

# HYDROFLUX

WATER | SCIENCE | TECHNOLOGY

December

NEWS FOR CUSTOMERS AND FRIENDS OF THE HYDROFLUX GROUP

2016

Advanced Odour Control Using Photoionisation

Full Story Page 2



How Safe is Our Water

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The future of Municipal Biosolids Dewatering

Full Story Page 1 and 2



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## What does the Future Hold for Municipal Biosolids Dewatering in Australia?

FEATURE STORY

BY JOHN KOUMOUKELIS

Each year in Australia over 85 million tons of biosolids (sludge) are dewatered at municipal Sewage Treatment Plants (STP's) into around 1.65 million tons of dewatered biosolids, also called wet biosolids, which is trucked offsite mainly for reuse in agriculture and composting.

Dewatering takes place via a variety of methods, with centrifuges being most commonly used at 39%, followed up closely by belt filter presses and drying beds at 24% and 23% respectively.

Biosolids dewatering takes place in most of the 2400 STP's in Australia.

Regionally there have always been trends in dewatering technology with centrifuges favoured by most large NSW utilities and belt filter presses being favoured in Queensland and Victoria, along with rural NSW.

There is however a new trend emerging and it has become the primary choice of major utilities in Brisbane and Western Australia – dewatering via screw press.

This is an interesting development, as like most of the

dewatering technology used, screw presses are not new and in fact may well be one of the oldest technologies. Indeed whilst the first centrifuges were used to separate dairy products around 1860 and belt filter presses were originally used in Europe in the early 1900's for pulp and paper, screw presses were first used in Roman times for pressing wine.

This new trend is being driven by changes in our economy and concerns over the environment and sustainability as well as a need for municipalities to continually improve their efficiency and operating costs.

Continued on page 2.



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## Water Security in Australian Infant Formula Production



A safe and secure supply of drinking water is a worldwide priority

FEATURE STORY

BY MITCHELL HASTINGS

Global demand for high quality infant formula has been rapidly growing since 2008 when the Chinese infant formula contamination with melamine lead to the deaths of six babies and put another 54,000 in hospital.

In a bid to prevent a repeat disaster, the Chinese Government raised the quality standards, essentially locking the vast majority of Chinese companies out of the market. As a result, demand for internationally supplied infant formula has sky rocketed.

New Zealand rapidly became the leading exporter of Infant Formula products into the Chinese \$13.3 billion infant formula market. Australia is however, steadily growing its

output with numerous new facilities in the pipeline. Demand from China dwarfs local demand, with some 20 million Chinese born each year, compared to only 300,000 new-born Australians.

Australian and New Zealand supply can barely keep up, resulting in a "grey market" where individuals sell infant formula they buy at the local supermarket online to China at a price roughly 5 to 6 times the local cost.

In order to take advantage of the high demand and margins for infant formula products, Australian dairy manufacturers are rushing to invest in new production facilities.

Murray Goulburn - which is Australia's largest dairy business, recently announced it had signed two major contracts to sell its infant formula in both

China and Indonesia. The company is planning to build a \$300 million nutritional powder factory in western Victoria as a result.

This rush to build "white gold" plants can, if we are not careful, lead to poorly thought-out processes being placed into operation.

"Product contamination, an inevitable consequence of poorly designed infant formula processes, is a serious risk and could result in more health scares as well as considerable financial loss for our infant formula manufacturers. The Fonterra botulism scare in 2013 demonstrated that even false alarms can lead to severe economic consequences for the export market," said Mitchell Hastings of The Hydroflux Group.

Continued on page 3.

EDITOR COMMENTS



Dear Readers,

2016 has been an extremely positive and memorable year for the Hydroflux Group.

One of our largest news items of the year was the opening of our UK office. The UK company was established to enable the launch of our proprietary range of products in the UK and it is already showing convincing signs that it won't be long before we see the UK expanding into Europe and further afield.

Hydroflux Industrial services the industrial wastewater market and has employed several more project engineers and with that, has added a wealth of process experience. In particular we welcome James Hall in NSW and Mitch Hastings who is running our Victorian office.

Hydroflux Industrial has installed over 30 DAF systems across all states and territories in a variety of industries along with numerous sludge handling systems and advanced biological plants. Hydroflux Industrial has also launched a comprehensive range of process water treatment systems to complement its wastewater treatment designs.

Hydroflux HUBER have continued to build and upgrade municipal sewage treatment plants using a range of the world's best and most established equipment including, HUBER, AeroStrip and Organica. We were also pleased to announce that we are supplying Water Corporation's Bunbury STP with over 7.5 Km of AeroStrip® fine bubble aeration diffuser strips. This is the third largest order ever for AeroStrip® diffusers worldwide.

The Hydroflux HUBER range of band screens is also proving to be a popular product with its competitive pricing, Australian build and robust design. We expect to be exporting the HyBAND via a worldwide distribution network in 2017.

Hydroflux Utilities are continuing to grow thanks to its excellent product range, but equally as important, the skills and knowledge of our specialists to apply chemistry to wastewater treatment and sludge dewatering processes is gaining industry recognition.

We extend our grateful thanks to our customers, subcontractors and staff who have shown us nothing but trust and loyalty this last year.

ANDREW MILEY  
DIRECTOR



A HUBER screw press dewatering combined primary and secondary sludge at an industrial plant in Sydney

FEATURE STORY CONTINUED

WHAT DOES THE FUTURE HOLD FOR MUNICIPAL BIOSOLIDS DEWATERING IN AUSTRALIA?

Large increases in operational and maintenance labour and power costs as well as the unsustainability of processes that use large quantities of washwater have certainly forced municipalities to look seriously at their current dewatering technology and search for better alternatives. Add odour generation, either around the dewatering process or in the dewatered biomass, noise and other environmental concerns and the reason for the trend away from

belt filter presses and centrifuges to screw presses becomes patently obvious.

Add to this the major advances in screw press technology in the last 10 years, enabling screw presses to now successfully dewater Waste Activated Sludge (WAS) and the trend becomes one that is certainly here to stay.

In fact it is safe to say that we can expect that most medium to large municipal dewatering facilities will make the change to screw press based dewatering in the near future.

For more information please visit [hydrofluxhuber.com.au](http://hydrofluxhuber.com.au)

HYDROFLUX HUBER	Screw Press	Belt Filter Press	Centrifuge
Operating Labour	Minimal	High	Medium
Maintenance Cost	Very Low - In House	High - In House	High - Manufacturer
Power Costs	Very Low	High	Very High
Rotational Speed	< 1 RPM	6 - 10 RPM	> 2500 RPM
Life Cycle Cost	Very Low	High	Very High
WHS Guarding	Good	Very Poor	Good
WHS Airborne	None	Significant	None
WHS Contact	None	Significant	None
Operation Setup	Simple	Complex	Complex
Equipment Odour	None	Very High	None
Cake Odour	Low	Low	High

Photoionisation Advanced Odour Control

BY ANDREW MILEY

Photoionisation is a method for effective and reliable treatment of odours. It's most common use is for the treatment of odours produced by waste, wastewater and wastewater sludge. The technology has been successfully used for more than ten years and hundreds of systems are in operation worldwide.

- APPLICATIONS**
- Pump Stations
  - Sludge Tanks
  - Treatment Plant Buildings
  - Balance Tanks
  - Sumps

Photoionisation is basically the oxidation of substances under radiation of UV-light in the presence of catalysts.



The Photoionisation process produces strong oxidizing agents via UV-light ionisation and these agents oxidize the odorous substances in the presence of catalysts leaving an odour free discharge.

The NEUTRALOX® Photoionisation system is available in Australia and New Zealand exclusively via Hydroflux Industrial.

NEUTRALOX® Photoionisation provides important advantages, which translate into reliable and durable odour control.

- Effective treatment of highly concentrated and varying odours.
- Odour reduction rates of >99%
- No water or chemicals are required and no effluent is produced.
- Electricity is the only input required.
- Maintenance requirements are limited to 1 day per unit per year.
- The process is immediately operational when switched on.
- Units are of modular design and can be placed directly at the odour sources.
- Very small footprint allows for decentralised odour control.

Feature story

**WATER SECURITY IN AUSTRALIAN INFANT FORMULA PRODUCTION**



Mitchell Hastings is a Development and Technical Manager in the Hydroflux Group - a team of water and wastewater treatment experts harnessing the power of world-leading research and technologies for a safer more sustainable use of water, energy and resources. Mitchell has for the last 10 years designed and delivered membrane systems to produce advanced, sanitary, recycled, desalinated, demineralised and ultrapure process water for customers in the fields of infant formula, biotechnology, laboratory, food & beverage, power, oil and gas and mining. He has worked throughout Australia, New Zealand, The Middle East, South East Asia, United States and the South Pacific.

The water treatment processes must also be designed for Australian conditions and Australian water sources. Receiving mains water and generating process water from original bore water sources is common practice in Australia. In infant formula production, this poses its own problems.

The highly saline nature of some bores need more complex desalination steps to meet the Australian Food Standards for Infant Formula Products with limits of 15 mg of Sodium and 35 mg of Chloride per 100 kg of infant formula product. To meet this standard infant formula process water typically requires total dissolved solids levels less than 10 – 15 mg/L. High iron, manganese, hardness and alkalinity levels in bores may need specific attention to prevent fouling of membrane systems.

Surface water supplies such as rivers, lakes or dams also face unique challenges. It is common for these sources to suffer from seasonal algal blooms, which must be pre-treated by specialised flotation equipment to prevent biofilm formation or the generation of carcinogenic trihalomethanes from disinfection systems.

The presence of nitrates is also common, particularly in water sources located near farming areas. Nitrogenous compounds are poorly removed by membrane desalination processes and can result in “blue baby” disease when present in even low concentrations within the final product.

Tailored, hygienically designed infant formula water treatment systems must be used to ensure a much greater level of safety when compared with generic non-hygienic process water systems.

Australia is entering a so-called “age of opportunity”. The food sector is one area, which poses a very real potential to drive Australia forward into the “Asian Century”.

Our image as a nation producing high-quality raw and manufactured food products will help our economy to grow. Infant formula is one area where Australia can grow into a global market leader. However, we must all be diligent and ensure the quality of this valuable product and the safety of our consumers, whom are our most precious commodity – the future generations of humanity.



Tailored, hygienically designed infant formula water treatment systems must be used to ensure a much greater level of safety when compared with generic non-hygienic process water systems.

# Innovation is key for Western Downs Regional Council



Decanter structure in the IDEAL

BY MATHEW PUGH

**Australia's multi-billion dollar beef industry is a critical part of our economy, and as the world's third largest exporter of beef, updating our ageing supply-chain infrastructure will be critical to securing growth into the future. With more than half of beef exports coming from Queensland, Western Downs Regional Council are leading the way having recently completed a \$12.6 million redevelopment of the Dalby Regional Saleyards.**

Australasian engineering company, Wiley, undertook the redevelopment on behalf of Western Downs Regional

Council, and innovation in design was key to future-proofing the Saleyards. As well as providing enhanced cattle and patron comfort, the new complex will excel in maintaining biosecurity and environmental compliance.

The Dalby Regional Saleyards are the largest one-day selling centre for livestock in Australia, selling more than 200,000 head of cattle each year. The new custom design significantly reduces risks to operator safety, and the new lane drafting system will allow four operators to process around 180 head of cattle per hour where before it took eight operators to process at most 100.

Michael Matthewson, Wiley's Business Operation Manager in Toowoomba, has commended the vision of the council to provide a superior facility, saying “It will take the industry to a new level in occupational health and safety, animal welfare, biosecurity and environmental compliance.”

Another innovative project in Dalby provided by Wiley to Western Downs Regional Council is a new Heavy Vehicle Washdown facility situated next to the Dalby Regional Saleyards. Co-located on the Dalby Regional Saleyards site it is an important feature in the overall redevelopment of the whole saleyard facilities. The wash-down system is designed to handle a peak use



Trucks positioned at the Dalby truck wash

on Tuesdays due to the weekly cattle sale each Wednesday.

The wash-down facility caters for trucks and 4WD's with dedicated wash bays for each. The facility also includes a state of the art wastewater treatment process including two stage screening, Intermittently Decanted Extended Aeration Lagoon (IDEAL) biological treatment and sludge management. Hydroflux provided and installed all the key mechanical equipment for the process, drawing from our wide range including HUBER Ro2 in-channel screens, Aeromix Tornado® mechanical aerators and a HUBER Q-Series Inclined Sludge Press.

The screening provided in the treatment process will help to control the spread of weed

seed, in particular Parthenium throughout the region. Parthenium weed is toxic to cattle, and meat from livestock that eat the weed can be tainted - native to North America, Parthenium costs Australia's beef industry \$16.5 million per year and cropping industries several million dollars per year.

The WWTP headworks screens the solid waste down to 0.5mm before flowing under gravity to the IDEAL which provides biological treatment reducing BOD, COD, TN and TP to domestic waste strength. The treated effluent is held in a storage pond before being discharged to the local STP during low flow periods. The Biolsolids produced are dewatered via the HUBER Q-Series Inclined Sludge Press which consistently produces a spadable dry cake.



View of the screening and solids handling facility



**NEWS**

Read more on these news stories from [info@hydroflux.com.au](mailto:info@hydroflux.com.au)

**01 NEW EMPLOYEES**

Hydroflux welcomes Mitch Hastings, James Hall and Silvia Susjardo to our industrial wastewater sales and project management teams. All join us with substantial skills, experience and qualifications in industrial wastewater treatment.

**02 POINT LOOKOUT STP**

Hydroflux Huber were awarded another inlet works package that includes the HyBand Centre Flow Band Screen and the associated launders, screenings and grit washing equipment, for the Pt Lookout STP. The whole system was designed using advanced 3D CAD software and included all interconnecting pipework to reduce site installation time on the island.

**03 CBD DAF SYSTEMS**

Spotting a Hydroflux GT-DAF being transported along the streets of Sydney's CBD is almost as common as spotting an Ibis in Hyde Park these days.

There are now over 10 GT DAF Dissolved Air Flotation systems treating wastewater from the ever expanding food courts in Sydney.



**04 SLASHING SLUDGE DISPOSAL COSTS**

Hydroflux recently commissioned a new centralised sludge dewatering facility for Stornaway in WA. The HUBER QPRESS was selected due to its high degree of dewatering and very low speed (<1 RPM). Following the successful operation and outstanding results from the QPRESS, a second system has also been ordered.



**05 STRAINPRESS FOR GOSFORD CITY COUNCIL**

Gosford City Council has ordered another HUBER Strainpress Sludge Screen to protect their anaerobic digesters at the Kincumber STP. Strainpress removes rags and fines upstream of digesters, reducing maintenance costs and increasing gas yield. The second unit has been commissioned.

**06 KIMBERLEY MEAT**

The Kimberley Meat Company abattoir is the first abattoir to operate in Western Australia's far north for 22 years. The wastewater is being treated in a Hydroflux treatment plant.

**07 STP FOR FIJIAN RESORT**

Owned and operated by Fiji's oldest resort company, the multi award winning Musket

Cove Island Resort has commissioned Hydroflux Industrial to provide an advanced wastewater treatment plant to further enhance protection of the local environment. The plant, comprises 3 containerised MBR's.

**08 ICONIC WASTEWATER UPGRADE**

Hydroflux have recently supplied and commissioned a new HyDAF trade wastewater treatment plant at Weis's purpose-built factory in Toowoomba, QLD. The new equipment has provided a marked improvement on the treated wastewater quality. John Flemming, Engineering Manager from Weis added, "Thanks for all your assistance, not only during install but from the emergence of the project, much appreciated by all here".

**9 BUNBURY WWTP**

Water Corporation has recently awarded a significant aeration project to Hydroflux HUBER for the Bunbury Wastewater Treatment Plant. The contract includes the supply of 2500+ AEROSTRIP diffusers which will increase the plants processing capacity and reduce OPEX associated with power.

**10 PEMBERTON WWTP**

Hydroflux HUBER have supplied a packaged inlet works to this remote site in WA. The system, called the HUBER Ro5, consists of a fine screening system, aerated grit trap and integrated dewatering, all housed in a sturdy stainless steel tank. Being a pre-fabricated system, the HUBER Ro5 provides significant reductions in civil costs associated with inlet works, for plants under 20000 EP.

**11 PERFECTING GREASE WASTE TREATMENT**

Hydroflux Industrial in conjunction with Hydroflux Utilities have arrived at an ideal method for treatment for greasy and oily waste at collection facilities. Having recently completed two systems, a third plant is currently being installed in WA. The process involves a specially-formulated chemical program along with Dissolved Air Flotation.



BY THE MARKETING DEPARTMENT

**Lets face it, project engineers are terrible at taking photographs!**

They spend weeks on site at all times of the day, so when the marketing department asks for some suitable marketing photos of the plant, you would expect them to have taken a few good ones. However, they seem to only take photos of problems so they can prevent others having the same issue, or perhaps so they can apportion blame...

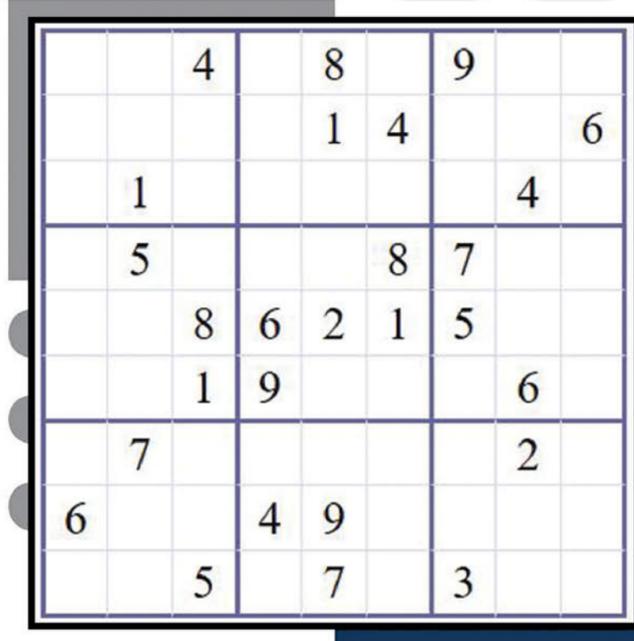
Anyway, our marketing department decided that if the engineers had an incentive to take good photos (which was to get them published in our newsletter), then they would. And it worked! The following photos were two of the best from 2016.



1st. Andrew Devlin. Surface aerator at Dalby truck wash.



2nd. Chris Hall. Upgrade of an industrial wastewater treatment plant in Tamworth.



For your chance to be in the draw for a \$200 JB-HI voucher simply complete the puzzle, scan and send this page to [quiz@hydroflux.com.au](mailto:quiz@hydroflux.com.au) Entries close end December 2016.

**ABOUT THE HYDROFLUX GROUP**

Hydroflux is an established, privately owned Australian business dedicated to water and wastewater treatment systems for both the municipal and industrial sectors. Via subsidiary companies, Hydroflux can manage design, operations and construction as well as supply equipment and technology.

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**SPOTLIGHT**

**JAMES HALL**



**WHAT IS YOUR ROLE?**

Throughout my career I have had a close association with the water treatment needs of my clients. I have developed a passion for this market place and enjoy the constantly changing challenges generated by our clients and regulatory bodies. I am primarily responsible for the development of new business in the industrial market and I'm passionate about understand-

ing our clients' needs and helping them make the right decision when it comes to investing in their water treatment plant.

**YOU HAVE RECENTLY JOINED THE HYDROFLUX TEAM, WHY DID YOU CHOOSE HYDROFLUX?**

I joined Hydroflux because of the reputation of the team. Within the water treatment industry they are highly regarded. I have known many of the directors in their previous roles for many years and had worked closely with them in the past.

**WHAT IS YOUR MOST EMBARRASSING MOMENT AT WORK?**

When visiting an Air Separation plant, I was the unlucky person to discover the poor placement of an emergency stop switch. When moving aside to let someone pass I innocently lent on the button and shut

down the plant. It was then that I was told that it was a 24hr process to restart the system!

**WHAT KIND OF HOBBIES AND INTERESTS DO YOU HAVE OUTSIDE OF WORK?**

When not at work I enjoy sailing competitively as well as socially. I'm part of a sailing team that sails regularly on Sydney Harbour and offshore. It can be a rewarding experience as part of this involves the training of junior sailors moving from small dinghies to offshore racing. I also have an interest in flying remote control planes, quadcopters as well as 3D printing. When I'm not enjoying one of these hobbies in my free time you can find me enjoying time with my kids or combining them all.

**WHAT WOULD YOU SAY IS YOUR GREATEST ACHIEVEMENT TO DATE?**

Apart from my two children Olivia (9) and William (7) I would mention two achievements that come to mind. The first being the completion of 2 Sydney to Hobart yacht races. This was a childhood dream of mine. The second and more recently was the completion of the Sydney half marathon in May this year. I had never been a runner in the past and had set the goal in January to complete the City to Surf in August, at 14km I thought this would be a stretch. Somehow I was convinced that the Half marathon was a real possibility for May and to actually achieve this was a major milestone in my life. I was pretty good at flying a helicopter in Grand Theft Auto as a teenager. I expect I'm equally as gifted but would love to find out for certain.