

HYDROFLUX

WATER | SCIENCE | TECHNOLOGY

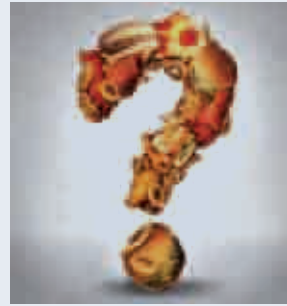
December

NEWS FOR CUSTOMERS AND FRIENDS OF THE HYDROFLUX GROUP PTY LTD

2014

Are grease traps facing a slippery slope?

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Is Sydney really boring?

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The downside of BOD

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JB HI-FI

WIN A \$200 JB HI-FI VOUCHER!

Page 4 to enter

An urban garden - the wastewater plant of the future

HH HYDROFLUX HUBER

BY JOHN KOUMOUKELIS.

Did you know that by 2050 more than two thirds of the world's population is expected to be living in urban areas? As our cities grow, traditional sanitation methods with centralised sewage treatment systems may not cope with growing sludge disposal restrictions, the need to reduce and retrieve nutrients and concerns about contaminants.



This led to new wastewater treatment solutions including Organica – a system that relies on a natural plant ecosystem to treat wastewater and makes a treatment plant look more like a greenhouse or a garden.

Organica uses plant roots that grow into the effluent encour-

aging bacteria and living organisms to develop. This creates a completely natural form of treatment and reduced energy and operating costs. Its bio-film-based treatment technology suits modern society with a small footprint, lower excess sludge production and integration into an urban environment.

“Organica uses plant roots that grow into the effluent encouraging bacteria and living organisms to develop.”

With 50 operating references around the world, Organica plants are successfully and easily installed into urban environments where typically it would be difficult to place a traditional wastewater treatment plant.

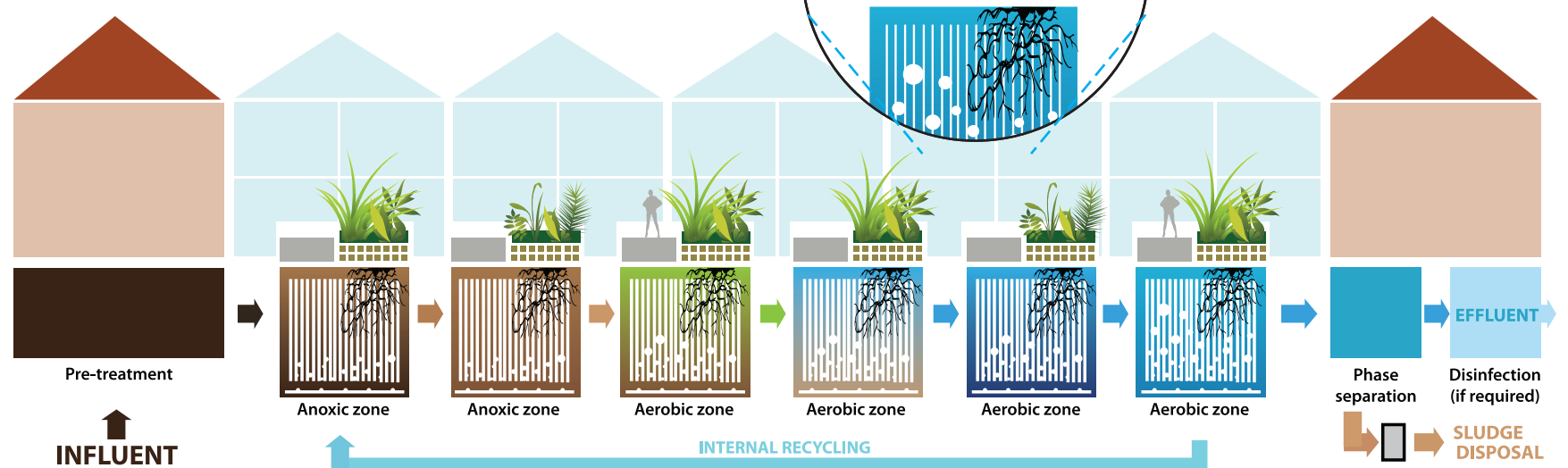
How does it work?

The Organica Food Chain Reactor incorporates wastewater treatment into a single structure and includes:

- Solids removal.
- Biological treatment / nutrient removal.
- Phase separation.
- Final treatment at a quality for re-use (if required).

This is done in a multi-stage cascade approach that uses Integrated Fixed Film Activated Sludge technology. It combines natural plant and engineered media to provide a habitat supporting a diverse range of bacterial culture.

The plant roots grow in water and their high specific surface **Cont. page 3**



EDITOR COMMENTS



Dear Readers,

What is the value of printing news these days? You are reading some right now!

I have a Kindle but I still like reading books. My desk is bare, but at least I can find my pen and there's plenty of room for my daily collection of coffee mugs. With most people now reading online, I think there's still something enjoyable about actually feeling a piece of paper.

We hope you will spend a few minutes casting your eyes over some interesting articles about progress in our industry in this way.

"...we are using this format as our way of sharing our news and our industry's news with you - our friends, customers and colleagues."

The Hydroflux Group does not print thousands of glossy brochures (which in reality are often no more informative than A Current Affair) so we are using this format as our way of sharing our news and our industry's news with you - our friends, customers and colleagues.

If you would like to find out more about us, please visit us online at www.hydroflux.com.au or drop us a line and tell us what you think of our publication by emailing info@hydroflux.com.au.

We hope you enjoy reading (in print) about some developments in this wonderful industry in which we live, breath and drink.

ANDREW MILEY
DIRECTOR

Is Sydney really boring?

HI HYDROFLUX INDUSTRIAL

BY ANDREW MILEY.

Well, we all know that Melbournians think so, but it is not the apparent difference in our lifestyles that is up for debate here.

Over coming years there are many construction projects in Sydney requiring significant boring including the \$9 billion North West Rail Link, the \$2.8 billion M1-M2 Link, the \$1.6 billion Sydney Light Rail, the \$3.6 billion first stage of the West Connex road project and highway upgrades.

Major construction needs to

deal with water used during construction, ground water penetration and once the plant is completed, a more permanent infiltration of iron and manganese laden ground water.

Iron and manganese are common metallic elements that occur together in ground water in many Australian regions. During underground construction and when groundwater is encountered, the water gets into contact with air, which enters the water and starts an oxidation process releasing carbon dioxide from the ground water into the atmosphere.

When this occurs, the pH values are increased and the Fe²⁺

and Mn²⁺ are oxidised into the insoluble Fe³⁺ and Mn⁴⁺ minerals resulting in the red precipitated material commonly seen.

Another issue with iron and manganese in water is iron and manganese bacteria. These bacteria do not pose a health threat, but they are responsible for the red brown (iron) and black brown (manganese) slime seen where water seeps through walls.

EPA guidelines' quote concentrations of 0.3 mg/L and 0.1 mg/L of iron and manganese respectively for discharging water back to the environment, so considering iron concentra-

tions in some areas can exceed 100mg/L, treatment plants are often required to remove over 99 per cent of the iron and similar for manganese.

Iron and manganese removal from water is a well-documented subject and there are many tried and proven methods, however constructing plants to handle the high variation in flow and the actual amount of precipitated material removed can be challenging.

Minimising the amount of ground water seeping into construction sites is important but in some cases large quantities are unavoidable.

Re-use of treated ground water is a viable proposition. Once the iron is removed from the water phase, the water is generally suitable to allow basic filtration and disinfection stages to produce a water quality that is (as a minimum) adequate for irrigation.

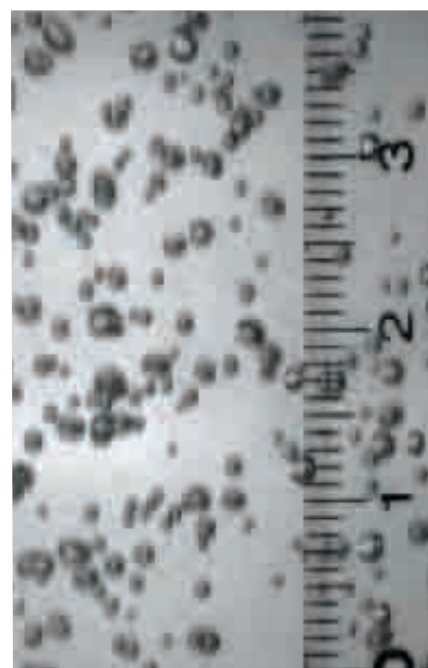
Hydroflux Industrial specialises in designing and building wastewater treatment systems, finding the right design for the most efficient treatment.

Visit us to find out more.
www.hydrofluxindustrial.com.au



Dealing with iron and manganese in ground water.

My bubble diffusers are just fine



"There is no single secret in how to manufacture one single, almost perfect AEROSTRIP® fine bubble

diffuser, the secret lies within the knowledge and technology of manufacturing thousands of aeration elements with identical properties, able to preserve their top performance ability after years of operation."

Adrian Ovezea, Marketing Manager - Aquaconsult

Today there are more than 1,500 installations, in 40 countries.

- The world's most efficient diffuser - up to 5.0 kg/O₂/kWh transfer efficiency
- Greater than 12 years lifespan
- Independently verified performance
- High quality manufacture
- Rigorous testing procedures
- Low maintenance demand

You may download a detailed paper from
www.hydrofluxhuber.com.au

Did you know?



1) HUBER'S roots stem from a copper fabrication business in 1786 and became a prominent manufacturer of stainless steel wastewater treatment equipment in the 1940's.

2) There are over 34,000 HUBER wastewater machines installed worldwide operating in over 65 countries including 40 machines at the world's largest STP in Mexico City.

3) HUBER actually invented the Step Screen, Inclined Drum Screen Technology and the Strainpress Sludge Screen, all of which are

popular screening methods used today.

4) HUBER pioneered the Screw Press for Sludge Thickening and Dewatering and also MBR Screening Applications.



5) HUBER'S high tech fabrication workshop boasts over 50,000 m² and is home to Europe's largest acid pickling bath.



The downside of BOD



HI HYDROFLUX UTILITIES
BY BRUCE WILLIS.

The 5 day biochemical oxygen demand (BOD) test is still the cornerstone method used today to indicate the amount of biodegradable organic matter in water. Unfortunately for industrial waters the Standard BOD method is of limited value only. Firstly the results do not measure accurately the amount of biodegradable organic material in the sample, and secondly these results are not reproducible.

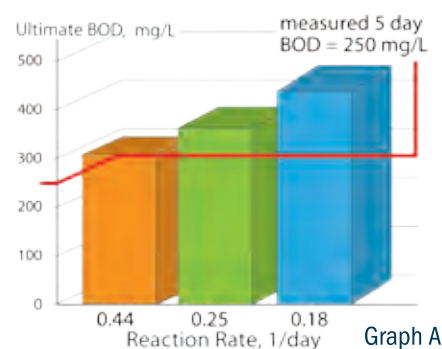
The BOD test was originally developed over 100 years ago for river waters having results between maybe 2-100 mg/L. It was never intended for industrial waste streams containing high BOD values (sometimes measuring in the thousands) or waste streams with complex biodegradable organic molecules (as might be found in a petrochemical wastewater stream), or for biological plants operating at temperatures up to 38°C.

Apart from temperature and bacteria source, particle size and reaction rate are the biggest influences on the BOD test.

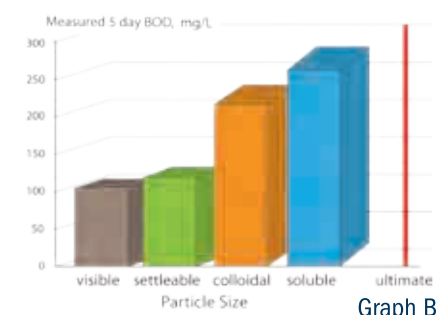
Looking at particle size, solid particles take time to hydrolyse and dissolve, and once dissolved it takes more time for the molecules to be broken apart to carbon chains of four or less in length before they can cross the bacteria cell wall and be consumed.

This means the larger and more complex the organic particle, the lower the standard five day BOD test result will be.

This phenomenon is shown in the Graph A where the particles were all the same type but of different particle size. The total (ultimate) BOD in each case was 300 mg/L.



Reaction rate is also a critical component. Different molecules are broken down and consumed at different rates by bacteria. Graph B shows how three different molecules with different ultimate BOD values and different reaction rates will record the same five day BOD result.



The more commonly discussed parameters of incubation periods, nitrification, interference by inorganics, inhibition of the "standard bacteria" by complex organics (for instance by those often found in petrochemical waste streams), incubation temperatures, and even being able to accurately measure the dissolved oxygen, all play a part in rendering this test not very suitable for determining the biodegradable organic content of industrial waste streams.

For plants that require a fast

and reproducible test method to determine biodegradable organic material, such as biological treatment plants, the chemical oxygen demand (COD) test provides an improved solution.

To provide utility, an on-site correlation between BOD and COD is constructed. Before testing, all samples should be filtered through a 0.22 micron filter, and the BOD test should then be conducted using on-site bacteria at on-site operating temperatures.

For more information regarding BOD have a read of our Technical Bulletin No 7, The Nature of BOD, or take a look at our video - Understanding BOD in water treatment or Google Hydroflux INTEL. www.hydrofluxutilities.com.au

An urban garden continued.

area provides an especially good habitat for microbes to form biofilm on the roots. Additional artificial carriers imitating plant root structure are installed into the deeper zone of the reactors where natural roots do not reach.

Due to the biofilm-based process, a lower footprint and lower excess sludge production can be achieved compared to conventional treatment technologies, decreasing capital and operational costs.



- ↑ Easy urban integration
- ↑ More natural treatment
- ↑ Water re-use
- ↓ Smaller footprint
- ↓ Energy demand
- ↓ OPEX & CAPEX costs

The owner of this technology, Organica Water, recently appointed Hydroflux HUBER, a subsidiary of the Hydroflux Group, as their exclusive Australian agent. Hydroflux HUBER is an equipment supplier of the world's best wastewater technology.

Read more www.hydrofluxhuber.com.au/applications

Three steps to find savings in Aussie food and beverage

HI HYDROFLUX UTILITIES
BY STEVE PETOUMENOS.

Eighty per cent of all Australian food and beverage executives say controlling costs is a moderate or significant challenge but many are unaware that a intensive examination of water and wastewater operations can reveal some significant savings.

Many have implemented basic water minimisation, however a review of chemical use and overall water, wastewater and sludge handling operations can uncover more cost benefits.



Here are three areas where your business can realise the savings through improvements to water and wastewater treatment:

1. Just because it works, doesn't mean it's best

Just because your wastewater treatment processes have worked for the last decade, this does not mean the overall treatment process being used is the most economical.

Process technologies and chemical programs have changed considerably over the years and there are many opportunities to reduce operational costs by tweaking or changing these - even without capital investment.

2. Waste not, want not – consider re-use

Water costs are increasing while improved techniques and efficiencies in treatment plants means the cost of recycled wastewater has reduced. In most Australian regions, the total cost of recycling wastewater is far less than the combined cost of mains water and the associated trade waste. Investments in wastewater re-use can provide a long term cost reduction but also secure water availability for the future.

3. Don't take sludge disposal costs for granted

Sludge disposal costs have risen dramatically and these costs can be taken for granted. There are many ways to reduce this cost - alternative disposal routes, invest in or improve your dewatering plant or change the chemistry of your treatment plant. A 10 per cent reduction in sludge disposal costs can often be significant.

Talk to us if you would like to find some business savings through better water and wastewater management.

Visit us to find out more. www.hydrofluxindustrial.com.au

A Hydroflux Hy-DAF HD Dissolved Air Flotation (DAF) System being off loaded at a dairy in Victoria.



Are grease traps facing a slippery slope?

HI HYDROFLUX INDUSTRIAL
BY MATTHEW PUGH.

In the 19th century in California, a gentleman called Nathaniel Whiting obtained a patent on the first grease trap. Despite the fact that this patent lapsed over 100 years ago, the design has not changed much since that time.



A Water Environment Research Foundation (WERF) report found that a grease trap's performance can be improved by



geometric modifications but achieving anything better than 1 log removal of grease requires something more.

With the increased volume of greasy waste being discharged to sewers, grease load to STPs is causing more frequent pipe blockages and this is of concern to Australian water authorities. Adding to this are large shopping complexes with many food outlets. Based on the traditional bums on seats calculations, some larger food courts need to install multiple grease arrestors to handle higher flows.

This leads to an unsatisfactory performance for the water authorities and can take up a reasonable amount of car spaces for the owner.

Although major developments in existing grease trap design has not occurred, a DAF system (which has been around for a long time now) is excellent at removing oils and grease from wastewater. DAF technology is even adaptable to treat drinking water, thicken sludge and recover algae for energy.

A DAF system is a good alternative to a grease trap, particularly in cases where multiple grease traps would otherwise be required.

At Hydroflux, we have a DAF system, called GT-DAF, designed to minimise the unit's size, improve performance and overcome operational issues associated with conventional systems.

To read more about the GT-DAF system visit - www.hydrofluxindustrial.com.au



NEWS
Read more on these news stories from info@hydroflux.com.au

01 HYDROFLUX INDUSTRIAL NOW OFFERING FLOOBED® MBBR

The FlooBed® MBBR is an advanced aerobic biological wastewater treatment using small plastic carrier elements in the biological aeration vessel to provide a larger surface area for bacteria to attach and grow. It's now available exclusively through Hydroflux.

02 HUBER WINS MULTIPLE CONTRACTS WITH ROTAMAT® WASTEWATER SCREENS

The highly reliable, cost effective German made inclined spiral screens were recently purchased by Acacia Prison and Yeeda Australian Rangeland Meat, both in WA and Shepparton Council in Victoria.

03 HYDROFLUX HUBER WELCOMES JOHN CARROLL TO BOARD

John Carroll joins the Board of Hydroflux HUBER with more than 30 years of experience with high profile clients including Sydney Water, NSW Department of Commerce, City of Gold Coast and MidCoast Water.

04 INCREASED PLANT RELIABILITY FOR GOSFORD

Gosford City Council in NSW recently installed a HUBER Strainpress® to pre-screen the digester feed at their Kincumber Sewage Treatment Plant which serves 130,000 residents. This has successfully removed fibre and fine materials and significantly reduced accumulation and blockages within the digesters.

JB HI-FI WIN \$200!

WIN \$200 VOUCHER FOR JB HI-FI to spend on all sorts of electronics, from movies and music to games and game consoles. All you need to do is name the DVD titles and you're in the draw to win! Entries close Monday 22nd December and the lucky winner will be drawn randomly.

Please email your entry to - info@hydroflux.com.au



HAVE YOU GOT THE INTEL?

Hydroflux Intel is a knowledge sharing platform providing information on water and wastewater treatment via short animations.

Visit our intel site to view a short video with narration on understanding BOD in water treatment.

Understanding BOD animation includes:

- Differences between TOC, COD, BOD.
- Where the BOD test originated.
- How the lab tests samples for BOD.
- What the BOD test can and cannot detect.

Go to the link below and choose education & training videos.

www.hydroflux.com.au/hydroflux-intel/

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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HYDROFLUX
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SPOTLIGHT

JOHN KOUMOUKELIS

1. WHAT IS YOUR ROLE?

I am primarily in business development, preparation of quotations and tenders, marketing and technical product management. I have been in the water industry for 20 years now, and I still get a huge buzz helping clients to make decisions on process or equipment to use in their treatment plants.

2. TELL US ABOUT HYDROFLUX AND YOUR PLANS FOR ITS FUTURE.

I think we have one of the best teams in the Australian water sector and a very complimentary balance between various business disciplines. I have worked with, or at least known all of our team for a long time and I think that part of our success can be attributed to this. Our plan is to be a major player within the domestic and international water market. I would like to see the Group expand into Asia, Europe and Latin America, and to extend our technology portfolio here in Australia, for both the industrial and municipal markets.

3. WHAT WAS YOUR FIRST EVER JOB?

I grew up in a takeaway food shop and at an early age I was tasked with cutting and cleaning potatoes for chips. My wages were my lunch!

4. DO YOU RECALL ANY EMBARRASSING MOMENTS AT WORK?

I was going on a sales trip to Griffith and for some reason had a mental block when booking my ticket. I only realised when I stepped off the plane in Wagga Wagga! I then got back on the same plane and was back in the office by lunchtime!

5. WHAT WAS YOUR BEST HOLIDAY?

I would have to say my honeymoon (otherwise I will be in the bad books!). We spent several weeks in the Mediterranean – Italy

and Spain. It would be nice to have another trip like that someday in the future. Greece though is probably one of my favourite places. It's part of my heritage and it's an incredible place to visit. There is so much on offer. I've been fortunate enough to go there several times in the last 15 years.

6. IF YOU COULD WITNESS ANY HISTORICAL EVENT, WHAT WOULD YOU WANT TO SEE?

Probably Woodstock! A lot of my favourite musicians played there. Sadly, it was only a few years before I was born.

7. WHAT KINDS OF HOBBIES AND INTERESTS DO YOU HAVE OUTSIDE OF WORK?

I have a passion for discovering cultures and travel but music is my main hobby. I have been playing guitar for 25 years now, and I like blues, rock, jazz and world music. Many people probably don't know but I used to play lead guitar in a psychedelic rock band called Red April in my late teens. We were offered a record contract but water was destined to be my life.

