Towards a water sensitive city
The urban drainage initiative – Phase 2

Looking after all our water needs

May 2009
Minister’s message

Western Australia’s urban centres are faced with many challenges, including climate change, the need to provide affordable and liveable neighbourhoods and the management and protection of environmental assets.

Central to these challenges is the management of the state’s water resources and the recognition that all aspects of the water cycle deliver social, economic and environmental benefits.

The use of stormwater within the urban form; efficient use of potable water supplies; exploring ways to reuse waste water as an alternative water supply; and the protection of ground and surface water assets are all under the management umbrella of the Department of Water.

Total water cycle management is an important step in achieving water sensitive cities and presents not only challenges but opportunities for innovation.

To this end, the Department of Water released its Urban drainage initiative in June 2007 to assist the Government of Western Australia to reform drainage and waterways management.

The initiative provided leadership and coordination for regional water planning, stormwater management, provision of land and water planning advice and the refinement of governance structures.

This brochure provides you with an overview of the achievements in these areas and gives direction to departmental priorities until 2010.

Furthermore, it marks the leadership role of the department in the context of the water sensitive cities concept and the recent release of Better urban water management – the joint state and local government agency and industry initiative to integrate the state’s water and land-use planning process.

I congratulate the Department of Water on its achievements in improving the state’s urban drainage system and urge you to become acquainted with Towards a water sensitive city, and help achieve the benefits of better urban water management.

Dr Graham Jacobs MLA
Minister for Water; Mental Health
Perth: moving towards a water sensitive city

A water sensitive city takes into consideration the total water cycle and encourages all levels of government and industry to adopt water management and urban planning practices that benefit the community, the economy and the environment.

The term ‘water sensitive city’ is derived from extensive research by the National Urban Water Governance Program, of which the Department of Water, the WA Planning Commission, the WA Water Corporation and representative local governments in Western Australia are members.

The concept is supported by the Western Australian and Australian governments.

Perth is already progressing towards becoming a water sensitive city.

To complete the transition requires:

- an adaptive management response that addresses challenges, such as climate variability and vibrant ‘liveable neighbourhoods’
- protecting important environmental assets
- providing economically viable options for water use
- recognising the need for incentives for change in water management.

Perth has come a long way. Twenty years ago, water management focused on urban drainage planning to prevent flooding – either by channelling stormwater runoff after rains to waterways, wetlands, oceans or basins; or by trying to minimise the effects of high groundwater levels in waterlogged parts of urban developments.

The limitations of such traditional approaches to drainage were soon realised and the term ‘water sensitive urban design’ (WSUD) was coined in a report released by the Western Australian Water Resources Council. From these beginnings, WSUD has been adopted across Australia as a design philosophy that encourages the incorporation of the total water cycle into the urban form.

The state government has incorporated WSUD concepts in its recently released integrated land and water planning framework Better urban water management (Western Australian Planning Commission 2008). The framework sets out the process for considering water issues at each stage of land use planning and development. This approach ensures that stormwater, wastewater and potable water supplies are valued as an integral part of the urban environment.

Implementing the framework and adopting better urban water management practices are essential steps in helping Perth move towards being a water sensitive city.

The Department of Water will address four components of urban water management to help Perth and regional centres make the transition to becoming water sensitive cities:

- urban water management planning
- technical guidance and research
- planning advice and assessments
- governance and coordination.

Street verge vegetated swale

Street tree infiltration pit
1 Urban water management planning

Drainage and water management planning

To protect and manage water resources associated with development, the Department of Water undertakes drainage and urban water management planning. This is carried out in accordance with the strategic planning framework and priorities set by the Western Australian Planning Commission in Better urban water management (WAPC 2008).

Drainage and water management plans (DWMPs) are currently being prepared for priority urban growth areas between Yanchep and Pinjarra.

DWMPs provide technical data that planners and developers can incorporate in water management strategies to support structure planning, scheme amendments and subdivision plans.

The plans combine existing knowledge with groundwater and surface water modelling and address land use and planning matters by setting out:

- stormwater and groundwater management strategies for flood management, including flow rates and paths for flood protection
- water sensitive urban design principles for water management and storage, including aquifer recharge
- water quantity and quality targets and strategies to protect environmental assets
- targets for water conservation.

The DWMPs also build on recommendations made in previous Department of Water plans.

These include statutory water management plans, drinking water source protection plans, floodplain management plans and drainage plans.

Achievements

- Released the North east corridor urban water management strategy.
- Released drainage and water management plans for the Byford townsite area and the Swan urban growth corridor, and published a draft plan for the Jandakot structure plan area.
- Published the Southern River integrated land and water management plan and the Forrestdale main drain arterial drainage strategy.
- Completed a review of the process to develop an integrated land and water management plan for Southern River.
- Provided support and technical guidance to state government agencies and local government authorities in their preparation of district water management strategies for Mundijong/Whitby, Wanneroo and Keralup.
- Supported local government authorities across the Perth metropolitan area to develop water conservation plans.

Priorities (now to 2010)

- Release the final drainage and water management plan for the Jandakot structure plan area.
- Prepare a drainage and water management plan for the Murray area, extending from Keysbrook to south of Pinjarra.
- In consultation with local governments and the Department for Planning and Infrastructure, rank major areas of proposed development and their hydrological constraints so as to determine state-wide priorities for the preparation of DWMPs.
- Assist local government authorities with developing urban water management plans.

Installing an infiltration cell within parkland
2 Technical guidance and research

In July 2007, the department released the *Stormwater management manual for Western Australia*. The manual provides information for all sectors of government and the development industry to ensure the best management of stormwater. The Australian Water Association recently recognised the manual with a Western Australia water environment merit award.

In addition to written material, the department has a capacity building program whereby officers work alongside local governments, developers, community and other industry professionals to ensure a common understanding of best practices in urban water management.

The department’s research and development program supports best practices for urban water management by providing trusted and reliable science on nutrient management, developing demonstration projects, collating monitoring data and developing modelling systems for surface and groundwater.

The department also supports local governments with their water efficiency plans. A specialised software package has been developed to guide councils in applying hydro-zoning measures to public open space.

Achievements

- Completed the *Stormwater management manual for Western Australia*.
- Provided training for state and local government personnel on using the stormwater management manual and land use planning guidance documents and ensuring compliance with the *Better urban water management* planning framework.
- Hosted technical training courses on building bioretention systems/rain gardens in Western Australian conditions and supported local demonstration projects.
- Developed draft guidance on ecological water requirements for urban water management.
- Released the *Report for potential use of stormwater in the Perth region: quantity and storage assessment*.
- Released a literature review on constructed lakes in the Perth metropolitan area and South West region.
- Established a research and development technical advisory group to set research priorities for best management practices for urban surface and groundwater quantity and quality management.

Priorities (now to 2010)

- Develop a guidance document on determining controlled groundwater levels.
- Complete the guidance document on determining ecological water requirements for urban water management.
- Develop demonstration bioretention/rain garden systems at lot- and street- scales, accompanied by performance monitoring.
- Develop decision support tools for Western Australian climatic and hydrological conditions, such as evaluating the application of the model for urban stormwater improvement conceptualisation (MUSIC) tool in Western Australia.
- Undertake long-term performance monitoring of the Bannister Creek living stream project and the constructed wetlands at Tom Bateman Reserve.
- Finalise the position statement and provide guidance on water management in constructed lakes.
- Provide guidance on performance and cost of water sensitive urban design approaches specific to Perth and Western Australia.
- Support urban water management research partnerships at Curtin University, the Commonwealth Scientific and Industrial Research Organisation and Murdoch University.
- Work with stakeholders to develop and simplify approvals processes for alternative water sources, such as ‘third pipe’ systems where non-potable water is supplied for use outside the home.
- Work with stakeholders to establish priorities for developing guidance documents on urban water management issues.

Further projects will be initiated subject to funding and the development of research partnerships.
The Department of Water works closely with the Western Australian Planning Commission, the Urban Development Institute of Australia and other stakeholders to set priorities for future land and water planning in the Perth to Peel area. Through its central and regional offices, the department is committed to deliver advice on water resource management issues to facilitate the land-use planning process in a timely manner and in coordination with other agencies.

To support the uptake of the Better urban water management framework, the department has published documents to guide in the preparation of local water management strategies and urban water management plans. These guidance documents build on the stormwater manual to ensure that WSUD is supported in subdivision and local structure planning processes, particularly in ‘greenfield’ areas. This advice and assistance is in addition to the department’s DWMPs and regional water plans.

### Achievements
- Provided technical guidance for Better urban water management (Western Australian Planning Commission 2008), a framework to guide integrated land and water planning across the state.
- Developed guidelines for preparing urban water management plans and for complying with subdivision conditions.
- Developed interim guidelines for preparing local water management strategies to inform local planning scheme amendments or local structure plans.
- Assessed several drainage and water management planning reports and assisted the land development industry with their preparation.

### Priorities (now to 2010)
- Consolidate technical guidance and provide capacity building to assist the transfer to local governments of clearance responsibilities for urban water management plan conditions on subdivision approvals.
- Release a position statement on the implementation of the Better urban water management framework.
- Work with the land development industry to evaluate the effectiveness of the guideline documents.
4 Governance and coordination

Responsibility for drainage management in the metropolitan area is spread across four authorities:

- Local government ensures land developments have adequate flood protection and ensures ongoing management and maintenance of infrastructure within its constituency.
- The Water Corporation manages 75 major drainage catchments that collect water received from local government systems.
- The Department of Water is responsible for drainage policy and drainage planning.
- The Economic Regulation Authority licenses the operation of drainage service providers and specifies water quantity criteria and outcomes.

In 2007, the Department of Water coordinated a drainage summit. The summit examined governance roles and responsibilities for urban drainage management. The recommendations from the summit are now being used to develop legislative reforms, review land and water planning processes and review drainage funding models.

Through the National Urban Water Governance Program, the department will work with all levels of government, industry representatives and community leaders across the water sector to build community and political support for the water sensitive cities concept in Western Australia. The aim is to create a common vision for water management that is based on trusted and reliable science and an agreed level of accountability and leadership across government.

Achievements

- Developed drainage legislation reform through the state water law reform process.
- Implemented the May 2007 Drainage Agreement between the Department of Water and the Water Corporation, which aims to achieve integrated land and water management planning.
- Reviewed options for funding models for drainage management.
- Reviewed the drainage management schemes implemented at the South Jandakot and Ellenbrook urban developments.

Priorities (now to 2010)

- Evaluate drainage management in response to urbanisation of rural drains.
- Continue to clarify roles in drainage management and planning, especially in relation to water quality and stormwater reuse.
- Develop approaches to manage whole-of-life-cycle costs for urban water management.
- Develop governance and operational arrangements for the conversion of coastal and rural drainage schemes to urban systems.
- Work with stakeholders to develop future governance arrangements for the drainage management schemes at the South Jandakot and Ellenbrook urban developments as a case study on how to manage drainage schemes.
Towards a water sensitive city

The following will be developed to assist progression towards a water sensitive city.

- Establish measurable targets for achieving water sensitive cities for Perth and regional centres.
- When developing urban water management plans, integrate all aspects of the total water cycle (stormwater management, wastewater management and reuse, potable water conservation, and groundwater management).
- Consider energy consumption and production as it relates to urban water management as part of the planning process.

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