

An Introduction to Plantwork Systems

# Innovative, Sustainable Wastewater Treatment Solutions

**NUTREM**

The logo for NUTREM features the word "NUTREM" in a bold, white, sans-serif font. Below the text are three white, curved lines that sweep from left to right, resembling a stylized wave or a leaf's edge.

**PLANTWORK SYSTEMS**  
INNOVATION BY NATURE

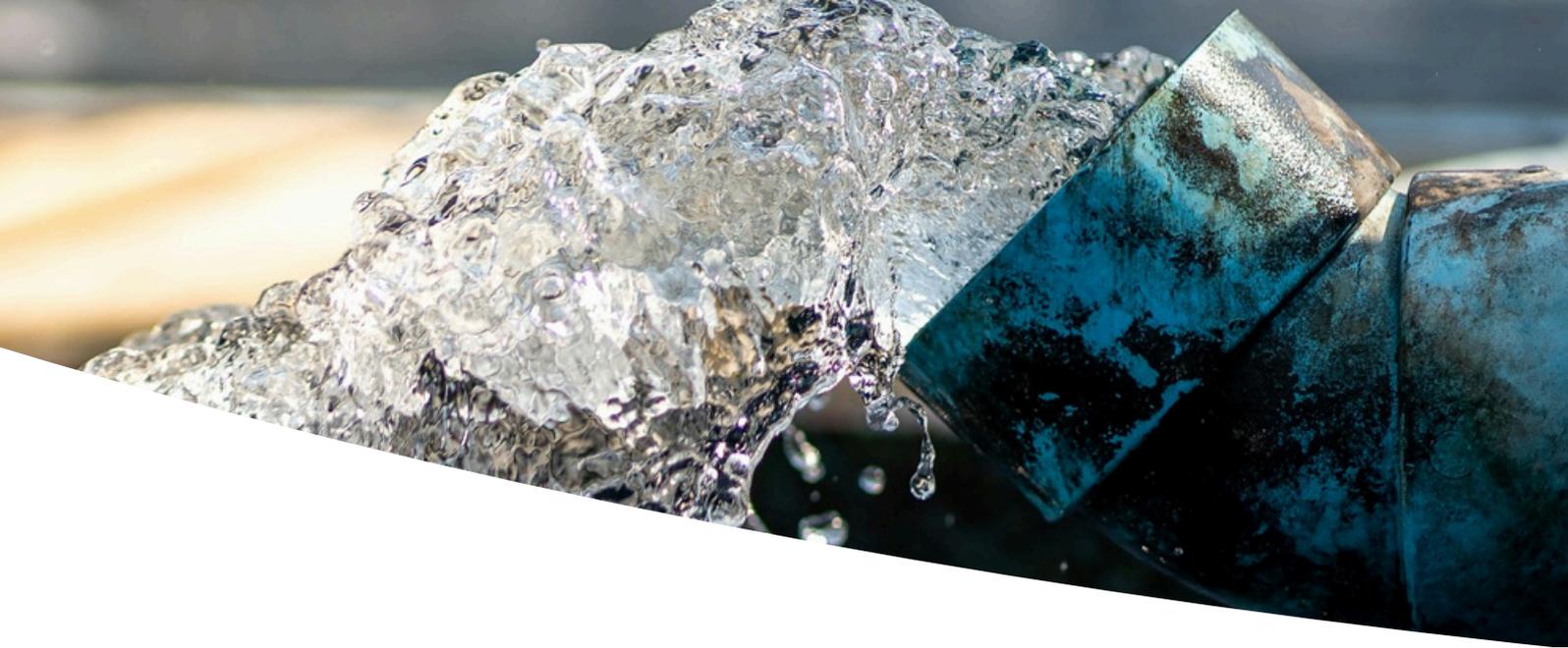


PLANTWORK SYSTEMS  
INNOVATION BY NATURE

Plantwork Systems Ltd (PWS) is the developer, owner and provider of unique and proprietary technologies which provide innovative, sustainable solutions to all sectors of the wastewater treatment industry.

We are in a unique position to offer market-leading technologies and consultancy to deal with today's major wastewater challenges.





# Complex Challenges - Sustainable Solutions

When you are balancing environmental, social and economic challenges, it is good to know that you can work with one wastewater treatment specialist to help you grow, sustain and protect your business.

## Our Process

PWS technology combines new wastewater treatment design with existing processes to offer **ground-breaking solutions** to all wastewater treatment needs. Combining biological engineering with mechanical and electrical design, our team delivers **first class results** in wastewater treatment.

## Our Products

PWS has developed a range of proprietary products and processes which are **PROVEN** to produce **higher water quality at lower cost**. Our range of unique proprietary products includes biological nutrient removal, filtration and sludge treatment. A strong synergy between our products enables solutions to be developed for various stages of wastewater treatment. We offer a powerful example of the kind of integrated solutions that are needed to help deliver net carbon savings **at the same time** as significantly higher quality discharges to meet today's tougher water quality limits, in an **economically viable** way.

## Our Passion

PWS is passionately committed to making a tangible, positive contribution to a sustainable, clean environment, offering our technical expertise and innovative design to create, supply and promote leading edge technological solutions for wastewater treatment.

# Meeting Customer Needs

## Our Customers

- Water and Sewerage Companies (WaSCs)
- Developers and House Builders
- Commercial Enterprise
- Leisure Sector
- Food & Drink Processors

We would be pleased to give you further details of our **success stories** and to discuss how we can meet **YOUR** wastewater treatment needs.

Our company's USP is offering unrivalled expertise to deliver unique, integrated and sustainable solutions to a range of sectors

### Water and Sewerage Companies (WaSCs)

With ever-stricter standards being imposed, we provide the water industry with the urgently needed better solutions for achieving both higher quality treatment and more efficient methods of dealing with the by-products created, such as 'sewage sludge'.

### Developers and House Builders

Developers are currently facing two new and significant challenges relating to wastewater disposal which are delaying construction on new developments. PWS products provide a solution to tackle BOTH the lack of capacity in the UK's wastewater infrastructure AND the requirement for Nutrient Neutrality for discharges in sensitive areas.

### Commercial Enterprise

The commercial sector is also suffering the consequences of the inadequacies of the wastewater infrastructure to cope with expansion. PWS provides unique and compact on-site treatment plants to efficiently and economically treat wastewater before it is released into the environment.

### Leisure, Food & Drink Sectors

Leisure facilities, such as golf courses, and food and drink processing facilities, including dairies, breweries and abattoirs, spend a lot of money on water and wastewater. Companies using PWS products to effectively and efficiently utilise high quality treated wastewater stand to reap a number of substantial rewards - financial, environmental and reputational.



# Our Products

## Your Problem

**Phosphorus and Nitrogen pollution** is a serious environmental and economic problem. The Government and Regulators are responding with ever-stricter standards for removal and the water industry urgently needs a better solution.

## Our Solutions

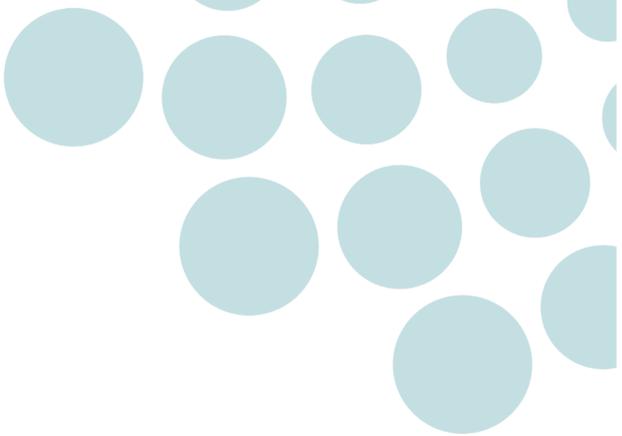
### NUTREM®

NUTREM® is a unique, compact and efficient Biological Nutrient Removal (BNR) process which has been developed specifically to overcome the current nutrient pollution issues being faced in the UK and around the world. The process provides **industry-leading levels** of Total Phosphorus (TP) removal with the added ability to remove Total Nitrogen (TN) in the same tanks, so avoiding significant cost.

As a **completely biological solution**, NUTREM® offers superior results in a much more environmentally sustainable way. It also offers WaSCs a number of **cost benefits**. With an innovative, modular construction, it requires a much smaller footprint and consumes less energy than more traditional BNR systems, with lower capital expenditure and lower operating costs.

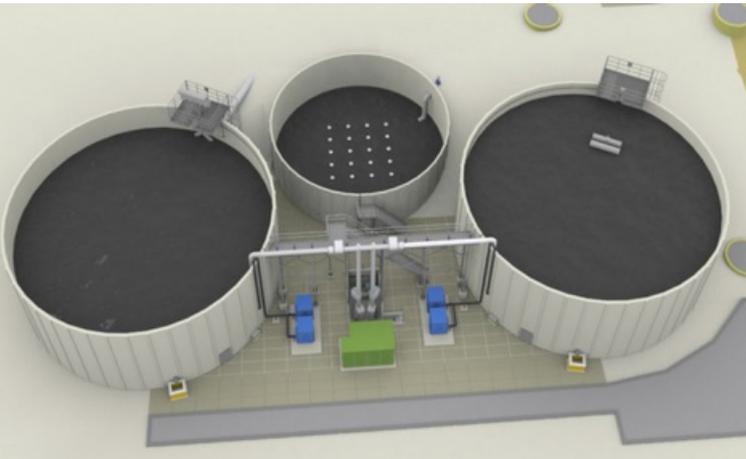
### NUTREM® Key Benefits

- Industry-leading levels of TP removal (below 0.25 mg/l)
- Industry-leading levels of TN removal (below 5 mg/l)
- Ability to meet 0.1 mg/l TP with the addition of tertiary filters
- No chemical dosing requirements
- Effective in all seasons (i.e. including weak sewage strengths)
- Lower capital expenditure
- Lower operating costs
- Smaller footprint, with resulting cost saving
- Modular and scalable, allowing cost to be spread
- High quality effluent capable of re-use without tertiary treatment
- Virtually odour free process
- No corrosive by-products



# NUTREM





## TN-REM

TN-REM is a compact, efficient, Biological Nutrient Removal process optimised to achieve **very low levels of Total Nitrogen** in treated water. The process offers a reliable and robust solution to nutrient removal, using **purely biological treatment** without the need to dose for an additional carbon source.

### Key Advantages of the TN-REM Process

- Total Nitrogen (TN) of less than 5mg/l
- Effective in all seasons
- Lower capital expenditure
- Lower operating costs
- Smaller footprint, saving space and cost
- Modular and scalable allowing cost to be spread
- High quality effluent capable of re-use without tertiary treatment
- Virtually odour- free process



A recent PWS installation where only the kiosk is visible above ground, the tanks having been buried.

TN-REM is suitable for works serving from ten to tens of thousands of people. It is particularly suitable for **dedicated treatment** for new residential developments that are required to demonstrate **Nitrogen Neutrality**; and also where connection to mains would unacceptably delay the development or involve prohibitive cost.

*Sensitive areas like the Solent have particular requirements for development to demonstrate that it is Nutrient Neutral.*

Understanding that every site presents a different set of circumstances and requirements, PWS offers unique dedicated treatment solutions for new residential developments that are required to demonstrate Nutrient Neutrality. **Every one of our processes is bespoke for each installation.**



## Your Problem

**Sludge Handling** conventionally requires huge resources of land, buildings and equipment, as well as the enormous costs involved in transportation.

## Our Solutions

### Static Sludge Thickener

PWS' Static Sludge Thickener (SST) is an ultra compact sludge thickening device developed specifically to meet the challenges of handling sludge, offering **significant transport cost savings** and **environmental benefits**. The potential savings to be made by reducing liquid sludge volumes are huge. The SST offers that potential with a highly efficient means of gravity settlement, making it possible to achieve considerably thicker sludge which significantly reduces handling and transportation costs.

A truly innovative and sustainable solution, at the same time the SST helps companies reduce their carbon footprint to meet tougher sustainability targets.

### Static Sludge Thickener Key Benefits

- Thick energy-rich sludge reducing transport costs
- Significant contribution to meeting net zero carbon targets
- By far lowest TOTEX cost solution
- Small footprint
- Lower energy consumption
- Reduced installation time and lower civil engineering costs

“The trial Static Sludge Thickener provided by PWS has been excellent. It fulfilled all our expectations in terms of dry solids and saved us over 60% in tankering costs.”

Craig Pearson, SevernTrent Water





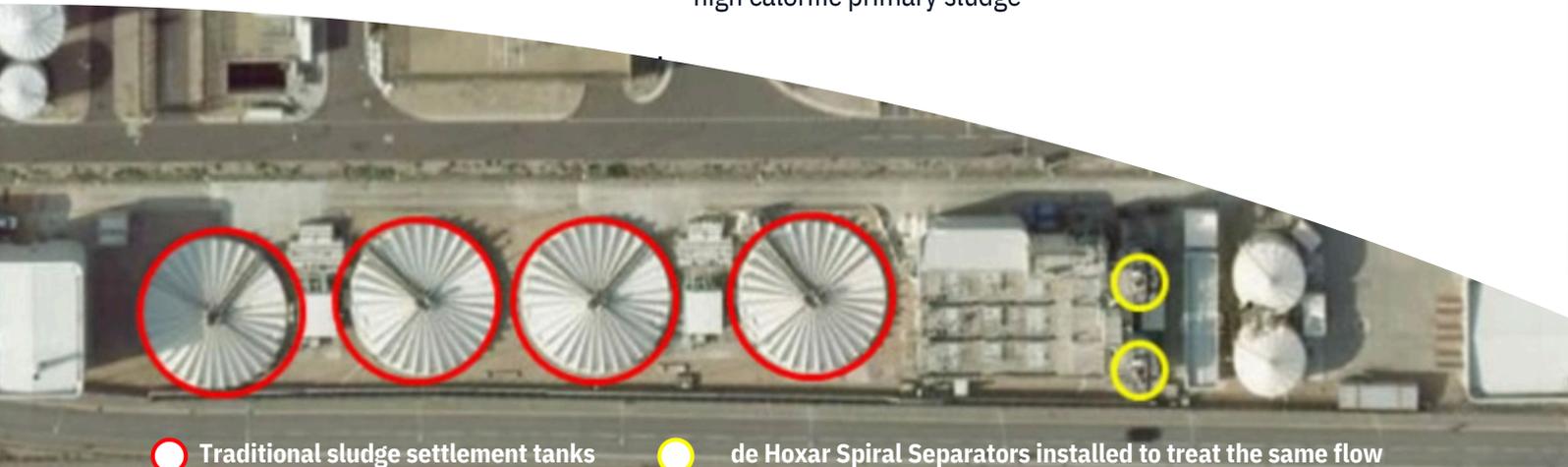
## De Hoxar Spiral Separator

PWS' deHoxar Spiral Separator is a **very compact gravity settlement device** which requires as little as 3% of the space of traditional settlement tanks. It also has the added advantage of producing thickened sludge which saves the requirement for additional thickening equipment and makes it an ideal solution for efficient extraction of high calorific primary sludge for anaerobic digestion.

Invented by PWS Chief Engineer, David de Hoxar, and developed in conjunction with Southern Water, our proprietary spiral separator is a well-established and proven technology which is in operational use in various regions across the UK and Japan, with multiple applications able to cater for populations from 50k - 250k.

### Key Benefits for Primary Sludge Treatment

- 3% of the site area is required compared to conventional tanks and only about 25% compared to lamella separators
- Far cheaper TOTEX solution compared to conventional processes with significantly reduced construction and operational costs
- Significant contribution to achieving net zero carbon through reduced sludge volumes, lower treatment and transportation cost and enhanced energy recovery
- Thicker sludge is produced in many cases saving one stage of sludge treatment
- Low cost to cover for odour control – the volume of air needed to be treated is typically 1% compared to conventional tanks
- Reduced visual impact makes it suitable for urban sites and sites next to areas with public access
- Anaerobic Digestion – ideal solution for efficient extraction of high calorific primary sludge



● Traditional sludge settlement tanks

● de Hoxar Spiral Separators installed to treat the same flow

## Your Problem

The need for flexible, scalable and sustainable wastewater treatment for a range of municipal, commercial and industrial developments, enabling recycling of grey or black water.

## Our Solution

### Aqua Renewal System

The PWS Aqua Renewal System is a more efficient, reliable and robust improvement on continuous flow systems, with proven benefits that make for a greener and simpler solution to a number of different wastewater challenges.

It is suitable for all biologically treatable waters, occupies comparatively little space and can recycle grey or black water without significant additional treatment. All this translates into a more environmentally and financially beneficial system.

The Aqua Renewal System is easily installed, easily operated and maintained and is virtually odour free, which makes it ideal for new developments, country estates and commercial sites. It is also capable of growing as the development grows, with the reactors being installed in stages as and when they are required to treat additional flow. Furthermore, the Aqua Renewal System still averages significantly lower energy consumption rates than alternative technologies.

#### Applications

- All biologically treatable wastewaters
- Grey or black water recycling
- Application as a 'side stream' technology
- Phased developments
- Treatment works likely to be subjected to contaminant and hydraulic shock loading

#### Key Benefits

- Small footprint
- Competitive whole-life costs
- Odour control
- Easy to install
- Easy to maintain
- Easy to operate with minimal training
- Low energy use

# AquaRenew System





## Your Problem

The need for an add-on treatment to meet water quality consents and extend the life of existing and failing wastewater treatment works.

## Our Solution

### Filtration +

The PWS Filtration + is a 'plug and play' filtration unit which provides an effective additional treatment step for the reduction of Suspended Solids in final effluent. Filtration + is easily installed within an existing plant to ensure the final effluent quality remains within consent, and can achieve solids removal levels in excess of 70% with no moving parts. It represents an ideal solution to extend the life of failing works and delay the need for significant capital investment.

### Key Benefits of Filtration+

- Easy installation
- Lightweight and easy to transport
- No moving parts
- Easy maintenance and servicing
- Peak flow treatment up to 3 litres per second
- Optimal solids removal
- Scalable - multiple units can be installed
- Affordable and flexible - can be moved between WwTPs



# PWS Consultancy

Helping you achieve solutions that get consent

In these increasingly challenging times, when both the market and the regulators demand tougher environmental limits *and* price control, Plantwork Systems is in an unrivalled position to advise and support you.

As well as the supply of our unique and innovative technology, we offer unrivalled experience and technical expertise in the wastewater industry. We can advise and support you from the beginning to the end, both in planning and developing new wastewater treatment facilities and with the successful improvement and development of existing works.

## Our Consultancy Services Include...

### Existing Works

- Conducting surveys and audits of existing plants to assess performance
- Providing comprehensive reports on the condition and serviceability of existing works, with recommendations for improvement
- Helping to implement improvements to meet discharge consents
- Supporting WaSCs with the integration of new technologies

### New Developments

- Expert advice and support on wastewater planning for new developments. including feasibility of achieving imposed discharge consent levels
- Support through the planning process to obtain planning permission for new plants
- Helping to obtain Environment Agency approval for meeting discharge consents
- Supporting developers in public consultations and planning meetings
- Assisting in the design of new plants and integration of new technologies
- Independent technical liaison with the regulators (Environment Agency and Natural England)





# PLANTWORK SYSTEMS

INNOVATION BY NATURE

YOUR ONE-STOP-SHOP FOR ADVICE,  
DEVELOPMENT & DELIVERY

## GET IN TOUCH

for an initial, no obligation, assessment of the options  
available for your wastewater treatment plants

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