

HYDROFLUX

WATER | SCIENCE | TECHNOLOGY

March

NEWS FOR CUSTOMERS AND FRIENDS OF THE HYDROFLUX GROUP

2016

Size Matters

Full Story Page 3



A LUXURY MOST NATIONS CAN'T AFFORD!

Page 1 and 3

THE IDEAL CLIMATE FOR SOLAR DRYING

Full case study report in insert Page 1



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Page 4 to enter

Struvite technology can help the world address a major fertiliser issue

Feature Story: Controlled struvite technology can help the world address a major fertiliser issue.

BY JOHN KOUMOUKELIS
Director, Hydroflux Pty Ltd

HYDROFLUX

In the not too distant future, the world will exhaust reserves of phosphorous.

Why is this something we should care about in a day and age when the 20-second comment dominates our broadcast news and where print media issues are driven by the 24-hour news cycle?

The fact is that phosphorous, together with potassium and nitrate, is a key component in fertiliser for the production of food.

The more food we need to produce as the world's population grows, the more phosphorous we need.

For example, as the middle classes grow in China, India and other developing countries, this will result in an increase in demand for meat - which in turn will increase demand for fertiliser. This is because large-scale



agriculture needs fertilisers to provide the nutrients for higher-yield crops.

While there is no shortage of potassium or nitrate, it is predicted that the world will exhaust reserves of phosphorous within 80 years.

And that is where struvite recovery technology, which is owned by CNP-Technology Water and Biosolids and is available in Australia and New Zealand exclusively through the Hydroflux Group, has an important part to play.

Since 2010, around 6,000 tonnes of fertiliser have been extracted - and sold to farms - thanks to the AirPrex® system which removes the magnesium ammonium phosphate from the Sewage Treatment Plant (STP) cycle.

In the not-too-distant future, the world will exhaust reserves of phosphorous.

Continued on Page 2



Removal of struvite leading to reductions in maintenance costs and helping prevent depletion of phosphorous supplies!

Environmental Protection – A luxury most nations cannot afford

Feature Story: Environmental Protection— a luxury most nations cannot afford.

BY ADRIAN MINSHULL
Director, Hydroflux Pty Ltd

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Having spent my entire working life designing and building what are essentially environmental protection systems in the more developed and transitioning countries around the world.

I often see or hear of the pollution that is happening every day in less developed nations. It makes me wonder if what I am doing

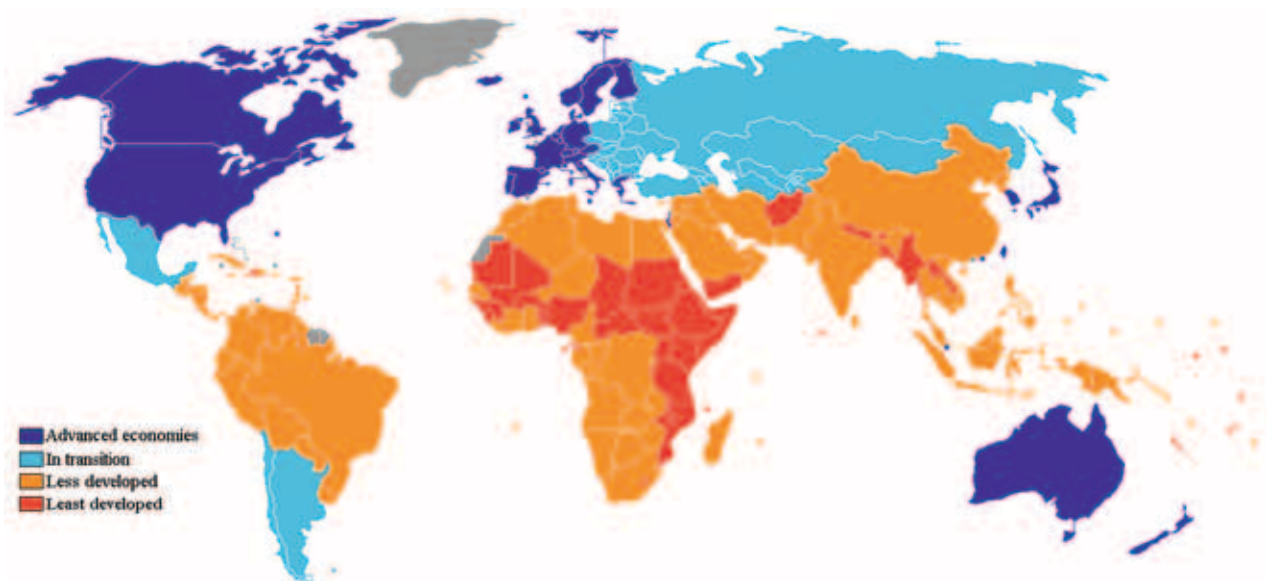
is really making a detectable difference to the global pollution issue?

As a country grows in economic wealth, its people generally take a series of steps, starting with seeking peace and security. Once

achieved this then paves the way for economic development. Economic development allows for trade and industry and

importantly the fighting of disease and hunger.

Continued on Page 3



Map sourced from <http://www.forbes.com/sites/evapereira/2011/01/12/developing-countries-will-lead-global-growth-in-2011-says-world-bank>

At the most basic level, an individual has three immediate needs.

- 1) Physical safety.
- 2) A safe and secure supply of drinking water and food.
- 3) Shelter.



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

EDITOR COMMENTS



Dear Readers,

2015 has been an extremely positive year for the Hydroflux Group which has seen the largest growth in projects that it has ever experienced, numerous successful Australian and water industry firsts and a massive increase in our technical and project support staffing.

Australian Water Authorities really sat up and took notice with 15 new water authorities and councils added to the rapidly growing list of water authorities and councils currently entrusting Hydroflux with their wastewater grit removal, classification, screening, aeration or sludge dewatering equipment needs.

We built a record number of Dissolved Air Flotation (DAF) systems to the extent that towards the end of the year our production facility was producing a new HyDAF system every 1 ½ weeks! This included the two largest HyDAF units to date both which were installed in Queensland.

Production was also busy constructing many GT-DAF systems which are proving highly popular in Sydney CBD as an improved system for treating greasy wastewater from shopping centres.

The introduction of Airprex®, an advanced struvite/phosphate removal and biosolids enhancement process for STP's has received a great deal of interest and the availability of this product into the Australian and New Zealand wastewater industry is already causing a serious rethink by authorities of their future planning for sludge digestion and dewatering.

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

**Feature Story Continued:
Controlled phosphate removal
in BNR Plants – producing a
sellable fertiliser.**

AirPrex™ The Basics

AirPrex™ is a complete sludge optimisation and phosphorus recovery system that's installed between anaerobic digestion and sludge dewatering steps.

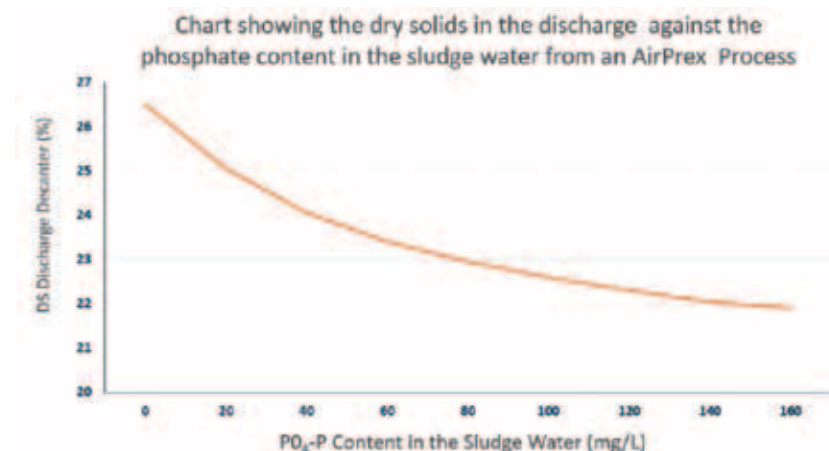
Controlled struvite precipitation is regulated by air stripping in the AirPrex™ reactor with the addition of a magnesium chemical product.

The combination of biological phosphate elimination and the AirPrex™ system achieves unrivalled effectiveness in terms of wastewater dewatering efficiency and cost.



Recovered fertiliser is sold in Europe for up to 60 Euros per ton.

In removing the phosphate, the AirPrex® system not only ensures that pipes and pumps are not blocked with struvite, it also delivers substantial savings in both sludge dewatering polymer usage and sludge disposal volumes. Importantly it reduces the amount of phosphate returned in the centrate to the biological treatment plant – and this,



**ENJOY PEACE OF MIND WITH
A HYDROFLUX EXTENDED
WARRANTY**

Extended warranties are nothing new. They provide peace of mind and prevent unexpected cash drains on maintenance budgets.

When you buy a new car, the dealer will often extend the



Recovered fertiliser is sold in Europe for up to 60 Euros per ton.

in turn, greatly improves the overall nutrient discharge from the STP.

The AirPrex® process is widely used throughout Europe where it is delivering significant cost savings. For example, several Dutch waste disposal companies have seen savings of around 350,000 euros (more than \$A500,000) per year.

John Koumoukelis, Director of the Hydroflux Group, says there are several benefits of using this leading technology in the treatment of wastewater at plants which service populations ranging from 20,000 up to 1.5 million people.

“While AirPrex® can successfully remove struvite which can then be on-sold as fertiliser, it can also reduce phosphorus load returned to the plant by as much as 90%, reduce

polymer consumption, create higher cake solids and reduce a plant's overall operational expenditure.”

By removing phosphorus-based plant fertiliser from waste sludge streams for sale to farms, the AirPrex® recovery technology can play a part in helping to overcome the challenge of this predicted global shortage whilst helping reduce the pollution of our waterways with phosphate.

The controlled removal of phosphorous from the digested sludge provides a number of operational advantages, including:

- Removal of struvite, leading to reductions in maintenance costs.
- Formation of a sellable fertiliser.
- Increased cake solids by 4%DS, leading to significant savings.
- 80% reduction of phosphate loads in return lines to the biological process.
- 20% reduction in polymer demand in the sludge dewatering plant.

The fertiliser can be sold to local farming groups and is a rich

source of phosphate. Should the biosolids be reused, then the struvite formation step can be removed, and the process still yields a drier cake and reductions in OPEX associated with less solids disposals.

Full scale references in Europe have demonstrated the potential of this process, and confirmed the OPEX benefit and return on investment.

For more information please visit www.hydrofluxhuber.com.au



CNP plant installed in Weiden, Germany.

warranty on the car provided it is serviced regularly by technicians who are fully trained on the specific vehicle.

This is the same approach we take at Hydroflux. We have the technical capabilities to provide expert service and if you decide to utilise this, you will receive an automatic extended warranty on your treatment plant.

Hydroflux has an extensive range of competitively priced chemicals designed for wastewater treatment. Purchasing chemicals from Hydroflux will provide further

extensions on the warranty and can also lead to unconditional performance guarantees on the system.

The optimum warranty can be provided by engaging Hydroflux to operate your wastewater treatment plant for you and unlike airline programs, you may join as a platinum member immediately. We can even provide extended warranty packages on competitors plant.

Purchasing plant and equipment with an extended warranty from Hydroflux provides you with a level of

comfort that your costs will be fixed for what can potentially be an indefinite period of time!

**HYDROFLUX EXTENDED
WARRANTY PACKAGES**

10 YEARS
Platinum Package
Up to 10 years warranty with full plant operation

5 YEARS
Gold Package
Up to 5 years warranty with chemical supply and service

3 YEARS
Silver Package
Up to 3 years warranty with service contract

**Feature Story Continued:
Environmental Protection—A
luxury most nations cannot
afford.**



At the most basic level, an individual has three immediate needs. The first is for physical safety. The second is for a safe and secure supply of drinking water and food. The third is for shelter.

Protecting the environment for the sake of the environment - and reducing pollution - comes well down the list of the needs of an individual.

For transitioning countries, as with an individual, protecting the environment and therefore reducing pollution is a very low priority. And when you look at the map (on page 1) above it would appear much of the world still has a long way to go before countries or individuals can seriously consider environmental protection as an important need.

Need it be so? Well, if I was struggling to feed my children, yes it would be well down my lists of priorities.

Is this the “right” attitude? Well I am not sure how much I would in that situation care about the “right” attitude.

Given the above, is there anything we water professionals can do? The answer is yes.

First, we need to design systems that cost less to build and operate for every stage of the less-developed nation’s economic development.

Second, we need to do it with a level of urgency

Third, we need to pull back on investing time and money in achieving fractional improvements to a developed a nation’s water systems and spending the money designing systems that the less developed nations can afford.

What can others do?

Developing and transitioning governments need to make building stronger water institutions a priority. This will ensure that public funds are used wisely and not squandered on inappropriate technology.

The water media and thought leaders need to educate the public in developing nations to help their people understand what is possible. More importantly these people will also need the knowledge that will enable them to ensure their leaders are made accountable if they don’t deliver.

We who live and work in developed nations must both



Pollution and safe drinking water must be tackled from all sources.

assist and lead by example, especially in our transactions and through our businesses that are working with and within these developing and transitioning nations.

As an example of what can be achieved, all of us in the water industry should be inspired by the activities of WaterAid which is tackling one of the world’s major health issues. Around 500,000 children are dying every year from diarrhea caused by drinking unsafe water and being exposed to poor sanitation? That is over 1,400 children a day.

WaterAid is attacking this issue from all angles - working

with local partners to help communities to gain access to safe water and sanitation. It is also using its experience and research to influence decision-makers to do more to provide these vital services. And it using practical technologies while ensuring the communities gain and maintain the right skills to keep these solutions working long into the future.

This approach has resulted in more than 21 million people worldwide now having access to safe water. And all of this has happened in some of the world’s poorest communities.

By taking a leaf out of WaterAid’s

book, if we can both lower the stage in economic growth at which developing and transitioning nations can afford to start work on environmental protection and increase the knowledge within these nations as to what is possible, there is every reason to believe that - sooner rather than later - environmental protection will no longer be a luxury that most of the world’s less-developed nations today cannot afford.



**Size Does
Matter**

BY LUIS BASTOS

HH HYDROFLUX HUBER

It does for Rockhampton City Council at least!

Among the major challenges facing many councils in Australia is the need to treat growing amounts of wastewater caused by population growth; the need to manage the costs of this treatment and the need to meet and comply with new and stringent discharge limits.

The South Rockhampton Sewage Treatment Plant now serves a population of more than 19,000 people, the price of electricity in Queensland rose more than 20% in July of 2013 and it’s no mean feat to keep under the effluent limit of 5-10 milligrams per litre for total nitrogen.

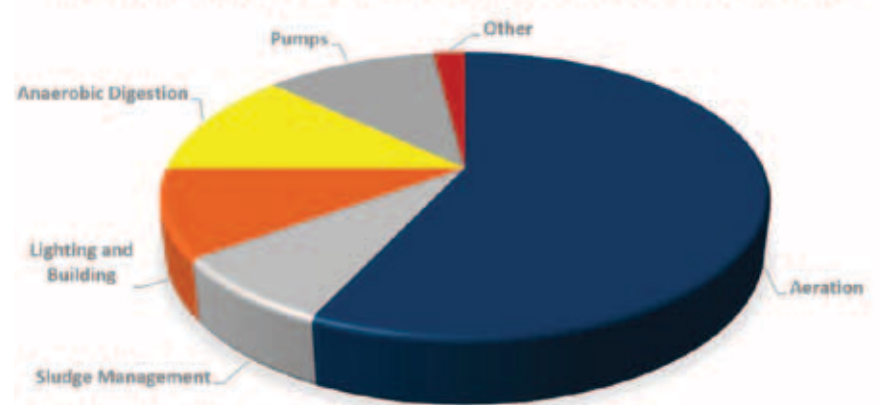
“We chose Hydroflux HUBER to install 80 of their four-metre AEROSTRIP’s not only because they will cut our energy use while reducing our carbon footprint; but also because Hydroflux HUBER provided performance guarantees for the installation. These guarantees, which have been met and verified, included oxygen transfer rates,” says Cr Greg Belz of Rockhampton Regional Council.

However, thanks to an upgrade of this treatment plant – which includes using a diffuser system considered one of the most efficient in the world – the Rockhampton Regional Council has achieved a total nitrogen limit as low as 3.1 milligrams per litre while aiming to reduce electricity costs by up to 20%.

“More than half of the energy used in a treatment plant such as ours is consumed in the biological/aeration process. This is why we have upgraded the plant by retrofitting it with the highly-efficient aeration system of AEROSTRIP® Diffusers,” says Cr Greg Belz.

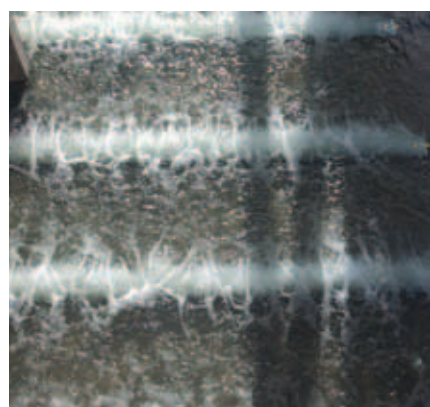
Luis Bastos, a Director of Hydroflux HUBER, said: “AEROSTRIP® diffusers are easy to retrofit into existing sites. What makes them particularly popular is that, as a result of the superior materials used in their construction, they outlast all other fine bubble diffuser technologies on the market. “The main benefits of the AEROSTRIP® diffusers are the significant power savings they achieve by the high oxygen

TYPICAL ENERGY CONSUMPTION OF A CONVENTIONAL STP



transfer rate 4.0-5.0 kgO₂/kW and the robustness of the membrane, which has a proven life of greater than 12 years. All of this is without fouling or loss of pressure. Proof of the popularity of this system of diffusers can be found in the fact that AEROSTRIP® diffusers have been installed at over 2,000 sites worldwide.

“They have proved particularly popular in Queensland as AEROSTRIP® diffusers also deliver cost savings in electricity and by lowering maintenance costs. The South Rockhampton Sewage Treatment Plant is the fifth installation in Queensland,” he adds.



Aerostrip® fine bubble diffusers in Rockhampton under testing procedures.



Aerostrip® fine bubble diffusers are manufactured under strict quality control in Austria.



Aerostrip® fine bubble diffusers in operation at Rockhampton STP.



100 MBBR's

Hydroflux Industrial has marked a major global milestone delivering the 100th Flootech MBBR. The installation was completed at a new meat processing plant in



Sydney. The overall treatment plant involved screening, DAF, MBBR and sludge dewatering using a HUBER inclined screw press.



Adrian Minshull with Mikko Siivonen of Flootech during a recent trip to Finland.

The most extensive range of Industrial DAF systems



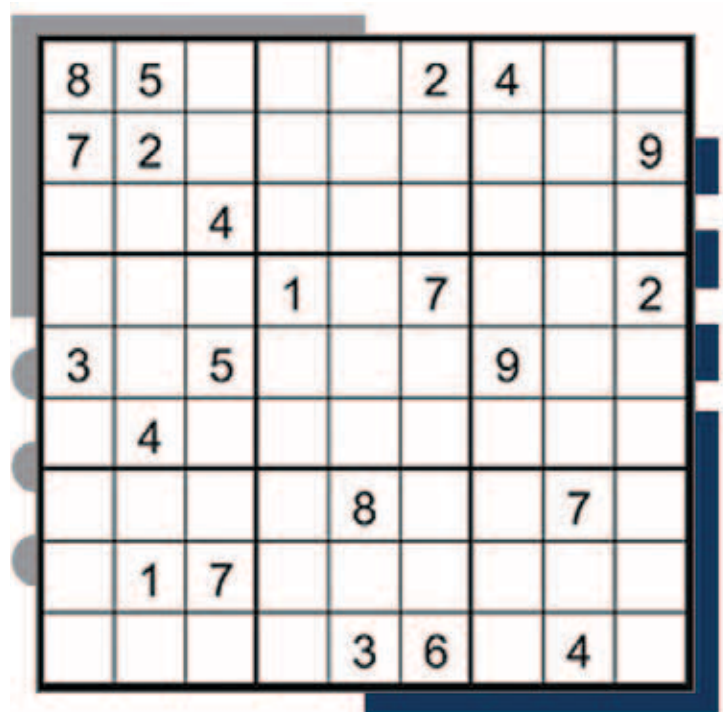
Hydroflux's range of industrial DAF systems are designed to treat wastewater from industry. Standard units can treat from 5 kL up to 500 kL of wastewater per hour.

The Hydroflux Hy-DAF is designed for the treatment of wastewater with a high solids loading. Each DAF system is matched with a suitably selected dissolved air production system that will achieve the desired air to solids ratio. Mathew Pugh of Hydroflux Industrial says, "matching dissolved air systems with the DAF body to suit the solids load not only ensures optimum performance, it also optimises the power consumption of the system."

In 2015 we were manufacturing Hy-DAF systems at a rate of one every week and a half!



Many options and accessories are available including covers for odour control.



SUDOKU
COMP

\$200

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. Entries close end March 2016



CAREER OPPORTUNITIES

Hydroflux is always looking for experienced wastewater engineers to join the team. Please feel free to contact us if you think you may be a good fit!

For further and more detailed news, please visit hydroflux.com.au



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

01 DALBY CELEBRATES

Western Downs Regional Council recently celebrated the Dalby Regional Saleyards 75th anniversary after the recent redevelopment of the Saleyards by Wiley. Hydroflux completed construction of the effluent treatment facility which comprises, HUBER Screening and Compacting equipment, an IDEAL with Tornado self-aspirating surface aerators, and HUBER sludge management equipment.



02 ANDREW DEVLIN JOINS THE TEAM

Hydroflux welcomes Andrew Devlin to our industrial wastewater project management team. Andrew has completed substantial projects for a range of industrial clients including Mining, Petrochemical and a variety of Food and Beverage applications.



03 MID COAST SCREENING

Hydroflux has been awarded another STP Inlet Works

contract by Mid Coast Water for the supply of perforated plate band screening technology, The HUBER Escamax® has been verified for 84% screenings capture ratio by the UK WIR, for 6mm perforations. The system will remove twice the screenings content as compared to the existing 5mm step type screens.



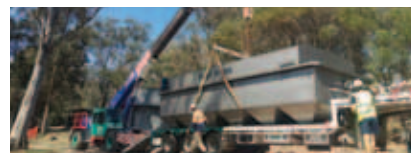
04 LUGGAGE PT SLUDGE UPGRADE

Hydroflux are supplying advanced HUBER Rotary Screw technology to manage the primary sludge volumes into the existing digestion facility, which in turn is used to produce biogas followed by electricity in a co-generation facility.



05 Hy-DAF 100S

A specially designed high dissolved air flow HD-100S DAF system was recently installed at a meat processing plant in Brisbane. The HyDAF HD-100S is being installed as part of a wastewater treatment plant upgrade including heat exchangers, screening and a new clarifier.



06 UNITY WATER

Unity water have awarded Hydroflux with the upgrade of the Bribie Island STP Biosolids Facility. The project includes the design and construction of a new sludge processing system using HUBER Inclined Screw Press technology, to replace the existing belt filter press.



07 SLUDGE DEWATERING IN WA

The Water Corporation have selected Hydroflux HUBER to design, supply and commission a fully automatic sludge dewatering skid for the Pemberton STP.



08 INDUSTRIAL TREATMENT IN WA

The Kimberley Meat Company abattoir will be the first abattoir to operate in Western Australia's far north for 22 years and will be opening early 2016. The wastewater will be treated in a Hydroflux treatment plant.



09 UNIQUE OIL SEPARATION

Hydroflux has developed a unique range of oil water separators. The systems can be used for industrial or storm water applications and are designed to achieve strict EPA requirements.



10 SAVING ENERGY IN THE SUNSHINE STATE

Monadelphous along with Queensland Urban Utilities (QUU) have awarded Hydroflux HUBER a contract to design and supply a diffused aeration system using the AEROSTRIP® advanced fine bubble diffusers for the upgrade of one of the bioreactors at Oxley Creek STP.



SPOTLIGHT



BRUCE WILLIS

1. WHAT IS YOUR ROLE?

My role at Hydroflux is to help our customers achieve the lowest total cost of operation for their water treatment plant by providing world-class operational, mechanical, biological and chemical expertise.

2. WHAT IS THE MOST UNUSUAL OR INTERESTING EXPERIENCE YOU HAVE HAD AT WORK?

My most memorable experience was working at the Shell LNG plant in Brunei and solving a long standing operational issue with rising sludge on their 50 ML/day raw water treatment plant.

3. WHAT IS YOUR MOST EMBARRASSING MOMENT AT WORK?

My most embarrassing moment at work was missing my flight to Indonesia and thus turning up 12 hours late to provide 1 days training to plant managers – oops.

4. WHAT DO YOU LIKE TO DO WHEN YOU ARE NOT AT WORK?

When I am not at work or with my family I like trying my hand at photography and even composing music.



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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March

NEWS FOR CUSTOMERS AND FRIENDS OF THE HYDROFLUX GROUP

2016



News from our International Partners

HUBER TECHNOLOGY WASTE WATER Solutions

LARGEST SOLAR SEWAGE SLUDGE DRYING SITE IN SOUTHERN GERMANY FULLY EQUIPPED BY HUBER

In a new sludge treatment plant in Bayreuth the sludge from 300,000 PE STP is dewatered and dried – fully automatically, with the use of exhaust heat and exhaust air treatment. The project is still in the construction phase. The new plant will process the generated sludge from 2016 onwards.

From the dewatering system into the dryer.

The digester sludge with a DR content of between 2.5 and 3.5% is dewatered by two centrifuges and automatically transported into the solar dryer by screw conveyors. Inside a Venlo greenhouse the dewatered sludge is evenly distributed onto five individual lines. If one or several lines should fail, the electrical control system automatically changes the feed to the plant so that the remaining lines process the generated sludge. The dewatered sludge can optionally be conveyed directly into a container if necessary.

From press cake to dry granulate.

While the HUBER machine turns and transports the press cake through the greenhouse the sludge gives off moisture to the air and the sludge is transported as a dry globular granulate at the end to the drying beds.

The special feature of the HUBER SRT sludge turner is its unique tool: The sludge is moved by a permanently rotating double shovel so that the sludge is rolled into round compact grains and intensively exposed to air at the same time. The double shovel can however also be used to selectively displace the sludge. For this purpose the SRT sludge turner takes up sludge into one of its shovels and places the sludge turning tool into a horizontal position. The HUBER SRT can thus not only backmix dry sludge into wet sludge, it also provides the possibility to feed wet sludge and remove dry sludge on the same side of the dryer, as is the case on the Bayreuth site.

The SRT sludge turner is installed to ensure that 99% of the surface covered with sludge is processed. The double shovel is able to move so close to the boundary walls that virtually no sludge remains in the corners. The turner shovels are driven by high-performance motors so that up to 1,000 m³ sludge can be turned per hour. In the first zone the sludge is still quite wet so composting effects can start with reduced sludge bed activity. To prevent this

the HUBER machine moves the organically highly active sludge every 15 minutes and thus eliminates undesired composting effects.

Such intensive and complete sludge bed treatment enhances water extraction, improves the mechanical treatability of the sludge, reduces odour emissions and produces a well dried stable end product – a free-flowing and easy-to-process dry granulate.

Wind and heat dry the sludge

A number of grade heaters are installed above the sludge bed which introduce exhaust heat from a nearby biogas plant into the sludge drying process. The greenhouse is equipped with a special condensate drain system which reduces remoistening of the sludge to a minimum. The grade heaters are made of galvanized steel to prevent corrosion. Ventilators move the dry and hot air above the drying surface through the greenhouse. The ventilators are speed controlled. They are able to rotate at very fast speeds and produce powerful air turbulences on the sludge bed or rotate slowly for energy-optimised operation.



SRT sludge turner installed at a solar drying facility in Germany.

When the air arrives at the feed end of the dryer it is saturated due to the moist sludge and is removed from the system via an exhaust air treatment system. The two-stage washer was manufactured under factory conditions and only needed to be mounted on site. All sealings are therefore of high quality. The air flow is routed through the washer as cross flow. The pressure losses are reduced through exhaust air treatment resulting in reduced power.

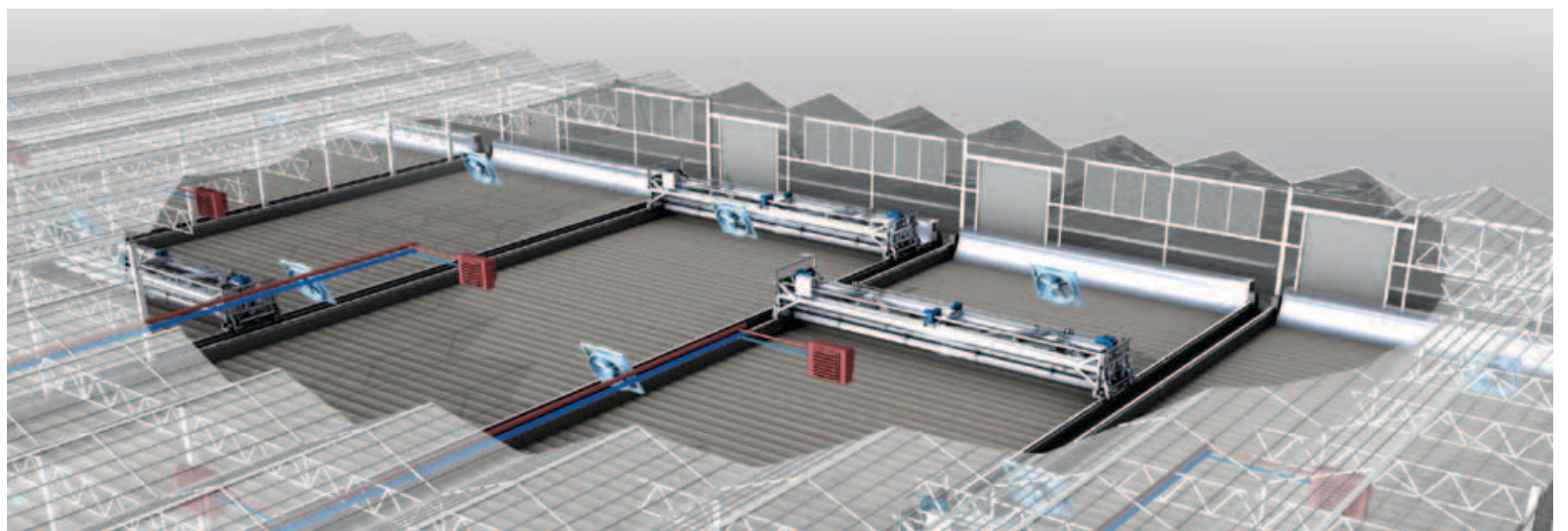
The dry granulate is collected, stored and quickly carried out for removal.

Screws transport the dry granulate to a bucket conveyor which delivers the sludge into a horizontal silo. The sludge is quickly removed from the silo. The granulate can be loaded with loading bellows either

onto an open dump truck or onto a closed silo truck. The silo is set on weighing cells so that it is possible to control the fill level and avoid overloading of the truck.

TECHNICAL LAYOUT DATA OF THE BAYREUTH PLANT:

- 8,940 m³p.a. digester sludge after dewatering (28% DR).
- 3,340 m³p.a. digester sludge after solar drying (75% DR).
- 5,600 m³p.a. water evaporation (incl. utilisation of exhaust heat from biogas plant).
- 4,970 m³p.a. water evaporation (without utilisation of exhaust heat from the biogas plant).



View of the 5 parallel drying beds and HUBER SRT sludge turners. HUBER Solar Dryers are distributed exclusively in Australia by Hydroflux HUBER Pty Ltd.





ORGANICA

FOXCONN ADOPTS ORGANICA REUSE SOLUTION TO CREATE URBAN GREEN SPACE

Foxconn Technology Group is the world's largest electronics manufacturer, assembling products like Apple iPhones and iPads, Sony PlayStations and Microsoft Xboxes.

One of their largest manufacturing plants is in Shenzhen, China, a modern city with a population of over 10 million people and thousands of workers live directly adjacent

to their work, making space a premium. Foxconn's Shenzhen plant employs more than 200,000 workers, living in the same densely populated community where they work. Previously, the wastewater of the company's office complex was discharged directly to a nearby river. In accordance with new national regulations

"Not only is Organica's plant flexible enough to fit in a highly dense urban environment, it also provides cutting-edge technologies for quality water treatment. Their approach to Nitrogen removal is superior to any existing technological solution."

Mr. Wen Shenzhen Environmental Engineering and Science Centre

however, the site needed to provide wastewater treatment to meet the business park's need to produce clean, reusable water.



Inside the greenhouse of an Organica STP.



View of the Organica wastewater treatment plant at FOXCONN in Shenzhen, China.

Foxconn opted for the Organica solution as it perfectly satisfies the water quality standards for reuse while offering large capacity in an exceptionally small footprint. Additionally, it provides odourless operation in an aesthetically pleasing greenhouse enclosure, eliminating the "psychological" footprint, which is a significant issue with conventional approaches. These advantages make Organica an ideal wastewater treatment solution in the dense urban environment.

An Organica facility also offers excellent automation and operational efficiency, greatly reducing downtime and energy consumption, while requiring minimal staff to operate.

Scarce space is no problem for the Organica Solution.

Since 2010, the treatment facility has produced high quality reuse water compliant with the strict local regulations. Its efficiency and low staffing needs saves Foxconn significant operating expenses, while the reclaimed water is used in cooling towers, providing on-site usable water and decreasing water costs. Apart from efficiently solving the park's wastewater treatment requirements, Organica's greenhouse design also creates a friendly space in the midst of concrete and manufacturing plants, improving the living conditions for Foxconn's workers with a

lush addition to their otherwise highly urbanised neighbourhood.

FOXCONN FACTS

Location
Shenzhen, China

Project Scope
Municipal WWTP design—build

Operational since
2010

Footprint
975m²

Hydraulic Capacity
3,000 m³ per day

Community served
18,000 people

Parameter	Influent mg/L		Effluent mg/L	
	Design	Actual	Design	Actual
COD	400	420	50	26.3
NH ₄ -N	30	36	5	3.3
TN	-	55	15	8.6
TP	6	6.5	0.5	0.2
TSS	250	224	10	9.5

2010 - 2011 averages from monthly spot samples



John and Luis at OZ Water exhibition in Adelaide with Imre Toth from Organica's head office in Hungary.

Flootech

DEMINERALISED WATER TREATMENT PLANT - STORA ENSO, VARKAUS POWER PLANT

As water is one of the most important raw materials in the power generation process, boiler feed water must be treated correctly to eliminate the salt content from the feed and to protect the boiler and downstream equipment from scaling and corrosion.

In 2014, Flootech designed and delivered a FlooRO™ Reverse Osmosis and FlooMB™ Mixed Bed ion exchange based demineralized water treatment solution to Stora Enso Varkaus Power plant project in Finland. Start-up of the Demineralized water treatment plant was in 2015.

Scope of Delivery

The scope of delivery included



The key processes for Flootech demineralized water treatment are FlooIX™ Ion exchanger, FlooRO™ Reverse osmosis and FlooMB™ Mixed Bed ion exchanger.

the engineering, manufacturing, installation and commissioning of a complete water treatment equipment consisting of 5 µm Cartridge Filters, 100m³/h FlooRO™ Reverse Osmosis and FlooMB™ regenerable Mixed Bed Ion Exchangers in two parallel lines.

Demineralized water preparation from lake water with a capacity of 2 x 70 m³/h.

Incoming Treated Water
Conductivity < 90 µS/cm < 0,1 µS/cm
Silica < 2,0 mg/l < 0,01 mg/l
Na < 5,0 mg/l < 0,01mg/l
KMnO₄ < 15 mg/l TOC < 0,2 mg/l

FlooMB™ Mixed Bed Ion Exchangers

When a water quality of very low conductivity and silica level is required, a FlooMB™ Mixed Bed Ion Exchanger is ideally suited to remove the last traces of the dissolved, undesired ions. In a FlooMB™ Mixed Bed ion exchange system, the cation exchange and anion exchange resins are intimately mixed and contained in a single pressure vessel. A FlooMB™ Mixed Bed polishing unit contains a strong acid cation resin and a strong base anion resin. The strong cation exchanger removes all positive ions (NH₄⁺, Ca⁺, Mg⁺, K⁺ and Na⁺) from feedwater by exchanging them with H⁺. The strong base anion exchanger removes negative ions (SO₄²⁻, Cl⁻, NO₃⁻, CO₂ and SiO₂) by exchanging them with OH⁻. The hydrogen and hydroxide ions then react to produce demineralised water.

On exhaustion of the capacity the mixed bed ion exchanger is taken out of service and chemical regeneration is

performed. To carry out regeneration the resins are first separated hydraulically by backwashing. As the cationic resins are of a higher specific gravity, they settle at the bottom of the vessel whilst the anion resins will float to the top. When the resins have been separated, each of them is separately regenerated with sulfuric acid and sodium hydroxide base, respectively. After partial emptying of the vessel, the two resins are remixed using compressed air.

Main Benefits of Flootech Demineralized Water Treatment

- Fulfilling demanding water quality requirements
- High reliance and stable outgoing water quality
- Low maintenance cost and stand-alone operability
- Compact and efficient design
- Integrated design for lowest fresh water usage



Flootech demineralized water treatment system at Stora Enso Varkaus Power Plant.