



Our Position in The Green Energy Space


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Carbon Neutral ORGANISATION

The Hydroflux Group is Climate Active Certified

Hydroflux is Proud Partners with NX Filtration

FEATURE STORY

BY JOHN KOUMOUKELIS

The Hydroflux Group is pleased to announce its channel partnership with NX Filtration to bring their industry leading direct nanofiltration technology (dNF) to the ANZ-Pacific market.

dNF membranes are the next generation of polymer membranes, providing an ideal solution for the removal of micro-pollutants, including the residues from antibiotics, hormones, pesticides, pharmaceuticals and nano-plastics.

“As Australasia’s fastest growing water tech and solutions business, we are excited to partner with NX to deploy their ground-breaking technology under our existing

HyPURE® range of integrated membrane systems.

Direct nano-filtration through a hollow fibre configuration provides significant benefits to customers in the municipal and industrial market that previously were not available.

Hydroflux has conducted a series of pilots across a range of applications that demonstrate the outstanding benefits of the technology. We are now constructing our first two HyPURE® NX units for customers in NSW and QLD.

NX is listed on European stock exchange, Euronext, with the highest sustainability rating as certified by independent research-based evaluation body CICERO. As the ANZ-Pacific’s first Climate Active certified carbon neutral water



tech business, Hydroflux and NX share a common vision of a low carbon and climate resilient future closely aligned to our purpose of

Protecting our Most Valuable resources.” Says Hydroflux director John Koumoukelis.

HyPURE® NX provides customers

with municipal and industrial benefits that was previously not available from comparable membrane technology.

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Hydroflux Industrial Announces Mathew Foster as CEO

BY ANDREW MILEY

Hydroflux Industrial Pty Ltd is thrilled to announce the appointment of Mathew Foster as Chief Executive Officer (CEO).

With over 20 years in the industry, and as Hydroflux Industrial continues to expand and deliver sustainable water treatment solutions to the food and beverage, infrastructure and Manufacturing sectors, we believe Mathew’s appointment will quickly build upon the

strong performance we have delivered in recent years to drive even better outcomes for our growing client base.

Mathew’s extensive experience spans over 20 years in the sector. His accountability and leadership skills, combined with his reputation as a trusted partner in pragmatic and sustainable solution delivery are a key part of the success of the Hydroflux Group, one of Australasia’s

fastest growing water solutions technology companies.

Mathew is a dedicated, well-rounded & experienced water industry professional with extensive skill, capability and knowledgeable of every aspect of the industrial water sector. Mat has been a key member of the Hydroflux Industrial Board and leadership team since 2013 and we look forward to his positive impact as we broaden our scope and impact in a decarbonising and cost conscious environment.

Reflecting on his appointment, Mathew said “I’m delighted to take on this appointment, continue my long association with the Hydroflux Group

and continue to build and develop our best of the best team and deliver excellent and sustainable solutions for our clients/customers/etc.”

The Hydroflux Group is a team of wastewater treatment experts harnessing the power of world leading research and technologies for a more sustainable use of water, energy and resources.

Hydroflux CEO Adrian Minshull said, “With his wealth of understanding and experience we have no doubt he will lead the growth and development of the Hydroflux Industrial business to even greater heights.”

FROM THE CEO



Welcome to our first issue for 2023! I'm delighted to take the helm at such an exciting time for Hydroflux. Our Chair, John Koumoukelis and I are committed to delivering on our promise of protecting our most valuable resources. With offices across Australia, New Zealand and Fiji, our organisation is one of the region's most dynamic and fastest-growing water groups. We have a diverse range of products and solution offerings with the largest and most experienced group of water & sustainability professionals.

In 2021, Hydroflux became Australia's first water treatment and technology company to achieve Climate Active carbon neutral certification for our entire organisation. Now our journey continues - with the certification of our range of water technology and associated chemical products as carbon neutral under the Climate Active program. This includes our Roadtrain® Decentralised Packaged Plants, BioCap® Digester Covers, HyDAF Dissolved Air Flotation, HUBER QPRESS® Sludge Dewatering System, proprietary chemicals including HYDRABOND® Polymers, HYDRAPRIME® Coagulants & numerous other chemicals used for water treatment for the municipal, mining and industrial sectors.

This is just the beginning of our carbon journey, and as industry leaders, we will encourage our clients, suppliers and service providers to make a start and a difference. We will do this by offering information and alternatives, by being selective in what we buy and whom we buy from and most importantly, by how we communicate. I hope you enjoy the issue.

Julia Seddon, CEO

Reinforcing Our Position in The Green Energy Space

BY MITCHELL HASTINGS

Hydroflux has been awarded a tender to supply a pilot scale high-grade ultrapure water treatment system for Graphite Energy's groundbreaking Green Steam™ project.

Over the past 24 months, the world has seen unprecedented levels of investment into decarbonizing global industrial processes. The food & beverage sector is no different, as manufacturers of all sizes are pledging to make net zero targets, with most matching or exceeding 2050 deadlines.

One of the major challenges for the F&B sector has been a reliable & efficient method of generating renewable thermal energy at high enough temperatures to meet the steam demands. Food & beverage manufacturers are often operating 24 hours per day and readily available steam is critical to how they operate.

Currently, most steam in the F&B sector is produced by natural gas boilers as supply is reliable and combustion provides a direct route for energy transfer into steam. Converting the variable capacity of renewable energy production from solar and wind into high-temperature, high-grade heat sources is the key challenge to reducing reliance on natural gas and decarbonising F&B manufacturing.

One company making strong headway in this battle is Australian firm Graphite Energy. Graphite Energy are pioneering the concept of thermal storage and Green Steam™ production in Australia. Their graphite thermal energy storage (TES) system offers a low cost, reliable and readily scalable solution for converting renewable energy directly into steam. The TES system is capable of continued steam production for long periods of time after the supply of renewable electricity is no longer available.

One major advantage of the Graphite Energy TES system is the modular design of the storage system. This concept allows it to be easily scaled up or down and makes the solution particularly attractive for F&B manufacturers of all shapes and sizes.

Graphite energy are currently developing a pilot project for a major F&B client in Wodonga Victoria. This project follows on from successful test work at their Lake Cargelligo site. Hydroflux are playing a small but critical role in the development of the Wodonga pilot plant through the supply of a specially designed ultrapure water (UPW) system.

The Hydroflux HyPURE® UPW process utilises several treatment stages including ion exchange, reverse osmosis,



membrane degassing & finally electrodeionization. The plant is fully automated and accessible remotely to minimize site maintenance time.

Tyreen Hasna, Hydroflux project manager has been working since the early engagement with Graphite Energy, ensuring energy & water efficiency were central to the design. "Hydroflux has developed specific design features to reduce both energy and water usage on the water treatment system and TES, while still being able to meet peak water usage demands."

"We talk a lot about reducing our carbon emissions, especially here at Hydroflux, while we've become pretty good at it (we are a carbon-neutral certified company group!), we're very excited to be working with Graphite Energy on a project which has the potential to change the way Australia produces and uses energy."

"The F&B industry is an important place to start, as it uses 30% of the available energy

globally and contributes to approximately 20% of the world's greenhouse gas emissions. The displacement of fossil fuel usage can have a drastic impact on global efforts to reach net zero."

The project further reinforces Hydroflux position as a leader in the green energy space through our drive to provide innovative, energy-saving solutions in the biogas, green hydrogen and green steam sectors. Hydroflux are looking forward to successful commissioning the UPW plant alongside Graphite Energy in the very near future.

"Hydroflux have been instrumental in improving the overall energy efficiency of the water treatment and associated systems. Their engineering expertise and flexibility have facilitated the integration process with the TES." - Casey Walsh, Head of Engineering at Graphite Energy

World's Largest Biosolids Solar Drying Facility Awarded to HUBER SE

BY JOHN KOU MOUKELIS

The Bahr El-Baqar STP located in Egypt will be the largest sewage treatment facility in the world, treating 5000 MLD with the final effluent being returned to the Sinai agricultural region for irrigation, slashing the area's potable water usage.

HUBER SE were contracted to deliver the world's largest biosolids solar drying facility.

Project Highlights

- 160,000 square meters of Biosolids Drying Area
- 8 sets of drying lines, each line with 16 greenhouses



- A total of 128 HUBER Solstice® Sludge Turning Devices each at 11m wide
- Over 3.6km of screw conveyors to feed manage the final dried product

Sustainability Highlights

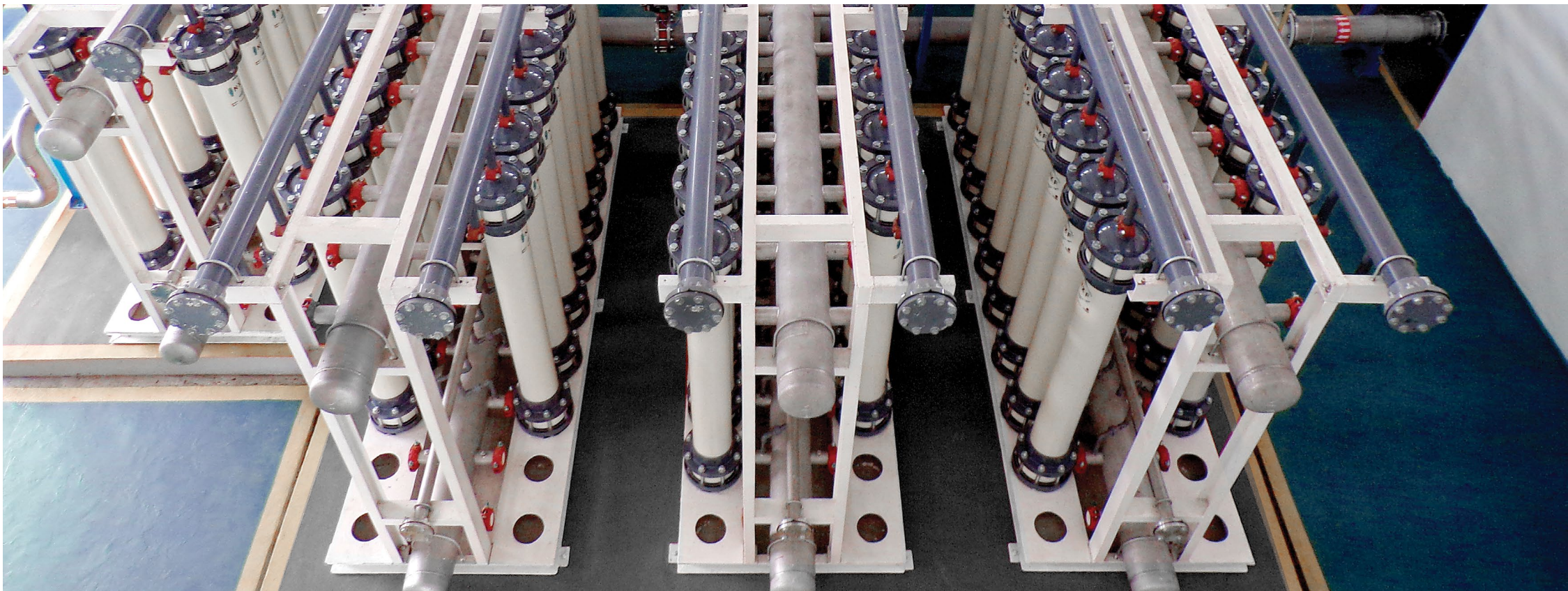
- Solar energy is harvested as the heat source, for free!
- The biosolids generated are dried to 75%DS, leading to a 65 - 70% volume reduction and significant reduction in truck movements, transport costs and the associated CO2 emissions

Technology Highlights

- HUBER Solstice® mechanism back mixes fresh cake with dried biosolids, eliminating odour release along the drying bed. It's the only design of this type on the market
- Low bed depths further reduce any potential for odour release
- HUBER Solstice® runs on a concrete track with a double shovel design that fully turns and moves the biosolids over the length of the dryer, maximizing drying ability of the sludge
- Complete stainless steel fabrication provides increased lifecycle value over carbon steel designs

To learn more about SOLSTICE® click here or contact Hydroflux Epco on 1300 417 697 or email info@hydroflux.com.au





FEATURE STORY: HYDROFLUX IS PROUD PARTNERS WITH NX FILTRATION - Continued

About NX Filtration

NX Filtration N.V. is a provider of direct nanofiltration membrane technology for producing pure and affordable water to improve quality of life. Its direct nanofiltration technology removes micropollutants (including pharmaceuticals, medicines, insecticides, and PFAS), colour and selective salts, but also bacteria, viruses and nanoplastics, from water in one step whilst offering sustainability benefits.

HyPURE® NX ZeroBrine Nanofiltration Process for PFAS Removal

What Are PFAS Compounds?

PFAS is a group of synthetic chemicals known as per- and poly-fluoroalkyl substances. The hallmark of PFAS compounds is their series of carbon-fluorine bonds which form part of the “backbone” of these chemicals. The backbone is combined typically with a carboxylic acid or sulfonic acid functional group. There are some notable exceptions to this, such as Gen X compounds. The high energy required to break the carbon-fluorine bonds within PFAS substances means they are virtually indestructible, which made them ideal for a wide range of industrial uses. These products have been used in everything from firefighting foams and Teflon, to grease resistant coatings in carpets and chip packets.

The major challenge with these compounds is they do not break down in the environment,

leading to bioaccumulation within animals and humans.

PFAS molecules are also highly mobile, due to their hydrophilic carboxylic acid and sulfonic acid functional groups enabling them to travel thousands of kilometres in groundwater and surface water. The combination of their ability to bioaccumulate and mobility has led to a global phase out of these products.

While PFAS compounds are not manufactured in Australia, they are still in use and are present in a range of imported consumer products. One of the primary sources of PFAS contamination is through firefighting foams. The sale and use of PFAS firefighting foams are banned in South Australia and New South Wales has introduced a range of restrictions in March last year (2021).

Due to its’ mobility & persistence PFAS contamination in the environment from firefighting foams, alongside other sources are widespread across Australia. The Current EPA national environmental management plant for PFAS recommends treatment of PFOS to 0.00023 µg/L (0.23 ng/L)

and PFOA to 19 µg/L prior to environmental discharge.

Existing Treatment Methods

There are currently a wide range of treatment technologies used to remove PFAS species from surface and groundwater. Many of these solutions are generally only functional on small scale, or for treatment of highly concentrated waste due to the high energy requirements to operate at either extreme temperatures or pH ranges to breakdown C-F bonds.

Several proven methods of treatment exist, including activated carbon (GAC) and/or ion exchange (IX) adsorption and foam fractionation. These technologies have proven effective at PFAS removal when incoming concentrations are high, however reliability reduces, and operating costs increase at very low concentrations (1 – 5 ng/L). All technologies also struggle to remove short chain compounds such as PFBS.

Reverse osmosis & nanofiltration membranes provide the most complete removal of PFAS compounds, even at very

low incoming concentrations (1 – 5 ng/L) however the management of waste brine creates a serious and currently unresolved challenge.

HyPURE® NX ZeroBrine nanofiltration process for PFAS removal

Hydroflux have developed a process which exploits the benefit of the physical barrier to PFAS compounds offered by nanofiltration membranes without the challenge of handling waste brine.

The ZeroBrine process utilises our HyPURE® NX system fitted with NX Filtration direct hollow fibre nanofiltration membranes at its’ core.

The NX Filtration dNF40 and dNF80 membranes have shown to be extremely effective at removal of PFAS compounds. The pore sizes and unique nanocoating within the membrane are ideally structured to retain PFAS and other organic pollutants whilst allowing dissolved inorganic salts to pass through.

The HyPURE NX ZeroBrine process can also be retrofitted to existing GAC, IX and foam

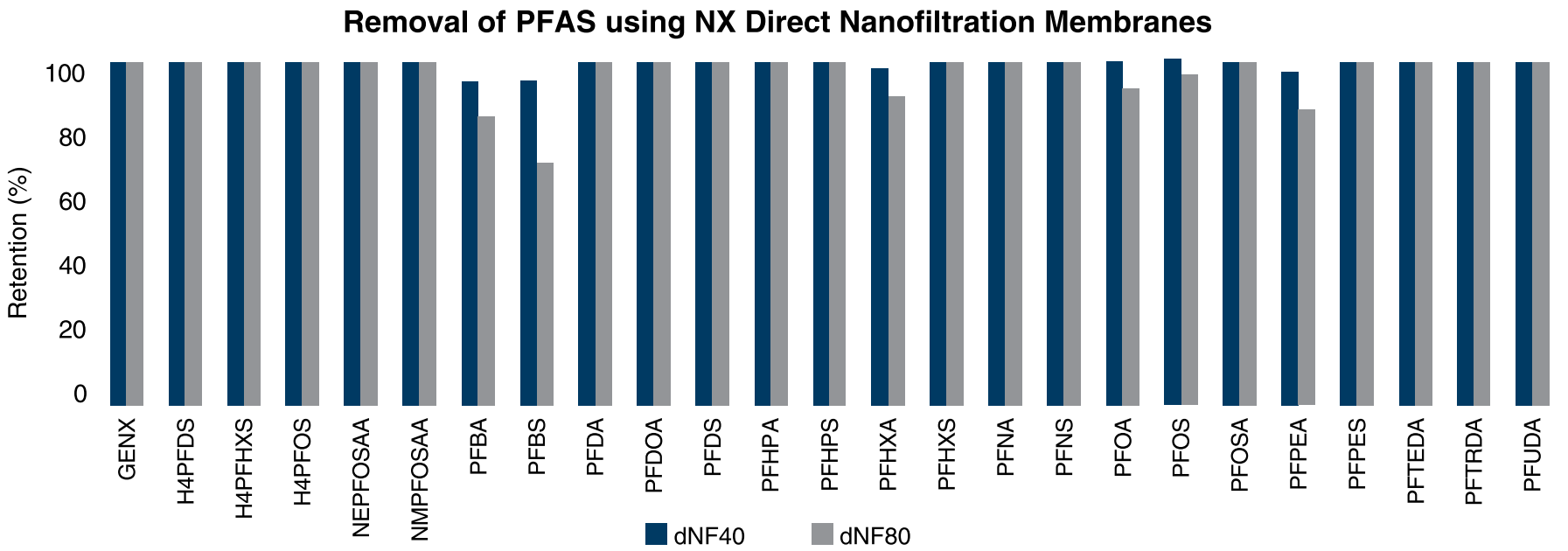
fractionation systems to provide either improved treatment performance, reliability, and significant savings in operating costs (less media replacement).

The membrane provides an effective barrier to remove a wide range of PFAS compound. An example of typical removal rates for the dNF40 and dNF80 membranes are provided below.

Removal of Co-Contaminants

One of the major benefits of the HyPURE NX system is it removes a broad spectrum of other contaminants in a single process, meaning that additional targeted treatment systems do not need to be provided. An overview of some of the many compounds removed by the HyPURE NX system is provided below:

- Heavy Metals including Zn, Pb, Fe, Mn, Cu, Cd, Cr, As
- Chromium VI (< 1 µg/L ANZG 2018 95% SPL)
- Dissolved hydrocarbons
- Pathogens, viruses, bacteria
- Microplastics



Hydroflux Utilities Introduces FlocBloc

BY TRISTAN PATERSON

Hydroflux Utilities are delighted to announce the acquisition of Environmental Warehouse.

This valuable acquisition adds FlocBloc and many other unique products to Hydroflux Utilities' already comprehensive range of speciality water treatment chemicals.

What is FlocBloc?

FlocBloc provides a simple & convenient method for applying flocculant polymers to water requiring clarification without the need for complicated or expensive dosing systems.

FlocBloc consists of fine granules of powder grade flocculant dispersed in a non-toxic and readily water-

soluble binding polymer. As water flows over the Bloc, flocculant is released which combines with the sediment, causing the sediment particles to agglomerate so they settle rapidly, leaving behind clear treated water.

Typical Applications

DamClear FlocBlocs are ideal for dosing flocculant for water clarification in many applications and are suitable for environmentally sensitive applications.

Some of the most common uses are:

Industrial wastewater

Clarification of trade & industrial wastewater to remove solids.



Construction sites

Clarification of stormwater on building sites, and commercial and residential developments.

Road construction

Clarification of stormwater run-off in sediment retention basins for road, rail and tunnel construction.

Dam water

Clarification of clay contaminated river & dam water for livestock, irrigation & horticulture, & for aesthetic improvement.

Mines & Quarries

Clarification of stormwater run-off from mining operations & stockpiles found at stone,

rock, sand and gravel, and mineral quarries. Clarification of water from drilling operations.

To learn more please [click here](#). Clicking the link will take you to the Environmental Warehouse website where you can learn more information or order online.

Delivering Safe Environmental Discharge for Saibai STP

BY JOHN KOUMOUKELIS

Located just 4km from Papua New Guinea (PNG), Saibai Island is the Northern most Island of the Torres Straits, located 3 kilometers from the PNG coastline with approximately 500 residents.

A new sewage treatment plant was recently commissioned to deliver high quality water for environmental discharge into the Arafura Sea. Hydroflux Epco's well proven Roadtrain®

RBC Decentralised Solution was selected for the Island due to its excellent track record in similar installations providing high quality discharge. The process has been specifically designed to suit remote installations and standardized across The Straits in six locations.

"The Hydroflux range of decentralized solutions are tailored to suit sites such as Saibai and we prioritise delivering infrastructure that is suited specifically to resorts,

villages, remote communities and mining camps. Our range of Roadtrain® transportable sewage solutions include the Original, PLUS, Advanced and Ultra. The process selection for each site is targeted to suit the application, the location, and the capabilities of the operational staff on the ground.

I have just returned from a new multi-million dollar project we are starting in Vanua Levu Fiji, using our Roadtrain® ADVANCED technology. The exciting aspect of that project is that we can convert the Roadtrain® from the ADVANCED to PLUS design, in stages, over a period to suit growth. This allows the client to double capacity within the same footprint with some minor additions in the future" says Paul Cobbin, General of Decentralised Solutions for Hydroflux Epco.



Saibai Roadtrain® Key Data - Proof of Performance Testing

- Average dry flow of 140 kL/d, with peaks recorded up to 280 kL/d
- BOD5 < 2 mg/L
- Ammonia < 0.1 mg/L
- Total Nitrogen < 7 mg/L
- Total Phosphorous < 0.95 mg/L
- Oil and Grease < 1 mg/L
- Faecal Coliforms < 10 cfu/100mL

Globally there are over 150 Roadtrain® systems that have been used for a variety of decentralized applications.

Installations from the late 1960's in South Australia, Victoria, New South Wales, Queensland, Papua New Guinea and Middle East are still in operation, demonstrating the robustness of design and life cycle benefit of using engineered tanks as opposed to modified containers.



HYDROFLUX QUIZ -
DIFFICULTY: MEDIUM

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7			9		8			
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HYDROFLUX

WATER | SCIENCE | TECHNOLOGY

The Hydroflux Group comprises eleven companies based in Australia, Fiji, New Zealand and the United Kingdom, providing ecologically sustainable, design-and-build, equipment, process and operational services in water and wastewater treatment.

The group's skill and experience span across municipal and industrial water and wastewater treatment with full after sales support.

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