HYDROFLUX
WATER | SCIENCE | TECHNOLOGY

July 2022

NEWS FOR CUSTOMERS AND FRIENDS OF THE HYDROFLUX GROUP

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The Hydroflux Group is Climate Active Certified

Australia's First Carbon Neutral Water-Tech Organisation

FEATURE STORY

BY ADRIAN MINSHULL

As part of our commitment to positive climate action, the Hydroflux Group has achieved Climate Active Certification as a Carbon Neutral Organisation - an Australian first for a Water-Tech Organisation.

Our business has reduced carbon emissions as much as possible and then invested in projects that reduce or remove emissions from the atmosphere.

For our clients this means you are engaging with a carbon neutral organization & supporting positive and verified action on climate change.

Climate Active certification aligns our values, business objectives and further direction by connecting our activities in the sustainable water and energy arenas with our values of reducing carbon emissions and our mission of Protecting Our Most Valuable Resources.

Hydroflux intends to remain at the forefront of research in the water industry with a particular focus on reducing emissions. Our commitment to addressing climate change extends beyond reducing emissions and being carbon neutral. We also believe in supporting our people and our clients in their understanding of the impacts of climate change, and the risks it presents on both a personal and business level as well as the opportunities within their grasp.

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Energy Efficient Sludge Dewatering Technology

BY JOHN KOUMOUKELIS

The new Lowood STP located in the Somerset Region of South East Queensland was recently commissioned as part of key environmental infrastructure delivered to secure the region's population growth.

Membrane Bioreactor (MBR) technology was selected for the treatment process which provides high quality discharge to the benefit of local waterways and allows the opportunity for water reuse.

Two large HUBER QPRESS® units were supplied & commissioned by Hydroflux Epco to dewater the biosolids generated from the MBR process.

The units achieve a greater than 95% volume reduction for this application which minimizes the associated offsite transport/ disposal costs.

Operating at less than 1rpm, the machines consume a fraction of the energy as compared to high-speed centrifuges, which also leads to reduced maintenance costs.

An equivalent sized high-speed alternative would emit over 12,000 t/a of additional CO2.

QPRESS® is an inclined screw press used to dewater sludge produced from sewage treatment plants. It results in high volume reduction of the raw liquid sludge that is wasted from the treatment process, leading to a reduction in sludge transport and disposal costs.

Fabricated entirely from stainless steel for superior resistance to corrosion, together with its low energy usage, Water Utilities can benefit from the technology's low carbon footprint, low maintenance regime and attractive life cycle value. For further information please contact Hydroflux Epco on 1300 417 697 or info@hydroflux.com.au

FROM THE CEO

At the beginning of this year we proudly announced that we are Australia's first carbon neutral Climate Active certified organisation in the technical water industry space & since then have a mountain of positive feedback and I am certain a lot of the businesses congratulating us are now thinking seriously about actioning this in their own organisations. This was very much the point of the exercise and we are very proud that Hydroflux is leading this action & helping make a difference.

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

Finally, I would like to thank the amazing team at Cress Consulting who have been our guiding force as we have navigated the search for carbon improvements & obtained Climate Active Certification. Their incredible depth of knowledge, drive & assistance in making this happen has been invaluable and we highly recommend Cress Consulting for assistance with sustainability & carbon neutral certification. If you'd like to find out more please visit www.cress.com.au

- ADRIAN MINSHULL

FEATURE STORY: AUSTRALIA'S FIRST CARBON NEUTRAL WATER-TECH ORGANISATION
- Continued

Hydroflux is a certified carbon neutral organization, what does that even mean?

It means we minimise our footprint to help you lower yours. We maintain an accurate and up to date inventory of emissions, and continue to find new ways to reduce our emissions as much as possible, such as by reducing waste to landfill, using renewable energy and installing LED lighting, and by investing in projects that help to reduce emissions around the world. It means your carbon footprint isn't impacted by partnering with us or using our services.

Our carbon neutral story

Hydroflux takes its climate responsibility seriously. Building on a long-term sustainability strategy, the Hydroflux Group recently became a certified carbon neutral business bring its commitment to a brighter future. This has involved identification of carbon reduction opportunities, a comprehensive review of carbon emissions, and a long term commitment to addressing climate change challenges.

Emissions are predominantly scope 3 in the supply chain and in purchased goods and services. Scope 2 electricity consumption is next largest followed by a small amount of scope 1 emissions, mainly transport fuel and refrigerant gases. our emissions reductions strategy focuses on energy efficiency, renewable energy, sustainable procurement, internal policies and procedures (e.g. minimising travel & transitioning the vehicle fleet to EV) as well as improved waste management practices.

Hydroflux intends to remain at the forefront of research in the water industry with a particular focus on reducing emissions.

About Climate Active

Climate Active is Australia's initiative for climate action. It was established to grow awareness of a carbon neutral certification and to promote positive action on climate change. Its vision is to counter climate change with emissions reductions and offsets. As a partnership between Australian Government (administered by the Commonwealth Government, Dept of Industry, Science, Energy and Resource) it is the most credible way to prove a carbon neutral claim.

The Simplest Method of Removing Phosphorus

BY ANDREW MILEY

Phosphorus, usually in the form of phosphates, originates from sources such as human and animal waste, detergents and food residues. Food and beverage processing plants will very often have phosphate inputs from all of these sources.

Wastewater treatment systems that are commonly used in the food and beverage industry typically manage to reduce biochemical oxygen demand (BOD) and nitrogen effectively, but very often are not as effective at reducing phosphorus to acceptable levels. To protect the environment, industrial wastewater treatment plants are tasked with reducing the levels of contaminants including phosphorus, so that the treated effluent meets environmental standards before it is discharged into a local water body.

The simplest method of removing phosphorus is through the use of a metal-based coagulant.

The metal targets phosphates via two routes:

1. **When a metal is added to wastewater it reacts directly with phosphates present in the wastewater, forming the metal phosphate, which is insoluble.**
2. **The metal ions hydrolyse in water, forming a dense, gel-like precipitate, (metal hydroxide), which binds with phosphorus to form the metal phosphate.**

Chemical treatment combined with physical removal in a dissolved air flotation system provides an effective solution for removing phosphate in industrial wastewater, allowing the clean treated effluent to be safely discharged.

Contact us to understand how you can use chemical precipitation to manage Phosphorus in your tradewaste discharge.

Leachate – What is it? & Why is it an Environmental Problem?

BY MATHEW FOSTER

When you hear the word leachate, what comes to mind?

Many, perhaps, would imagine a small polluted stream of water. Others might immediately think of landfills and the problems caused by the unsustainable disposal of waste material for decades.

The latter, of course, is correct while the polluted stream may be true sometimes. Leachate is the term used for any liquid produced by the action of 'leaching'. Leachate is the water that has percolated through any permeable material.

Government data suggests that there are around 500 officially registered landfill sites in Australia and although the annual increase is declining, the average size of the landfill site is increasing. Approximately 75% of garbage in Australia goes to just 38 sites. Thankfully, we are reducing our reliance on landfills, partly by recycling as much as we can and focussing more on the sustainable use of anaerobic digestion plants that are converting our waste to energy. We are also reducing the amount of non-biodegradable products that we use. Coles and Woolworths implementing a ban on disposable plastic bags recently is one example of Australia's commitment to protecting our environment.

Released in 2016, the second edition of The Environmental Protection Authority's Environmental Guidelines for Solid Waste Landfills, requires that (among many other regulations), all landfills are to have a leachate barrier to contain leachate & prevent the contamination of surface water and groundwater over the life of the landfill. However, even if all landfills met these requirements, leachate from old landfills still needs addressing as the problem lingers for many years.

And It is not only landfills that generate leachate. There are many other problems associated with contaminated land in general. There are numerous sites throughout Australia where developers need to overcome leachate problems caused by historical industrial activity. There are many infamous cases in Sydney alone, where over the last few decades we have had to deal with far more severe pollutants than those found in conventional landfill operations, and there will certainly be a lot more cases in future.

What are the options for handling leachate from landfill sites?

The options available include offsite disposal, discharge to sewers with or, possibly, without pre-treatment or treatment onsite for environmental disposal or reuse. Offsite disposal is very uncommon due to prohibitive costs unless the landfill is very small.

Discharge to sewers may be possible depending on the site location, and infrastructure availability and capacity. The degree to what leachate has to be treated depends on local trade waste legislation.

Leachate from landfill sites contains a variety of different substances, although by far the most significant contaminant is ammonia. Ammonia and other forms of nitrogen occur naturally in the environment, but concentration levels in leachate are alarming. Decomposition of plant, animal & human waste produces ammonia & many household & industrial cleaning products, including disinfectants, also contain ammonia.

Ammonia levels for discharge to sewers vary across Australia. For example, Sydney Water requires an ammonia concentration of less than 100 mg/L for sewer discharge whilst Urban Utilities in Queensland set 200 mg/L as a more lenient upper limit. However, with ammonia often present in concentrations in excess of 1000 mg/L in landfill leachate, discharging leachate to sewers will almost certainly require some form of pre-treatment anywhere in Australia.

Naturally, discharging into the environment has far more stringent requirements. Due to ammonia's environmental effects, discharge concentrations are very low. In fact, 0.3 mg/L for freshwater and 0.5 mg/L for marine waters are the trigger levels established by the Australian and New Zealand Environment and Conservation Council (ANZECC).

What Leachate treatment methods are available?

Ammonia concentrations in leachate can be reduced by air stripping, chemical treatment or biological processes.

Air stripping is not common practice as stripping towers are expensive with high operating costs due to high alkalinity, strong buffering and the need for large volumes of alkali to enable the process to work. Air stripping also releases large quantities of ammonia into the air resulting in air pollution, which is a major concern also.

Work and research has also been conducted on chemical precipitation with some success and although sewer discharge limits may be achievable with this method, operational costs are also high.

Biological processes are the preferred means of treatment of leachate and there are several types of aerobic biological processes that can be adapted for ammonia removal. Mixed Bed Biological Reactors (MBBR). Membrane Bioreactors (MBR), activated sludge, various fixed film media processes and Sequential Biological Reactors (SBR). The preferred option generally comes down to cost, space requirements or simply personal choice.

Hydroflux has extensive experience in treating wastewater sources containing high ammonia loads and are experts in the field of design, construction and operation of many different types of wastewater treatment plants.

The Hydroflux HySMART® SBR can easily be configured for ammonia removal.

Hydroflux Completes Another Permanent Groundwater Treatment Plant in NSW

BY ELIZABETH KOLOS

Hydroflux Industrial's specialist water & wastewater engineers have been installing temporary & permanent ground water treatment plants for major infrastructure projects throughout Australia since the early 2000s and we are pleased to announce completion of one of our latest NSW projects.

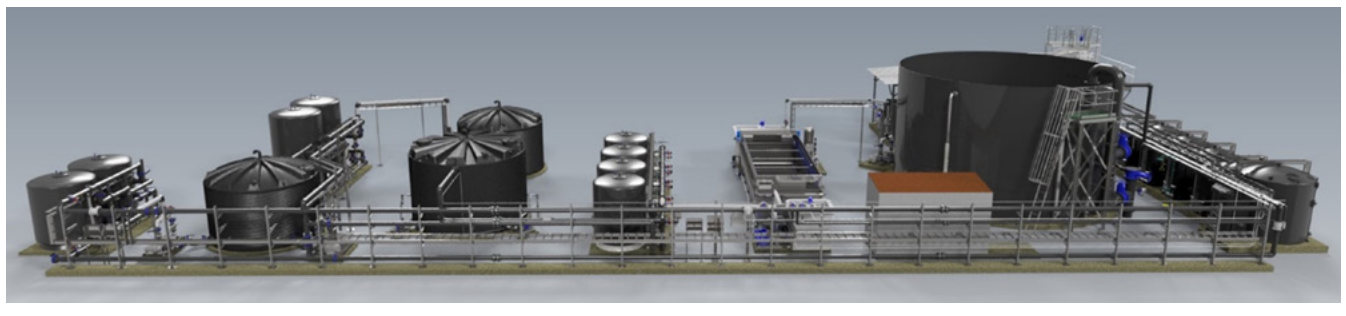
The presence of "forever chemicals", such as PFAs combined with increasingly stringent discharge regulations imposed the NSW Environmental Protection Agency (EPA) on a much broader range of potential toxicants has resulted in many changes to the water treatment processes adopted 20 years ago and the client requirements in terms of plant performance, longevity, and reduced carbon footprint are at an all-time high.

This latest water treatment plant has been completed, commissioned, & is meeting all expectations, and the Hydroflux Industrial project management team (pictured) responsible for this system are super proud of their achievements.

This plant was designed to meet some of the highest environmental, sustainability and quality requirements. It can process up to 24L/s of contaminated groundwater with peak inflows exceeding 200L/s.

The process comprises Dissolved Air Flotation (DAF) followed by various stages of filtration and adsorption and the associated solids handling facilities.

The very high salinity in the ground water required ultra-high specification components and materials including the construction of a DUPLEX HyDAF dissolved air flotation system.



Hydroflux 3D design & modelling guarantees safe operability and maintenance access.

Hydroflux are leaders in GWTP for infrastructure and are proud to be making a positive contribution to the community and environment. Our systems are designed and constructed to incorporate available carbon neutral products and we are continually refining new designs to operate on as low a carbon footprint as possible.

Upskill with Hydroflux Intel – A Free Online Educational Resource

BY AMBROSE MOLLENHAUER

At Hydroflux we believe that knowledge is power, that's why we've made available a range of wastewater treatment information free of charge. View our online training topics and videos to improve your understanding of best practice wastewater treatment.

As industry experts in water and wastewater treatment, Hydroflux has gathered a wealth of knowledge over many years of operation. Our staff have first-hand experience in plant design, operation and maintenance. Utilising these skills to improve our customers business operations, with the goal of achieving cleaner water at the lowest total cost of operation.

As part of our company philosophy, Hydroflux believes in sharing knowledge with our customers and colleagues to help improve the overall knowledge base of the industry. One step we have taken towards this outcome is to set up Hydroflux Intel, an online portal with informative videos explaining technical wastewater treatment principles. By making this resource freely available to all, we hope to empower anyone wishing to manage their waste more efficiently and help them get the best outcomes for their plant and business.

Hydroflux also offers site-specific training for plant operators and engineers. Regardless of whether the plant has been built by Hydroflux or others, we conduct a thorough audit of your wastewater treatment system, including the current operating conditions, feed water and discharge results etc., then tailor a training package around the topics most needed by your staff. By increasing the technical knowledge of the people overseeing a wastewater treatment plant day-to-day, the plant settings and controls can be finetuned to produce the highest quality outputs possible. A broad knowledge of wastewater treatment also means that plant issues can be addressed more effectively and resolved with minimal plant downtime.

If you want to gain a greater understanding on how to optimise your wastewater treatment plant, take some time to peruse Hydroflux Intel.

If you can't find a specific solution or need further assistance with plant optimisation, please contact our specialists for expert advice and support.

To get started with intel, visit: hydrofluxutilities.com.au/hydroflux-intel/

HYDROFLUX QUIZ - DIFFICULTY: HARD

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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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