

rewater

farming with recycled water



Water Reuse in the Alice project

By Nicole Manison, Power and Water Corporation, NT.
www.waterreuse.nt.gov.au

In the harsh arid environment of Central Australia, water is a precious resource.

After extensive consultation with the local community, the Northern Territory's Power and Water Corporation is putting in place a state-of-the-art water banking and recycling scheme to maximise the use of this precious resource, rather than letting it go to waste.

The \$9.4 million 'Water Reuse in the Alice' project was announced in 2003 and will initially recycle 600 megalitres of water from the Alice Springs Wastewater Treatment Plant each year. It has the potential to recycle 1,200 megalitres per year in the future, depending on the success of the scheme in its first few years.

Initially the recycled water will be stored underground for later use for irrigation in a horticulture project being coordinated by the Northern Territory Government's Department of Primary Industry Fisheries and Mines, aiming to create employment and economic opportunities for the community.

While the initial use for recycled water will be in horticulture, in the long-term there is potential to use the water for much more.

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HAL

Know-how for Horticulture™

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From the editor

ReWater has been developed in recognition of the growing interest in the use of reclaimed water in agriculture.

We would like ReWater to become a forum for you to communicate your thoughts about the beneficial use of reclaimed water.

If you would like to receive a copy of ReWater electronically, email us at rewater@recycledwater.com.au

If you have articles, ideas or would like to raise issues in the letters to the editor, submit them to the National Coordinator for Reclaimed Water Development in Horticulture.

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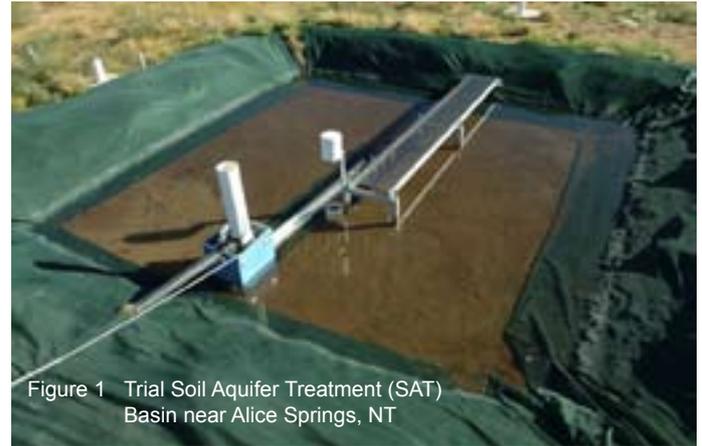


Figure 1 Trial Soil Aquifer Treatment (SAT) Basin near Alice Springs, NT

Power and Water Project Manager Mark Skinner said as the water will be stored underground, it will be effectively banked until it needs to be withdrawn.

“Extensive research was undertaken by the Northern Territory Government and the CSIRO to test the suitability of using Soil Aquifer Treatment (SAT) basins and underground storage for the project, and they were both found highly suitable,” said Mark.

“In this project, the water will be treated at a dissolved air flotation plant and then disinfected before it is pumped to SAT basins that will filter the water into an underground aquifer. During filtration, through the SAT basins, natural processes in the soil will further treat the water.

“Underground storage provides a far larger capacity to store water, it eliminates the potential for mosquito breeding and the water won’t be subject to the high evaporation rates of Central Australia.

“SAT systems have been in place overseas for decades and are proven performers, plus the research conducted on SAT systems indicated we have the ideal filtration rates for it,” said Mark.

A dissolved air flotation treatment plant and the SAT basins for the ‘Water Reuse in the Alice’ project will be built this year and water recycling for horticulture is expected to start in 2007.



Figure 2 Soil Aquifer Treatment (SAT) research of soils, Alice Springs, NT

Community, agricultural, environmental and industrial benefits from the new Gippsland Water Factory

By Stephen Smolenaars, Arris Pty Ltd

www.vicwater.org.au/uploads/RUWA%20Initiatives.pdf
www.gippswater.com.au/media/new.asp?new_id=144
www.transfieldservices.com/media_investor_centre/media_releases2005/gippsland_water_factory.htm

Gippsland Water will soon have the technology to deliver odourless, "Class A" recycled wastewater to industries such as Australian Paper. One of the main drivers has been the smell from the open channel section of the Regional Outfall Sewer in Gippsland, which has been an ongoing concern for the Gippsland community for many years. The remainder of the recycled wastewater will bring many environmental and economic benefits to the region through increased environmental flows for the Latrobe River Catchments, increasing river health and the health of the Gippsland lakes. This new facility will address the odour problems associated with the regional outfall sewer.



Figure 3 Pilot plant of Water Factory

New Technology

The "Gippsland Water Factory" uses new technology called a Membrane Bio-Reactor. This system is made up of a membrane, which is placed in a tank that is then filled with wastewater. The membrane acts like a filter that is dotted with thousands of holes one-ten-thousandth of a millimetre in diameter. The wastewater gets absorbed through the holes and the solid particles get trapped on the outside of the membrane, leaving a much cleaner wastewater product inside the membrane. Up to 10 million litres per day of this treated wastewater will then undergo a reverse osmosis treatment to reduce its salt content, making it more suitable and of higher quality for industry. The estimated total capital cost of the project is in the vicinity of \$140 million.

Upon completion, it is estimated the facility will be capable of treating up to 35 million litres of domestic and industrial wastewater daily. The pioneering wastewater recycling plant will be the first of its kind in Australia and will ensure that the recycled water will be of high quality and odour-free, addressing the existing odour issues of the current sewer outfall.

Future Benefits

There are possibilities to increase the commercial viability of this project by undertaking initiatives that encourage the use of recycled water in the Gippsland region. Such initiatives could include:

- Applying an environmental levy based on extraction quantities
- Increased extraction licence fees
- Reductions in extraction allocations for environmental flows
- Taxation rebates for users of recycled water
- Significant infrastructure development grants
- Greenhouse Gas credits for the use of recycled water (eg similar to a Renewable Energy Certificate)
- Recycled Water Certificates that could be traded to offset excess allocation to irrigators (ie virtual water trading)
- Imposed environmental targets on water consumption

Brisbane park irrigated with recycled water

By Stephen Smolenaars, Arris Pty Ltd
www.brisbane.qld.gov.au/rocks_riverside_park/home

The Rocks Riverside Park in Brisbane recently became the city's largest urban park development involving the use of recycled water to irrigate parks and gardens. The park consists of 13 hectares of river flat terrace land developed as recreation parkland, and 13 hectares of natural escarpment eucalypt woodland (Figure 4).

The key aim of the Rocks Riverside Park was to reflect how public space could be developed in a sustainable and inclusive manner. The primary purpose of the water mining facility is not wastewater treatment but rather the supply of irrigation water. Nevertheless, investigation shows from the sewage treatment cost perspective and relative to the treatment capacity, that water mining and reed bed treatment performs comparatively and costs less than most other recycling options. The water mining plant also has the added benefit of a low environmental footprint and the ability to function unattended for prolonged periods with stable output volumes of recycled water. Construction was completed in September 2004.



Figure 4 Looking down from the water mining site on to the recycled water irrigated parklands

Process

The water mining plant consists of a septic tank, a horizontal filter bed, a vertical filter bed, UV disinfection system and storage tank.

Wastewater from an existing pressure main is intercepted and flows to a three pass septic tank. The target flow rate is controlled automatically to provide even flow through the septic tank. The effluent in the tank passes through a set of cartridge filters to a wet well, equipped with a transfer pump, which feeds the subsurface flow horizontal filter. These pumps are controlled by a combination of the water level in the wet well and the water level in the entry of the horizontal filter. The horizontal filter has a nominal area of 1700m² (24m x 72m) and is constructed in a basin excavated from the site which is lined with a 1.5mm HDPE (High Density Polyethylene) membrane.

The entry section of the horizontal filter utilises coarse gravel (20-30mm) media to spread the incoming feed evenly to the active media. The whole bed is planted with *Phragmites Australis* (Figure 5), a common River Reed grown from seed and planted as 18 month

old tube stock. This planting was carried out in December 2003, well in advance of commissioning, to ensure a healthy stand of reeds prior to loading the bed with effluent. The nominal residence time in the horizontal filter at design flow is 40 hours.

The primary treated effluent passes from the exit well to a vertical flow constructed wetland. The site is on a considerable slope which has reduced the construction costs of the facility as gravity replaced the need for extra pumps. The vertical flow has a nominal area of 800m²

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and can be considered as a slow sand filter planter with reeds (again *Phragmites Australis*) which act as biological filters. The vertical flow helps to eliminate ammonia, further reduce BOD (Biological Oxygen Demand) and filters the effluent to mean turbidity (≤ 2 Nephelometric Turbidity Units).

Wastewater is distributed through a network of surface pipes and is collected at the base in a layer of coarse gravel from where it is collected for final treatment and storage before use for park irrigation. The treated water flows through an in-line turbidity meter and then on through a UV disinfection unit to the treated water storage tank (24 hour storage). The final treated recycled water (Class A) is available to other customers such as Council Tankers for watering street landscapes and trees. Surplus treated water can be diverted to the sewer line prior to storage tank. The advantages these strategies provide for sustainable development, decentralised treatment and reuse are:

- Virtually zero energy requirements for treatment;
- Can be operated easily with minimum training of staff;
- Minimal periods between inspections and minimal maintenance; and
- Ability to withstand relatively large swings in both volume and input quality without deleterious effects on output quality.

For information on reed bed treatment systems contact Andy Krumins, Manager, Strategic Planning Policy & Innovation, Brisbane Water, phone 07 34030238.

Summary

The water mining project at Rocks Riverside Park is an example of innovation and research and development providing highly sustainable solutions for drought proofing urban parklands, with potential for low operating cost wastewater treatment.

Subsurface flow constructed wetlands have been used in Europe for treating domestic and municipal wastewater for over twenty years. They enjoy a reputation for robust, maintenance free operation with consistent quality of output and virtually zero energy cost. Many thousands of facilities have been constructed and indeed in France and Belgium particularly, they are the preferred method of treatment for communities of up to about 2500 effective people.



Figure 5 Reed beds of the Rocks Riverside Park water reclamation system

Salinity conversion and plant suitability made easier

Soil salinity is an important consideration in any farming enterprise, particularly when using recycled water, as it can often be more saline than traditional water sources. A number of methods are used to measure soil salinity, producing a range of measures and associated units. The abundance of salinity units can create confusion among users and providers, which may result in mismanagement of recycled water.

Dr Som Jarwal and Dr Anne-Maree Boland (Department of Primary Industries Victoria) have developed an easy to use Salinity Unit Converter (Figure 6). This decision-support tool has been developed as part of a Land and Water Australia project "Use of reclaimed effluent water in Australian Horticulture" with support from the Department of Primary Industries Victoria, National Program for Sustainable Irrigation, Horticulture Australia Limited and Cooperative Research Centre for Irrigation Futures. The tool helps users to understand salinity units and their relationships with the international standard, dS/m (deci Siemen per metre), and makes conversion from one unit to another easy. The Salinity Unit Converter is in the form of robust circular discs and is designed for field use.

On the other side of the Salinity Unit Converter, relative salt tolerances of fruit or vegetable crops are given. The crop salt tolerance information includes the threshold soil salinity levels above which crop yield is reduced and the per cent of yield reduction for each additional unit of salinity above the threshold. It also provides soil salinity tolerance ratings of each crop and the indicative soil salinity level for achieving approximately 90% and 75% crop yields.

The tool aims to help growers gain a better understanding of salinity. It will help growers make more informed decisions about the suitability of their crops, soil salinity and recycled water use.



Figure 6 Salinity Unit Converter with salt tolerances of fruit crops

Adelaide Airport saves by recycling water

By Dr Daryl Stevens and Stephen Smolenaars, Arris Pty Ltd
www.aal.com.au

Class A recycled water from the Glenelg Wastewater Treatment Plant is used for toilet flushing (Figure 7) and landscape irrigation (Figure 9) at the new Adelaide Airport. The pay back period for the additional plumbing, testing, operation and maintenance costs required has been estimated to be approximately 3 years with substantial saving in water costs after the 3 year period. The cost of supplying recycled water to the new terminal is estimated to be approximately \$230,000. However, the use of 180 ML of recycled water for flushing toilets will yield savings in excess of \$90,000 per year. Adelaide Airport Limited also investigated the use of aquifer water as a supplement to recycled water but considered recycled water to be more economically and environmentally sound.

They expect to use 300 ML per year, comprising of 180 ML per year in flushing toilets (providing an all year round demand), 80 ML in new irrigated areas and 40 ML on existing irrigated areas (which is a more seasonal demand). There are approximately 3.2 Ha of lawn watered using recycled water, mainly through pop-up sprayers. However, there are some drippers used around trees and some sub-soil drippers being trialled. Most of the grasses and trees planted are natives. However, some are sensitive to phosphorus so not all the natives can be irrigated with recycled water.

To ensure the use of recycled water was safe and environmentally sound, Adelaide Airport Limited worked closely with SA Water, SA Department of Health and SA EPA. Adelaide Airport Limited led the move to increase the use of Class A recycled water and SA Water responded by increasing the available supply. SA Water also provided water quality data to Adelaide Airport Limited for their Irrigation Management Plan. SA Department of Health, world leaders in human health risk assessment for recycled water use, ensured there were insignificant risks to human health when using the recycled water for toilet flushing and landscape irrigation (ie the recycled water was fit for the intended use).



Figure 7 Toilets using recycled water at the new Adelaide Airport

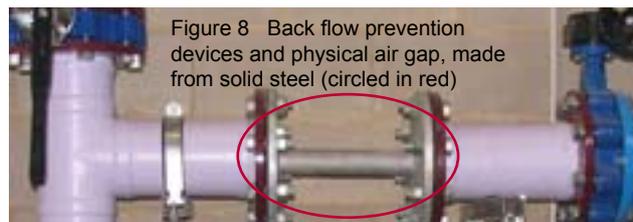


Figure 8 Back flow prevention devices and physical air gap, made from solid steel (circled in red)

Other key issues that had to be addressed were: cross connections; the capacity of buffer storage; signage and marking of pipes; environmental monitoring (irrigated area soil testing); ongoing auditing; and staff/contractor training and awareness programs.

Extensive testing of the system was completed before commissioning. Part of the audit was to turn off all potable water supplies to the airport complex and pressurise the recycled water systems (third pipe). Then every potable water tap was turned on and drained one at a time to ensure no cross connections between the third pipe systems and the potable water systems (ie once the potable supply residing in the pipe structure was drained, no water came from the potable water taps). Another part of the audit process was to check that the correct signage was displayed and pipes used were lilac coloured where required.

As a back up to guarantee an uninterrupted water supply, potable water can be connected to the recycled water system. Contamination between potable water and recycled water is prevented by three separate barriers (triple barrier). The first two are conventional backflow prevention devices. The third is an ingenious physical air gap (Figure 8) which has to be manually changed from the recycled water supply to potable supply by maintenance staff, only necessary in the event of a break in supply of recycled water.



Figure 9 Native species and lawn grown around the new Adelaide Airport

Australia

States Shamed into Recycling

From Lawlex Water Newsfeed 05/01/06
www.theadvertiser.news.com.au/common/story_page/0,5936,17724542%5E2682,00.html

The Age reports that Parliamentary Secretary for the Environment Greg Hunt has launched a "shame campaign" intended to pressure Victoria and New South Wales into recycling more sewage. Mr Hunt said the two states were Australia's biggest water wasters and labelled their water recycling practices as "19th century practice in the 21st century". They cannot be forced to recycle more sewage "because they own the resources and, constitutionally, they have the responsibility", Mr Hunt said. "So we'll continue a campaign of shame".

Launching the "shame campaign", Mr Hunt acknowledged South Australia as the best water recycling State, The Advertiser reports. Whilst South Australia reuses over 20% of recyclable water, Mr Hunt reportedly said it should "push for 100 per cent recycling".

Water Use on Australian Farms

Source: Australian Bureau of Statistics
[www.ausstats.abs.gov.au/Ausstats/subscriber.nsf/Lookup/9C90643E5B78B440CA2570A600763F80/\\$File/46180_2003-04.pdf](http://www.ausstats.abs.gov.au/Ausstats/subscriber.nsf/Lookup/9C90643E5B78B440CA2570A600763F80/$File/46180_2003-04.pdf)

The Australian Bureau of Statistics has released a report entitled Water Use on Australian Farms 2003-04 (27 October 2005), which shows that fewer Australian farms undertook irrigation activity during 2003-04, while "the total area irrigated increased by 1.0% to 2,402,000 hectares, and the total volume of water applied increased slightly to 10,442 gigalitres".

More Funding for Sustainable Irrigation

From Lawlex Water Newsfeed 04/11/05
www.maff.gov.au/releases/05/05053pm.html
www.npsi.gov.au/default.asp

Agriculture Minister Peter McGauran has announced \$500,000 in extra funding to continue the National Program for Sustainable Irrigation, which "draws together public and private sector partners, including irrigators, water authorities, research agencies, Australian and State government departments and commodity groups".

Mr McGauran also launched an Innovation in Irrigation booklet and video, "presenting case studies to encourage further development in the skills and technology Australia needs to realise the potential of irrigation". Copies of the booklet and video are available free of charge by phoning 1800 062 823.

Victoria

Rural Water Price Review

From Lawlex Water Newsfeed 16/12/05
www.reggen.vic.gov.au/water1060.html

The Victorian Essential Services Commission is undertaking a review of irrigation, rural and urban water prices to be charged by regional water businesses. The Commission is assessing the Water Plans submitted by urban water providers, Grampians Wimmera Mallee Water and Lower Murray Water, and rural/irrigation water providers, Goulburn-Murray Water, the First Mildura Irrigation Trust and Southern Rural Water. On 1 October 2005 the abovementioned five rural water businesses were required to submit final Water Plans to the Commission for assessment. These plans set out the prices that each of the businesses propose to charge for their water, sewerage and other related services to urban and rural customers for the two year period commencing 1 July 2006. The plans also include more detailed information about the strategies and initiatives that are proposed and the revenue needs of the businesses from 2006-07 to 2007-08.

The Commission is required to assess the Water Plans against certain principles set out in the Water Industry Regulatory Order and decide whether to approve the prices proposed by the businesses or the manner those prices are to be calculated or otherwise determined. This is the first review of rural water prices undertaken by the Commission since it became the economic regulator of the Victorian water industry on 1 January 2004.

Supplies Identified for Lake Wendouree

www.chw.net.au/news/december_2005.htm

The Lake Wendouree Water Supply Task Group has announced that a sustainable long term water supply solution for Lake Wendouree has been identified. The six month study examined a number of potential water supply sources for the lake including reclaimed water from the Ballarat North Waste Water Treatment Plant, stormwater, groundwater and a reconfiguration of Lake Wendouree. After considering a number of potential supply sources for the lake, the Task Group has identified "that a combination of treated reclaimed water from the Ballarat North Waste Water Treatment Plant and stormwater from Paul's Wetland in Wendouree could provide sufficient quantities of suitable quality water to sustain Lake Wendouree".

Western Water Recycling Extension

From Lawlex Water Newsfeed 08/12/05
www.westernwater.com.au/downloads/MEDIA%20release%20-%20recycled%20water%20initiative.doc

Western Water has announced a \$520,000 extension to the Sunbury-Melton recycled water scheme, which it says "will provide sufficient supplies to irrigate six sporting ovals and an athletics track at Sunbury" and save up to 45 million litres of drinking water a year. Western Water said "a 3.1 kilometre pipeline will deliver recycled water to Boardman Reserve, Langama Park and Sunbury Downs Secondary College from the existing main in Vineyard Road". The extension is scheduled for completion in December 2006, and will be funded by Western Water, Hume City Council and the Victorian Government.

Cann River Sewerage Scheme Opened

From Lawlex Water Newsfeed 01/12/05
www.dpc.vic.gov.au/domino/Web_Notes/newmedia.nsf/8fc6e140ef55837cca256c8c00183cdc/4592f537c2212fd5ca2570c3007e814b!OpenDocument

Officially opening a \$2.5 million sewerage scheme in the Cann River township, Water Minister John Thwaites said "about 200 local properties could be connected to the new scheme, eliminating pollution from local septic tanks leaking into the Cann River". Mr Thwaites said the treated wastewater will irrigate pasture on a local farm. The scheme was funded by the Victorian Government through East Gippsland Water and the New Town Sewerage initiative.

South Australia

Kangaroo Island Treatment Plant Upgrade Announced

From Lawlex Water Newsfeed 16/12/05
www.premier.sa.gov.au/minister.asp?mld=3&pld=6&slid=5843

The South Australian Government has announced that it will spend \$4.5 million upgrading the Middle River Water Treatment Plant on Kangaroo Island. Minister for Administrative Service, Michael Wright, said the upgrade uses MIEX® (Magnetic Ion Exchange) technology; "MIEX® resin is a reusable material that reduces dissolved organic carbon in water".

New South Wales

New Operations Save Drinking Water

From Lawlex Water Newsfeed 16/12/05
www.sydneywater.com.au/ProjectsandTendering/MajorProjects/NorthHeadSTP/NorthHeadSTPDetails.cfm
www.sydneywater.com.au/WhoWeAre/MediaCentre/MediaView.cfm?ID=296

Sydney Water has announced that a new recycled water facility for operational uses at North Head Sewage Treatment Plant (STP) is saving up to 1.5 million litres of drinking water per day. "The \$3.5 million recycled water plant is part of a \$100 million program of works at North Head STP, designed to improve the plant's reliability and ensure the ongoing protection of water quality at local beaches", according to Sydney Water.

In addition, Sydney Water is preparing to build a new biosolids management facility at the North Head STP. United Group Infrastructure Pty Ltd is expected to begin construction in early 2006 for completion in 2007.

Western Australia

Wastewater Study Gets Funding Boost

www.abc.net.au/news/newsitems/200512/s1532608.htm

Curtin University in Perth has been awarded a \$1 million grant to investigate the effectiveness of microfiltration and reverse osmosis for treating industrial waste water. ABC News reports "the treatment system has been set up at the Kwinana Water Reclamation Plant and is modeled on technology already used in Singapore".

\$3 Million Aquifer Recharge Plan Unveiled

From Lawlex Water Newsfeed 04/11/05

www.mediastatements.wa.gov.au/media/media.nsf/0c079b992e7e607a48256a5a0016e16b/c6ae3ddd76f16b35482570ab002151bf?OpenDocument
www.sundaytimes.news.com.au/common/story_page/0,7034,17076119%5E948,00.html

Premier Geoff Gallop has announced a plan to recycle 100 gigalitres of wastewater currently pumped into the ocean each year. Mr Gallop said the \$3 million Managed Aquifer Recharge project will “study the potential to infiltrate treated wastewater into our depleted aquifers and reclaim it as a new water source for irrigation and ultimately even drinking”. The Sunday Times reports the plan would produce “more water than the desalination plant and the Yarragadee proposal put together, and a third of the annual water needs of Perth and the Goldfields”. The project will be a joint initiative between the CSIRO, the Water Corporation, Curtin University, the Chemistry Centre of WA, the University of WA and the Centre for Groundwater Studies.

Mr Gallop said a concurrent Department of Health study would “identify necessary safeguards to protect the environment and public health” and “investigate if current treatment systems can consistently produce water suitable for recharging our aquifers and subsequent drinking”.

Queensland

Recycled Water Delivered To Homes

From Lawlex Water Newsfeed 16/12/05

<http://statements.cabinet.qld.gov.au/cgi-bin/display-statement.pl?id=9874&db=media>
www.epa.qld.gov.au/environmental_management/water/manual_for_recycled_water_agreements/
www.epa.qld.gov.au/register/p01739aa.pdf

Premier Peter Beattie has announced the commissioning of Queensland's first recycled water treatment plant. The water will be used for gardening, flushing toilets and washing cars as well as for the irrigation of public open space. 14 homes in Springfield are the first domestic households to use recycled water from the \$1.5 million plant.

Mr Beattie has also launched the Queensland Water Recycling Guidelines and Manual (December 2005). The Manual was prepared by the Environmental Protection Agency (EPA), and provides councils, water authorities and developers in Queensland “information and guidance on writing a contract for the supply and use of recycled water”.

Overseas

Denver Water Recycling Plant in Colorado treats water to get the most out of it in a water-scarce region

www.progressiveengineer.com/features/denverWater.htm

As the largest water recycling facility in Colorado, the Denver Water Recycling Plant treats up to 30 million gallons of effluent a day coming from the neighbouring Metro Wastewater Reclamation District Plant, which only treats effluent to a standard that allows discharge into rivers and creeks. The effluent in the Denver Water Recycling Plant is treated to standards that allow it to be used in irrigation and industrial applications. The recycled water is pumped through 18 miles of purple pipes to Xcel Energy, the Denver Zoo, Denver parks, golf courses, school systems and other users in the area.

An average of two tours a week are run through the state-of-the-art facility during the school year, with groups ranging from elementary students to professional engineers.

New Reclaimed Water Plant in Washington State Nearing Final Approval

www.watereuse.org/news/wrnews_011806.htm

The Washington State Department of Ecology is expected to approve a permit to allow the LOTT Alliance to use reclaimed water from a new treatment plant after a public comment period ends February 8, according to The Olympian. LOTT's four government partners – Lacey, Olympia, Tumwater and Thurston County, Washington – chose reclaimed water as the core of their long-range Wastewater Resource Management Plan because of a strong public desire to begin treating wastewater as a valuable resource. In 2004, LOTT completed building one reclaimed water plant and began construction on a second. The 2 million gallons per day (mgd) of reclaimed water from the new plant, combined with 1 mgd of water produced by LOTT at its downtown Olympia plant, will make LOTT the largest producer of reclaimed water in the state, the newspaper reported. By late spring, the reclaimed water from the new plant is expected to be piped three miles to wetlands and groundwater infiltration basins. The reclaimed water is expected to be ready for irrigation and other non-potable purposes by early 2007.

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New Water Recycling Plant Underway in Watsonville, California

www.watereuse.org/news/wrnews_011806.htm

A new \$26 million water recycling plant will be built in Watsonville, CA as an alternative to groundwater that is being contaminated by saltwater seeping into coastal wells, according to the Santa Cruz Sentinel. The City of Watsonville, which is located on the Pacific Coast in Santa Cruz County, produces a variety of fruits and vegetables, such as strawberries, blackberries, and table mushrooms. The water agency sent coastal landowners a packet in early January to gauge interest in using recycled water and other alternative sources to irrigate crops, according to the article. The responses will help determine how many miles of purple pipe need to be built along the coast. The agency has already installed seven miles of pipe at a cost of \$11 million. The water recycling plant, which will deliver 4,000 acre feet of water annually, is expected to begin operating next year.



Judge Allows Snowmaking with Reclaimed Water

www.watereuse.org/news/wrnews_011806.htm
www.signonsandiego.com/sports/outdoors/20060113-1022-wst-skiingsacredpeaks.html

A federal judge is permitting the Arizona Snowbowl to use reclaimed water to make artificial snow at its facility, which sits on federal land in the San Francisco peaks, the San Diego Union-Tribune reported. The ruling upheld an earlier decision by Coconino National Forest to allow the facility to buy reclaimed water from Flagstaff, AZ for snowmaking. Snowbowl has struggled with short seasons in recent years because of a lack of snow. The plan to use reclaimed water has been opposed by Native American tribes and others who argue that the Forest Service failed to comply with environmental laws and that using reclaimed water would taint a mountain considered sacred by Indian tribes. Opponents have vowed to appeal the decision.

7th IWA Specialty Conference on Small Water and Wastewater Systems

March 7-10 2006 Mexico City, Mexico

<http://pumas.iingen.unam.mx/small2006/>

Source: Australian Water Association - Promoting the Sustainable Management of Water

Influenced by the general debate on sustainable development and driven by a proposal for an integrated water resources management, the "Small Water and Wastewater Systems group" was established. Decentralised systems for water supply and wastewater treatment and their association with receiving bodies and industrial wastewater systems became the major focus for the group.

The specialist group made several efforts to define "small". Eventually, an agreement was reached according to which small systems are those serving from a few persons up to 4,000 population equivalent. Within this range, there are very small wastewater systems (one to ten families), medium small systems (50 to 500 inhabitants) and large small systems (500 to 4,000 inhabitant equivalent). Due to the size, many industrial water and wastewater systems can be included as "small systems".

Associated with the size and the resources for operation and maintenance, many countries lack qualified personnel to provide the expertise for the optimal operational conditions. This is why small systems represent a challenge for the small communities or industry to achieve the effluent values imposed by the regulations. Therefore, the "small" systems must deal with a wide variety of knowledge topics from basic concepts of physics, chemistry, biochemistry and microbiology through to the fundamentals of process engineering, to design practices and operational matters. Training of personnel is one of the most important keys to successful operation of the systems. Details are available on the website and online registration is available.

California Conference: advanced wastewater treatment and disposal issues related to water recycling

March 12-14, 2006 San Francisco, USA

www.watereuse.org/news/wrnews_091505.htm

The California Section of the WaterReuse Association has issued a call for papers for their 2006 Annual Conference to be held at the Hyatt Regency San Francisco on March 12-14, 2006. The theme of the conference is Bridging the Gap with Recycled Water. The conference presentations will include panel discussions, individual sessions and workshops covering advanced wastewater treatment and disposal issues related to water recycling.

The 2nd National Water Education Conference

April 18–21, 2006 Alice Springs, NT Australia

www.awa.asn.au/Content/NavigationMenu/NewsEvents/2ndNationalEducationConference/2nd_National_Educat.htm

Registration and Program Education is now recognised across the water sector as a key component and tool for sustainable water management. AWA convened its first water education conference in Canberra in early 2004. Later that year, the Water Education Network, known as the WEN, was established. The WEN is an inclusive and broad network open to anyone with an interest or role in water education. In its first 12 months, the WEN has grown to more than 1,200 participants and includes professionals across the areas of school education, vocational education and training, tertiary education, community education, communications, community engagement and public participation. 'From the Waters Edge to the Red Centre' is open to anyone who would like to attend. However, the conference will provide the first opportunity for the WEN to come together to meet nationally. Interest from overseas delegates has also been expressed so there will be opportunities to mix with international counterparts. The conference organising committee looks forward to welcoming you to Alice Springs, the centre of Australia, for what should be an amazing three days of networking, professional development and socialising.

Enviro 06 Conference and Exhibition

May 9-11, 2006 Melbourne, Vic Australia

www.enviroaust.net/e6/what_is_enviro_2006.html

The Enviro Conference & Exhibition is a platform for showcasing the Australian environment industry. To be held in Melbourne from Tuesday 9 May to Thursday 11 May 2006, the Enviro 06 Conference & Exhibition will be presented by Enviroaust Convention, the Australian Water Association and the Waste Management Association of Australia in partnership with the Victorian Government.

Since it began in Sydney in 2000, Enviro has grown from strength to strength, drawing 6,000 people to Melbourne in 2002 and more than 5,000 to Sydney in 2004. The organisers are expecting another 6,000 to attend the Melbourne event in 2006, which will comprise 24 streams and an exhibition arranged around the theme of Building Sustainable Cities.

AWA Biosolids Specialty Conference III

June 7-8, 2006 Melbourne, Vic Australia

www.awa.asn.au/Content/NavigationMenu/NewsEvents/BSCIII/Biosolids_Specialty.htm

Call for papers for AWA Biosolids Specialty Conference III, Melbourne, June 2006. Papers invited on technologies, projects, case studies and research on viruses, health risks, stabilisation, land and other applications.

Sustainable Water in the Urban Environment II

June 19-21, 2006 Brisbane, Qld Australia

<http://qld.ieaust.org.au/jetspeed/static/items/2/2825/SWUERegistration.pdf>

Conference at the University of the Sunshine Coast, Maroochydore. For sponsorship, trade display opportunities or further details email Kathy, AWA Qld on awaq@bigpond.net.au with your contact details.



International Symposium on Irrigation of Horticulture Crops

August 28-September 2, 2006 Mildura, Vic Australia

www.dpi.vic.gov.au/dpi/nrenfa.nsf/LinkView/F5FA46F7DD7E7A8BCA256FF1000AC37CF744A1A3F9FF74D14A256DEA0012605A

Hosted by the Victorian Department of Primary Industries (DPI), the 5th International Symposium on Irrigation of Horticulture Crops will be held in Mildura from 28 August to 2 September 2006. Participants who wish to submit papers must register their details and abstract to the conference convenor by 28 February 2006, using the Call for Papers form. Early Bird registration closes on 31 May 2006.

Further information from DPI.



Websites

National Guidelines for Water Recycling Managing Health and Environmental Risks

www.ephc.gov.au/pdf/EPHC/Water/DraftGuidelines_Oct05.pdf

Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)

www.mincos.gov.au/pub_anzwq.html

Other good reads

VicRoads Environmental Guidelines: Using Recycled Water for Road Activities

www.vicroads.vic.gov.au/vrpdf/mproj/RecycledWaterGuidelines.pdf

Vic Roads has developed environmental guidelines for the use of recycled water for road activities. These guidelines are to help VicRoads staff and contractors identify opportunities for using recycled water in road activities and provide an aid in developing the required documentation for EPA.

About ReWater

This newsletter, ReWater, has been designed to make information relevant to reclaimed/recycled water use in horticulture more accessible to horticulturalist (growers/farmers), the water industry and other interested people. It is part of the service provided by the National Coordinator for Recycled Water Development in Horticulture (www.recycledwater.com.au), funded through Horticulture Australia.

Back issues and instructions for subscribing to receive ReWater electronically quarterly can be accessed at www.recycledwater.com.au/newsletter.php

We would appreciate your feedback and suggestions for contributions. Please email to rewater@arris.com.au or contact us on 08 8303 6706.

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.

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