

ALTERNATIVE WATER SOURCES – W3

Eco-efficiency resources for the food processing industry

Reduce reliance on mains water

Many food processors are dependent on mains water as food safety regulations mandate the use of potable water for all processing where water is in direct contact with food. For processing activities where water is not in direct contact with food such as utilities and auxiliaries, processors are now investigating alternative sources to supplement their mains potable water supply.

Process water on site

Water requirements can be reduced by matching relatively clean wastewater streams that require minimal treatment, with process water demands. For example final rinse water can be reused for subsequent pre-rinses or process water for cleaning.

WATER REUSE SAVES MONEY

Australian Country Choice, an integrated meat processor, uses recycled bleed water for truck wash and to wash exposed undercover (non-food processing) areas, saving approximately 100 kL per production day.

Modification of single pass cooling systems (such as liquid ring pumps and ice machines that discharge water to drain after one cycle) to operate on a closed loop can save significant amounts of water. If the water cannot be recirculated it might be possible to collect it for other purposes such as cleaning.

INTERNAL WATER REUSE

SnapFresh, a prepared meal processor, undertook a water audit and found that the cooling water on the laboratory distilling unit was flowing straight to the sewer. As the laboratory was located next to the boiler room this water was diverted and used as boiler feedwater, saving approximately 135 kL of water per year.



Stormwater collection

Food processing plants generally have large roof areas, providing an ideal surface to collect large volumes of stormwater. Stormwater can be an excellent alternative water source for activities such as vehicle washing or to supplement cooling tower and boiler makeup water.

The salt levels in stormwater are generally lower than that of mains water, therefore cooling towers or boilers can usually be operated at higher cycles of concentration with reduced blowdown water losses. The lower level of salt in stormwater also results in lower chemical requirements.

Depending on the level of contamination and use, pre-treatment of stormwater may be required for some applications. As the security of supply is dependant on rainfall, processors will need to ensure they have an adequate catchment and storage capability or back-up mains supply to meet the demands of the intended use.



Stormwater can provide an alternative water source for activities such as cooling tower and boiler makeup water.

STORMWATER USE SAVES MONEY

Australian Food Corporation was using 6,300 kL/year in the cooling water of the Formax heat exchange system. A pump was installed to close the loop and 23.5 kL of rainwater tanks were installed to collect stormwater top-up to the system.

This system cost less than \$2,000 to install, achieving approximately \$8,757 in water savings per year and a payback period of three months. (Australian Food Corporation is an ecoBiz participant.)

STORMWATER FOR WASHING

Ginger processor Buderim Ginger harvests stormwater from the ground floor of its green ginger receiving area and the roof of the ginger wash plant. A first flush system directs the initial flow of rainwater to the wastewater treatment plant and the remainder is directed to the wash collection pits. The rainwater is used for the initial wash of fresh ginger from the farm. (Buderim Ginger is an ecoBiz participant.)



Treated wastewater

Government regulations currently allow food processors to use water that is either potable or that will not make the product unacceptable.¹ This must be undertaken in accordance with regulatory approval and a food safety risk identification and mitigation plan. The fact sheet *Other treatment options (W9)* provides additional information on water treatment and reuse options. Export requirements are more stringent and may negate this option.

A risk-management based approach is required for the use of treated wastewater. Local and State Government agencies (including tradewaste officers) need to be contacted if the project will impact the volume or concentration of the site's tradewaste. Licensing authorities need to be contacted if it could impact on any licence conditions.

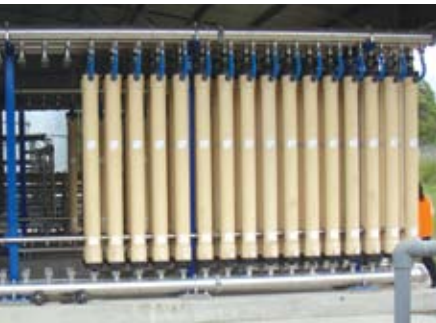
Under the *Workplace Health and Safety Act 1995* businesses using non-potable water are obligated to ensure that any person using, handling, storing or transporting the water is not affected by its use.

Currently there is no requirement to contact the Queensland Department of Health unless the food processing plant intends to reuse water treated to a potable standard for activities where the water will come in direct contact with food product.

The *Workplace Health and Safety Queensland 2007 Guide to Workplace Use of Non-potable Water Including Recycled Waters* provides information on health, precautions for use, recommended uses, storage rules, and testing data to assist businesses to prepare risk management plans.

For more information visit: [Guide to Workplace Use of Non-potable Water Including Recycled Waters, www.deir.qld.gov.au/pdf/whs/non-potable_guide.pdf](http://www.deir.qld.gov.au/pdf/whs/non-potable_guide.pdf)

¹ Safe Food Production Queensland, Water Recycling, Primary Industries and Fisheries
www.safefood.qld.gov.au/images/PDF/dairy_dairy_products/water_per_centzorecycling.pdf



Foster's Australia wastewater treatment plant.

The Queensland Environmental Protection Agency should be notified if the recycling project will impact the environment. For example using treated wastewater for irrigation would be considered a material change of use, potentially requiring an amendment of the site's development permit.

Export food processing companies are also required to notify their regional Australian Quarantine and Inspection Service (AQIS).

RO REDUCES WATER CONSUMPTION BY TWO THIRDS

Reverse Osmosis (RO) is reducing water consumption by 65 per cent at the Foster's Australia brewery. This equates to two thirds of the water used at the brewery being recycled, a saving of 1.5 ML per day.

The uses of this recycled water include all non-product contact uses including cooling towers, boilers, washing trucks, non-product contact floors, line lubricant and toilets.

The cost of using mains water (including tradewaste costs) is over \$4.00 per kL, while the cost of treating reject water is about \$0.85 per kL. The recycling plant cost \$6.5m to install but paid for itself in three years. This investment was made even more worthwhile as Foster's would have been required to contribute \$6 million to the expansion of the local municipal wastewater treatment plant if it had continued to discharge that water to sewer.

Recycled reclaimed water (from municipal treatment plants)

Some local government treatment plants provide recycled water of varying quality (sometimes at a cost) for activities that do not require potable water.

Employee exposure, to aerosols in particular, must be considered in the risk-management based approach required to assess the viability of reclaimed water use. Councils should be able to assist with information on the safeguards to be considered.

For more information visit: Queensland Environmental Protection Agency, Queensland Water Recycling Guidelines, December 2005, www.nrw.qld.gov.au/compliance/wic/guidelines_recycle.html

Natural Resource Management Ministerial Council Environment Protection and Heritage Council Australian Health Ministers Conference, Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase1), 2006, www.ephc.gov.au/ephc/water_recycling.html

Bores

Underground bores can supplement or meet the water requirements of a food processing plant. Bore water is only available in certain areas of the State, and permission to use this water must be obtained by the Department of Natural Resources and Water. Queensland Health, Food Industries Division should also be consulted prior to bore water use in product contact.

Water taken from regions with geothermal properties such as Birdsville can also provide thermal energy. Refer to the Alternative energy sources (E4) fact sheet for further information on geothermal energy from bores.

For more information visit: Queensland Department of Natural Resources and Water, Groundwater factsheets, www.nrw.qld.gov.au/factsheets

This series of fact sheets provides examples and suggestions to the modern food processor on how to achieve both economic and environmental benefits from eco-efficiency. Visit the project website www.ecoefficiency.com.au for more ideas and case studies.

The eco-efficiency for the Queensland food processing industry project is an initiative of the Department of Tourism, Regional Development and Industry and the Environmental Protection Agency with technical information provided by UniQuest through the UNEP Working Group for Cleaner Production.