s commitment to putting EEO policies into practice. Four grievance officers have also been appointed this year.

Women in the workplace

In response to the Government’s initiatives as outlined in its Two Year Plan for Women, the Commission reviewed all EEO policies and employment advertising to ensure there was no inadvertent or implied restrictions on women. The review found no such restrictions.

Recruitment and selection

During 1998-99, the Water and Rivers Commission advertised 35 positions. There were no applications to review alleged breaches of the Public Sector Standards in Human Resource Management.

Occupational Safety and Health

Ten Workers Compensation claims for the period up to 30 June 1999 have resulted in 56 days of lost time.

RiskCover issues a quarterly incident report.

Brokerage, negotiation and facilitation training

As part of the commitment to the principles of being a 'negotiating organisation', the Commission has identified areas of training for managers to work better with stakeholders and the community.

Two brokerage and negotiation training programs were held, each lasting one and a half days. Twenty-seven staff participated.

Two facilitation training programs were held, each lasting three days. Twenty-four staff attended courses.

Communications

The Commission's links with the community remain as important as ever and we continue to strive to understand our stakeholders and how best to interact with them. At their simplest, projects run by the Commission aim to provide accessible information about the many facets of water management. The more complex of the Commission's projects involve a high level of consultation with collaborative effort where appropriate. Using communications planning tools developed in the Commission, many projects now involve sophisticated consultation strategies. Projects such as consultation over major water allocation plans or water law reform, for example, have helped to enhance the Commission's reputation as an honest broker that is willing to engage stakeholders in meaningful debate.

Highlights in communications during the past year include:

Promoting efficient domestic bores

A major campaign was run to promote the efficient use of bores in domestic gardens in appropriate areas. The campaign, which encapsulates the fundamental issues of good water management at the domestic level, was designed to reduce demand for high quality scheme water for garden use. By using lower quality water for gardens, it is hoped that the demand for new water supplies (with the environmental impacts that these entail) will be slowed. A balanced approach is needed, however, to ensure that domestic bores are not installed in inappropriate areas such as near wetlands or areas where salt water could intrude. The campaign also had to be careful to promote a message that groundwater is still a precious resource and must not be squandered.

Raising the Commission's profile

The Commission continued to raise its profile through press and television advertising designed to provide the public with key messages on water management. These campaigns were formulated to link in with other initiatives, or current issues, to create maximum impact.

Swan-Canning Cleanup Program

As described elsewhere in this report, the Commission provided a high level of communications and community involvement support to the Swan-Canning Cleanup Program. The Action Plan was released as a draft for comment in July 1998 and the final plan was released in June 1999. The plan was developed through collaboration with community, government, industry and scientific institutions and received strong support throughout the community consultation phase of the project. Community awareness, education and involvement will be key features of the plan's implementation in the coming year.

Website

An interface with the community that is increasing in importance is the Commission's internet home page. At the time of reporting, the home page was receiving between 7000 and 9500 hits each week. A popular destination once on the site, is the Commission's information sheet on pollution. This and other fact sheets provide on-line access to a wealth of information also available in hard copy from Water and Rivers Commission offices.

Ribbons of Blue

The Commission's school education effort remains focused through the highly successful Ribbons of Blue program. More than 200 schools are enlisted in the program which is based on partnerships with the Commonwealth Government's Waterwatch program, the WA Education Department and other State and private bodies. Through this program the Water and Rivers Commission involves local communities, schools, students and teachers in care and improvement of our waterways, wetlands and groundwater. The program has been carefully designed to help teachers deliver curriculum framework requirements for Western Australia.

Swan River Education Kit

Another initiative in the education area was the release of the Swan River Education Kit. This teaching resource is the product of many years of effort and it is hoped will become a critical tool for teachers to educate children about the river and its catchment. This is seen as the foundation for ensuring the next generation has the knowledge and commitment to protect the river system. The kit provides the opportunity for practical involvement in classroom and field activities linked to the curriculum in a way that the Commission hopes will help to secure a healthy future for the Swan River.

Customer focus

The Water and Rivers Commission works in partnership with the community, industry, State and local government to fulfil its role as custodian of Western Australia's most vital resource — water. We recognise that our water resources are essential for water supplies, recreation and conserving natural ecosystems. In protecting these values for present and future generations we are committed to:

- protect and manage natural resources
- balance the needs of people and the environment
- provide leadership in setting future directions for water management

In delivering our services, we make the following commitment.
We will do our best to:

- communicate and involve stakeholders and the community
- be professionally objective from a base of good science
- strive to make sure our services are cost-effective
- respond to your enquiries promptly and courteously
- if telephone enquiries cannot be dealt with immediately, we will endeavour to return your call within 24 hours
- respond to licence applications within 14 days
- meet deadlines for responses to statutory referrals
- ensure people reporting pollution are advised of outcomes
- ensure that information provided is, to the best of our knowledge, accurate and up-to-date
- uphold the provisions of the *Freedom of Information Act 1992*
- consider the needs of people with disabilities and other special needs

CUSTOMER FOCUS
WESTERN AUSTRALIA

Much of the Commission's focus as a 'negotiating organisation' is on involving and consulting with stakeholders and the community. Initiatives linked to Commission projects are detailed throughout this report. In addition managers and staff have been encouraged to develop appropriate skills through training, and 'learning sets' to share experiences and develop case histories.

Specific initiatives to support customer service commitments during 1998-99 included:

- development of a Code of Conduct
- development of a Disability Services Plan
- improvement of quality control of information through publication coordination processes.

The Stakeholder Council continued to be an important mechanism for reviewing customer and stakeholder service standards.

Our services

We provide services to key stakeholders as follows:

State and local government, business, industry and consultants

- allocation and availability of water for various uses
- requirements for developments that affect water resources and water dependent ecosystems
- proposed subdivisions, developments and town planning scheme amendments
- permitted land uses in Public Drinking Water Source Areas
- policies and guidelines on best practices to protect water resources
- drainage planning and floodplain management
- rainfall, streamflow, climate and water quality data
- groundwater data, including hydrogeological maps and reports
- groundwater levels for bores (metropolitan only)
- wetland mapping, classification, evaluation and management
- river and wetland protection and restoration techniques
- streams disputes
- pollution control techniques
- groundwater contamination

General public and community groups

- publications on Western Australia's water resources, their protection, allocation and management, and environmental issues including salinity and algal blooms
- maps of groundwater and wetlands
- data on rainfall, streamflow, climate, groundwater, water levels and water quality
- information on wise water use (water conservation)
- practical advice and support to community groups on waterway, wetland and catchment management

Students and teachers

- fact sheets on water issues
- education programs for specific waterways
- Ribbons of Blue school and community water monitoring program
- teacher training and development opportunities
- sponsorship for environmental education initiatives

Researchers and research institutions

- financial support for research projects
- input to external research projects
- supervision for tertiary student research projects
- hydrographic training
- hydrologic instrument and systems support
- rainfall, streamflow, climate and water quality data
- wetland, groundwater and bore data

Corporate planning

Business planning

During 1998-99 the Commission has continued development of its planning and management frameworks. Considerable effort was made to develop business planning and budget allocation systems, as well as encouraging and supporting greater participation of managers, employees and key stakeholders. Internal management systems for improving contract management and project management continue to be enhanced and implemented. In addition, the Commission has begun integrating risk management principles into strategic and business planning and project management.

Considerable effort was placed on developing business planning and budget allocation systems, as well as encouraging and supporting greater participation of managers, employees and key stakeholders

Cultural development

At a cultural level, the Commission continued to develop and implement strategies to build a leading class organisation. These strategies centre on modern management philosophies such as stakeholder involvement and negotiation.

The transfer of learning from stakeholder interactions and employee experiences continues to be a key strategy for driving continuous improvement of efforts. To enhance this, the Commission established ‘learning sets’ that support the development of managers and increase our involvement in developing and implementing a ‘best practice’ work environment.

Information services

Significant progress was made in the delivery and development of information services throughout the year. This was particularly evident in the areas of Intranet development and Geographic Information Systems (GIS) and in the infrastructure to support these. Corporate office software was upgraded to bring the Commission in line with current software versions, and to provide a platform for better development and use of web technologies.

Web technology

The use of web technology is ideally suited to the Commission’s structure as the many regional offices are traditionally both difficult to support and expensive to provide services for. This technology allows the deployment, operation and support of systems and information over relatively low-cost communication lines.

The Commission’s Business Planning system can now be accessed through the Intranet, and a major management tool, the project management system, has also been developed for use via the Intranet

The redevelopment and initial population of the Commission’s Intranet was completed successfully. There will be a continuous process of populating the Intranet with existing and new corporate documents. Cooperation between Information Services, Corporate Development and the Communications branches has been an important factor in the Intranet’s initial success, just as establishing Commission-wide ownership will be essential to its continued success. Information on the Intranet includes static documents such as policies and procedures, as well as a number of applications that provide access to databases of information. Staff can find internal contact information by using the Phone Manager; look at their own leave, pay and acting details by going to the Human

Resources enquiries system; and can look for books, videos and journals through the Library Information system. The Commission's Business Planning system can now be accessed through the Intranet, and a major management tool, the project management system, has also been developed for use via the Intranet. Several government agencies have been particularly impressed with the systems and have adopted some for their own use.

Geographic Information Systems (GIS)

Sound planning and infrastructure development over the previous two years have enabled significant progress in Geographic Information Systems (GIS). A general viewing system has been developed and released, providing a facility that is available to all staff to view key data. A 'metadata'system has been developed to provide a consistent method of describing spatial data used by the Commission. The Commission is responsible for custodianship of 11 GIS datasets which are part of the WA Land Information System. Efforts have been made over the year to develop custodial responsibilities among the internal groups identified as the dataset owners. A GIS Coordinator and three GIS analysts have been appointed to help with further developing and implementing GIS strategies. A 'Spatial Data Management Project' has started to reform the way we interact with and manage spatial data. The project will see a consolidation of the Commission's spatial data into a GIS-based 'Spatial Data Warehouse', and will ensure standards relating to spatial data and spatial data management are developed and adhered to.

Information Centre

Following a review of the Library and Records in 1997-98, these two functions have been combined to form the Information Centre. An Information Centre Coordinator has been appointed. The final structural arrangements for this section should be in place by the end of 1999. Planning for combined accommodation and the establishment of a 'shopfront' has commenced. The Information Centre continued with its development of the 'Virtual Library' theme with the release of the Library Holdings system on the Intranet, and the provision of increased access to electronic publications and articles. Correspondence Tracking has been established as a new service.

Year 2000 compliance

Some work still needs to be done but our risk is manageable

A project to determine the effect of the Year 2000 problem on the Commission has been given a high priority over the year. The project has included an awareness campaign, evaluation of every computer system in the Commission, a check of every PC and Server, investigation of accommodation and security issues and a risk assessment of our supply chain. The key findings indicate that the Commission does not have a significant exposure to the Year 2000 date change problem. Being a new and modern organisation has provided some immunity from large-scale concerns as we approach the Year 2000. Some work still needs to be done but our risk is manageable. A contingency plan will be developed to ensure the Commission has a 'fall back'in the event of unexpected Year 2000 problems.

Water resources licensing system

Phase 1 of the Water Resources Licensing System was completed successfully. The system is now operational, replacing the old mainframe system which has been decommissioned. Planning for phase 2 has begun and this will include new legislative requirements and a GIS interface.

Water information system

Development commenced on the Water Information System which brings together water resource information from several legacy systems. The system is expected to be operational by the end of 1999, and will enable more efficient access to the Commission's core data by staff and external stakeholders.

Plans in development

Information Services planning has commenced for the development of an Information plan, a Disaster Recovery plan, and an Electronic Document Management plan. These plans will be used as guidelines for information services delivery for the next five years.

Project management system

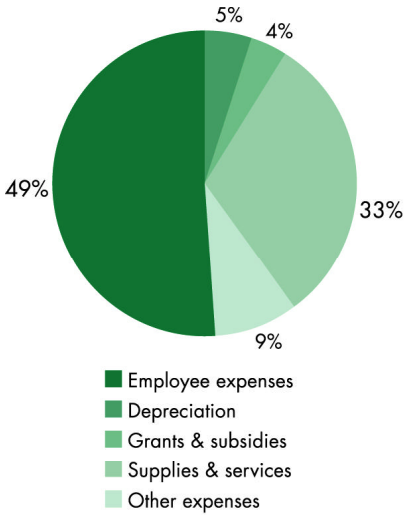
A system has been developed to ensure improved corporate project management. The system has been integrated with the Commission's business planning system and financial management system, and has potential to link to a corporate performance measurement system. It imposes rigour and accountability to corporate projects. Managers are able to view agreed project details and the financial status, and update schedules, targets, and progress.

Ministerial correspondence tracking

The Commission is now able to better track and report on the large number of Ministerial letters and requests received. The system, developed in the Commission, notifies staff if they have correspondence to respond to, and allows a coordinator to view the status and current location of individual requests. This system has been highly regarded by other agencies that have viewed it, and to date has been implemented by two of these agencies.

Financial highlights

Expenditure by major type 1998-99



Expenses

Total expenditure in 1998-99 was $41.4 million up from $39.9 million in 1997-98, which represents a 3.8 per cent increase. The increase in expenditure is mainly attributable to higher employee expenses and increases in grant and subsidy payments.

Revenue

The Commission received a total appropriation from the State Government of $35.9 million from both recurrent and capital funds. In addition, $2.6 million was received from the Federal Government via the Natural Heritage Trust (NHT) and Land and Water Resources Research and Development Corporation (LWRRDC). Other sources of funds, which represent 8.6 per cent of total funds received, include licence fees and charges, recoups from the Office of Water Regulation and the Swan River Trust for services rendered and interest revenue.

Assets

Total assets for 1998-99 increased by $1.4 million to $78.3 million, after allowing for depreciation of fixed assets. The major reason for the increase is due to current asset items in:

- cash resources
- accounts receivable
- prepayments.

Liabilities

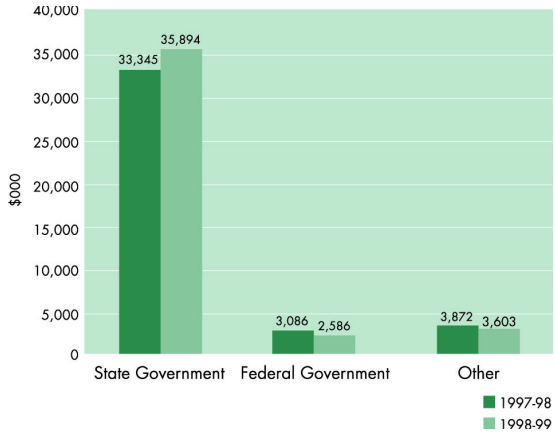
Total liabilities increased marginally in 1998-99 to $9.6 million from $9.2 million in the previous year. Shifts were in the areas of:

- increase in accounts payable and accrued salaries
- decrease in long-term borrowing from WATreasury Corporation.

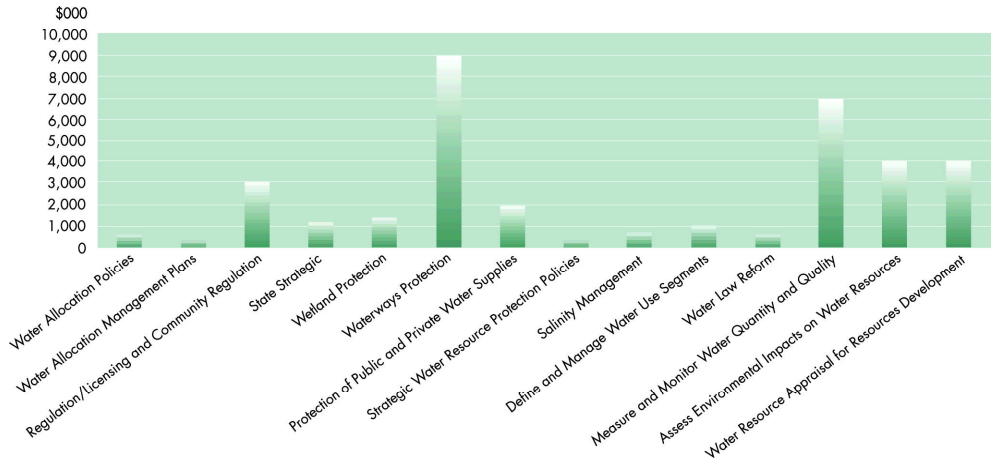
Summary

The net cost of services increased by 6.9 per cent to $35.2 million in 1998-99, compared with $32.9 million in the previous year. Net assets the Commission controls increased marginally to $68.7 million from $67.7 million in 1997-98.

Sources of funds: two-year comparison

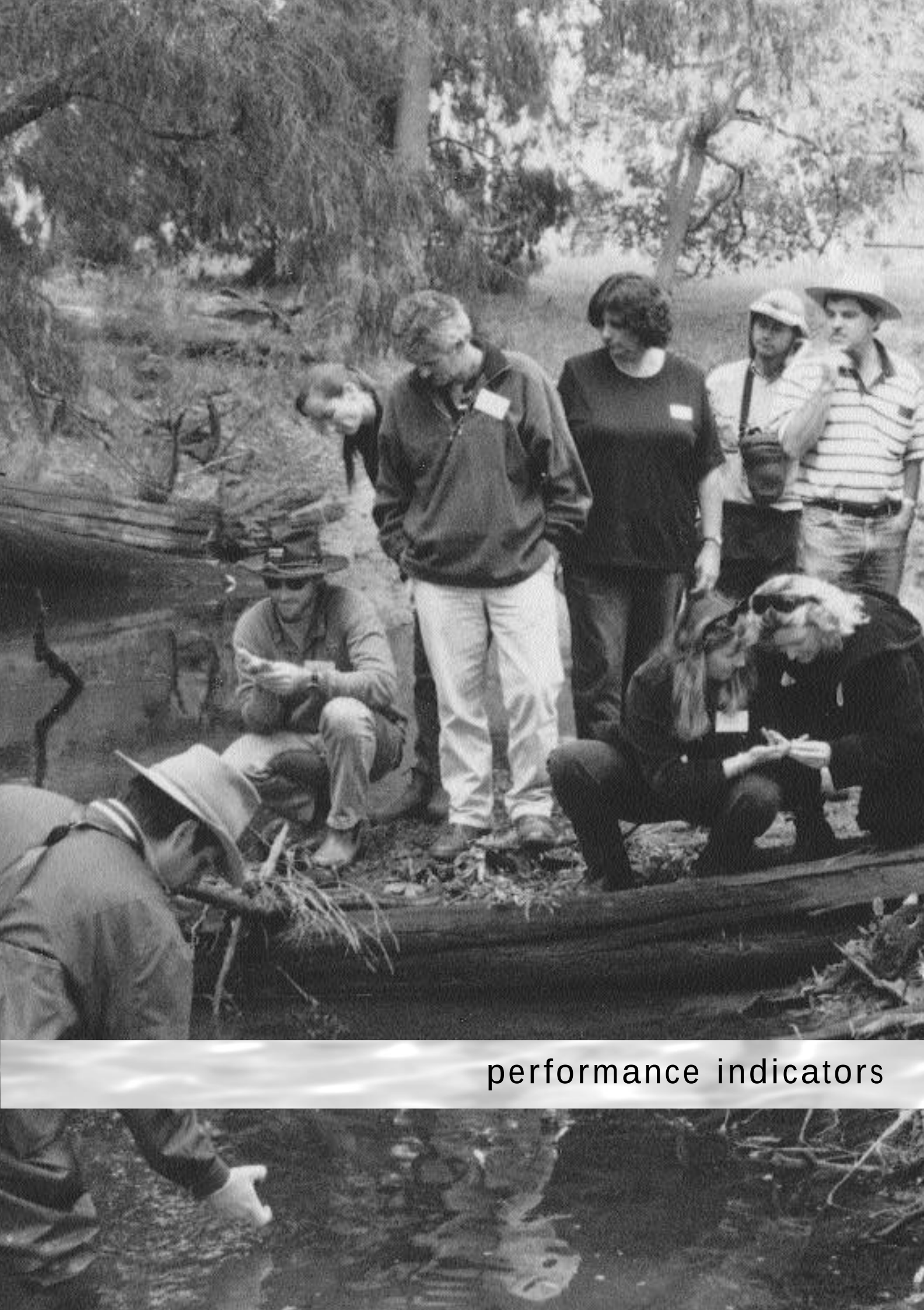


Net cost of services by output 1998-99



Financial overview

	1998-99 $'000	*1997-98 $'000*
SUMMARY OPERATING STATEMENT		
COST OF SERVICES		
Total operating expenses	41,372	39,862
Total operating revenue	6,189	6,958
Net cost of services	(35,183)	(32,904)
REVENUES FROM GOVERNMENT		
Consolidated Fund (recurrent and capital)	35,894	33,345
Resources received free of charge	345	123
Total revenues from Government	36,239	33,468
Change in net assets resulting from operations	1,056	564
Add opening balance of accumulated surplus	1,518	954
Closing balance of accumulated surplus	2,574	1,518
SUMMARY STATEMENT OF FINANCIAL POSITION		
Total assets	78,327	76,888
Total liabilities	9,581	9,198
Net assets	68,746	67,690



performance indicators

Statement by Accountable Authority on Performance Indicators

We hereby certify that the key performance indicators presented in this section are based on proper records and fairly represent the performance of the Water and Rivers Commission for the twelve months ended 30 June 1999.

Mr Ken Webster
Board Chairman

Mrs Jos Chatfield
Deputy Chairperson

27 August 1999

Opinion of the Auditor General

Auditor General

To the Parliament of Western Australia

WATER AND RIVERS COMMISSION
PERFORMANCE INDICATORS FOR THE YEAR ENDED JUNE 30, 1999

Scope
I have audited the key effectiveness and efficiency performance indicators of the Water and Rivers Commission for the year ended June 30, 1999 under the provisions of the Financial Administration and Audit Act 1985.

The Board is responsible for developing and maintaining proper records and systems for preparing and presenting performance indicators. I have conducted an audit of the key performance indicators in order to express an opinion on them to the Parliament as required by the Act. No opinion is expressed on the output measures of quantity, quality, timeliness and cost.

My audit was performed in accordance with section 79 of the Act to form an opinion based on a reasonable level of assurance. The audit procedures included examining, on a test basis, evidence supporting the amounts and other disclosures in the performance indicators, and assessing the relevance and appropriateness of the performance indicators in assisting users to assess the Commission's performance. These procedures have been undertaken to form an opinion as to whether, in all material respects, the performance indicators are relevant and appropriate having regard to their purpose and fairly represent the indicated performance.

The audit opinion expressed below has been formed on the above basis.

Audit Opinion
In my opinion, the key effectiveness and efficiency performance indicators of the Water and Rivers Commission are relevant and appropriate for assisting users to assess the Commission's performance and fairly represent the indicated performance for the year ended June 30, 1999.

D D R PEARSON
AUDITOR GENERAL
November 19, 1999

4th Floor Dumas House 2 Havelock Street West Perth WA 6005 Western Australia Tel: (08) 9222 7500 Fax: (08) 9322 5664

Key Performance Indicators

The Commission's objective is to ensure that the State's water resources are managed to support sustainable development and conservation of the environment, for the long-term benefit of the community.

The existing performance indicators provide information on outcomes and outputs delivered by the Commission.

The Commission's overall performance for 1998-99 has remained relatively stable. As indicated last year, the Commission under the State Government's Outcome Based Management approach is redefining its business in terms of outcomes. Accompanying this is the need to review, and where required, develop corresponding indicators.

Table 1 summarises the existing key performance indicators. Key Performance Indicators focus on reporting the effectiveness and efficiency of the Commission in meeting agreed outcomes. Explanatory notes in the following pages support these.

The performance covers the period between 1 July 1998 and 30 June 1999.

Table 1 - Summary of Key Performance Indicators

	Note No.	Unit Actual	12 Months June 97	12 months June 98	12 months June 99	Target
Outcome: Sustainable use of water r esources for economic development						
Objective: Water use is within sustainable limits						
Effectiveness Indicators						
Percentage of licensed use covered by a formal management plan	A					
- Board approved		%	51	55	61	100
- Senior Management approved		%	74	77	97	100
Percentage of Groundwater Management Areas with use in excess of management objectives	B	%	7.6	6.3	6.3	<5
Efficiency Indicators						
Average accrual cost per Gigalitre of water managed in accordance with agreed management plan (1191 GL)	C	Avg $ Cost	New	2856	3405	Reducing
Accrual cost of issuing, managing and administering water allocation licences	D	Avg $ Cost	209	165	147	Reducing
Accrual cost of building, maintaining and operating the State Reference Network for the collection of water resources quality and quantity information	E	Avg $ Cost per Work Unit	4057	4042	2331	Reducing
Outcome: Protection and enhancement of the quality of the State's surface and gr oundwater						
Objective: Clean and healthy water resources 1. For rivers, estuaries and wetlands • Restore high risk/critical water dependent systems to functional condition. • Slow rate of decline of water salinity in priority catchments. • Reduced algal blooms, pollution and fish kills in priority areas. 2. For public water supply • Quality of existing public water supply resources are maintained.						
Effectiveness Indicators						
Surface water quality - annotated hydrograph of Collie River	F	Graph				Improving
The extent to which management objectives have been developed for rivers, estuaries and wetlands	G	%	New	New	75[1]	Improving
The extent to which rivers, estuaries and wetlands water quality meet agreed management objectives	H	%	New	New	61[1]	Improving
The extent to which the waterways are protected while providing facilities for public use	I	No. of Pollution complaints	94	122	100	Reducing
The extent to which management objectives have been developed to guide the protection of the State's public water supply catchments/basins	J	%	New	21	30	100%
Efficiency Indicators						
Accrual cost per catchment protected	K	Cost $ per tonne	New	23	22	Reducing
Average accrual cost per Statutory Referral	L	Cost $ per referral	New	New	142	Reducing
Average water supply protection cost (per Gigalitre) covered by an agreed Management Plan (1191GL)	M	Cost $ per GL	New	1300	1403	Reducing

Notes: (1) New = Not previously measured

Notes

Effectiveness Indicators

A Percentage of Licensed Use Covered by a Formal Management Plan

- Board Approved
- Senior Management Approved

This indicator reflects the effectiveness of the Commission in managing water use in accordance with formal (Board approved) management plans, for the sustainable benefit of the community. The present indicator relates to groundwater management.

The indicator has been derived by determining the volume of water licensed for use in accordance with formal management plans and dividing by the total volume of water licensed for use in the State. Not all the water used in the State requires licences. Licensing is introduced when use grows to levels which require management.

The Commission aims to have formal plans indicating the amount of water available and allocation policies for all areas where licensing is carried out. The indicator may be used to assess performance by showing the extent to which water resources are being allocated to beneficial uses following public consultation.

Formal plans are defined to mean those plans which are endorsed by the previous Water Authority of Western Australia's Board, or the current Water and Rivers Commission Board following an appropriate level of community involvement in their formulation. The formal plans also include independent review by the Allocation Committee before Board approval. Senior Management approved plans are plans which have not yet received Board and Allocation Committee approval.

Note B provides a summary of the Commission's performance in managing to these planned objectives.

B Percentage of Groundwater Management Areas with Use in Excess of Management Objectives

The indicator is relevant to the program objective because it shows how effective the Commission's management is in ensuring sustainable benefits from groundwater.

The indicator has been derived by determining the number of groundwater management areas with a licensed use greater than the management objectives described in the plans and dividing by the total number of groundwater management areas in the State.

The effectiveness of the management of the resource is reflected in whether the resource is being used in excess of management objectives, based on assessed available resources. Performance may be assessed by viewing increases in areas with over-use of the source as indicative of the need for improved resource management in some areas.

About two thirds of the licensed groundwater use is covered by formal groundwater management plans with the highest priority placed in areas with high utilisation levels. About 4% of groundwater management sub areas have allocations close to, or at the level of sustainability. The reduction in over-allocation has resulted from increased levels of management and the ongoing implementation of initiatives such as water restrictions and community education on water efficiency.

Other groundwater sources are approaching the sustainable threshold and need closer management to ensure sustainability. This closer management will require increased levels of policy development, resource monitoring and re-evaluation, user compliance monitoring and community education and awareness raising. Development pressures also require the Water and Rivers Commission to extend the areas of licensed water use.

The Commission will also need to expedite its review of existing plans in high priority areas with relatively high utilisation levels to maintain sustainability.

C Accrual cost per Gigalitre of water managed in accordance with agreed management plans

This indicator shows the efficiency with which the Commission manages the allocation of water to economic, social and environmental uses. The indicator represents the activities associated with developing and implementing allocation management plans and policies.

The Commission's internal objective is to adequately manage the State's water resources at a minimum long-term cost. This indicator is holistic in that it considers the total planning effort expended by the Commission and divides it by the quantity of groundwater allocated. It is beneficial in that as demand for water grows, so too does the management effort required by the Commission. The target for the Commission is to maintain a stable level of effort.

Whilst the Commission does produce plans and policies, determining the average cost of a plan is not a reliable measure. This is because plans and policies do vary significantly in cost.

This indicator is new and as such represents a first year benchmark.

D Cost of issuing, managing and administering water allocation licences

This indicator shows the efficiency with which the Commission administers water allocation licences.

Licensing of allocations in declared areas is a statutory function of the Commission. Licensing is essential to ensure the objectives of water management are met, and those inappropriate precedents are not set. It is one of the primary mechanisms for managing the State's water allocations.

The indicator has been derived by determining the number of licences administered (23 324), and dividing this into the cost of the Allocation Business output – Regulation, Licensing and Community Education ($3 441 000).

The improvement in this indicator has resulted from a significant increase in the volume of licence applications whilst maintaining relatively stable level of resources. The improvement is also due to employee productivity and the development of new processing systems and processes to streamline licence assessments and approvals.

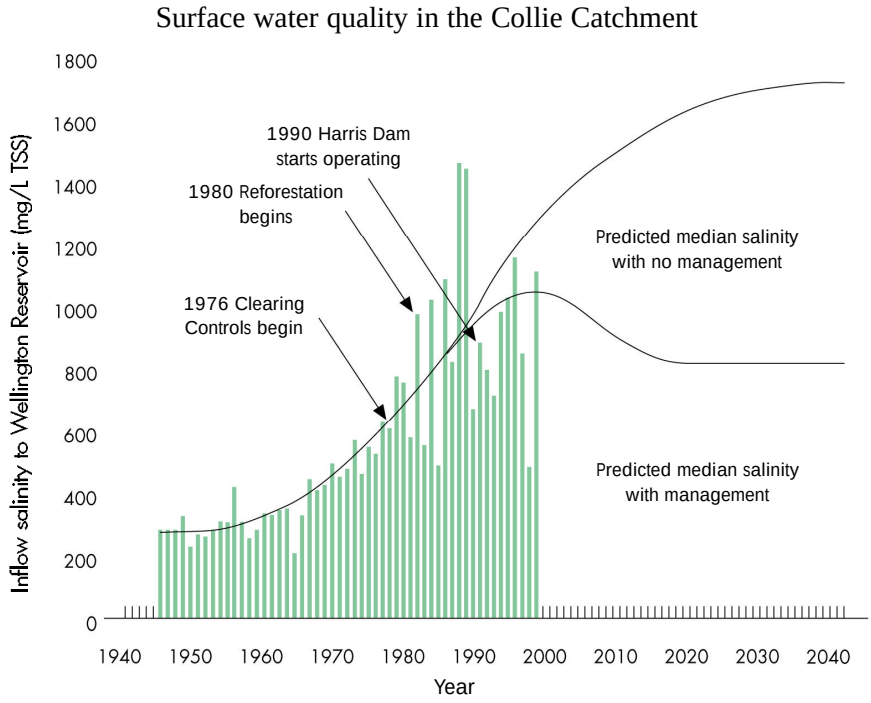
E Accrual cost of building, maintaining and operating the State Reference Network for the collection of water resources quality and quantity information

The Surface Water Reference Network consists of approximately 656 surface water and 3425 groundwater bore work units. Work units are generic names, which comprise gauging sites, rainfall measurement sites, salinity measurement sites and water quality sites. These surface water and groundwater measurement sites provide valuable

information for the management of water resources, sustainable development of water resources, and for the management of flood-related hazards.

The indicator has been derived by determining the number of operating sites, and dividing this into the total network operating costs ($ 9 512 000)

While the Commission continually reviews and improves its measurement network, the significant improvement in performance results from a reasonable level of underspending. It also results from a change in accounting policy where on the groundwater management activities in areas such as Waterways and Salinity are costed within those outputs. Major changes are reflected in the Notes to the Financial Statements.



F Surface Water Quality — Annotated Hydrograph of Collie River

This indicator shows changes in the water quality of a surface water resource degraded by increasing salinity. Whilst the Commission is implementing improvement strategies within five key catchments, Wellington is used because of the data available and that it is the catchment which has had the most management effort focussed. As more data become available, performance trends will be reported for the other catchments.

The initial increases in salinity have been a result of changes in land use, and the ongoing trend reflects the effects of management activities aimed at limiting or reducing the salinity. Salinity is a widespread problem in the State and similar management activities have been put in place in other catchments. The Collie River is representative of the success of more intensive management efforts.

The predicted salinities are those expected in years of median rainfall. The higher curve shows what was expected if clearing had continued in the catchment and there was no other action to limit the development of dryland salinity. The lower curve shows the expected result from limiting further clearing from 1976 and reforestation between 1980 and 1990. Subsequent initiatives to help farmers integrate water management with agriculture are expected to result in even lower salinity in the long term.

Observed salinities are lower in years of above median rainfall, and higher in years of below median rainfall. Consequently, significant trends in observed values can only be determined certainly over a period of many years. The record unfolding in recent years is considered to show a favourable result, although not conclusive evidence that, in the long run, the salinity of inflow will be the same or lower than predicted.

G The extent to management objectives have been developed for rivers, estuaries and wetlands

H The extent to which rivers, estuaries and wetlands water quality meet agreed management objectives

The aim of the Water and Rivers Commission is not to return catchments to the pre-developed state. It is to help manage catchments so they remain economically productive without degrading the resource.

Instead the Commission recommends using water quality targets as a series of benchmarks to be achieved. With this system no consideration is given to the pre-development state of the system or the condition of other similar systems. Only the waterbody's current state determines the target. The target defines the 'now' and compliance monitoring defines deviations from now. If water quality is currently known to be poor the target level is set so it will 'fail' the compliance test. It will continue to 'fail'until there has been a measurable improvement in water quality.

The targets represent a series of management *benchmarks* that encourage continual improvement towards an ultimate desired state. A continual lowering of the bar until water quality is acceptable is the best the Commission can hope to achieve. For waterbodies in which water quality is known to be currently good, the target level will help identify emerging degradations.

I The extent to which the waterways are protected while providing facilities for public use

This indicator is assessed through two measures.

1. Number of pollution complaints

Management Authority	Number of Complaints 1997-98	Number of Complaints 1998-99
Leschenault Inlet	6	4
Peel Inlet	98	81
Albany Waterways	7	13
Avon River	6	1
Wilson Inlet	5	1

Pollution complaints may relate to incidents which are not significant in their effects, or the pollution may not in fact reach the waterway because of effective pollution response by the Commission and other authorities. The decrease in complaints is due in part to a reduction in algal blooms and smells from decomposing weeds, as well as reduced foreshore damage in the Peel district. All reports were inspected and responses made to minimise pollution effects.

2. Level of compliance with licence conditions

Management Authority	Numbers of Licences Administered	%Compliance
Leschenault Inlet	3	All 100%
Peel Inlet	5	All 100%
Albany Waterways	4	All 100%

Compliance continues to be monitored and consultation with licence owners.

J The extent to management objectives have been developed to adequately protect public water supply for current and future generations

A key objective of the Water and Rivers Commission is to provide adequate protection of the State's public water supplies. Protection is not just for today, but also for future generations. The effective management of surface and groundwater catchment areas is paramount to minimising water supply production costs.

The primary impact on the quality of our water resources result from the activities carried out in surface water catchments and on the land covering our groundwater resources. In some area of the State these land uses are incompatible with protection objectives and the resource itself is at risk. Dealing with these incompatible land uses and influencing other planning processes to avoid more, are the primary means of achieving good outcomes for the State.

Western Australia relies heavily on groundwater for *water supply*, and the generally sandy soils makes the underlying groundwater highly vulnerable to groundwater contamination in this State. There are approximately 128 public water supplies in the State. The plans are an essential tool for guiding land use, and in turn adequate levels of protection of water.

K Accrual cost per catchment protected

This indicator shows the average cost of managing and protecting catchment areas under the Commission's control. The indicator is derived from total accrual cost of management and protection divided by the total square kilometres of catchment area under management. The total square kilometres under management is 567 751.

L Average accrual cost per Statutory Referral

The primary impact on the quality of our water resources result from the activities carried out in surface water catchments and on the land covering our groundwater resources. In some area of the state these land uses are incompatible with protection objectives and the resource itself is at risk. Dealing with these incompatible land uses and influencing other planning processes to avoid more, are the primary means of achieving good outcomes for the state.

The Commission provides advice on land and development proposals to the Ministry for Planning, Local Government, and other land planning authorities. Our advice is commonly known as a Statutory Referral. Through this advice the Commission seeks to influence land planning in order to protect water resources from potential pollution or adverse environmental impacts.

In 1998/99 the Commission received 6680 referrals from which advice was provided. This compares with an estimated volume of 6300 in 1997-98.

M Average Water Supply Protection Cost (per allocated Gigalitre) covered by an agreed management plan

Output Based Management Indicators

In 1998-99, the Commission in accordance with Treasury Guidelines continued implementation of output based management. An important component of this approach was the development of output indicators to provide information on the outputs and their cost. The following section reports the Commission's outputs and performance information for the 1998-99 financial year.

Outcome: Sustainable Use of Water Resources for Economic Development

Output 1. WaterAllocation Policies and Licensing

A system for administration of the Commission's role in allocating water to competing users and the environment.

Allocation Plans

		97-98	*98-99 Target*	***98-99 Actual***
Quantity	Volume of groundwater under management (gigalitre)	not previously measured	1260	**1260**
Cost	$ Cost per 1 000 000 kilolitres allocated	not previously measured	2866	**2512**

Licensing and Regulation

		97-98	*98-99 Target*	***98-99 Actual***
Quantity	Number of licences issued	20 176	20 200	**23 324**
Timeliness	% of licences issued with appropriate number of days	75	65.4	**63**
Cost	Total allocation cost of issuing and administering a licence ($)	205	163	**179**

Output 2: Water Information Allocation Plans for Sustainable Development

Plans that provide information on: the resource and its values; how it can be accessed to support economic development; sustainable levels of use and associated management criteria; and provide the policy basis for administration of allocation licensing at a local level.

Plans

Quantity	Number of plans produced	4	5	**5**
Quality	Stakeholder satisfaction with management information	not previously measured	80%	**70%**
Timeliness	% of plans produced within agreed time frames	not previously measured	80%	**71%**

Measurement Sites (for water information)

Quantity	Number of groundwater and surface water measurement sites	4224	4100	**4175**
Cost	Average cost per measurement site ($)	4047	4042	**3889**

Output 3: Water Conservation Strategies

Promotion, education, regulation and encouragement of the community in the efficient use of water.

Plans and Impact

		97-98	*98-99 Target*	***98-99 Actual***
Quantity	Number of Strategic Water Use Management Plans produced	4	4	**3**
Quality	Reduction in average per capita consumption	180	178	**178**

Outcome: Protection and Enhancement of the Quality of the State's Surface and Groundwater

Output 4: Water Protection Policies, Guidelines and Regulation

A system for administration of the Commission's role in protecting and enhancing the quality and amenity of the State's water resources.

		97-98	*98-99 Target*	***98-99 Actual***
Quantity	Number of key policies developed	11	3	**11**
	Number of Ministerial inquiries	650	632	**874**
Timeliness	% of Ministerial Responses within agreed time frame	96	96	**38**
Cost	Average cost per Ministerial ($)	not previously measured	137	**146**

Output 5: Water Resource Information, Protection Plans and Works

Plans that provide information on the resource, its quality, standards that need to be met to protect its quality, and remediation or enhancement activities where necessary.

Plans

		97-98	*98-99 Target*	***98-99 Actual***
Quantity	Number of recognised rivers requiring management	208	208	**208**
	Number of estuaries under management	22	22	**22**
	Number of Management Plans	4	8	**23**
Quality	Stakeholder satisfaction with beneficial use	not previously measured	80%	**80%**
Timeliness	% of plans completed within agreed timeframes	not previously measured	90	**71**
Cost	Cost per tonne of algae harvested ($)	4094	4000	**3833**

Output 6: State Development Planning and Approvals

Advice and assessments on the availability, distribution and quality of water to support development proposals, planning and approvals.

Statutory referrals / Land planning assessments

		97-98	*98-99 Target*	***98-99 Actual***
Quantity	Number of Statutory Referrals	6100	6300	**6680**
Timeliness	% of Statutory Referral Responses within agreed time frame	81	93	**96**
Cost	Average cost per referral ($)	100	100	**95**

financial statements

Certification of Financial Statements

The accompanying financial statements of the Water and Rivers Commission have been prepared in compliance with the provisions of the Financial Administration and Audit Act 1985 from proper accounts and records to present fairly the financial transactions for the period 1 July 1998 to 30 June 1999 and the financial position as at 30 June 1999.

At the date of signing, we are not aware of any circumstances which would render the particulars included in the financial statements misleading or inaccurate.

Ken Webster
Board Chairman

Jos Chatfield
Deputy Chairperson

Peter Kent
Principal Accounting Officer

27 August 1999

Opinion of the Auditor General

Auditor General

To the Parliament of Western Australia

WATER AND RIVERS COMMISSION
FINANCIAL STATEMENTS FOR THE YEAR ENDED JUNE 30, 1999

Scope
I have audited the accounts and financial statements of the Water and Rivers Commission for the year ended June 30, 1999 under the provisions of the Financial Administration and Audit Act 1985.

The Board is responsible for keeping proper accounts and maintaining adequate systems of internal control, preparing and presenting the financial statements, and complying with the Act and other relevant written law. The primary responsibility for the detection, investigation and prevention of irregularities rests with the Board.

My audit was performed in accordance with section 79 of the Act to form an opinion based on a reasonable level of assurance. The audit procedures included examining, on a test basis, the controls exercised by the Commission to ensure financial regularity in accordance with legislative provisions, evidence to provide reasonable assurance that the amounts and other disclosures in the financial statements are free of material misstatement and the evaluation of accounting policies and significant accounting estimates. These procedures have been undertaken to form an opinion as to whether, in all material respects, the financial statements are presented fairly in accordance with Accounting Standards, other mandatory professional reporting requirements and the Treasurer's Instructions.

The audit opinion expressed below has been formed on the above basis.

Audit Opinion
In my opinion,

(i) the controls exercised by the Water and Rivers Commission provide reasonable assurance that the receipt, expenditure and investment of moneys and the acquisition and disposal of property and the incurring of liabilities have been in accordance with legislative provisions; and

(ii) the Operating Statement, Statement of Financial Position and Statement of Cash Flows and the Notes to and forming part of the financial statements are based on proper accounts and present fairly in accordance with applicable Accounting Standards, other mandatory professional reporting requirements and the Treasurer's Instructions, the transactions for the year ended June 30, 1999 and the financial position at that date.

D D R PEARSON
AUDITOR GENERAL
November 19, 1999

4th Floor Dumas House 2 Havelock Street West Perth WA 6005 Western Australia Tel: (08) 9222 7500 Fax: (08) 9322 5664

Operating statement For the year ended 30 June 1999

	Note	1998-99 $'000	1997-98 $'000
COST OF SERVICES			
Operating expenses			
Salaries and wages		17,579	16,204
Other staffing costs	2	3,113	2,738
Interest		188	217
Depreciation	3	2,048	2,795
Doubtful debts expense		5	10
Grants & subsidy payments		1,561	1,460
Operating lease & hire payments		1,942	1,365
Service related expenses	4	9,075	9,407
Goods & materials	5	2,508	2,341
Other operating expenses	6	3,183	3,078
Net loss on sale of non-current assets	7	170	247
Total operating expenses		41,372	39,862
Revenues from services			
Licence fees and charges		140	288
Commonwealth grants and contributions	8	2,586	3,086
Net surplus on sale of non-current assets	9	20	141
Recoup from the Office of Water Regulation		191	207
Recoup from Swan River Trust		1,800	1,549
Interest		88	0
Other operating revenues	10	1,364	1,687
Total revenues from services		6,189	6,958
Net cost of services	**23**	**35,183**	**32,904**
REVENUES FROM GOVERNMENT			
Consolidated Fund - recurrent appropriation		33,521	29,592
- capital appropriation		2,373	3,753
Resources received free of charge	11	345	123
Total revenues from Government		36,239	33,468
Change in net assets resulting from operations		**1,056**	**564**
Add			
Opening balance of accumulated surplus		1,518	954
Closing balance of accumulated surplus		**2,574**	**1,518**

THE ACCOMPANYING NOTES FORM AN INTEGRAL PART OF THESE FINANCIAL STATEMENTS

Statement of financial position as at 30 June 1999

	Note	1998-99 $'000	1997-98 $'000
CURRENT ASSETS			
Cash resources	12	12,904	10,379
Accounts receivable	13	406	396
Prepayments	14	305	24
Accrued income	15	8	0
Total current assets		13,623	10,799
NON-CURRENT ASSETS			
Property, plant, and equipment	16	64,704	66,089
Total non-current assets		64,704	66,089
Total assets		**78,327**	**76,888**
CURRENT LIABILITIES			
Accounts payable	17	313	37
Accrued salaries	18	281	190
Borrowings from WA Treasury Corporation	19	357	357
Employee entitlements	20	2,211	2,141
Total current liabilities		3,162	2,725
NON-CURRENT LIABILITIES			
Borrowings from WA Treasury Corporation	19	1,954	2,326
Employee entitlements	20	4,440	4,132
Developer bond		25	15
Total non-current liabilities		6,419	6,473
Total liabilities		**9,581**	**9,198**
Net assets		**68,746**	**67,690**
EQUITY			
Accumulated surplus	22	2,574	1,518
Reserves	21	66,172	66,172
Total equity		**68,746**	**67,690**

THE ACCOMPANYING NOTES FORM AN INTEGRAL PART OF THESE FINANCIAL STATEMENTS

Statement of cash flows For the year ended 30 June 1999

	Note	1998-99 $'000 inflows (outflows)	1997-98 $'000 inflows (outflows)
CASH FLOWS FROM GOVERNMENT			
Consolidated Fund - recurrent appropriation		33,521	29,592
- capital appropriation		2,373	3,753
Net cash provided by government		35,894	33,345
Utilised as follows:			
CASH FLOWS USED IN OPERATING ACTIVITIES			
Payments			
Payments to suppliers		(20,904)	(18,961)
Payments to employees		(17,263)	(17,453)
Interest paid to WA Treasury Corporation		(188)	(216)
Receipts			
Receipts from customers		140	288
Commonwealth grants and contributions		2,586	3,086
Recoups from Government Agencies		1,991	1,950
Interest		80	0
Developer bond		10	0
Other operating revenue		1,349	1,281
Net cash used in operating activities	23	(32,199)	(30,025)
CASH FLOWS USED IN INVESTING ACTIVITIES			
Payments for purchase of property, plant and equipment		(910)	(2,415)
Proceeds from the sale of property, plant and equipment		97	187
Net cash used in investing activities		(813)	(2,228)
CASH FLOWS FROM FINANCING ACTIVITIES			
Repayment of borrowings - WA Treasury Corporation		(357)	(357)
Net cash used in financing activities		(357)	(357)
TOTAL CASH FLOWS USED IN OPERATING, INVESTING AND FINANCING ACTIVITIES		(33,369)	(32,610)
Net increase in cash held		**2,525**	**735**
Cash at the beginning of the reporting period		10,379	9,644
Cash at the end of the reporting period	**12**	**12,904**	**10,379**

THE ACCOMPANYING NOTES FORM AN INTEGRAL PART OF THESE FINANCIAL STATEMENTS

Notes to the financial statements 30 June 1999

1. STATEMENT OF ACCOUNTING POLICIES

The following accounting policies have been adopted in the preparation of the financial statements. Unless otherwise stated these policies are consistent with those adopted in the preceding year.

a) General System of Accounting

i) The financial statements are prepared in accordance with the *Financial Administration and Audit Act 1985*.
ii) Subject to the exceptions noted in these accounting policies, the financial statements have been drawn up on the basis of historical cost principles.
iii) The accrual basis of accounting is being applied.
iv) The financial statements constitute a general purpose financial report which has been prepared in accordance with Australian Accounting Standards and UIG Consensus Views as applied by the Treasurer's Instructions. Several of these are modified by the Treasurer's Instructions to vary application, disclosure, format and wording. The Financial Administration and Audit Act and the Treasurer's Instructions are legislative provisions governing the preparation of financial statements and take precedence over Australian Accounting Standards and UIG Consensus Views. The modifications are intended to fulfill the requirements of general application to the public sector together with the need for greater disclosure and also to satisfy accountability requirements.

If any such modification has a material or significant financial effect upon the reported results, details of that modification and, where practicable, the resulting financial effect, are disclosed in individual notes to these financial statements.

b) Valuation of Non-current Assets

Assets acquired as a result of the execution of the *Water and Rivers Commission Act 1995* have been brought to account at fair value. All other assets are brought to account at cost.

c) Leased Assets

The Commission has entered into a number of operating lease arrangements for buildings, office equipment and motor vehicles where the lessors effectively retain all of the risks and benefits incident to ownership of the items held under the operating leases. Equal instalments of the lease payments are charged to the operating statement over the lease term, as this is representative of the pattern of benefits to be derived from the leased property.

d) Depreciation of Non-current Assets

Property, plant and equipment, other than land, are depreciated over their estimated useful lives using the straight line method. The following estimated useful lives are applied in determining the depreciation rates used for each class of asset:

Buildings	20 - 80 years
Plant and equipment	5 - 20 years
Computer equipment & accessories	3 - 5 years
Furniture and fittings	7 - 10 years
Measurement sites	40 years

In accordance with the requirements of AAS 4 "Depreciation of Non-current Assets", second hand assets acquired as a result of the execution of the *Water and Rivers Commission Act 1995* are depreciated over their remaining useful lives.

e) Foreign Currency Translation

Transactions denominated in foreign currency are translated at the rate in existence at the dates of the transactions. Foreign currency receivables and payables at balance date are translated at exchange rates current at balance date. Exchange gains and losses are brought to account in determining the results for the year.

f) Employee Entitlements

Employee entitlements have been transferred from those government agencies for whom employees worked before the creation of the Water and Rivers Commission on 1 January 1996. Entitlements have been calculated on a continuing service basis as follows:

i) Annual and Long Service Leave

Annual and long service leave entitlements are provided at current remuneration rates. Annual leave loading has only been calculated on amounts accrued up to and including 31 December 1997.

Long service leave is calculated for employees who have accrued leave, are 55 years or older, or are employed under the Australian Workers Union Award. A pro-rata liability for long service leave is also recognised for officers who have completed four or more years of service.

An actuarial assessment of long service leave was carried out at 30 June 1997, and it was determined that the actuarial assessment of the liability was not materially different from the liability reported. This method of measurement of the liability is consistent with the requirements of Australian Accounting Standard AAS 30 "Accounting for Employee Entitlements".

ii) Superannuation

Staff may contribute to the Superannuation and Family Benefits Act scheme, a defined benefits pension scheme now closed to new members, or to the Gold State Superannuation Scheme, a defined benefit and lump sum scheme now also closed to new members. All staff who do not contribute to either of these schemes become non-contributory members of the West State Superannuation Scheme, an accumulation fund complying with the *Commonwealth Government's Superannuation Guarantee (Administration) Act 1992*.

The liability for superannuation charges incurred under the Superannuation and Family Benefits Act pension scheme, together with the pre-transfer service liability for employees who transferred to the Gold State Superannuation scheme are provided for at balance date.

The liability for superannuation charges under the Gold State Superannuation Scheme is extinguished by quarterly payment of employer contributions to the Government Employees Superannuation Board.

The note disclosure required by paragraph 51(e) of AAS 30 (being the employer's share of the difference between employee's accrued superannuation benefits and the attributable net market value of plan assets) has not been provided. State scheme deficiencies are recognised by the State in its whole of government reporting. The Government Employees Superannuation Board's records are not structured to provide the information for the Commission. Accordingly, deriving the information for the Commission is impractical under current arrangements, and thus any benefits thereof would be exceeded by the cost of obtaining the information.

iii) Sick Leave

No provision has been made for sick leave since average sick leave taken each reporting period is less than the entitlement accrued for that period (in accordance with Urgent Issues Group Abstract 2).

g) Revenue

Revenues from licence fees and charges represents revenue earned from fees and charges for licences issued under the Rights, Water and Irrigation Act and the Waterways Conservation Act. Other revenue is fully described in the Operating Statement.

h) Appropriations

Appropriations in the nature of revenue, whether recurrent or capital, are recognised as revenues in the period in which the Commission gains control of the appropriated funds. Appropriations which are repayable by the Commission to the Treasurer are recognised as liabilities.

i) Accounts Receivable, Accounts Payable, Accrued Salaries and Borrowings

Accounts Receivable are recognised at the amounts receivable and are due for settlement no more than 30 days from the date of recognition.

Collectability of trade debtors is reviewed on an ongoing basis. Debts which are known to be uncollectable are written off. A provision for doubtful debts is raised where some doubts as to collection exists and in any event where the debt is more than 60 days overdue.

Accounts Payable, including accruals not yet billed, are recognised when the economic entity becomes obliged to make future payments as a result of a purchase of assets or services. Accounts payable are generally settled within 30 days.

Borrowings from WA Treasury Corporation predominately represents debt assigned to the Commission on separation from the Water Authority. An additional amount was borrowed to fund land purchases in the Blackwood area. Borrowings are recognised and carried at the amount of net proceeds received. Interest is recognised as it becomes payable throughout the year.

Accrued salaries represent the amount due to staff but unpaid at the end of the financial year as the end of the last pay period for that financial year does not coincide with the end of the financial year. The Commission considers the carrying amount approximates net fair value.

j) Net Fair Values of Financial Assets and Liabilities

Net fair values of financial instruments are determined on the following bases:

- Monetary financial assets and liabilities not traded in an organised financial market - cost basis carrying amounts of accounts receivable, accounts payable and accruals (which approximates net market value);

- Fixed rate borrowings and leave liabilities - current risk adjusted market rates.

k) Comparative Figures

Where necessary comparative figures have been adjusted to conform with changes in presentation in the current year.

	1998-99 $'000	*1997-98 $'000*
2. OTHER STAFFING COSTS		
Superannuation	1,966	1,448
Payroll tax	964	1,044
Fringe benefits tax	183	246
	3,113	2,738
3. DEPRECIATION		
Buildings	122	84
Plant and equipment	500	481
Computer equipment and accessories	526	1,157
Furniture and fittings	22	20
Measurement sites	878	1,036
Motor vehicles	0	17
	2,048	2,795
4. SERVICE RELATED EXPENSES Service related expenses include professional and non professional service contracts, chemical analysis, legal charges, consultants, insurance, advertising, public relations and other service related expenses.	9,075	9,407
5. GOODS & MATERIALS Goods and materials include office supplies, library acquisitions, laboratory supplies, motor vehicle running expenses, utilities and other consumable equipment and materials.	2,508	2,341
6. OTHER OPERATING EXPENSES Other operating expenses include communication expenses, asset maintenance costs and other sundry operating expenses.	3,183	3,078
7. NET LOSS ON DISPOSAL OF NON-CURRENT ASSETS		
Plant and equipment	160	98
Computing equipment	3	149
Furniture and fittings	7	0
	170	247
Gross proceeds from disposal of assets were	**66**	**30**

	1998-99 $'000	*1997-98 $'000*
8. COMMONWEALTH GRANTS AND CONTRIBUTIONS		
National Land Care Programme revenue	0	178
Land and Water Resources Research and Development Corporation	390	63
Natural Heritage Trust	1,926	2,832
Waterwatch Revenue	270	13
	2,586	3,086
9. NET PROFIT ON DISPOSAL OF NON-CURRENT ASSETS		
Plant and equipment	20	0
Motor vehicles	0	141
	20	141
Gross proceeds from disposal of assets were	***31***	***157***
10. OTHER OPERATING REVENUE		
Waterwatch revenue	13	16
ALCOA	174	215
Other grants	90	465
Groundwater monitoring	30	112
State Salinity Council	187	160
Other miscellaneous revenues	870	719
	1,364	1,687
11. RESOURCES RECEIVED FREE OF CHARGE		
Service related expenses	345	123
Resources received free of charge has been determined on the basis of the following estimates provided by agencies.		
Office of the Auditor General		
- audit services	35	40
Department of Land Administration		
- land registration dealings	94	39
Treasury Department		
- administration services	5	3
Crown Solicitors Office		
- legal service charges (legislation redraft)	195	0
Contract and Management Services		
- contract services	16	41
	345	123
12. CASH RESOURCES		
Operating Account	8,671	10,375
Interest Bearing Account	4,228	0
Cash advance	5	4
	12,904	10,379

	1998-99 $'000	*1997-98 $'000*
13. ACCOUNTS RECEIVABLE		
Accounts receivable for goods and services supplied	419	406
Less: Provision for doubtful debts	13	10
	406	396

(i) Credit Risk Exposure

The Commission does not have any significant exposure to any individual customer or counter party.

(ii) Net Fair Values

The Commission considers the carrying amounts of Accounts Receivable approximate their net fair value.

14. PREPAYMENTS		
Western Australian Treasury Corporation	7	24
RiskCover - Insurance	298	0
	305	24
15. ACCRUED INCOME		
Interest Receivable	8	0
16. PROPERTY, PLANT, AND EQUIPMENT		
Land at cost	37,479	37,119
Buildings	2,338	2,188
Less: Accumulated depreciation	280	157
	2,058	2,031
Computing equipment	2,971	3,300
Less: Accumulated depreciation	1,554	1,653
	1,417	1,647
Furniture and fittings	127	125
Less: Accumulated depreciation	51	33
	76	92
Measurement sites	25,288	25,234
Less: Accumulated depreciation	3,450	2,572
	21,838	22,662
Plant, machinery and equipment	3,166	3,762
Less: Accumulated depreciation	1,330	1,224
	1,836	2,538
Total property, plant, and equipment	64,704	66,089

	1998-99 $'000	1997-98 $'000

Government Property Register

Valuations of property held on the Government Property Register (GPR) were performed by the Valuer General's Office during 1998. The valuations dated 1 July 1998 were $13,094,700 current use and $69,596,960 best use. It should be noted that the Valuer General does not assign a value to the Commission's Crown Reserves, which are a significant component of the Commission's land holdings.

17. ACCOUNTS PAYABLE

Accounts Payable for goods and services received.	313	37

The Commission considers the carrying amounts of Accounts payable approximate their net fair values.

18. ACCRUED SALARIES

2% pay rise to be back dated to 29 May 1999	17	0
Amounts owing for 4 working days at 30 June1999	264	190
(1998 – 3 working days)	281	190

19. BORROWINGS FROM WA TREASURY CORPORATION

Borrowings	2,683	3,471
Less: Repayments of borrowings	372	788
	2,311	2,683
Current	357	357
Non-current	1,954	2,326
	2,311	2,683

(i) Significant Terms and Conditions

Nature of borrowings	Debt portfolio
Composition	Short & long lines
Face value	$ 3,471,000
Premium	N/a
Date of maturity	15/04/2006
Interest rate	Variable
Interest repayment schedule	Quarterly
Capital repayment schedule	Quarterly fixed amounts
Repricing dates	Monthly
Guaranteed by the Treasurer	Yes
Readily traded on organised markets	Yes

(ii) Net Fair Values

The Commission considers the carrying amount of borrowings approximates the net fair value.

	1998-99 $'000	*1997-98 $'000*
20. EMPLOYEES ENTITLEMENTS		
Current liabilities		
Liability for annual leave	1,225	1,194
Liability for long service leave	986	947
	2,211	2,141
Non-current liabilities		
Liability for long service leave	1,174	1,019
Liability for superannuation	3,266	3,113
	4,440	4,132

The superannuation liability has been established from data supplied by the Government Employees Superannuation Board.

The Commission considers the carrying amounts of employee entitlements approximate their net fair values.

21. RESERVES		
Fixed assets acquired under restructuring arrangements	66,287	66,287
Cash received under restructuring arrangements	3,550	3,550
Debt acquired under restructuring arrangements	(3,665)	(3,665)
	66,172	66,172

22. DISCLOSABLE AMOUNTS INCLUDED IN ACCUMULATED SURPLUS		
Accumulated surplus includes the following amounts which have been disclosed as revenue during the reporting period:		
- Non-repayable amounts provided by the state for capital purposes but not as specific equity contributions	2,373	3,753
Total of disclosable amounts	2,373	3,753

23. RECONCILIATION OF NET CASH USED IN OPERATING ACTIVITIES TO NET COST OF SERVICES		
Net cash used in operating activities	32,199	30,025
(Increase) / Decrease in Debtors	(10)	(189)
(Increase) / Decrease in Prepayments	(281)	1
Increase / (Decrease) in Accrued Income	(8)	0
Increase / (Decrease) in Payables and Accruals	367	(645)
Increase / (Decrease) in Employee Entitlements	378	688
Depreciation	2,048	2,795
Resources received free of charge	345	123
Loss on sale of non current assets	170	247
Developer Bond	(10)	0
Provision for Doubtful Debts	5	0
Surplus on sale of non current assets	(20)	(141)
Net cost of services (operating statement)	35,183	32,904

	1998-99 $'000	*1997-98 $'000*
24. REMUNERATION OF ACCOUNTABLE AUTHORITY AND SENIOR OFFICERS		
The total fees, salaries and other benefits received or due and receivable for the financial year, by members of the Accountable Authority, from the Commission or any related body.	183	181
The total fees, salaries and other benefits received or due and receivable for the financial year, by Senior Officers other than members of the Accountable Authority, from the Commission or any related body.	500	364
The number of members of the Accountable Authority whose total of fees, salaries and other benefits received or due and receivable for the financial year falls within the following bands:		
$ 0 000 - $10 000	2	1
$10 000 - $20 000	3	4
$120 000 - $130 000	0	1
$130 000 - $140 000	1	0
The number of Senior Officers other than members of the Accountable Authority, whose total of fees, salaries and other benefits received or due and receivable falls within the following bands:		
$80 000 - $90 000	0	1
$90 000 - $100 000	2	3
$100 000 - $110 000	3	0
25. RETIREMENT BENEFITS		
In respect of members of the Accountable Authority, the following amounts were paid or became payable for the financial year:		
Contributions to West State Superannuation Scheme	15	15
Contributions to other superannuation funds	22	28
	37	43
In respect of Senior Officers other than members of the Accountable Authority, the following amounts were paid or became payable for the financial year:		
Contributions to Gold State Superannuation Scheme and West State Superannuation Scheme	54	47

	1998-99 $'000	*1997-98 $'000*
Numbers of Senior Officers presently employed who are members of the Superannuation and Family Benefits Act Scheme:		
Senior Officers other than members of the Accountable Authority.	1	1

26. REMUNERATION OF THE AUDITOR

The value of audit services received or receivable from the Auditor General for the financial year, is as follows:		
- for external audit	35	40
- for other services	0	0
	35	40

27. LEASE COMMITMENTS

Analysis of operating lease commitments:		
Payable no later than one year	1,439	542
Payable later than one year, not later than two years	1,542	732
Payable later than two, not later than five years	2,071	1,893
Payable later than five years	0	0

28. CAPITAL COMMITMENTS

Capital expenditure commitments	2,190	893

29. FINANCING FACILITIES

At the reporting date the Commission had fully drawn on all financing facilities, details of which are disclosed in the financial statements.

30. CONTINGENT LIABILITIES

No contingent liabilities exist at 30 June 1999.

31. EVENTS OCCURRING AFTER REPORTING DATE

No events have occurred after reporting date which would materially impact on the financial statements.

32. RELATED AND AFFILIATED BODIES

The Water and Rivers Commission currently does not provide any assistance to other agencies which would deem them to be regarded as related or affiliated bodies under the definitions included in Treasurer's Instruction 951.

33. DISCLOSURE OF WRITE OFFS AND LOSSES

	1998-99 $	*1997-98 $*
Accounts receivable	1,440	0
Petty cash shortage	10	0
	1,450	0
Loss of property through theft/fraud	955	0
Recovery of Losses	(955)	0
Net loss of property through theft/fraud	0	0

34. ADDITIONAL FINANCIAL INSTRUMENTS DISCLOSURES

Interest rate risk exposure

The Commission's exposure to interest rate risk, repricing maturities and the effective interest rates on financial instruments are:

	Weighted average effective interest rate	Floating interest rate	Fixed interest rate maturities			Non interest bearing 1998-99	Non interest bearing 1997-98	Total 1998-99	Total 1997-98
			1 year or less	1 to 5 years	Over 5 years				
	%	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
30 June 1999									
ASSETS									
Operating Account & Cash Floats						8,676	10,379	8,676	10,379
Interest Bearing Account Established 98-99	5.07%	4,228						4,228	0
Accounts Receivable						406	396	406	396
Interest Receivable						8	0	8	0
Total Financial Assets		**4,228**				**9,090**	**10,775**	**13,318**	**10,775**
LIABILITIES									
Accounts Payable						313	37	313	37
Borrowings from WATC 98-99	7.26%		357	957	997			2,311	
Borrowings from WATC 97-98	7.38%		357	1,314	1,012				2,683
Accrued Salaries						281	190	281	190
Developer Bond						25	15	25	15
Employee Entitlements						6,651	6,273	6,651	6,273
Total Financial Liabilities 98-99		**0**	**357**	**957**	**997**	**7,270**		**9,581**	
Total Financial Liabilities 97-98		**0**	**357**	**1,314**	**1,012**		**6,515**		**9,198**
Net Financial Assets (Liabilities) 98-99		**4,228**	**(357)**	**(957)**	**(997)**	**1,820**		**3,737**	
Net Financial Assets (Liabilities) 97-98		**0**	**(357)**	**(1,314)**	**(1,012)**		**4,260**		**1,577**

Credit risk exposure

The Commission's accounts receivable financial assets are unsecured. Amounts owing by other government agencies are guaranteed and therefore no credit risk exists in respect of those amounts. In respect of other financial assets the carrying amounts represent the Commission's maximum exposure to credit risk in relation to those assets.

The following is an analysis of amounts owing by other government agencies:

	1998-99 $'000	***1997-98 $'000***
Western Australian Government agencies	332	112
Government agencies of other jurisdictions	1	262
Total	333	374

35. EXPLANATORY STATEMENTS

a) Comparison of actual results with those of the preceding year.

Details and reasons for significant variations between actual revenue and expenditure and the corresponding item of the preceding year are detailed below. Significant variations are considered to be those greater than $200,000 where exceeding 10% of the preceding year's figure.

	1998-99 Actual $'000	1997-98 Actual $'000	Variance $'000	Variance %
Operating Expenses				
Salaries and Wages	17,579	16,204	1,375	8%
Other Staffing Costs	3,113	2,738	375	(a) 14%
Interest	188	217	(29)	13%
Depreciation	2,048	2,795	(758)	(b) 27%
Doubtful Debt Expense	5	10	(5)	50%
Grants & Subsidy Payments	1,561	1,460	101	7%
Operating Lease & Hire Payments	1,942	1,365	577	(c) 42%
Service Related Expenses	9,075	9,407	(332)	4%
Goods & Materials	2,508	2,341	167	7%
Other Operating Expenses	3,183	3,078	105	3%
Net Loss on Sale of Non Current Assets	170	247	(77)	31%
Total Expenses	41,372	39,862	1,510	4%
Revenues				
Licence Fees and Charges	140	288	(148)	51%
Commonwealth Grants and Contributions	2,586	3,086	(500)	(d) 16%
Net Surplus on Sale of Non Current Assets	20	141	(121)	86%
Recoup from the Office of Water Regulation	191	207	(16)	8%
Recoup from Swan River Trust	1,800	1,549	251	(e) 16%
Interest	88	0	88	n/a
Other Operating Revenue	1,364	1,687	(323)	(f) 19%
Total Revenues	6,189	6,958	(769)	11%
Net Cost of Services	**35,183**	**32,904**	**2,279**	**7%**

Explanation of variances – Actual 1998-99 to Actual 1997-98

(a) Superannuation expense increased as a result of:
1) the effect of a pay rise on the Commission's percentage based contribution to employee superannuation schemes; and
2) an increase in the provision for superannuation as a result of the effect of a pay rise on the past service liability for members of defined benefit schemes.

(b) Depreciation expense was higher in 1997-98 due to accelerated depreciation in the Computer Equipment and Accessories category.

(c) Operating Lease and Hire Payments have increased as a result of increases in accommodation costs. The lease originally negotiated by the Commission included a honeymoon rate rental. In accordance with the lease the rental rate has now increased.

Motor vehicle lease payments have increased as a result of decreasing residual values (slump in second hand car market).

(d) The reduction in Commonwealth Grants & Contributions is mainly attributed to a $906,000 decrease in Natural Heritage Trust Funding and a $178,000 decrease in National Land Care Program revenue. These reductions have been partially offset by increases in Waterwatch ($257,000) and Land and Water Resources Research and Development Corporation ($327,000) revenues.

(e) During 1997-98 time spent working on Swan River Trust (SRT) projects by Water and Rivers Commission (WRC) staff was reflected in the salaries and wages of SRT. During 1998-99 work performed by WRC staff on SRT projects was treated as the purchase of services by SRT. The change in treatment is as a result of a new service agreement between WRC and SRT.

(f) Other Operating Revenues is mainly made up of grants and contributions and other miscellaneous revenues. A breakdown is shown at note 10. The decrease in Other Operating Revenues is mainly attributed to a reduction in other grants.

b) Comparison of Estimates and Actual Results

Section 42 of the Financial Administration and Audit Act requires statutory authorities to prepare annual budget estimates. Treasurer's instruction 945 requires an explanation of significant variations between these estimates and actual results. Significant variations are considered to be those greater than 10% of budget.

During 1997-1998 the Commission operated within four sub programs. The Commission redefined these sub programs to fourteen outputs in 1998-1999 under the State Governments Outcome Based Management initiative. The fourteen outputs were further refined down to six outputs for the 1999-2000 and future financial periods. The Commission's performance indicators for the 1998-1999 period have been framed in line with the 1999-2000 budget estimates (six outputs). In order to show how the fourteen 1998-99 outputs relate to the six 1999-2000 outputs used for performance indicator reporting, the fourteen outputs have been grouped into the six 1999-2000 outputs on the table below.

		Estimate 1998-99	Actual 1998-99	Variance	Variance
	OUTPUTS	**$'000**	**$'000**	**$'000**	**%**
1.	Water Allocation Policies	575	174	(401)	70%
2.	Regulation, Licensing and Community Regulation	3,076	3,441	365	12%
3.	Define and Manage Water Use Segments	1,021	1,168	147	14%
4.	Water Law Reform	619	780	161	26%
	Water Allocation Policies and Licensing	N/a	5,563	Equivalent 1999-2000 Output	
5.	Water Allocation Management Plans	244	1,726	1,482	607%
6.	Measure and Monitor Water Quantity and Quality	7,122	7,290	168	2%
7.	Assess Environmental Impacts on Water Resources	4,077	1,903	(2,174)	53%
8.	Water Resource Appraisal for Resources Development	4,070	319	(3,751)	92%
	Water Information Allocation Plans for Sustainable Development	N/a	11,238	Equivalent 1999-2000 Output	
9.	State Strategic	1,149	207	(942)	82%
	Water Conservation Strategies	N/a	207	Equivalent 1999-2000 Output	
10.	Strategic Water Resource Protection Policies	326	949	623	191%
	Water Protection Policies, Guidelines and Regulations	N/a	949	Equivalent 1999-2000 Output	
11.	Wetland Protection	1,366	370	(996)	73%
12.	Waterways Protection	9,192	8,143	(1,049)	11%
13.	Salinity Management	705	3,798	3,093	439%
	Water Resource Information, Protection Plans and Works	N/a	12,311	Equivalent 1999-2000 Output	
14.	Protection of Public and Private Water Supplies	1,899	1,671	(228)	12%
	State Development Planning and Approvals	N/a	1,671	Equivalent 1999-2000 Output	

Explanation of variances – Actual to Estimate

There are significant variations between the Commission's budgeted allocations and final expenditures. The variations were largely due to:

1. Changes in internal accounting policies and continued revision of the Commission's definition for Outcomes and Outputs. These improvements enable the Commission to more accurately reflect the actual use of finances and reduce administrative overheads with project management;
2. Committed carry forwards of approximately $3.0million, which are not reflected in the 1998-99 output expenditures;
3. A shift towards accrual accounting standards; and
4. Changes in priorities to meet stakeholder needs.

In the lead up to the 1998-99 financial year the Commission made a number of decisions to improve accounting for expenditures within outputs. In some instances (Water Allocation Policies, Salinity, Strategic Water Protection Policies) this resulted in final expenditures being significantly different from the original budget estimates. For example; in the establishment of its budgets, the Commission traditionally spread the estimates for corporate processes such as water information measurement and statutory referrals across several outputs.

The following table provides detailed explanations for those outputs where variances to planned work, or budget allocations did occur and is to be read in conjunction with the preceding table.

1. Water Allocation Policies	Reduced spending provided funds to Water Law Reform activities.
2. Regulation, Licensing and Community Awareness	The Commission was required to increase its budget for redeveloping its Water Allocation System to mitigate year 2000 risks. This system is critical in supporting the sustainable allocation and management of water resources.
3. Define and Manage Water Use Segments	Funding increased to cover the Western Australian Estuarine Foundation Grant Agreement.
4. Water Law Reform	The Commission increased its water law reform activities as needed to ensure adequate public consultation for the proposed reforms.
5. Water Allocation Management Plans	Mixture of Strategic Water Use Plans. The remaining increases were due to meeting new state priorities in the Kimberley, Pilbara and Gascoyne - all regional initiatives, which became priorities. Additional spending was environmental impacts for establishing Environmental Water Provisions and Environmental Water Requirements for critical water sources.
6. Measure and Monitor Water Quantity and Quality	No significant change from budget.
7. Assess Environmental Impacts on Water Resources	Approximately $1.5m of activities was undertaken for salinity purposes. Expenditures have been recorded under the Salinity output to more accurately reflect the Commission's contribution to the State Salinity Action Plan. Also see item 5.

8. Water Resource Appraisal for Resource Development	Much of this work has been undertaken within other outputs. Information has been extensively used in providing land planning responses to support state development. These expenditures are reflected in item10. Measurement activities within this output were also reviewed during the year and adjusted downwards.
9. State Strategic	See item 5. This output was also affected by the change in internal accounting policy.
10. Strategic Water Resource Protection Policies	The Commission expends a significant effort in providing advice to support and influence land planning and development proposals. In the Financial Estimates this was budgeted across all outputs. However, the Commission changed policy to account for actual expenses during the year in one output.
11. Wetland Protection	Approximately $500 000 of activities was undertaken for salinity purposes. Expenditures have been recorded under the Salinity output to more accurately reflect the Commission's contribution to the State Salinity Action Plan.
12. Waterways Protection	Approximately $500 000 of activities was undertaken for salinity purposes. Expenditures have been recorded under the Salinity output to more accurately reflect the Commission's contribution to the State Salinity Action Plan. Additionally there was under spending.
13. Salinity Management	See items 7, 11 and 12.
14. Protection of Public and Private Water Supplies	There were approximately 8 protection plans developed at a lower cost than expected hence the recorded under spending.

36. SEGMENT REPORTING

Treasurer's Instruction 1101 modifies AAS 16 "Financial Reporting by Segments" to define a segment as outputs or a collection of related outputs. The Commission considers that all of it's outputs are related to one industry and geographical segment being the management of the State of Western Australia's water resources to support sustainable development and conservation of the environment for the long term benefit of the community.

reports and publications

Water and Rivers Commission publications for the period 1 July 1998 – 30 June 1999

Reports

A complete list of publications is available from the Commission or on our website

www.wrc.wa.gov.au/public

Water Resource Allocation and Planning Series (WRAP)

Groundwater Allocation Plan - Exmouth Groundwater Subarea, Water and Rivers Commission, WRAP 9, June 1999

Water Resource Management Report Series (WRM)

Draft Avon River Management Programme, Water and Rivers Commission and Avon River Management Authority, WRM 10, January 1999

Serpentine River Management Plan, Stage 1 - Goegrup Lake to Barragup Bridge, Water and Rivers Commission, WRM 12, July 1998

Water Resource Technical Report Series (WRT)

Report on the Statewide Foreshore Policy Workshops, A technical paper in support of the Statewide foreshore policies for creeks, streams, rivers and estuaries, Water and Rivers Commission, WRT 1, February 1999

Review of the Experimental Catchments in the Intermediate Rainfall Zone Research Programme, Water and Rivers Commission, WRT 13, April 1999

Water Quality in Wilson Inlet 1995-1997, A report on the monitoring data collected between 1995 and 1997, Water and Rivers Commission, WRT 14, May 1999

Trees on Farms to Reduce Salinity in the Clearing Control Catchments, volume 3: Kent Catchment, Water and Rivers Commission, WRT 20, November 1998

Hydrological and Associated Research Related to Bauxite Mining in the Darling Range of Western Australia — 1997 Review, Water and Rivers Commission, WRT 26, November 1998

Dawesville Channel Monitoring Program, Technical Review Report, Water and Rivers Commission, WRT 28, 1998 (Technical review summary is also available)

Water Resource Protection Report Series (WRP)

Cervantes Water Reserve Water Resource Protection Plan, Cervantes Town Water Supply, Water and Rivers Commission, WRP 8, April 1999

Jurien Water Reserve Water Resource Protection Plan, Jurien Town Water Supply, Water and Rivers Commission, WRP 9, April 1999

Dandaragan Water Reserve Water Resource Protection Plan, Dandaragan Town Water Supply, Water and Rivers Commission, WRP 10, April 1999

Badgingarra Water Reserve Water Resource Protection Plan, Badgingarra Town Water Supply, Water and Rivers Commission, WRP 11, April 1999

Harvey Basin Stream Restoration Trust, A Proposal for Funding Stream Restoration Works in the Harvey Basin, Water and Rivers Commission, WRP 14, May 1999

Harding Dam Water Source Protection Plan, West Pilbara Water Supply Scheme, Water and Rivers Commission, WRP 15, May 1999

Cane River Water Reserve Water Source Protection Plan, Water and Rivers Commission, WRP 17, May 1999

Nullagine Water Reserve Water Source Protection Plan, Water and Rivers Commission, WRP 18, May 1999

Dunsborough and Yallingup Town Water Supply Water Source Protection Plan, WRP 23, February 1999

Millstream Water Reserve Water Source Protection Plan: West Pilbara Water Supply Scheme, Water and Rivers Commission, WRP 32, May 1999

Hydrogeological Map Explanatory Notes Series (HM)

Hydrogeological Maps and Records

Hydrogeology of the Ravensthorpe Hydrogeological Map 1:250 000 Sheet, Water and Rivers Commission, HM 4, August 1998

Hydrogeological Record Series (HG)

Groundwater Resources of the Northern Goldfields, WA, Water and Rivers Commission, HG 2, June 1999

River Recovery Plan Series (RRP)

River Recovery Plans

River Recovery Plan, Section 3 — Toodyay, Water and Rivers Commission and Avon River Management Authority, RRP 1, February 1999

River Recovery Plan, Section 6 — Northam, Water and Rivers Commission and Avon River Management Authority, RRP 2, April 1999

Water Reform Series (WR)

Water Reform Series

Draft Environmental Water Provisions Policy for Western Australia, Water and Rivers Commission, WR 4, February 1999

Water Law Reform Guide to Legislative Change, Water and Rivers Commission, WR 9, August 1998

Guidelines Series

Guidelines

Waste Management of Kennel Operations within the Jandakot UWPCA, No. 25, Water and Rivers Commission, February 1998

Other Reports, Booklets and Catalogues

Other reports

Ribbons of Blue Snapshot 1998, Water and Rivers Commission, 1998

A Framework for Floodplain Management in Western Australia with a Focus on Carnarvon, Report of the Ministerial Taskforce into floodplain management to the Minister for Water Resources, Water and Rivers Commission, July 1998

Watering the Western Third - Water, Land and Community in Western Australia, 1826 - 1998, Water and Rivers Commission, August 1998

Western Australian Salinity Action Plan, Draft Update 1998, State Salinity Council, 1998

Yallingup Brook Action Plan, Water and Rivers Commission and GeoCatch, February 1999

Gnangara Land Use and Water Management Strategy, Part one (for public comment), Western Australian Planning Commission and the Water and Rivers Commission, May 1999

Gnangara Land Use and Water Management Strategy, Part two - Technical Background (for public comment), Western Australian Planning Commission and the Water and Rivers Commission, May 1999

Newsletters

Newsletters

Harvey Basin Water Allocation Plan, No. 5, Water and Rivers Commission, November 1998

Harvey Dam Catchment Water Source Protection Plan, The new Stirling-Harvey Scheme, Community Newsletter No. 1, Water and Rivers Commission, June 1999

Jandakot Kennels, Waste Management Guidelines, Community Newsletter, No. 1, Water and Rivers Commission, May 1999

Reports to the Community

Reports to the Community

Wilson Inlet, Summary of Wilson Inlet Studies from 1994 to 1997, No. 1, Report to the community, Water and Rivers Commission and Wilson Inlet Management Authority, July 1998

GeoCatch Report to the community, No. 1, Water and Rivers Commission and GeoCatch, October 1998

Albany Hinterland, Report to the community, Water and Rivers Commission and Albany Waterways Management Authority, June 1999

Water Advice

Water Advice Series

Caring for Groundwater near Bunbury, Water Advice No. 5, Water and Rivers Commission, 1998

Growing Local Plants to Protect Water Resources, Water Advice No. 6, Water and Rivers Commission, 1998

Is a Garden Bore the Right Choice for you?, Water Advice No. 7, Water and Rivers Commission, 1998

Caring for Groundwater on the Exmouth Peninsula, Water Advice No. 8, Water and Rivers Commission, 1999

Preventing Aquatic Weeds in Waterways - Advice for Aquarium and Pond Owners, Water Advice No. 9, Water and Rivers Commission, February 1999

Water Facts

Water Facts

Taking Water from Streams and Lakes in Western Australia, Water Facts No. 5, Water and Rivers Commission, 1998

Algal Blooms, Water Facts No. 6, Water and Rivers Commission, August 1998

The Water Cycle, Water Facts, No. 7, Water and Rivers Commission, December 1998

What is Groundwater? Water Facts No. 8, Water and Rivers Commission, December 1998

Western Australia's Groundwater Resources, Water Facts No. 9, Water and Rivers Commission, December 1998

Groundwater Pollution, Water Facts No. 10, Water and Rivers Commission, December 1998

Bore Water Use in Perth Gardens, Water Facts No. 12, Water and Rivers Commission, August 1998

Water Talk

Water Talk

Wetlands, Water and Rivers Commission, September 1998

Manuals and Kits

Manuals and Kits

A Manual for Managing Urban Stormwater Quality in Western Australia, Water and Rivers Commission, October 1998

A Manual for Managing Urban Stormwater Quality in Western Australia (brochure), Water and Rivers Commission, 1999

Albany Waterways Resource Book, Water and Rivers Commission, 1999

Swan River Education Kit, Water and Rivers Commission and Swan River Trust, 1999

Pamphlets and Brochures

Pamphlets

Focus on Wetlands - Schools Competition 1998, Water and Rivers Commission, September 1998

Ribbons of Blue 1999 Schools Competition, Reflections, Water and Rivers Commission,

Managing and Protecting Western Australia's most Vital Resource, Water and Rivers Commission, July 1998

Algal Blooms and Nutrients. An educational video on the Swan and Canning rivers, new release, (videos order form), Water and Rivers Commission, September 1998

Ellen Brook Action Plan, Water and Rivers Commission, October 1998

Landcare for Wetlands (schools activity sheet), Water and Rivers Commission, 1998

Swan River Education Kit, Curriculum support activities and resources for schools, (pamphlet) Water and Rivers Commission, December 1998

Videos

Videos

Algal Blooms and Nutrients

You can order publications on the publication order form on our website. www.wrc.wa.gov.au/publications


Find out about
Water on the Web
www.wrc.wa.gov.au
Managing and protecting Western Australia's water resources (and links to other watery sites)
www.wrc.wa.gov.au/swanavon
Community and government working together in the Swan-Avon catchment - your link to catchment and community groups
www.wrc.wa.gov.au/srt
Managing the Swan-Canning River System (view the Swan-Canning Cleanup Action Plan and Swan River landscape description)
www.wrc.wa.gov.au/ribbons
Ribbons of Blue - supporting school and community involvement in monitoring and caring for wetlands and waterways

statements of compliance

Statement of compliance with written law

The Water and Rivers Commission has been established under the provisions of the *Water and Rivers Commission Act 1995.*

Enabling legislation

The Water and Rivers Commission administers the *Water and Rivers Commission Act 1995* and the *Waterways Conservation Act 1976* and parts of the following Acts together with associated Regulations and By-laws:

Legislation administered

- *Water Agencies (Powers) Act 1984*
- *Rights in Water and Irrigation Act 1914*
- *Metropolitan Water Supply, Sewerage and Drainage Act 1909*
- *Country Areas Water Supply Act 1947*
- *Metropolitan Water Authority Act 1982*
- *Water Boards Act 1904*
- *Freedom of Information Act 1992*
- *Swan River Trust Act 1988*
- *Financial Administration and Audit Act 1985*
- *Public Sector Management Act 1994*
- *Salaries and Allowances Act 1975*
- *Equal Opportunity Act 1984*
- *Government Employees Superannuation Act 1987*
- *Occupational Health, Safety and Welfare Act 1987*
- *Worker's Compensation and Assistance Act 1981*
- *Industrial Relations Act 1979 (Employment Acts) 1991*
- *State Supply Commission Act 1991*
- *Disability Services Act 1993*

Other legislation impacting on Water and Rivers Commission activities

To the best of our knowledge, we understand that the Commission complies with the above written laws in the performance of its functions.

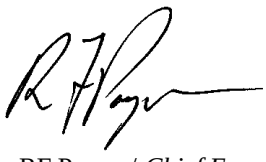
The Water and Rivers Commission is of the view that we comply with the Public Sector Standards in Human Resource Management in terms of their practical application to human resource processes within the Commission.

As a developing organisation, the Water and Rivers Commission fully intends to ensure that policies and procedures reflecting the Human Resource Standards are implemented in 1999-2000.

The Commission also complies with the Western Australian Public Sector of Code of Ethics, and has developed a Code of Conduct.

At the date of signing we are not aware of any circumstances which would render the particulars included in this statement misleading or inaccurate.

Ken Webster / *Chairman*



RF Payne / *Chief Executive*

Public sector standards and ethical codes

Human resource management

The Water and Rivers Commission has adopted policies, guidelines and processes supporting the public sector standards in human resource management.

Detailed policies and procedures for each of the standards have been developed, apart from the standard in performance management, and have been endorsed by the Corporate Executive of the Commission. The Commission is in the process of developing our performance management policy and procedure. These policies and procedures are accessible to all staff via the Intranet. A copy of the public sector standards in human resource management can also be found on the Commission's Intranet.

These policies and procedures have been developed not only to ensure compliance with the standards, but also to create clear, flexible human resource policies and procedures within the Commission. Compliance and checking mechanisms are contained within each of the policies and procedures.

The Manager, Human Resources Branch has a monitoring and advisory role to ensure the agency's compliance with the standards. Staff within the Human Resources Branch provide advice and act as assessors of compliance with the standards. The Employee Relations Consultant monitors all discipline cases for compliance with the standards.

Code of Conduct

The Water and Rivers Commission finalised development of its Code of Conduct. The code was endorsed by Corporate Executive on 15 December 1998.

The development of the Code of Conduct is a milestone in the evolution of our organisation. It is a declaration of how we go about our work, the things that are important to us, and the way that we behave in all of our relationships. It is a series of principles and policies developed and supported by the staff of the Commission. The Code of Conduct contains 17 major policy issues relating to the way that we conduct our business, manage our organisation, and treat one another, and a compliance strategy with sanctions for non-compliance.

All staff have access to the Code of Conduct on the Intranet and are regularly reminded of its application to the Commission.

Breach of standards applications 1998-99

Thirty-five positions were advertised.

The applications made for breach of standards review and the corresponding outcomes for the reporting period are:

• Number lodged - nil • Number of breaches found - nil • Number still under review - nil

Roger F Payne
CHIEF EXECUTIVE

Statement of expenditure incurred by certain classes

Reporting requirement under section 175Ze of *Electoral Act 1907* — Public agencies to report on certain expenditure.

Class of expenditure	**Total expenditure for class**	**Name of person, agency or organisation where total annual payments are greater than $1,500**
Advertising agencies	$91,402	Core Marketing Group - $17,317 Marketforce - $74,085
Market research organisations	$16,548	Market Equity - $16,548
Polling organisations	0	0
Direct mail organisations	$13,138	Core Marketing Group - $13,138
Media advertising	$116,240	Media Decisions -$113,700
Total Expenditure	$236,578	$234,788

Statement of compliance with environmental conditions

As part of the environmental conditions set by the Minister for the Environment on the 'Jandakot Groundwater Scheme Stage 2 Public Environmental Review' and the 'Gnangara Mound Groundwater Resources Review of Proposed Changes to Environmental Conditions'the Water and Rivers Commission is responsible for meeting minimum water level criteria in wetlands and vegetation. Over the 1998-99 financial year, eight of the 67 criteria were not met due to dry climate conditions.

On the Gnangara Mound the required spring water level was not achieved in Lake Nowergup by 2 cm because of artificial maintenance pump failures. This has now been upgraded. The required end-of-summer minimum water level was not met in three native vegetation monitoring wells. On the Jandakot Mound the required end-of-summer minimum water level was not met in two vegetation monitoring wells and North Lake and Lake Forrestdale.

A much greater number of criteria were predicted to be breached and the Water and Rivers Commission with the cooperation of the Water Corporation took action to prevent or minimise non-compliance by switching off a large number of production wells, most since November 1997 and some additional wells since November 1998. Over the 1998-99 year, 15 wells were switched off in Gnangara and one was operating at half operation. Eleven wells were switched off in Jandakot and one operated at a low quota. Despite this action, the limited recharge to the aquifers as a result of very low rainfall in 1997 and 1998 meant there was still some minor non-compliance outlined above.

There has been no environmental damage as a result of not meeting these criteria. Environmental monitoring is conducted to ensure the environment is not adversely impacted by abstraction.

Appendix 1 Summary of achievements 1998-99: Protection and enhancement

Activity	Expenditure	Description	Major achievements	Outcomes/performance
Wetland protection	$370,000	Wetland Management Plans	• Developed five Water Notes on aspects of wetland management (vegetation, fire, buffers, waterbirds, weeds) and a Water Facts sheet on Living Wetlands (to be released later in 1999). • Provided support to the Wagin Lakes and community groups in developing NHT applications. • Reviewed wetland management plans. • Provided advice to local government and community groups on wetland management and planning.	Information and advice for landowners, catchment managers and community groups to enable better management of wetland environments.
		Regional wetland evaluation – South Coast	• Completed a regional wetland evaluation to classify wetlands and identify wetlands of regional, State and international significance.	Better understanding of wetlands and priorities for planning and on-ground works.
Waterways protection	$8,143,000	River restoration	• Two River Restoration Workshops carried out in South West Region - training in stream ecology and river assessment surveying, planning and rehabilitation techniques (financial support from NHT).	Training for 50 people including local government, community groups, other State agencies and business, as well as Commission staff.
		Management plans	• Serpentine River Management Plan Stage 1 completed and released.	Information and advice for landowners, catchment managers and community groups to enable better management of waterway environments.
		Foreshore assessment	• Foreshore assessments carried out on Bennett, Bannister, Canning, Southern Wood, Wright, Ellen and Breera brooks in the Perth metropolitan area. Full community involvement. Reports to be released later in 1999.	Basis for management to address issues.
		Rivercare Program	The Commission administered the NHT Rivercare Program for WA — a total of 51 projects in 1998-99 totalling $3.7 million; 27 continuing projects ($1.9m) and 24 new projects ($1.8m). There were 32 community projects (18 new, 14 continuing). Agency projects totalled 19, (6 new and 13 continuing). Key projects: **Community continuing:** • Geographe Bay Catchment and river foreshore streamlining activities – GeoCatch	Fencing of riparian zones. Protection and restoration of river and stream systems.

			• Restoring Serpentine Jarrahdale for Tomorrow – Serpentine Jarrahdale LCDC. **Community – new** • Blackwood Catchment: NHT Package 1998-2001 – Blackwood Basin Group • Crossing the boundaries – Southern Peel Partnership Coolup LCDC • Supporting community driven ICM in the Swan Catchment – Swan Catchment Council **Water and Rivers Commission – continuing** • Waterways WA coordination and technical support • Water resource process assessment in the Moore River Catchment • Modelling nutrient management on the Scott Coastal Plain • Swan Avon (Avon River Catchment Program) Management of the Avon River environment • Development and implementation of Local River Action Plans – South Coast Region • State agency contribution to land conservation/biodiversity revegetation **Water and River Commission – new** • Community training in data management and reporting • Surveying and planning for management of Chapman and Greenough River ecosystems	
		Albany Resource Book	• Albany Waterways Resource Book (Educational Resource). Accessible information on waterways and catchments of the Albany region for educators and the community was completed and released.	Community information resource.
		Waterways WA – Statewide program for the management of waterways for the next 20 years.	• Produced introductory pamphlet. • Appointed three staff (final four to be finalised July 99) • Provided introductory briefings to stakeholder groups. • Developed approach for developing the policy/strategy in consultation with key stakeholder groups. • Developed training workshops for community groups. • Assisted regional strategy groups in consideration of waterway issues in regional strategies. • Identified the range of projects within WRC that directly or indirectly relate to the program.	In-principle support for policy/strategy approach from stakeholders. Basis for effective coordination and stakeholder involvement in coming year.

Activity	Expenditure	Description	Major achievements	Outcomes/performance
		State waterways management needs assessment - decision - making framework.	• National and international literature review of methods used by other organisations to prioritise waterways needs. Establishment of methodology using an expert panel approach to the prioritisation of waterways for management. Formation of a census style questionnaire to be used for the ranking of pressure, state and response indicators. Completion of a decision-making framework report.	The Commission will use this decision-making framework to develop its priorities for management, data collection, responses to issues and identification of suitable health indicators.
		Floodplain management	• Floodplain management advice Busselton, Moore River, Chapman River.	Information available to community and landholders.
		Ellen Brook Action Plan	• Released plan for initiatives to reduce nutrient export from the catchment.	Support for community involvement in catchment management.
		Swan-Canning Urban (SCULP) Landcare Program ($1.25 million Alcoa funded support to community groups)	• Concept with Alcoa and SRT. SCULP Steering Committee constituted. • Launch of the program in August 1998. Implementation of the first year of five-year program in 1999, including two public forums, guidelines and criteria for funding applications developed, project proposals called for and assessed. ($185,000 approved for 22 projects from $1,500 – $65,000.) Funds disseminated and projects commenced in April 1999.	Major funding program for community on-ground restoration projects in Swan-Canning catchment. Negotiations underway to also deliver ~$100,000 of SCCP restoration funds through SCULP.
		Swan-Canning Cleanup Program	• Support provided to SCCP and Swan Catchment Centre/Swan Catchment Council. • Action Plan launched June 1999. (Details in Swan River Trust Annual Report).	Basis for expanding support to Integrated Catchment Management and on-ground action in the Swan-Canning catchment.
		Avon River Management Plan	• River Care Protection Manual for the Avon River and various sections along its length.	Information and advice for landowners, catchment managers and community groups to ensure better management of waterways.
		Darling Range Regional Park Interim Management Committee	• Provide advice to the Management Committee on issues associated with water concerns and catchment management in amalgamation of the Darling Range as a regional park.	Information and advice for government and local authorities on catchment management.
		Development proposal application kit (horticultural)	• All major government agencies have combined to highlight their requirements in a simple application form which contains issues that need to be addressed by developers.	Simplified process for developers and agencies involved.

		GeoCatch	• Establishment of Vasse River Cleanup Program. • Trial of oxygenation to reduce algal blooms. • Forty-eight fencing and planting projects funded by community grants scheme. • River action plans for Yallingup Brook and Capel River.	Community involvement and partnerships progressing catchment management.
Protection of public and private water supplies	$1,671,000	Protection of Perth's public water sources	• Worked with local government to incorporate Jandakot MRS amendment into Town Planning Schemes. • Forty-seven permits were issued for potentially contaminating activities on the Gnangara and Jandakot Mounds. • Negotiated inclusion of special control areas in Draft Peel Region Scheme. • Developed the Gnangara Park Concept Plan under the coordination of CALM.	Further reinforcement of water quality protection principles in land planning process. Increased community awareness of the impacts of development on groundwater quality. Increased community understanding of the importance of public water source protection. Secured the long-term protection of the Gnangara Mound from contamination.
		Protection of country public water sources	• Thirteen water source protection plans were published. • A further 14 were released for stakeholder comment. • Six water reserves were endorsed by the Commission's Board for proclamation.	Increased community awareness of the impacts of development on quality of country water supply sources. Improved legislative controls and implemented other measures for protecting country water supply sources.
		Water quality protection policies and guidelines	• Initiated a State Water Quality Management Strategy. • Released policy and guidelines on sand mining. • Released 11 guidelines on mining and mineral processing in WA for public comment. • Continued to work with other government agencies on seven joint agency documents. • Twenty-nine water quality protection notes were prepared and included on the Commission's Internet site.	Facilitated a whole-of-government approach to water quality management Improved service to stakeholders with a joint-agency approach to guideline development. Increased awareness and involvement of the community in developing policies and guidelines. Increased community awareness of the impacts of development on water quality. Improved access to water quality information.

Activity	Expenditure	Description	Major achievements	Outcomes/performance
		Land use impact investigations	• Completed desk-top investigation into the impacts of golf courses on water quality. • Completed desk-top investigation into alternative treatment units. • Contributed to a nationwide study of contamination of groundwater systems by nitrate.	Increased understanding of the potential impacts of land uses on water quality.
Strategic Water Resource Protection Policies	$949,000	Policies	• Continued development of policies including Ord Land and Water Management Plan, working with community.	Policies available to guide agency and community actions to protect water resources.
Salinity management	$3,798,000	Management Program in partnership with community to protect key water resources from salinity for future public benefit	• Preparation of the WRC Salinity Management Program. • Initiated Recovery Teams for the Kent/Denmark, Warren and Collie River Recovery Catchments.	Recognition by stakeholders of the approach being adopted by the Commission. Development of a negotiating framework for implementation of planned works.
		Regional capacity building	• Arranged regional Salinity Management Teams in Albany and Bunbury offices	Effective communication for management with community. Significant on-ground work.
		High water-use perennial plants as water management tools. Assessment of drainage for salinity management	• Arrangement to establish 400 ha of lucerne on 20 properties to demonstrate best practice for lucerne establishment. • Preparation of a policy statement.	Renewed interest in adoption of lucerne into farming systems. Recognition by stakeholders of the intent of the Commission with respect to rural drainage.
		State Salinity Action Plan	• Coordinated review of State Salinity Action Plan. • Updated plan released for comment and revised.	Up-to-date strategies to coordinate Government and community action to combat salinity.

Appendix 2 Summary of achievements 1998-99: Allocation

Activity	Expenditure	Description	Major achievements	Outcomes/performance
Water industry reform	$780,000 $174,000*	The Council of Australian Governments Water Reform Agreement of 1994 requires substantial changes to be implemented in water resources management	• Progress of the water reform program. • Proposed amendments to *Rights in Water and Irrigation Act* introduced to Parliament June 1999.	Modernised water management legislation. Water markets may be implemented where appropriate. Environmental water needs formally recognised.
Water allocation management plans	$1,726,000	Groundwater and surface water allocation management plans	• A management plan for Exmouth was finalised. • Plans for Cockburn and Esperance groundwater areas and Murray surface water area were progressed.	The plans specify the availability of water for withdrawal and the conditions that should apply to any licensing of withdrawals.
		Environmental flows for key river systems	• Development of environmental water provision plans for the Leschenault and Canning river systems.	Sustainable management of abstraction and protection of high environmental values dependent on surface water.
		East Gnangara environmental water provisions (EWP) plan	• Approval by the Minister for the Environment of the EWP plan for East Gnangara.	Process for achieving sustainable management of abstraction and protection of high environmental values dependant on groundwater.
		Wetland protection	• Successfully negotiated for many of Perth's wetlands to be recognised for protection within Perth Bushplan sites. • Provided foundations for further protection in the 1999 review of the Swan Coastal Plain (policy lakes) Environmental Protection Policy. • Successfully negotiated for a number of Perth's wetlands to be protected as a condition of development approval.	Release of Perth Bushplan. Conservation category wetlands published in the Bushplan Site Maps. Wetlands protected in Public Open Space.
		Wetland mapping, evaluation and allocation into management categories	• Continued development of State custodian advice on wetland and hydrographic mapping and wetland evaluation database. • Carried out a regional assessment of wetland values in the Albany, Esperance and Pilbara regions.	Digital information, advice on wetland values. Incorporation of wetland information on the Commission's Statewide general enquiries system. Preliminary identification of regionally significant wetlands.

* Provided from Water Allocation Policies output

Activity	Expenditure	Description	Major achievements	Outcomes/performance
		Perth Drought Management Strategy	Development of a strategic drought management strategy for Perth.	Approval of construction of deep aquifer wells. Establishment of a joint agreement between the Commission and the Water Corporation to develop a deep aquifer model.
Regulation, licensing and community awareness	$3,441,000	Perth garden bore strategy	Increase in public awareness of the need to conserve scheme water supplies.	Encouraging the efficient use of groundwater for domestic irrigation as an alternative to high cost public water supplies.
		Regional water use efficiency plans	Produced regional water use efficiency programs for North West, Midwest/Gascoyne, South West and South Coast regions.	Implementation of State water conservation programs.
		Groundwater user surveys	Surveys of all groundwater users in the Jandakot area.	Information to guide future water planning, including water supply options, sustainable management of withdrawals and protection of the quality of the resource.
		Broome townsite groundwater use survey	Survey of all groundwater users in the Broome townsite	Improved public understanding of groundwater issues in Broome.
State Strategic Planning	$207,000	Strategic water use plans Kimberley Allocation Plan	Began consultation with community groups on issues in the Kimberley region and La Grange groundwater area.	Establishment of a process to involve the community in developing allocation plans.
		Harvey Basin Regional Allocation Plan	The Plan was endorsed by the Environmental Protection Authority and the Board of the Commission.	Implementation of the plan.

Appendix 3 Summary of achievements 1998-99: Water information

Investigation into the State's water resources to provide water-related information and understanding needed for the best management of the State's water resources.

Activity	Expenditure	Description	Major achievements	Outcomes/performance
Measure and monitor water quantity and quality	$7,290,000	Groundwater data transfer standards Quantification of salinity trends and stream flows in the south west of WA	As part of national study specific data transfer standards have been developed and applied to AQWABase, the groundwater database. • Trends and status of stream salinity for major rivers in the south west have been developed. • Mapping for Collie and Warren River catchments completed.	The ability to transfer and receive data from interstate in a standard uniform format, with uniform definitions. A sound understanding of the status and trend in stream salinity, which will benefit allocation policies and performance measurement for salinity management strategies.
		Hydrogeological datasets and maps	Publication of Newdegate Hydrogeological map, and Explanatory Notes, completing the Bremer Basin series of maps.	A complete set of groundwater and hydrogeological data for a major structural region in WA is now available to managers and farmers on the south coast of WA.
		Evaluation of airborne geophysics for salinity management Strategic review of surface water measurement	Completion of reports on the use of airborne geophysics in the catchments of Chapman Valley, Toolibin and Broomehill, as a tool for management of salinity. A strategic review of stream gauges was completed.	A clearer understanding of the suitability of aerial geophysical surveys for salinity management has been achieved from studies carried out with Agriculture Western Australia. Effective and efficient surface water measurement network.
		Gingin Vineyards	Established a protocol with local authority re availability of groundwater for large scale development of drive orchard in Gingin.	Information to developers on their prospects and consideration of water use efficiencies.
Assess environmental impacts on water resources	$1,903,000	Ellenbrook-Swan hydrogeological datasets for catchment management	Draft maps and conceptual models for the Ellen Brook catchment have been prepared, showing how the groundwater systems are related to local geology. The conceptual models show how changes in the groundwater system can potentially increase the risk of salinisation.	Collation of extensive hydrogeological information in a format that can be utilised by the community groups.
		Contaminated site investigations and appraisals	Investigations were carried out and advice on contaminated sites was provided to other agencies as required.	The Commission is seen as a centre of expertise on contamination issues within government, and has a key role in ensuring that land redevelopment does not affect the quality of water resources.

Activity	Expenditure	Description	Major achievements	Outcomes/performance
Assess environmental impacts on water resources (continued)		Swan-Canning Cleanup Program	• The R&D phase of developing the SCCP Action Plan has been completed. The Action Plan was released in June 1999. • The new scientific understanding is being synthesised in a number of technical and community reports. • Understanding of the sources of nutrients and algal response has been improved so that action can now be taken. New remediation techniques are ready for large scale application and trial. • Targets for estuarine performance have been established to augment the catchment targets.	Substantial Commonwealth funding has been received to complement State initiatives. Recommendations from the SCCP Action Plan have been incorporated into an ambitious remediation program which will continue to provide innovative solutions to nutrient reduction. Much of the process understanding and the remediation solutions are applicable to other areas of the State.
		Environmental targets and monitoring	• Water quality targets have been identified as a key component of the Swan-Canning Cleanup Program. • Water quality targets for the Swan and Canning estuaries were developed with the goal of setting progressive benchmarks for management. • A report describing the targets and their derivation was drafted in April 1999 and distributed nationally for review.	The use of testable statistically based targets to be used as benchmarks for a program such as SCCP is an Australian first. Initial comments on the reviewed report have been positive. These targets have a potential to be used elsewhere in Australia. The Murray-Darling Basin Commission is developing water quality targets for the Murray River Basin and has expressed an interest in the derivation approach.
		Nutrient investigations on the Scott Coastal Plain	A water quality monitoring program has been installed. Soil and groundwater samples have been collected for laboratory analyses. Initial results have been sent to the region. Community consultation and further monitoring are on-going. A nutrient transport model has been set up.	The project has improved the understanding of water balance and nutrient movement within the catchment. Initial results have also enabled development of a plan for further water quality monitoring at other land use sites.
		Support for salinity management in water recovery catchments	Catchment models of the Kent and Collie catchments were updated to show the effects of recent tree plantations. Investigations are being undertaken for the Mobrup Catchment Group in the Tone River catchment, including salinity hazard mapping.	Information on the contribution of recent plantations to reduction of salinity is available to assist catchment planning in the Kent and Collie catchments. Understanding of the groundwater systems in the Mobrup catchment will assist detailed planning by the catchment group. A clearer understanding of salinity distribution and hydrological processes in the Warren recovery catchment has been achieved.

Assess environmental impacts on water resources (continued)		Flood hydrology and floodplain management	• Flood management options have been developed for Busselton. • Flood warnings have been provided for Carnarvon and Moore River. • Commissioned telemetred flood warning system network for Greenough and Moore rivers. • Provided timely and accurate flood warnings to Carnarvon, Walkaway, Greenough and Moore.	Effective management of floodplains to minimise damage and loss from flooding.
		State of the Water Resources	Draft report prepared for discussion with community.	An overall view of the condition of and pressure on the State's water resources.
		Protection and management of remnant vegetation in water supply recovery catchments	Reporting of the NHT funded project *Assessment and Rehabilitation of Remnant Vegetation in Water Catchments* was completed.	Information for effective management and rehabilitation of remnant vegetation in critical future water supply catchments is now available. Criteria to prioritise projects for funding are also available.
		Bauxite mining in the Darling Range	An assessment of the impact on salinity of water resources due to a proposed mining trial by Alcoa in the Intermediate Rainfall Zone was completed.	A basis for the EPA and Dept. of Resources Development to approve trial mining in the Intermediate Rainfall Zone of the Darling Range has been provided.
		Investigations into cattle deaths	A potential source of the contamination has been identified, and a drilling program is being developed to determine the extent and severity of contamination at the site, and the need for a cleanup program.	The Commission is now acknowledged as the lead agency dealing with an issue that has caused health problems. Procedures for dealing with incidents such as this have been developed with the SW Region.
		Groundwater contamination – Albany	An investigation program has been completed, and sources of nutrient, heavy metal and arsenic contamination have been identified in the Munster Hill catchment near Albany.	The study is the first intensive investigation of groundwater quality in the area, and will improve water resource management in an area adjacent to the town water supply wellfields.
		Lead mine tailings - Galena	Preliminary sampling of runoff from tailings area.	Initial sampling indicates further investigation is warranted to determine extent of contamination.
Water resource appraisal for resource development	$319,000	Northern Goldfields water resource appraisal and hydrogeological maps for resource management and planning	A major appraisal of the water resources of the Northern Goldfields, an area extending from Laverton to Wiluna has been finalised. It has provided detailed information on the water resources of the region which will assist regional development and the mining industry.	A comprehensive report and a set of hydrogeological maps detailing groundwater occurrence in the Northern Goldfields will enable the Commission to manage and protect the water resources more efficiently and effectively, as well as provide more reliable advice and assistance for water resources planning.

Activity	Operating budget	Description	Major achievements	Outcomes/performance
		Ord River Irrigation Area (ORIA)	• A report on long-term pumping tests has been completed and a geological map and hydrogeological map with sections compiled. • A study into hydrology of the Ord River was also completed.	The results have provided a sound scientific basis for the development of ORIA Stage 2 and for the future management of potentially damaging high groundwater levels under the irrigation area. In addition an understanding of the surface water impacts of Stage II irrigation on the lower Ord River has been developed.
		Carnarvon groundwater modelling	Groundwater is abstracted from beneath the Gascoyne River to provide a water supply for Carnarvon and the local horticultural industry. As Carnarvon is an arid environment the challenge is to manage sustainably the limited water resources for the benefit of the community and local industry, while protecting the environment from any detrimental effects of abstraction. The outcomes to date have been the verification of time series data within State Water Resources Information System, identification of gaps in our knowledge base and the increase in the Commission's intellectual property in the latest technology in numerical modelling and parameter estimation.	The groundwater modelling has greatly enhanced our understanding of the groundwater flow regime and has seen the development of an acceptable representation of a complex, dynamic physical system. This represents a major achievement. The project will deliver a management tool for the protection and allocation of groundwater that is at the forefront of modern technology. Community awareness has been raised of the Commission's role in the protection of water resources and the work undertaken for the benefit of the community through consultation with key stakeholders.
		Collie Basin groundwater resources assessment	Assessment of hydrogeology and groundwater resources of the structurally complex Collie Basin including: estimation of sustainable yields of the unconfined and confined aquifers, assessment of impact of coal mining on groundwater resources, assessment of groundwater and surface water interaction near Collie River South Branch, and development of in-house expertise on hydrogeology of Collie Basin to guide future water supply and management.	Collie Water Advisory Group (CWAG) reconvened to reconsider its water resources management strategies for Collie Basin. The in-house technical knowledge of Collie Basin is aiding formulation of new policies for water allocation, and for development of strategies for long-term supplementation of the environmentally significant Collie River pools.
		Modelling the Albany wellfield	• A two-dimensional groundwater model has been calibrated and used to determine water source protection boundary, and to identify new source areas. • A Water Source Protection Plan has been developed and additional source areas have been identified.	The increase in groundwater resource will benefit the local community and improve the Commission's business profile in the Region.

Appendix 4

Natural Heritage Trust Projects 1998-99

Project	Budget (State & NHT contribution) 1998-99 $
Continuing projects	
Landcare	
Technical Support for Water Quality Monitoring	106 435
Avon ICM Network	62 750
Swan Network (Catchment Centre)	295 000
ICM Coordinator - Leschenault Catchment Coordinating Group	36 615
Leschenault Water Quality Monitoring Program	78 000
Perth Groundwater Resources and Contamination Database and Map System	158 978
Foreshore Condition Assessment in the Swan Catchment	27 986
Swan Hydrogeological Resource Base and Catchment Interpretation	223 142
Regional Strategy and Action Plan for the South West (WA)	309 870
Development and Implementation of a Geographe Catchment Council (GeoCatch) Action Plan	207 700
Preparation of a Coordinated Management Strategy for the Moore River Catchment	350 300
Sub total	**1 392 591**
Rivercare	
Water Resource Assessment & Improvement South Coast Region	397 361
Waterways WA Coordinator and Technical Support	854 134
Modelling Nutrient Management on Scott Coastal Plain	238 580
Geographe Catchment River Restoration	54 000
Evaluation of Rivercare Practices within the South Coast Region	76 570
Development and Implementation of Local River Action Plans, South Coast Region	167 440
South West River Restoration Training and Demonstration Programme	106 024*
Leschenault Catchment, Rivers Protection & Enhancement Program	131 415*
Integrated Natural Resources Management Plan for the Brockman River	75 765*
Management of the Avon Riverine Environment	688 500*
Water Resource Process Assessment in Moore River Catchment	345 000*
Sub total	**3 129 904**
Wetlands	
Development of Wetland Management Plans: Facilitation and Support	178 331
Sub total	**178 331**

Waterwatch

Waterwatch State	240 000
Waterwatch Bunnings Watercare	30 000
Sub total	**270 000**

New projects

Survey & Planning for Management of Chapman & Greenough River Ecosystems	87 400
Rehabilitation of the Lower Moore River	340 775
Flood Forecasting & Warning System - Collie & Preston Catchments	110 000
Water Resources Management Plan for the Busselton-Dunsborough Area	163 550
Floodplain Management Program	250 000
Community Training in Data Management & Reporting	60 000
Building Knowledge Networks for Catchment Management in the Avon	368 000
Promotion of Techniques to Improve Urban Water Quality	77 800
Supporting Community Driven ICM in the Swan Catchment	590 776
Swan Canning Industry Survey & Pollution Prevention Project	77 266
Sub total	**2 125 567**
Total NHT	**5 729 689**

* Projects being finalised within financial year

Appendix 5

Research and Development Projects (as at 30/6/99)

Project Title	Budget $
Climate variability	78 312
Economic values of fresh water in WA	44 156
Innovative salinity management in high rainfall zone	12 852
Water quality investigation - Dunham and lower Ord	50 694
Pilbara measurement network	144 504
South coast wetlands management plan development	42 144
Land use planning rural drainage	5446
Measurement and licensing activity quality control	119 449
State waterways management needs assessment	25 320
Sediment nutrient cycling	69 996
Wilson Inlet catchment groundwater and eutrophication monitoring	91 751
Gnangara Environmental Water Provisions (EWP) management and implementation	111 900
Corporate Data modelling	33 432
Eutrophication and environmental impacts management	100 080
Allocation computer modelling	38 148
Research and Development Strategy development	38 734
Wilson Inlet Nutrient Eutrophication Management Program (NEMP) program	98 434
Decision support model expertise	113 000
Industry partnerships and stakeholder liaison	29 676
Irrigation industry forum	28 026
Flood forecasting development and application	61 732
Moore River stream flow	38 000
Central Pilbara groundwater studies	33 384
Modelling nutrient flows in Scott Coastal Plain	52 500
Bauxite mining investigations	27 981
Margaret River groundwater resource assessment	28 620
Sediment nutrient cycling	560 421
Assessment of groundwater conditions in the Ord River	15 432
Hydrological studies floodplain management	30 468
Wastewater reuse	19 536
Contaminated loads in rivers and drains	17 784
Monitoring and network maintenance	71 239
Support for Centre for Groundwater Studies	66 252
Guidelines for riparian protection zones	20 000
Catchment water balance for salinity control	46 776
Native freshwater fish distribution and protection	10 000
Total	**2 376 239**

WATER AND RIVERS COMMISSION

Annual Report feedback form

The Water and Rivers Commission seeks your comments on the Commission's Annual Report for 1998-99. Your feedback will help us to respond to the needs of our readers and improve future reports.

Please mark your response [X]

What is your area of interest?

Government
- federal ❒
- state ❒
- local ❒

Industry
- commerce ❒
- trade ❒
- tourist ❒
- primary ❒
- other ❒

Professional/consultant
- planning ❒
- land and water ❒
- management ❒
- other ❒

Media ❒

Community or catchment group ❒

Business ❒

Educational institution
- primary ❒
- secondary ❒
- tertiary ❒

Research ❒

Special interest group
- natural heritage ❒
- cultural ❒
- heritage ❒
- recreation ❒
- other ❒

Individual
- applicant for a position ❒
- student ❒
- interested member of the community ❒

Other — please specify

_____

_____

How do you rate the publication over all?

Excellent ❒ Good ❒ Satisfactory ❒ Poor ❒

Rate each of the following aspects on a scale of 1 (very poor) to 5 (excellent)

Quality of information	1	2	3	4	5
Extent of information	1	2	3	4	5
Readability	1	2	3	4	5
Design and presentation	1	2	3	4	5
Tables & graphs	1	2	3	4	5

How might the Annual Report be improved?

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Other comments

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Please post this form to:

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Water and Rivers Commission
PO Box 6740 Hay Street East
East Perth, Western Australia 6892

Or fax to (08) 9278 0301