

# ReWater

Water recycling in Australia

SPRING/SUMMER 09

## 10 years of recycled water use at Virginia

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### **VIRGINIA IRRIGATION SCHEME**

A joint initiative of the Government of South Australia,  
South Australian Water Corporation, the Virginia Irrigation Association  
and Euratech.

Reclaimed water used on this property is rated  
Class A and is approved for unrestricted irrigation.  
Its use for irrigation is safe and sustainable.



**DO NOT DRINK**



**New greywater  
standards  
for boating**

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**New community  
established with  
Recycled Water**

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**Innovative  
eco-tower for  
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**Stormwater  
the last  
resource?**

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# ReWater

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#### On the cover:

Photo courtesy of Arris Pty Ltd

### About ReWater

This newsletter, ReWater, has been designed to make information relevant to recycled water use in horticulture more accessible to horticulturalists (growers/farmers), the water industry and other interested people. It is part of the service provided by the Australian Coordinator for Recycled Water Use in Horticulture, funded by Horticulture Australia.

Back issues and instructions for subscribing to receive ReWater electronically quarterly can be accessed at [www.recycledwater.com.au/rewater](http://www.recycledwater.com.au/rewater)

#### Your Feedback and Contributions

We would appreciate your feedback and suggestions for contributions. Please email [rewater@arris.com.au](mailto:rewater@arris.com.au) or contact us on 03 9421 1701.

[www.recycledwater.com.au](http://www.recycledwater.com.au)



The delivery of research and development outcomes from this project to the horticultural industry is made possible by the Commonwealth Government's 50% investment in all Horticulture Australia's research and development initiatives.

Know-how for Horticulture™

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The Virginia Scheme now services over 400 connections.

## 10 years of recycled water use at Virginia

### Ten years of irrigating fresh vegetables with recycled water in Australia

Water Infrastructure Group's Virginia Pipeline Scheme in Adelaide celebrates 10 years of operations this month. The Scheme commenced operations in October 1999 and was Australia's first major water recycling scheme to irrigate over 20 different crops, including many fresh vegetables. Today, the scheme remains Australia's, and one of the world's, largest high-quality water recycling initiatives of its kind. Since it began, the scheme has provided farmers with over 100GL of Class A recycled water fit for the purpose of irrigating food crops which can be eaten raw, during a period which has been one of the driest on record in some parts of Australia.

The success of the Virginia Pipeline is invariably linked to the cooperative nature of the scheme; a public-private partnership between the Virginia Irrigation Association (representing market gardeners and other irrigators), SA Water and Water Reticulation Systems Virginia (a private sector subsidiary of Tyco International). Tony White of Water Reticulation Services Virginia, said, "This year Water Infrastructure Group expanded the scheme into the Angle Vale area delivering an additional 16ML/day of Class A recycled water to 60 new cus-

tomers who now look forward to a secure future for their businesses." With a \$19m capital cost, and the recent Angle Vale extension which cost \$6.6m, the results have ensured the economic sustainability of vegetable growing in the region. The growers were another crucial component to the success of the scheme; end-users of the water were one of the key drivers in bringing about the scheme, maximising their farm's potential.

As John Ringham, SA Water Chief Operating Officer said: "South Australia is a national leader when it comes to the reuse of treated wastewater and the Virginia scheme has had an important

**South Australia is a national leader when it comes to the reuse of treated wastewater and the Virginia scheme has had an important contribution to this**

contribution to this. In May 2009 the Federal and State Governments announced the completion of the jointly funded Virginia pipeline extension – a \$6.6 million project to provide an

extra three billion litres of recycled water annually. The pipeline now has the ability to provide up to 18 billion litres of recycled water. The Virginia scheme and the extension is a good example of SA Water working with a private company to maximise the use of recycled water."

The project has received international  
*continued page 3*

recognition from water recycling experts. Prof Thomas Wintgens, Professor in Environmental Engineering at the University of Applied Science in Northwestern Switzerland, has said "Australia is one of the front runners in water recycling and the Virginia Pipeline Scheme has a long term track record as a carefully designed and managed water recycling scheme of international significance."

The role of recycled water in irrigating food crops has set the benchmark for sustainable farming practices in Australia. "The Virginia Pipeline Scheme clearly established the precedent in Australia for recycled water to be adopted into productive agricultural systems", says Dr John Radcliffe, Honorary Research Fellow CSIRO and author of "Water Recycling in Australia". With continued periods of drought, and the unsustainable nature of groundwater extraction for agriculture, recycled water for crops will continue to grow over the coming years. As Ken Carypidis, of Lights View Wines states, "having a secure water supply just eliminates one problem out of the way and you can get on with your job."

Dr Daryl Stevens, Australian Coordinator, Recycled Water Development in Horticulture has been involved in aspects of the project since its initiation in the early 90s. In this regard, Daryl believes the scheme has set a global example on the use of recycled water for agriculture: "The Virginia Pipeline Scheme is very significant on an Australian standard and a world standard with respect to recycling water from sewage treatment plants and using that to grow food crops that are uncooked. The quality of the water, the quality assurance programs, the standards put into place and the guidelines used to develop the scheme have set the world stage for growing food crops using recycled water."

"The scheme has successfully operated for 10 years with no human health issues and no detrimental environmental impacts, proving that recycled water can



provide a safe and sustainable water resource." "It is one of the best examples in the world of using recycled water to grow an enormous range of food crops, many eaten raw".

"The success of the scheme is a credit to the growers of the district, SA Water and the scheme operators, both for their foresight in developing the scheme and its ongoing operation" says Dr Stevens, who acknowledges that horticulture without recycled water irrigation in some parts of Australia would have been virtually impossible: "I know many irrigators that have received just about no allocation of their water right over the last few years".

### Recycled water can provide a safe and sustainable water resource

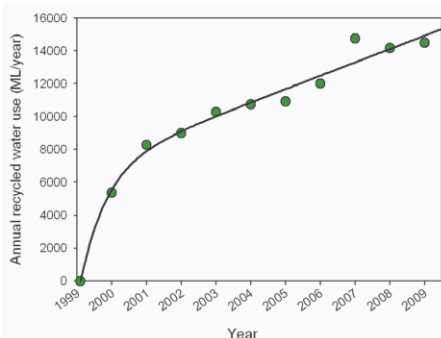
Recycled water has delivered nearly half the water required by growers at Virginia. This water helped produce about \$110 million of product

on average each year at the farmgate in the Virginia area advised Justin Ross (PIRSA). This equates to approximately \$50 million of produce grown a year with recycled water. If multipliers indicated by Horticulture Australia are used (i.e. 2), farmgate value can be converted into benefit to the district of about \$100 million a year from recycled water use (HAL 2006) or \$1 billion for the 10 years of the project.

From its modest beginnings, providing 45ML/day over peak season with 190 connections, the scheme has now reached maximum capacity at 105ML/day in Summer, servicing over 400 connections. The lesson to learn from this venture is that recycled water schemes for agriculture will only continue to grow, and building for excess capacity for future demands may provide greater long-term benefits.

As Clinton Zerella (Zerella Holdings) indicated, "One of the things that the scheme has really brought to light in Australia today is the sustainability of water resources. I believe this scheme has been a shining light throughout Australia and highlights the way that modern farming can work in with suburban life." •

**For more information:** Leif Ericson, Corporate Affairs Manager, Water Infrastructure Group, phone: 03 9863 3503, [lericson@wigroup.com.au](mailto:lericson@wigroup.com.au)



**Uptake and use of recycled water at the Virginia Pipeline Scheme, Northern Adelaide Plains, South Australia.**

## Technology trials at wastewater treatment plant

### Aim to reduce energy consumption, greenhouse gas emissions and biosolids produced

Over the past eight months, Bathurst Regional Council has been conducting a trial of a new technology that promises to offer significant improvements in energy consumption and the production of biosolids from sewage treatment.

The technology could help reduce greenhouse gas emissions from wastewater treatment operations and decrease the volume of biosolids produced.

The Bathurst Regional Council has offered its sewage treatment plant over several decades to participate in trials that have assisted the wastewater industry to develop new plant designs and technologies.

Bathurst Regional Council Manager - Water & Waste Authority David Swan explained that the work done at the Bathurst plant over the years has given rise to a design of sewage treatment plant known as the

### This should translate to substantial energy reductions

'Bathurst Box', which is now widely adopted in Australia and overseas. Swan said that the adoption of this new technology, which could reduce energy cost and therefore greenhouse gas emissions as well as biosolids, would be an extremely good innovation for the wastewater industry, regional councils and the environment.

BiOWiSH Technologies has been participating in trials with Bathurst Regional Council with an enzyme-based approach to wastewater treatment.

Using high-speed enzymes that were discovered in natural mangrove en-

*continued page 4*



# UQ pilot wastewater plant treats domestic waste

## Recovering energy and water

Generating clean energy and high-quality recycled water from two of the main sources of household waste is closer to reality, thanks to University of Queensland environmental engineering research.

Simon Tannock, a PhD student from the BioMass BioEnergy (BmBe) group in the School of Engineering, has designed an innovative wastewater treatment plant to recover energy and nonpotable water from food waste and wastewater.

A pilot plant integrating the environmentally sustainable wastewater treatment system pioneered by Tannock and fellow PhD student Beth Rounsefell is now in operation at the St Lucia campus.

The energy-efficient plant provides a complete treatment system which digests household waste and wastewater under anaerobic conditions to produce methane and high-quality non-potable recycled water.

Mr Tannock said the plant offered a new, more effective way of dealing with the serious waste and wastewater treatment issues facing Australians across the country.

"We are treating two major sources of domestic waste in a way that will reduce energy use and carbon emissions, while ensuring the maximum recovery of two valuable resources - energy and water," he said.

"The recycled water generated by the plant is expected to be Class A+ standard, so it will be safe to use around the home for toilet flushing or in irrigation systems. The methane is a clean, renewable energy source.

"Importantly, the pilot plant has been designed to meet Brisbane City Council requirements for onsite water treatment at large building developments and rural areas, and this research will confirm that we do meet those requirements."

The new technology incorporates an environmentally sustainable process known as biological nutrient removal.

Tannock said that in biological nutrient removal treatment systems, naturally occurring bacteria were encouraged to remove nutrients such as nitrogen and phosphorus.

"The food scraps which are fed into the

Image is courtesy of Stewart Gould of UQ



system act as a source of carbon for the bacteria so that they can treat the wastewater and bring these nutrients down to an acceptable level," he said.

"The rest of the carbon from the food scraps is biologically converted into methane, which can be captured and used to produce heat and electricity."

Further research will determine if the system will be able to generate enough methane to operate off its own electricity supply.

The project is supported by an Australian Research Council Linkage Grant awarded to Associate Professor Bill Clarke from the Faculty of Engineering, Architecture and Information Technology and Professor Jurg Keller of the Advanced Water Management Centre.

Companies interested in partnerships to commercialise the system are being sought. ●

**Source:** UQ News 23.03.2009  
[www.uq.edu.au](http://www.uq.edu.au)

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vironments, the technology claims to reduce the reliance on bacteria and other microorganisms to break down sewage and reduce nutrient levels prior to discharge into the environment. This will result in lower energy requirement for aeration of the wastewater and a reduction in the final biosolids produced through the process of sewage treatment. There is also a benefit of lower odour emissions, thereby improving conditions for local residents.

BiOWiSH Technologies Chief Executive Officer Rod Vautier explained that a technology such as this will assist the environment, wastewater treatment industry and governments in many ways.

"Any contribution today to reduce energy consumption and therefore greenhouse gas emissions is highly valuable and the adoption of this technology offers the potential for reductions in electricity for aeration of up to 50%," he said.

The BiOWiSH enzymes rapidly break down the waste matter and therefore less biosolid material is theoretically produced in the plant. The beauty of this technology is that it can be applied to any existing biological treatment plant at low cost; and in the developing world, it could offer the potential to meet growing capacity needs without increasing capital expenditure.

Swan added that early indications have proved very encouraging with the strength of the sewage being reduced by up to 83% and the solids by up to 90% prior to entering the aeration chamber for traditional biological treatment. This should translate to substantial energy reductions and potential plant capacity increases without the requirement for significant capital equipment.

Further trial work is to be considered for later this year to verify the actual reductions in aeration energy and final biosolids production. ●

**Source:** BiOWiSH Technologies  
[www.SustainabilityMatters.net.au](http://www.SustainabilityMatters.net.au)



# Establishing greywater standards for inland boating

## Proactive risk reduction and protection of South Australian inland waterways and rivers

Standards Australia, in collaboration with the South Australian Environment Protection Authority (SA EPA), has published a new Australian Standard providing the minimum requirements for greywater treatment systems installed on vessels operated on inland waters.

AS 4995 'Greywater treatment systems for vessels operated on inland waters' sets out specifications for the design, construction, installation and operation of onboard greywater treatment systems to minimise the environmental and public health risks caused by untreated greywater discharge.

The Standard was developed to support new greywater management legislation introduced by the South Australian government in 2008 to help reduce potential risks posed by the discharge of greywater into the Murray River and South Australian waterways.

It is estimated that more than 2000 recreational and commercial vessels operate on the Murray River, many discharging untreated greywater directly into the river, damaging the ecosystem, creating algal blooms and contributing to health risks to human and aquatic life.

Greywater is the wastewater from washing, laundering, bathing and showering. It contains dissolved or undissolved by-products such as fats, oils, food scraps, household chemicals, soap and detergent and bacteria and viruses.

Amongst other requirements, the South Australian legislation (Code of Practice for Vessel and Facility Management) introduces the option of managing greywater through the use of treatment systems installed on vessels. AS 4995 has been developed in just 11 months to assist boat builders, manufacturers, vessel owners and operators in complying with this option.

Based on ISO 8099 Small Craft - Toilet waste retention systems and AS 3542 Pleasure Boats - Toilet waste collection, holding and transfer systems, AS 4995 provides an industry benchmark to minimise the development and installation of substandard units that do not meet the requirements of the legislation.

John Tucker, CEO of Standards Australia, said Standards Australia's work with



A houseboat on the River Murray.

the SA EPA is one of the first projects to be completed under the organisation's Collaborative Pathway for standards development, where both parties share funding and resourcing responsibilities.

"This project is a great example of how Standards Australia can work with government, industry and stakeholders to develop a solution that will bring significant benefits to the broader community," Tucker said.

### *A solution that will bring significant benefits to the broader community*

"New greywater treatment systems built and operated in compliance with AS 4995 will help reduce the negative environmental

and public health impacts caused by untreated greywater released into inland waterways such as the River Murray."

SA EPA Chief Executive Helen Fulcher said the new Standard is an excellent opportunity to use a standardisation process to promote and implement the requirements of the new EPA Code of Practice for Vessel and Facility Management.

"Working with Standards Australia we have created an important new Standard that will deliver real environmental benefits for the River Murray communities and all Australians. The Standard will help greywater treatment system manufacturers develop and install systems that fulfil the requirements of the Code of Practice," Fulcher said.

"Our officers have commenced promoting the new Standard to River Murray boat users and initial feedback has been very positive."

The stakeholders represented on Committee WS-037 are:

- South Australian Environment Protection Authority
- Department of Transport, Energy and Infrastructure SA
- Australian Marine Industries Federation
- Boating Industry Association of SA
- CSIRO
- NSW Maritime Authority
- South Australian Murray-Darling Basin Natural Resources Management Board
- Goulburn Murray Water
- Houseboat Hirers Association SA
- Murray-Darling Basin Commission

Additional interests include the Department of Health, the government of South Australia and SA Water. The work undertaken by WS-037 may be adopted as the basis for future Standards for vessels operated on other waterways. ●

**Source:** Sustainability Matters 14.09.2009  
<http://www.sustainabilitymatters.net.au/news/35469-New-Australian-Standard-now-available-for-greywater-treatment-systems>

**For more information:**  
AS 4995 can be purchased from [www.saiglobal.com](http://www.saiglobal.com)



# Establishing new communities with Class A recycled water

A visionary scheme accommodating the water needs of a growing population

**W**ater Infrastructure Group has delivered a \$7 million Class A Recycled Water Plant at Melton for Western Water. The plant was officially opened on Friday 10 July.

The new Surbiton Park Class A Recycled Water Plant delivers 100% water recycling for Eynesbury Township, the first new town created in Victoria for 100 years. Western Water and Water Infrastructure Group recently received a United Nations 2009 World Environment Day Award for Excellence in Sustainable Water Management for this ambitious and visionary project.

"The greater Melbourne area, like elsewhere in Australia, is facing a considerable challenge to accommodate the water needs of a growing population with our water storages at less than one third of their capacity," said Water Infrastructure Group General Manager, Peter Everist. "This new Class A recycled water plant will help Western Water meet its conservation goals and continue its strategy for integrated water resource management."

***With the drying out of the south-east of Australia comes a particular challenge for new residential developments***

John Wilkinson, Western Water's Managing Director, explained that the project is a model for water sensitive urban design.



Recycled water in use - benefiting community spaces.

"Our Class A plant is able to provide 5 million litres of recycled water daily to Eynesbury for use in toilet flushing, residential garden watering, recreational irrigation and fire fighting, reducing the use of household drinking water by half."

"To accommodate population growth, the plant has a modular design so that it can be easily expanded to deliver up to 15 million litres daily, with potential drinking water savings estimated at more than 4,200 million litres annually by 2030," Mr Wilkinson said.

Water Infrastructure Group will also operate the plant for the next 3 years. The technologically advanced plant features a five barrier treatment, including micro-filtration where the water passes through tubes 1000 times smaller than a human hair; and disinfection of the water with Ultraviolet (UV) light 1000 times more intense than the UV in sunlight.

Water Infrastructure Group designed, built and operates Melbourne Water's Eastern Irrigation Scheme which provides Class A recycled water to the Sandhurst and Hunt Club residential developments in Melbourne's south-east.

"With the drying out of the south-east of Australia comes a particular challenge for new residential developments, and this project provides an excellent model for similar developments being planned right now," said Patricia Collett, Executive Director of the United Nations Association of Victoria, when she congratulated Western Water and the Water Infrastructure Group on this project. ●

**Source:** Surbiton Park Launch – Media Release, 10/7/2009

**For more information:**

Leif Ericson, Corporate Affairs Manager  
Water Infrastructure Group, phone: 03 9863 3503  
lericson@wigroup.com.au



UN World Environment Day awards night (left to right) Alan Shea (WW), Martin Neave (WIGroup), Dorothy Bell (WW), Daniel Haworth (WIGroup), Kevin De Leenheer (WIGroup), Les McLean (WW), Stephanie Gillespie (WW), Leif Ericson (WIGroup).

# Recycled water for urban and industrial use at Appin

A pressure sewerage system is being built to meet community and urban growth demands and transfer effluent for water recycling

The PSP Alliance, consisting of Sydney Water, MWH Australia Pty Ltd, John Holland Group Pty Ltd, United Group Infrastructure Ltd and Manidris Roberts Pty Ltd, has so far delivered seven sewerage schemes on Sydney's outskirts over the past ten years as part of the NSW Government's Priority Sewerage Program.

Sydney Water Managing Director Kerry Schott said the contract was recently extended to ensure construction could start as soon as possible.

"Over the past decade the PSP Alliance has demonstrated it can deliver sewerage schemes on time and on budget to the highest standards and with an excellent safety record and environmental sensitivity," Dr Schott said.

"Staff working on the schemes have become experts in their field and the PSP Alliance has established systems and protocols to ensure the smooth delivery of the schemes.

"The PSP Alliance has already done some planning work on the Appin scheme, and extending the contract will ensure construction work can start on schedule. Issuing a Design and Construct tender would add another year to the project."

Dr Schott said the contract extension meant the PSP Alliance would now be responsible for the design development, cost estimate, detailed design and construction of the Appin scheme.

Planning for the Appin scheme is well underway and assessment process

the environmental started in June.

The new scheme will provide sewerage services for the existing properties in the Appin village and some nearby urban growth, but it has been decided not to build a sewage treatment plant at Appin.

The proposed scheme will include the construction of a pressure sewerage system, with wastewater transferred to the Glenfield Sewerage System at Rosemea-

dow for treatment at the Glenfield Sewage Treatment Plant.

The treated effluent will then be available to be used in an industrial recycled water scheme in the Rosehill, Camellia and Smithfield areas.

Dr Schott said the construction phase would support jobs in the water industry, with an average of 125 people on site each day.

"The project is also estimated to inject up to \$A2 million each year into the local economy through flow on benefits to local suppliers and businesses," Dr Schott said.

Planning work was continuing on a sewerage scheme for the nearby villages of Douglas Park and Wilton, and a preferred strategy was expected to be completed by the end of the year. ●

**Source:** Trenchless Australasia 31/08/2009  
<http://trenchless-australia.com>

**For more information:**  
Call 1800 627 630 or visit the Major Projects section of the Sydney Water website at [www.sydneywater.com.au](http://www.sydneywater.com.au)

*The project is also estimated to inject up to \$A2 million each year into the local economy*

## GOOD READS and website links

### Water in Australia: Facts and Figures, Myths and Ideas. 2nd edition.

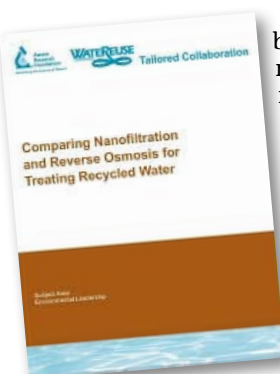
Reviewed, updated and expanded by Chris Davis, this little book contains valuable information on Australia's resources, policy and planning for management of the resource such as with stormwater harvesting or aquifer recharge, and explanations of some of the technologies such as desalination and water recycling. Member price \$25 plus p.& h.

AWA Bookshop [bookshop@awa.asn.au](http://bookshop@awa.asn.au)

### Comparing Nanofiltration and Reverse Osmosis for Treating Recycled Water

By: Jorg E. Drewes, Christopher L. Belona, Pei Xu

The purpose of this study was to explore whether nanofiltration (NF) and ultra-low pressure reverse osmosis (ULPRO) membranes can consistently meet pot-



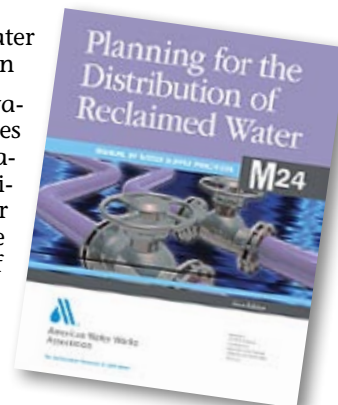
able water quality requirements with respect to total organic carbon (TOC), total nitrogen, and regulated and unregulated trace organic compounds. The goals were also to determine whether or not operating characteristics of NF and ULPRO membranes (such as flux, fouling/scaling, and cleaning frequencies) are comparable to conventional thin-film composite RO membranes and operating feed pressure requirements are significantly lower than conventional RO.

[www.booktopia.com.au](http://www.booktopia.com.au)

### Planning for the Distribution of Reclaimed Water

By: American Water Works Association

This manual of water supply practices provides information to water utilities and water engineers on the distribution of properly treated, non-potable water for applications that do not require potable-quality water, such as irrigation and industrial applications. [www.booktopia.com.au](http://www.booktopia.com.au)





# Wastewater treatment plant being built for brewery

CST Wastewater Solutions is partnering with Global Water Engineering (GWE) to deliver and install a treatment system with best-practice water re-use standards, while at the same time providing renewable energy for Pacific Beverages' Bluetongue brewery in New South Wales.

The \$120 million state-of-the-art brewery now being built on NSW's Central Coast will eventually have an annual capacity of 150 million litres.

The brewery's wastewater will pass several pre-treatment steps before entering a GWE ANUBIX-B anaerobic methane reactor in which the wastewater's organic content (COD) is digested by bacteria in a closed reactor, degrading the compounds and converting them into valuable biogas and cleaned effluent.

This anaerobic treatment will significantly reduce the brewery's carbon footprint by avoiding the release of carbon dioxide into the atmosphere.

Biogas from the process will be collected and re-used as renewable energy to power the brewery's boiler.

Treated effluent will then continue to an aerobic post-treatment stage in which organic content is further reduced by GWE's proprietary MEMMBROX Membrane Biological Reactor (MBR) system.

In the water-polishing step, the water from the MBR unit is sent through a reverse osmosis (RO) installation. Finally, the effluent is led to a disinfection and storage unit, where the recycled water is kept for re-use.

Jean Pierre Ombregt, CEO of Global Water Engineering, said: "It clearly shows large corporations recognise our mature and state-of-the-art renewable technologies as best practice for their sustainable production and future growth."

Michael Bambridge, Managing Director of CST Wastewater Solutions, said:

"Environmental initiatives such as green energy generation from wastewater treatment do not always get as much attention in Australasia as the more

traditional renewables, such as solar and wind. In fact there is a huge, often hidden, potential in using wastewater as a source of renewable energy. Global Water Engineering (GWE) encourages businesses with organic content in their wastewater and waste streams to investigate the anaerobic potential for their specific case. The technologies involved are highly applicable to Australia and New Zealand." •

Source: August/September 2009 - Sustainability Matters 9  
[www.SustainabilityMatters.net.au](http://www.SustainabilityMatters.net.au)

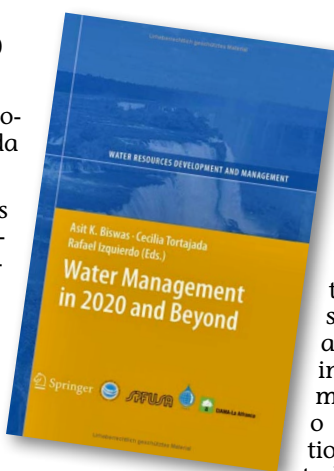


## GOOD READS and website links

### Water Management in 2020 and Beyond

Edited by: Rafael Izquierdo-Avino and Cecilia Tortajada and Asit K. Biswas

Food production accounts for 90% of water use in developing countries. Hydro-power production evokes emotions; yet sustainable energy production is among cornerstones of economic development. The damages caused by floods and droughts are escalating all over the world. The human impacts on ecosystems are increasing as well. Water is largely a political good since a bulk of the mankind lives in river basins shared by two or more nations. These complexities are approached in



the book in depth. The analyses include consideration of how developments in seemingly unrelated processes and sectors such as globalisation, free trade, energy, security, information and communication revolutions, health-related issues such as HIV/AIDS, as well as emerging developments in sectors that are linked more conventionally to water, such as population growth, urbanisation, technological development, agriculture, infrastructure, energy, management of water quality and ecosystem health, are likely to affect water management in the future.

[www.booktopia.com.au](http://www.booktopia.com.au)

### Sewage Treatment: Uses, Processes and Impact

By: Anna Stephens, Mark Fuller

This book provides current studies and research on the treatment and use of sewage. Using this material as a fertilizer can benefit the environment by turning wastes into valuable resources. These sludges would otherwise have to be disposed of by landfilling, lagooning, incineration, or ocean dumping. On the other hand, heavy metals sometimes found in sewage sludge may present environmental problems as there is filtration of metals towards the aquifers which get contaminated. This book addresses these concerns as well as benefits.

[www.fishpond.com.au](http://www.fishpond.com.au)



# Engineering project in USA on water reuse and supply gets \$2M USD in funding

**Developing a water management computer model to ensure minimal energy use while meeting increased demand for water.**

Professor Kevin Lansey, head of the department of civil engineering and engineering mechanics at The University of Arizona, and four of his UA colleagues have been awarded \$2 million by the National Science Foundation to research water reuse and supply systems.

The NSF's Office of Emerging Frontiers in Research and Innovation is funding the research project – Optimization of Dual Conjunctive Water Supply and Reuse Systems with Distributed Treatment for High-growth Water-scarce Regions – which will ultimately produce a computer model for water managers who are grappling with the problem of using less energy while meeting increased demand for water.

The U.S. Government Accountability Office has reported that as many as 36 states will experience a water shortage in the next five years. This research project is particularly relevant to the serious problems faced by water managers in Arizona, which is already experiencing explosive population growth coupled with drought. Arizona's surface-water supplies, especially near urban areas, are all spoken for, and many communities rely on water pumped up from aquifers. Such a resource is unsustainable, and some of Lansey's research revolves around the question of how willing we are to reuse wastewater and to what extent.

"In water-scarce areas, people will eventually have to use reused water as part of their water supply," said Lansey. "And now the question is how much further people will use it."

Lansey defines the research project has having three goals, or three costs, what he describes as a "triple bottom line." They are, he said, "economic cost, environmental cost – which includes energy



consumption and greenhouse gas production – and social costs, or social acceptability."

The research group will work with the City of Tucson, Pima County and Global Water, a private water provider. Based on Lansey's proposed model of decentralized, distributed water treatment plants, it is apparent that Tucson is doing things the hard way.

***In water-scarce areas, people will eventually have to use reused water as part of their water supply***

Tucson has two wastewater treatment plants within a mile of each other in the northeast part of the city. One of the

problems with clustering facilities in this way is the prodigious amount of energy required, and greenhouse gases emitted, to move the vast volumes of water around the city between consumers and treatment plants.

Golf courses or individual households, or even fire-fighters, in Vail may want to use recycled water because they expect it to be cheaper than 'clean' water. However, pumping all that water back to Vail for reuse makes every drop virtually as costly as fresh water.

This is the problem at the heart of Lansey's research project, and where the computer-modelling tool will play a role.

"Instead of having one centralized plant, choose a decentralized design," said Lansey. "You could have multiple satellite wastewater treatment plants based on a dual distribution system that provides

potable water for consumption and non-potable water for reuse."

Lansey's group will look at where to locate these decentralized plants. The group will also consider how to make such systems reliable, and how to ensure that the water being served is of the appropriate quality. "We're going to show what's cost-effective at what scale," said Lansey.

Parallel increases in drought and population mean hard choices ahead for residents of the Southwest. Reusing water means not allowing it to flow back into the environment.

In Tucson, for example, the water treatment plants release between 30 and 40 million gallons of water a day into the Santa Cruz River, which supports an endangered riparian cottonwood-willow ecosystem that is home to many other threatened or endangered species.

"If you start taking that water and reusing it for different purposes," said Lansey, "you have a trade-off between how much to supply for environmental purposes versus how much for human uses."

In the desert Southwest, Lansey can see the day coming when demand for clean drinking water makes it a costly commodity. "We either accept expensive water or we leave the desert," he said. ●

**Source:** The University of Arizona Campus Sustainability 29.07.2009

**For more information contact:** Kevin Lansey  
lansey@email.arizona.edu  
[www.sustainability.arizona.edu](http://www.sustainability.arizona.edu)



# Business case finds large-scale recycled water projects too expensive

**Eastern Treatment Plant provides an example of a localised, cost effective recycled water project**

The Brumby Government will focus on localised, cost effective recycled water projects after a business case found large projects would have cost up to \$3.8 billion adding substantially to Melbourne household's water bills.

The Government rejected two large-scale recycled water projects after the business case found they did not deliver value for money for Melbourne water users.

The Latrobe Valley option, to substitute recycled water to cool power stations, would have cost approximately \$3.8 billion and used 67 billion litres of recycled water. The Yarra River option, to substitute river flows with recycled water, would cost approximately \$2.1 billion and used 60 billion litres of recycled water and had environmental and water quality risks.

Water Minister Tim Holding said "Building these large recycled water projects would have a significant additional impact on Melbourne household water bills, which is not appropriate in the current economic climate."

"It is disappointing that these large projects have proved too expensive, however there are limits on how much water bills should increase to pay for water projects."

"In 2002, the Government committed to recycling 20 per cent of Melbourne's wastewater by 2010. We reached this target two years ahead of schedule and in 2007/08 we recycled 23.2 per cent of our wastewater," Mr Holding said.

Mr Holding said Melbourne used 66.7 billion litres of recycled water in 2007/08

– almost three times the next closest Australian city.

"Recycled water will be increasingly used for a range of purposes including industry, agriculture, sportsgrounds, open spaces and residential housing developments," he said.

An example of a cost effective, localised recycled water project is the upgrade of the Eastern Treatment Plant which will provide Class A recycled water to Melbourne's south-east and clean up water discharged at the ocean outfall at Gunnamatta.

New projects and projects underway would use around 7 billion litres of Class A recycled water from the completion of the Eastern Treatment Plant upgrade in 2012.

## *Project will use 7 GL of recycled water*

Melbourne Water recently completed 12 months of trials at the Eastern Treatment Plant into the best method for

improving the quality of treated effluent, to satisfy environmental standards under its licence.

Melbourne Water Managing Director Rob Skinner said the trial findings and preferred treatment approach would be provided to EPA Victoria in the coming weeks.

"The upgrade of the treatment plant will significantly reduce the impact of treated effluent on the marine environment at Gunnamatta, as well as creating a new source of recycled water," Mr Skinner said.

From 2012 the following projects will utilise Class A recycled water from ETP:

- Boneo Recycling Project will receive 1.6 billion litres (and an additional 1.6 billion litres from Boneo Treatment Plant) for market gardens and for public open spaces;
- Casey Residential Project will receive up to 2.8 billion litres for dual pipe systems including the Hunt Club Estate;
- Dandenong Recycling Scheme to receive around 800,000 litres for industry, households and public open space;



**Mornington Peninsula Race course to benefit from Mornington Recycling Project.**

- Officer and Berwick South Project to receive 1.3 billion litres for dual pipe systems;
- Mornington Recycling Project to provide 300,000 litres to irrigate the Mornington Racecourse and public open spaces (instead of Class C recycled water).; and
- Frankston Community Recycling Scheme to receive 700,000 litres for public open spaces (instead of Class C recycled water).

South East Water and Melbourne Water have identified potential projects to use up to 40 billion litres over the next thirty years, which will continue to be investigated as the Eastern Treatment Plant is completed. ●

**Source:** Minister for Water Media Release 26.06.2009  
[www.premier.vic.gov.au](http://www.premier.vic.gov.au)

### **For more information:**

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# Innovative water recycling in Singapore eco-tower

**Proposed building claims 55% water self sufficiency based on collection of rainwater and greywater reuse throughout building.**

The designers (T R Hamzah and Yeang) claim the building will have a 55% water self sufficiency based on collection of rainwater and greywater reuse throughout the building.

Singapore has long been a champion of water recycling, given that the country is heavily reliant on neighboring Malaysia for fresh water sources. Within Singapore, the main source of freshwater is from direct rainfall.

The Editt Tower exemplifies rainwater harvesting and 'water self sufficiency' at the building scale. The rainwater-collection system will be comprised of 'roof-catchment-pans' and layers of 'scallop' located at the building's facade to catch rain-water running off its sides.

According to the architects, "continuous vegetation throughout the building will also act as a gravity-fed water filtration system for greywater. Water flows through gravity-fed water-purification system, using soil-bed filters.

The filtered-water accumulates in a basement storage-tank, and is pumped to the upper-level storage-tank for reuse (e.g. for plant-irrigation and toilet-flushing). Mains water is only here for potable needs." Reliance on air-conditioning will be reduced through strategic use of ventilation, ceiling fans and water misters.

Sewage will also be treated within the building to create compost (fertilizer for use elsewhere) or bio-gas fuel. Aside from this innovative approach to water reuse and efficiency at such a large building scale, design features include an emphasis on place making, adaptability of the building design to future retrofitting and adjustments, by enabling removable partitions and floors depending on desired uses i.e. commercial retail space to residential or office use. ●

For more information: [www.trhamzahyeang.com](http://www.trhamzahyeang.com)



Concept model of the Editt Tower.

## Host named for new water recycling centre of excellence

**Helping to develop and commercialise new water recycling technologies.**

Western Corridor Recycled Water Pty Ltd will receive \$20 million over five years to host the National Centre of Excellence in Water Recycling in Brisbane.

The announcement of the Centre was made by the Minister for Climate Change and Water, Senator Penny Wong.

"As we tackle the challenges associated with climate change, the Government is committed to supporting state governments and local communities as they identify new ways to secure their urban water supplies," Senator Wong said.

"The Government is providing \$1.5 billion towards new water infrastructure projects to help take the pressure off mains water supplies and provide cities and towns with alternative sources of water that are less dependent on rainfall.

"Many communities around Australia are considering new water supply options including stormwater harvesting, desalination and water recycling."

Senator Wong said establishing the National Centre of Excellence in Water Recycling would help develop and commercialise new water recycling technologies.

"Today's announcement honours an election commitment to contribute \$20 million over five years to a Centre of Excellence in Water Recycling in Brisbane," Senator Wong said.

Western Corridor Recycled Water is owned by state authority WaterSecure. WaterSecure chief executive officer, Keith Davies, said the expertise of the Centre's partners and connections with national and international academia, industry and technological providers would ensure that Australia is recognised as an

international leader in water recycling research.

"Our key focus is to bring together, under one Centre of Excellence, parties from around Australia with an interest in developing and commercialising breakthrough water recycling technologies, and finding solutions to our water issues in a collaborative and pioneering environment," Mr Davies said.

"This is a great coup for South East Queensland, a region that is more than familiar with the effects of serious water shortages and water challenges."

Western Corridor Recycled Water Pty Ltd will host the centre with involvement from founding partners University of Queensland, Griffith University, University of New South Wales and the Commonwealth Scientific and Industrial Research Organisation (CSIRO), along with industry partners including Veolia Water Australia Pty Ltd and GHD Pty Ltd.

The centre is expected to start work later this year. ●

For more information about the Centre of Excellence see: [www.environment.gov.au](http://www.environment.gov.au), or call 1800 218 478. Sara Collins, Corporate Communications – Water Secure phone 07 3015 9773 [www.watersecure.com.au](http://www.watersecure.com.au)

# Stormwater the last resource?

## Is stormwater the last source of 'new' urban water?

President of the Stormwater Industry Association, Stephen Frost, writes that Australia's worsening water shortage is prompting an increase in efforts to harvest stormwater run-off in our towns and cities. There seems to be a consensus in the Stormwater Industry Association (SIA) that a range of strategies is needed to address the issues effectively, which include sourcing, harvesting, managing and use of stormwater. As urban growth increases the pressures already placed on our ability to provide essential water supplies for our population, waterways and ecosystems will increase.

We need to innovate further and new thinking is needed to meet the future demands. The CSIRO maintains that 97% of our urban runoff and 86% of effluent water is unproductive. It argues the case for the reclamation and reuse of stormwater, treated sewage effluent, treated industrial discharge and 'grey' (household) wastewater to better deal with water shortages in this, the driest inhabited continent on earth.

Low dam levels and ever-growing populations continue to place pressure on our limited potable water supplies. There is a growing focus on alternative water supply options. Desalination, large-scale wastewater reclamation, sewer mining and stormwater harvesting, are subjects of growing interest to find additional and even alternative solutions to traditional water supplies.

Stormwater harvesting is increasingly one of the main areas of interest and funding in the stormwater industry. Many examples of projects involving stormwater capture, treatment, storage



and reuse are being presented to industry by private and public organisations.

The Australian Government is providing substantial funding to provide the impetus to the implementation and research. This is essential for "proof of concept" before stormwater harvesting becomes common practice.

### Creating Water Sensitive Cities

The Australian Government's long-term aim through its National Water Initiative is to create 'Water Sensitive Cities'.

### *The promise of increasing the resilience to the impacts from climate change*

There is a growing groundswell of support from organisations like the SIA researchers, state government agencies and local government,

who wish to facilitate progress towards achieving a 'Water Sensitive City'.

The concept of Water Sensitive Cities sets an evolutionary framework for urban water management, which includes decentralised solutions that allow the development of adaptive multifunctional infrastructure and urban design, which reinforce water sensitive behaviours.

A Water Sensitive City holds the promise of increasing the resilience to the impacts from climate change.

It is in this context that this article touches briefly on the wider benefits of stormwater harvesting within an integrated water management framework.

Some of the benefits of stormwater harvesting are:

- **Reduced potable water demand:** The volume of stormwater generated in Australian cities equals or exceeds the current demand for potable water. Sustainable stormwater solutions have the potential to harvest rainfall and runoff to provide water to supply a range of "fit for purpose" internal and external water needs.

- **Reduced flood risk:** Traditional drainage treatments will come under increasing pressure to cope with greater amounts of runoff from extra impervious surfaces due to development and population pressures. Sustainable stormwater solutions that reduce the amount of runoff through infiltration, harvesting and retention will reduce the flood risks.

- **Improved stream health:** Pollution from urban runoff and the amount of stormwater generated in urban catchments are recognised as major factors that degrade our waterways. Sustainable stormwater solutions can reduce the amount of runoff and treat stormwater through Water Sensitive Urban Design to remove pollution and restore the health of urban waterways.

- **Social and aesthetic amenity:** Modern cities have evolved to disconnect people from natural landscapes. Stormwater solutions that incorporate landscape features and treatments will enhance the urban landscape amenity.

- **Reconnecting people to the natural environment in an urban context** has important social and community health outcomes.

- **Increased biodiversity and urban habitat:** Sustainable stormwater solutions that incorporate water sensitive Urban Design principles can be used as an opportunity to provide landscape features, which increase biodiversity and urban habitat.

- **Improved urban climate:** Modern cities contribute to the urban heat island effect. Sustainable stormwater solutions have the potential to play a part in cooling the urban climate and reducing energy demands.

- **Rural and urban water equity:** Stormwater solutions that are effectively implemented and promoted

continued page 13



result in greater awareness by urban dwellers of the water cycle impacts. By effectively managing and utilising urban stormwater as a resource, it has the potential to redress some of the perceived inequities between rural and urban water users.

### Impediments to stormwater harvesting

A number of impediments to providing cost effective stormwater harvesting systems are evident including the following:

- **Price of potable town water:** The current price of potable town water does not compare favourably to the cost of harvested stormwater. Storage costs: The capital costs of providing storages that are also local (to reduce the cost of transport) do not compare well, at today's price of water.
- **Institutional impediments:** Some examples include historical issues that have led to stormwater being "decoupled" from other water sources; legislation, organisational structures and administrative relationships which all pose impediments to varying degrees.
- **Technology:** Constant improvement is likely to address the majority of the health and safety concerns around removal of stormwater pollutants and other contaminants so that the water is "fit-for-purpose".
- **Governance issues:** A primary impediment; issues concerning the ownership and operation, cost and public perceptions of reusing harvested water.
- **Understanding the value of stormwater:** traditionally stormwater has been undervalued as a resource and seen as a nuisance to be disposed of.

An excellent report discussing the impediments to water reuse, including stormwater was prepared in 2004 by the CSIRO, authored by Darla Hatton MacDonald and Brenda Dyack from Policy and Economic Research Unit. The key points made by the authors are that the issues can be categorised in number of themes concerning consumer perceptions and economics of the reuse market; property rights; governance; health and safety; environment protection guidelines; and research development.

The National Urban Water Government Program provides a similar scenario in recent study, where they explored institutional barriers and drivers for uptake of alternate water supply solutions.

Ultimately, Hatton McDonald et al suggest that it is necessary to define property



rights along the full length of the hydrological cycle, as this will be the only way to reduce uncertainty for private investors. They suggest: "who owns stormwater is not well defined though responsibility for managing the water is straightforward and defined. With the encouragement of full cost pricing, water restrictions and catchment planning and management, the issue of stormwater is likely to become a more interesting question."

At some point in the future, many of these impediments will inevitably change as the price of potable water and continuing restrictions move the balance further in favour of the harvesting option.

### Conclusion

Storm water may well be the 'last resource'. It has been undervalued and traditionally seen as a nuisance to dispose of as quickly as possible.

As water becomes scarcer, the value of harvesting and reusing stormwater inevitably increases and its value as a resource is redefined. As more stormwater harvesting schemes become operational the industry will learn many lessons on

how to operate, manage, and main: these schemes. The industry will also learn how to minimise health risks, liability and water supply shortfall potential.

However, there are gaps in our understanding of the administration, operational and ownership models. From the technology side, it is possible to achieve very good quality water in copious amounts. ●

**Source:** Based on extracts from an article published in Public Works Engineering June/July 2009 prepared by Stephen Frost. Stephen Frost wishes to acknowledge substantial contribution of Murray Powell President of SIANSW and Andrew Allen President of Stormwater Victoria, for input to this article.

## Sydney Water new sustainable offices

### Recycling, water and energy efficiencies

The NSW government has moved 1400 jobs to Parramatta with the official opening of Sydney Water's headquarters in May. The building at One Smith Street, Parramatta (built and owned by Brookfield Multiplex), was designed to achieve a 5-star green rating.

Water Minister Phil Costa said Sydney Water had moved from an ageing CDB office block to a modern, water- and energy-efficient office building. "This is a fitting headquarters for Sydney Water and an excellent example of an environmentally sustainable workplace," he said.

The building is designed to use 75% less drinking water than a standard office building and reduce carbon emissions by about 30%. Using less water reduces the flow of wastewater to the sewerage system by up to 90%.

An on-site water recycling plant provides recycled water for toilet flushing and cooling towers. A 100,000 L rain-water tank provides additional water for toilets and cooling towers. Solar panels supplement hot water requirements. The building also includes water-efficient toilets, showers and taps, and water and energy use is monitored to ensure ongoing efficient use of the building.

A chilled beam air-conditioning system is used instead of conventional air conditioning, which reduces energy use. It works by running chilled water through cooling elements in the ceiling. Rising warm air is cooled by chilled beams and then descends, due to natural convection.

Located next to public transport, the building has showers, bike racks and other facilities to encourage staff to commute in a more sustainable way. ●

**Source:** Sydney Water Corporation  
Phone: 13 20 92  
[www.sydneywater.com.au](http://www.sydneywater.com.au)



# 16 EVENTS diary dates

## Australia



### Sustainability Implementation: Actions and Tools for Change National Workshop Series

Melbourne: 17-19 November 2009  
Brisbane: 16-17 February 2010  
Perth: 24-25 March 2010

AWA, in collaboration with EcoSTEPS, is pleased to announce a unique and first time program designed to help participants discover leading edge skills, tools and actions that can be used to improve organisational sustainability, enhance project performance and uncover new business opportunities.

Five modules presented over two days, will cover:

- Sustainability Theory
- Sustainability in Practice
- Effective Engagement Strategies
- Implementing Sustainability, and
- Sustainability Reporting

Designed with even the most experienced sustainability professional in mind, this action orientated program is set up to facilitate cross-learning and networking among participants. With a limit of only 30 participants per workshop, it will be a unique opportunity to extend your sustainability network.

To download the shortcourse flyer:  
[www.awa.asn.au](http://www.awa.asn.au)

### IWES Short courses in 2010

3-27 November 2009, Perth and 15-19 February 2010, Sydney

IWES now has registration open for its short courses in water, wastewater treatment and environmental management both in Perth later this year and Sydney in 2010.

From principals in wastewater treatment and membrane plant design, to seawater desalination and beyond, IWES has many different courses on offer suitable for a variety of industries and professionals.

Visit IWES website at [www.iwes.com.au](http://www.iwes.com.au) for further information about the program.



### AWA master class: disposal and reuse of water treatment wastes

30 November - 1 December 2009, Sydney.

As regulators tighten discharge requirements and landfill sites are closed or removed far from urban centres, pressure builds on water utility and industry service providers on finding viable, technical solutions. Top of the list needs to be the focus on sustainable solutions - reuse, re-constitution or re-deployment of a waste product - so that the process is seen as a value-add rather than an expense for any institution or utility.

For more information:  
[www.awa.asn.au](http://www.awa.asn.au)

### Master Class: Desalination Operations and Maintenance

2-4 February 2010, (3 days) Citigate Hotel, 169 Thomas Street, Sydney

The drinking water supplies to Australia's largest cities are beginning to benefit from the construction and operation of large seawater desalination plants following a belated recognition that the demand for water, particularly in the capital cities was outpacing the traditional replenishment by rainfall and floods. Large urban plants are operating in Perth and on the Gold Coast, and will others will shortly supply Sydney, Adelaide and Melbourne. Inland, smaller desalination units are important for mining sites, regional towns and remote farming businesses.

All of these plants need to be manned by skilled operators and managed by engineers and scientists who understand the technology, how it works, what can go wrong and how to solve any problems to ensure continuity of supply.

For more information:  
[www.awa.asn.au](http://www.awa.asn.au)

## ozwater'10

08-10 March 2010 • brisbane

### OzWater'10 Achieving Water Security

8-10 March 2010, Brisbane Queensland

Delegates will have the opportunity to see for themselves or participate in discussion on: the South East Queensland Water Supply Grid; operation of a significant desalination plant; the largest recycled water scheme in the country designed for Indirect Potable Reuse of water and third largest in the world; new regulatory systems for Indirect Potable Reuse of water; implementation of one of Australia's most

successful demand management campaigns; innovative approaches to water management in the urban environment; outputs from a significant water security research agenda; new approaches to water utility and regulatory institutional arrangements; leading edge approaches to water resource planning and provisions for environmental flows; successful examples of improving the health of waterways and estuaries, and more.

Registration is now open.

For more information:  
[www.ozwater10.com.au](http://www.ozwater10.com.au)



### Irrigation Australia Expo and Conference

June 2010, Sydney

The only conference event that involves the entire value chain of the irrigation industry, it is a unique opportunity for all sectors of the industry to interact, exchange information and hear about the latest developments in the industry. From irrigators to water supply authorities, from system designers to suppliers, from manufacturers to researchers, they will all be there. There is a full program with concurrent streams to ensure all interests are fully covered.

If you are involved in the irrigation industry, you should be there.

For more information:  
<http://www.irrigation.org.au>

### International Conference on Integrated Water Management

2 - 5 February 2011, Environmental Technology Centre Murdoch University, Perth WA

The conference will discuss and explore new and innovative methods of treatment, better understanding and assessment of resources and their supporting ecosystems, proper management for conservation and approaches to achieve the dual aim of economic development and ecological sustainability. The focus is the necessary infrastructure to provide good quality water, in sufficient quality, in the most sustainable manner.

For more information:  
[www.etc.murdoch.edu.au](http://www.etc.murdoch.edu.au)





# EVENTS

# diary dates

## International



### International Desalination Association (IDA) World Congress

7-12 November 2009, Atlantis Resort, The Palm, Dubai, UAE.

"Desalination for a Better World," 5 day technical program with more than 300 presentations and 4 specialised workshops featuring the latest in desalination and water reuse.

For more information see:  
[www.idadesal.org](http://www.idadesal.org)

### Water Expo China

18-20 November 2009, Beijing Exhibition Centre, Beijing, China

Supported by China's Ministry of Water Resources, the expo aims to provide networking opportunities and showcase the latest technologies for water treatment, conservation and environmental management applications.

For more information see:  
[www.waterexpochina.com](http://www.waterexpochina.com)

### Water Harvesting, Storage and Conservation WHSC 2009

Kanpur, Uttar Pradesh India 23-25 November 2009

IIT KANPUR is organizing an international conference to foster coordination amongst various stake holders and bring together experts of national and international repute on the subject to share their knowledge and experience.

The three day conference is expected to pave way for producing compendium of technological options, policy guidelines and implementing mechanisms for water-harvesting, storage and conservation.

For more information:  
[www.iitk.ac.in](http://www.iitk.ac.in)

### 15th Water Conservation / Xeriscape Conference and Expo – The land use water use connection

25-26 February 2010, Albuquerque New Mexico United States

The aim of the conference is to challenge and inspire the water and environmental community by sharing knowledge and best practice, which is at the heart

of meeting key global challenges. The 2010 Conference will focus on Land Use – Water Use Connections, from the urban core/suburban with New Urbanist Doug Farr and UCLA's Environmental Health Professor Dr Richard Jackson to the rural/natural. Three of this country's most renowned water experts Peter Gleick, Sandra Postel and Robert Glennon will also participate. Dr Isobel Heathcote, Environmental Scientist and Environmental Engineer from the University of Guelph – Toronto, will address watershed management.

For more information:  
<http://www.xeriscapenm.com>



### ensis: The New Zealand Land Treatment Collective Annual Conference

17-19 March 2010, Dunedin New Zealand

The most important date on the LTC calendar is the annual conference. It provides members and delegates with the opportunity to meet and discuss research, engineering, legal, community and practical issues related to land treatment of waste products. It provides a unique and relaxed environment where researchers, consultants and government organisations can mix freely, share ideas, develop contacts and provide future directions for land treatment of waste products in New Zealand. Non-members are most welcome to attend the conference, but will pay a full conference attendance fee.

For more information:  
[www.ensisjv.com](http://www.ensisjv.com)

### Sustainable water management conference and exposition

11-14 April 2010 Albuquerque, New Mexico United States

Hosted by the American Water Works Association, themes include: Impacts of water conservation on alternative water supplies; Distribution efficiency solutions to stretch existing water supplies; Technology Solutions to lower customer demands; Managing water distribution systems to conserve water supplies; Demand management solutions in response to the Obama Administration's agenda and a changing water supply paradigm.

For more information:  
[www.awwa.org](http://www.awwa.org)

### Water & Environment 2010 CIWEM'S annual conference

28-29 April 2010, Olympia Conference Centre London United Kingdom

In April 2010 CIWEM will hold a two-day Annual Conference that will address multidisciplinary issues across all areas of the global water and environment sector. There will be a mix of keynote speakers, offered papers, exhibitions and networking opportunities that will make this the key event for water and environment professionals.

For more information:  
[www.ciwem.org](http://www.ciwem.org)

### 2010 International Symposium on Waterborne Pathogens

2-4 May 2010, Manhattan Beach California United States

The fifth in a series of symposia addressing waterborne pathogens, this event will provide a comprehensive forum for the exchange of up-to-the-minute information and cutting edge ideas relating to this critical public health issue. Special areas of concern includes sources of pathogens, detection methods, outbreak investigations, new water and wastewater treatment technologies, and public health effects, treatment, and communications.

For more information:  
[www.awwa.org](http://www.awwa.org)



### IWA World Water Congress and Exhibition

19-24 September 2010, Montreal Canada

'Water - the lifeblood of the world' is the theme for the IWA World Water Congress & Exhibition, the Association's main biennial event, is a valuable and unique opportunity for the community of world-leading water professionals to meet, exchange ideas, explore the state of the art and debate the key issues underlying the science and practice of water. It is also where the entire water community congregates and in particular IWA specialist groups showcase their work and plan for future activities.

For more information:  
[www.iwa2010montreal.org](http://www.iwa2010montreal.org)

# Beijing bans tap water use on urban parks

**Urban landscape features such as fountains and man-made lakes will be prohibited from using underground water or tap water.**

Encouraging the use of recycled water is one of the highlights in the new measures. According to the regulations, the use of rainwater and recycled water should be prioritized in order to preserve Beijing's ecological environment, and urban water attractions will be banned from using underground water or tap water. To encourage the use of recycled water, the government at various levels will formulate policies and take action to develop users of industrial recycled water and expand the use of recycled water in agricultural irrigation. The regulations also stipulate that within the coverage of recycled water distribution networks, water used for landscaping, sanitation and construction projects must be recycled water.

Sources of surface drinking water will also be better protected. According to the regulations, vehicles loading with poisonous and or hazardous substances will not be permitted to enter water protection zones; cage-breeding of fish will be banned; water-related tourism, swimming or other types of activities that may cause water pollution will be prohibited. Personnel who organize water-related tourism activities in water protection zones or engage in cage-breeding fish will be fined 20,000 to 100,000 yuan. Any individual who goes swimming or fishing

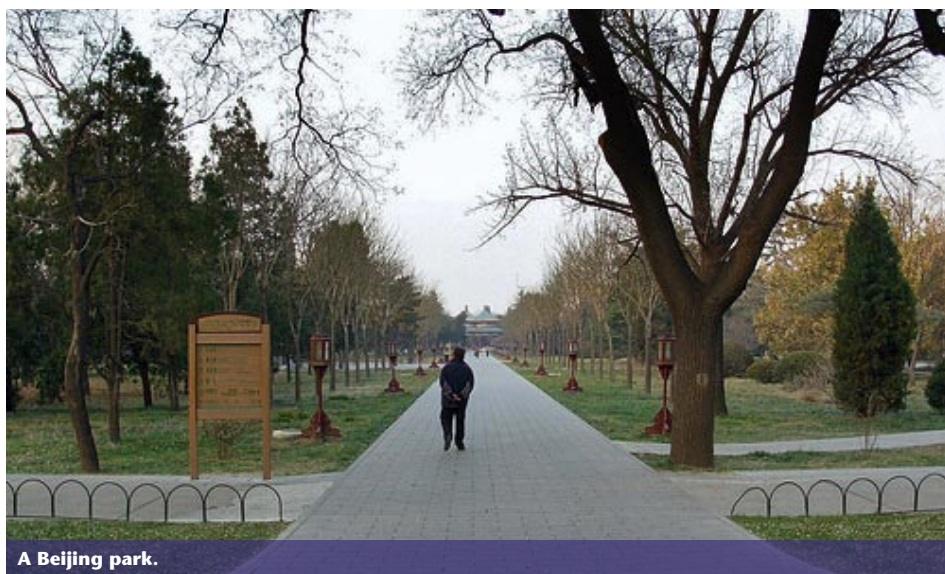
in the first-grade protection zones, which are used as a source of drinking water, will be fined 500 yuan or below.

In addition, the regulations also specify a compensation system for those riverside districts and counties located downstream of polluters. If the districts and counties located upstream fail to meet the water quality targets that will be tested from the banks at various parts of stream, the

people's governments there will pay compensation to their neighbouring districts or counties located downstream, who are the ones that will be affected by the polluted water.

In order to finally improve the ecological and environmental water situation, Beijing will also put a limit on total water consumption to gradually achieve a balance between water consumption and water resources. ●

Source: CCTV  
[www.cctv.com](http://www.cctv.com)



A Beijing park.

## NEWS innovations & information

### Australia wide

#### Budget funds water project grants

Funding for a previously-announced \$200 million program that will provide funding for councils' stormwater harvesting projects has been confirmed in the 2009-2010 Federal Budget. Local, state and territory governments, public water utilities and private companies were all eligible to apply for funding from the program, which will fund up to 50% of eligible capital costs for each project through grants or refundable tax offsets. To be eligible for funding through the new program, a stormwater recycling project must cost at least \$4 million. Funding will be capped at \$20 million per project. The funding for the program is sourced from the Rudd Government's National Urban Water and Desalination Plan.

Source: Public Works Engineering, June-July 2009

### Western Australia

#### Perth as host city for IDA World Congress 2010

The International Desalination Association (IDA) has announced that Perth will be the host city for the 2011 World Congress on Desalination and Water Reuse. This marks the first time that the IDA World Congress will be held in Australia. An industry consortium led by the AWA and Water Corporation was successful in securing this major international water event for Australia.

Source: AWA Water E-News 14/09/2009

#### Recycled water to ease demand on Margaret River

Water taken from the Margaret River will soon be reduced, with construction beginning on the town's new water recycling project. The \$3 million Margaret River water recycling project will use treated

waste water, instead of river water, to irrigate the town's parks, gardens and golf course. The Augusta-Margaret River Shire's Wayne Pragnell says the project will create a long-term sustainable water source for the town's public open spaces. "It's also quite exciting because it will allow us much better access to water to improve the quality of our sporting fields and parks and gardens and give us that growth in our water supply as we look to improve our facilities as the population of the region grows," he said. The project is set to be up and running by early next year.

Source: ABC News Online 15/10/2009





## Queensland

### Sarina in need of new sewage plant says council

The Mackay Regional Council has agreed Sarina needs a new sewage treatment plant by 2013, with four possible locations currently being investigated. Possible sites being investigated are north-east of the golf course, a site off Brooks Roads, a block of Queensland Rail land and upgrading the current site at Brewers Road is also an option. Councillor Karen May says she hopes the project will be able to recycle water for use on community lawns, as well as the golf course which already receives treated water. "Depending on the location of the new sewage treatment plant will determine how much it costs to be able to recycle that water back to the township of Sarina in the garden and the Field of Dreams parkland area," she said. Council says the current plant is inadequate because it is too close to urban developments and Sarina's population is expected to double in the next 20 years.

Source: ABC News Online 24/09/2009

### Expanding the Pulgul Farm Recycling Scheme

The Fraser Coast Regional Council is to receive almost \$1 million in state government funding to expand the Pulgul Farm recycling scheme. The project, which uses treated water in cane fields and woodlands, will receive "a new pump, pipes and trickle irrigation network, with Minister Boyle pointing out there were many flow-on benefits to the community".

Source: Local Government Minister's media release 17/9/2009

<http://statements.cabinet.qld.gov.au>

### Warwick Sewerage Upgrade Bringing Benefits

Ms Boyle has advised that the nearly completed \$5.25 million upgrade of the Warwick Sewerage Treatment Plant has already passed on benefits to the local community, with the improved recycled water outflow from the plant being used on "town parks, the race course, golf courses and school playgrounds".

Source: Local Government Minister's media release 21/09/2009

<http://statements.cabinet.qld.gov.au>

### Holiday Resort Fined for Poor Sewage Management

Illawong Lakes Resort managers, Zaps and Sons Pty Ltd, and the resort's body corporate, have been fined \$40,000 each for extensive breaches of the conditions of their operating licence. Officers of the Department of Environment and Resource Management found "a range of

problems including poor effluent quality, insufficient monitoring and poor disposal of treated effluent by irrigation to land". The parties pleaded guilty to contravening their environmental licence conditions and for non-compliance with environmental protection orders issued in 2005 and 2007.

Source: Climate Change and Sustainability Minister's media release 21/9/2009  
<http://statements.cabinet.qld.gov.au>

## South Australia

### Stormwater plan will ease drain on Murray

A key element of one of SA's largest stormwater recycling projects has been approved. The Christie Creek upgrade, a major component to the first stage of the Water Proofing the South plan, includes building a storage dam to hold 80 megalitres of water for irrigation use.

Source: The Advertiser

For full story see: [www.news.com.au](http://www.news.com.au)

### Housing Development Adopts Recycled Water

Acting Water Security Minister Jay Weatherill has announced that a new housing development at Northgate will be drought-proofed via a 1.8km pipeline that will carry recycled water from the Salisbury wetlands to a purpose-built pumping facility. "Under this initiative, every home built at Lightsview will be plumbed with a purple pipe for recycled water," the Minister said. The Lightsview housing development, a joint venture between the state government and Canberra Investment Corporation, will use the recycled water for flushing toilets and garden irrigation as well as parklands, but not for consumption, household use or swimming pools.

Source: Acting Water Security Minister's media release 14/9/2009  
[www.ministers.sa.gov.au](http://www.ministers.sa.gov.au)

### New plans released for Concordia

The masterplan for a multi-billion-dollar town of more than 18,000 homes and 46,000 people, earmarked for Adelaide's north, has been released.

Macquarie Group's land development arm, Urban Pacific, has drawn up the masterplan to expand the little-known town of Concordia, east of Gawler. About 2500ha of farm land would be developed over a 40-year period but, contingent on state planning approval, work could start as early as 2011 with the first houses available in 2012.

Among the features proposed for the town is a wastewater treatment plant

to provide recycled water for irrigation. "The vision for the new Concordia township is to create a large-scale sustainable and largely self-contained new town," said the submission, prepared by Jensen Planning and Design on behalf of Urban Pacific. Construction of the town would require the State Government to rezone the land from rural to urban.

Barossa Mayor Brian Hurn said the council had been aware of the project for "quite some time" and supported the establishment of a new town centre at Concordia. "What the council has said is that we need to have some further information and further investigation into the detail," he said.

Source: AdelaideNow.com.au 18/10/2009

### CSIRO Convert Stormwater to Drinking Water

The Commonwealth Scientific and Industrial Research Organisation (CSIRO) has created pure drinking water from captured stormwater in what it calls an "exciting demonstration" of the value of stormwater. Stormwater captured in the City of Salisbury, on the Northern Adelaide Plains in South Australia, was passed through wetlands and then stored in a porous limestone aquifer before being determined fit to drink.

Source: CSIRO's media release 7/9/2009  
[www.csiro.au](http://www.csiro.au)

## New South Wales

### Climate Change, Stormwater and the Law

The Land and Environment Court has released Climate Change, Stormwater and the Law (10 September 2009), a paper presented by Justice Peter Biscoe to a seminar on "Adapt Mitigate or Perish: The Effects of Climate Change on Stormwater Management" conducted by the Stormwater Industry Association NSW. (Source: Land and Environment Court)

Source: SAI Global Newsfeed 22/9/2009  
[www.lawlink.nsw.gov.au](http://www.lawlink.nsw.gov.au)

### Saving Sydney Harbour Stormwater

A project that aims to harvest enough rainwater and stormwater to supply all non-potable water needs for the Sydney Harbour sites of North Head and Cockatoo Island has received \$861,500 in federal government funding. Ms Wong advised that the Sydney Harbour Federation Trust would receive funding for their Sydney Harbour Green Precincts project.

Water Minister's media release (19 September 2009) (Source: Water Minister)  
Source: SAI Global Newsfeed 22/9/2009  
[www.environment.gov.au](http://www.environment.gov.au)

## Recycled water system starts at coal terminal

Representatives from the Port Kembla coal terminal say about 360 million litres of drinking water will be saved per year with the switching on of a new recycled water system.

The coal terminal's existing water system has been upgraded with the assistance of the State Government, to allow recycled water to be used for environmental management and dust suppression. Minister for Water, Phil Costa, says nearly 20 per cent of the water used in the Illawarra is now recycled for industry and watering public areas.

"It will bring the Illawarra up to 18 per cent, replacing 18 per cent of its drinking water by recycled water," he said. "That means 18 per cent of the water that was once taken out of the reticulated drinking system is now being recycled and going back into industry".

Source: ABC News 1/6/2009  
[www.abc.net.au](http://www.abc.net.au)

## Victoria

### Frankston water recycling project drills on

South East Water continues to install a new pipeline using horizontal directional drilling, which will bring recycled water from the Eastern Treatment Plant to irrigate sporting fields in Frankston, located in southeast Melbourne, Victoria.

The water will be transported along 5.5 kilometres of PE pipeline connected to an off take of the South Eastern Outfall. To date, tunnels have been drilled at a production rate of approximately 30 metres a day through the Karingal section using a Ditch Witch 4,000 pound thrust HDD rig.

The scheme also includes the construction of a new pump station. The \$A4 million Frankston Recycling Scheme is a partner-

ship between the Victorian Government, South East Water, Frankston City Council and the Federal Government which will provide 47 million litres of Class C recycled water to irrigate Ballam Park, Jubilee Park and Lloyd Park.

Source: Trenchless Australasia 21/9/2009  
<http://trenchless-australasia.com>

### Recycling to Dye For

Regional and Rural Development Minister Jacinta Allan has opened a new wastewater recycling plant at Victoria Carpet's Bendigo-based facility, stating that the plant would halve the company's water use and save 45 million litres of water each year. "The new recycling plant captures wastewater from the dye baths and spin dryers and treats the water for reuse back in the dye bath process", said Ms Allan.

Source: Regional and Rural Development Minister's media release 21/8/2009  
[www.premier.vic.gov.au](http://www.premier.vic.gov.au)  
Source: SAI Global Newsfeed 25/8/2009

### Producing Sparkling Emerald Stormwater

Water Minister Tim Holding officially opened the Nobelius Heritage Park water sensitive urban design project at Emerald on 19 August. The project involved the installation of landscaped works including sediment pits, swales and rain-gardens along Wattle Creek's existing drainage. Mr Holding advised that these landscaping techniques would improve the quality of stormwater before it enters rivers and waterways in the region, adding that "the Nobelius Heritage Park water sensitive urban design project is an excellent example of how we can use simple landscaping techniques to protect and improve the quality of stormwater entering our catchments."

Source: Water Minister's media release 19/8/2009  
For more info:  
[www.premier.vic.gov.au](http://www.premier.vic.gov.au)



## International

### Salazar Announces \$27.3 Million USD of Economic Recovery Funding to Improve Water Conservation in California

Through the Challenge Grant Program's Water Marketing and Efficiency Grants, Reclamation provides 50/50 cost share funding to states and irrigation and water districts for projects focused on water marketing, conservation and efficiency. Projects are selected through a competitive process, based on their ability to meet the goal of improving sustainable water supplies in the western United States.

The \$40 million investment in the water conservation, efficiency, and water marketing projects is part of President Barack Obama's \$1 billion investment of ARRA funding provided by the Department of the Interior for water projects across the West. Including the nearly \$27.3 million in funding announced today, total funding for California water-related activities under the Interior portion of ARRA is \$391 million to expand water supplies, repair aging water infrastructure and address drought mitigation.

Source: Yubanet Sierra News 20/08/2009  
<http://yubanet.com>

# New manual helps communities develop water supplies

The WateReuse Association announced the release of an indispensable new publication designed to help communities address the need for a sustainable, drought-proof water supply, while protecting public health and the environment.

The Manual of Practice on How to Develop a Water Reuse Program provides

a standardised planning approach for communities to develop and analyse new water reuse projects. The advice in this manual comes from professionals that have first-hand knowledge of what it takes to develop a successful water reuse program.

For more info: WateReuse  
[www.watereuse.org/node/801](http://www.watereuse.org/node/801)

