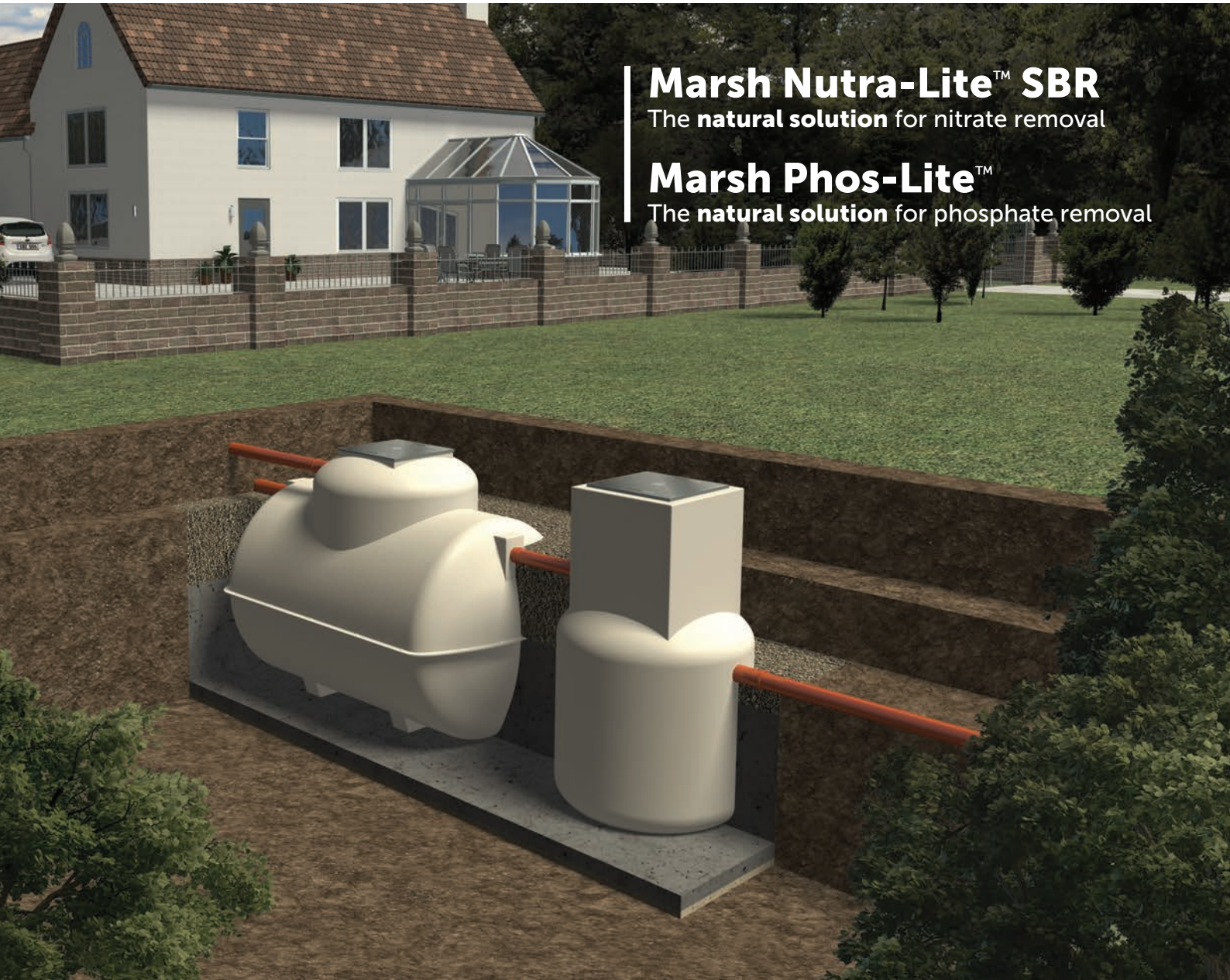


Marsh Natural Solutions™

For phosphate and nitrate reduction

Marsh Nutra-Lite™ SBR
The **natural solution** for nitrate removal

Marsh Phos-Lite™
The **natural solution** for phosphate removal



Environmental compliance
without chemical dosing



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Marsh Nutra-Lite SBR
Advanced sewage treatment plant

Key benefits

- 84% biological reduction of nitrates
- Exceeds nitrate targets to enable site development
- Certified performance in reducing COD, BOD, and Suspended Solids



SBR technology for superior nitrate reduction

Overview

Marsh Industries proudly presents the Marsh Nutra-Lite, an advanced Sequential Batch Reactor (SBR) sewage treatment plant designed to enhance effluent quality for off-mains wastewater systems and significantly reduce biological nitrates.

The Nutra-Lite is available in capacities catering to sites for up to 50 people, with state-of-the-art technology and rigorously tested, the Nutra-Lite sets a new standard for sustainable wastewater management.

Can be supplied as a complete system, combined with the Marsh Phos-Lite. See page 5 for Phos-Lite details.

Features

Outstanding discharge quality

The Nutra-Lite boasts the highest overall discharge quality of any plant available today. A unique self-cleaning, self-sealing sediment reduction valve ensures total control over suspended solids. No mechanical parts provide reliability and efficiency.

Nutra-Lite not only excels in phosphate and nitrate removal but also significantly reduces other key effluent constituents:

COD	95.8%	33mg/l
BOD	98.7%	4 mg/l
TNb	83.9%	11.1mg/l
NH ₄ n	99.1%	0.5mg/l
Ptot	34.3%	6mg/l
SS	97.1%	11mg/l

SBR technology for superior nitrate reduction

The Nutra-Lite harnesses SBR technology, achieving an impressive 84% biological reduction in nitrates. Unlike traditional methods, no chemicals or carbon are used – just biological processes.

Remote configuration and adaptability

Unique to Marsh Industries, the Nutra-Lite can be adapted to seasonal changes in biological treatment, ensuring optimal year-round performance. Remote configuration allows adjustments based on ongoing nitrate reduction research.

Secure telemetry and alarm monitoring

All Nutra-Lite plants feature bi-directional communication for maintenance and monitoring. Telemetry options include mobile connectivity or homeowner Wi-Fi/internet.

Efficiency and cost savings

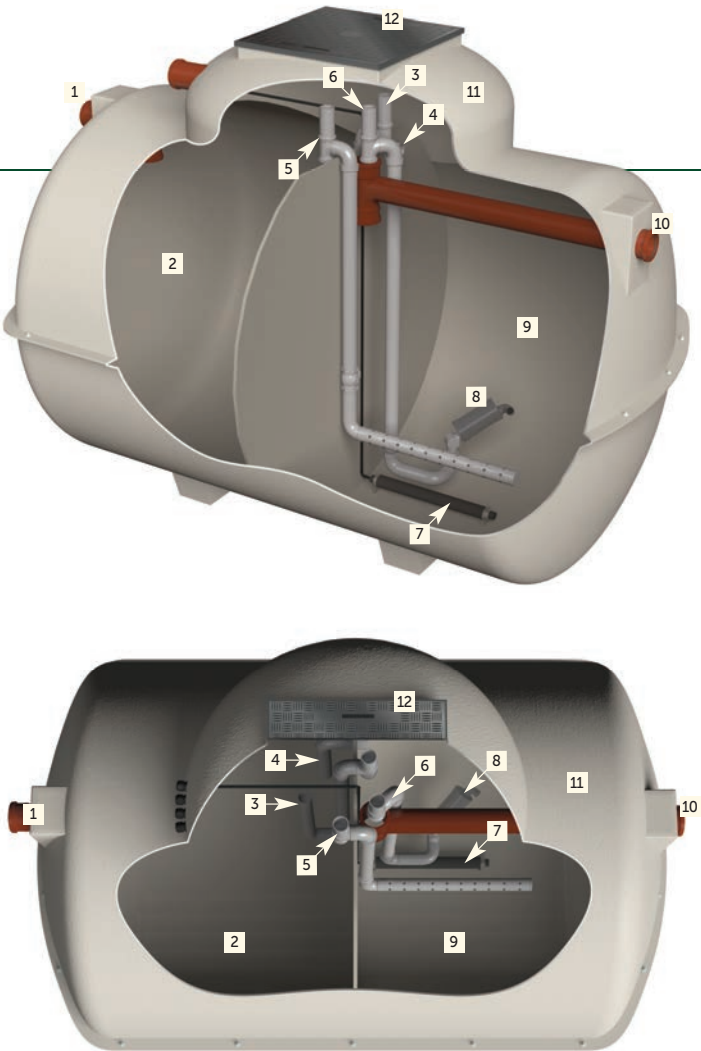
A single compressor minimises electrical power consumption without compromising performance. Economy mode further reduces running costs during process changeovers.

Certified performance

Rigorously tested at the world-leading notified test centre, PIA GmbH, in Aachen, Germany, the Nutra-Lite is certified to BS EN 12566-3 after 50 weeks of continuous testing. This system holds accreditation to EN12566-3 Annex B for systems of up to 50 Population Equivalent (PE) and complies with the UK Forward for BSEN12566-3, demonstrating its reliability and effectiveness.

Material strength and fire safety

Marsh Industries' GRP material successfully meets the requirements of EN ISO 11925-2:2010 standards and is tested for direct flame impingement. All units come with a 25-year structural guarantee.



Key

- | | |
|-----------------------------------|----------------------------|
| 1 Inlet | 7 Air diffuser |
| 2 Primary chamber | 8 Sediment reduction valve |
| 3 Inflow air-lift pipework | 9 Secondary chamber |
| 4 Overflow pipework | 10 Outlet |
| 5 Recirculation air-lift pipework | 11 Heavy duty GRP shell |
| 6 Outflow air-lift pipework | 12 Access cover |

Specifications

Model (Pop)	PE	Length +/-50mm	Width +/-50mm	Height +/-50mm	Inlet		Outlet	
					Invert	Ø	Invert	Ø
NL6	4-6PE	2602	1680	1865	550	110	625	110
NL10	7-10PE	2862	1952	2139	550	110	625	110
NL16	11-16PE	4252	1952	2284	600	110	675	110
NL25	17-25PE	5240	1952	2284	600	160	675	160

Addressing critical environmental concerns

Any existing sewage treatment plant

Marsh Phos-Lite
Phosphate reduction unit

- Phosphate reduction without chemical dosing
- Achieves phosphate levels of 0.2mg/l
- Exceeds phosphate targets to enable development
- Certified performance in reducing COD, BOD, and Suspended Solids



Innovative technology for cleaner water

Overview

Marsh Phos-Lite is a groundbreaking product designed to efficiently remove phosphate from wastewater. Utilising a unique adsorption process, Phos-Lite binds phosphorus to the surface of its media, which is composed of naturally occurring elements. This ensures long-term performance across varying flow rates and influent concentrations.

Recommended for up to 35PE (population equivalent), Phos-Lite is fully scalable to meet larger demands. The plant is engineered for maximum retention time, guaranteeing stable, low effluent phosphorus concentrations certified by PIA GmbH at 0.2mg/l.

With an electrical consumption of just 0.03 kWh/d, Phos-Lite operates at very low cost. This innovative tertiary treatment solution seamlessly connects to the outlet of both new and existing treatment plants.

Features

Enhanced effluent quality

Phos-Lite not only excels in phosphate removal but also significantly reduces other key effluent constituents.

The Marsh Nutra-Lite treats effluent to the following standards:

BOD	4mg/ltr
Suspended Solids	11mg/ltr
Ammonia	0.5mg/ltr

When the Marsh Nutra-Lite and Marsh Phos-Lite are combined, the effluent quality is further improved to:

BOD	1.62mg/ltr
Suspended Solids	4.3mg/ltr
Ammonia	0.38mg/ltr
PTot	0.26mg/ltr
TN _b	10.5mg/ltr

Test results achieved when combined with the Marsh Ensign:EL		
COD	56.1%	23 mg/l
BOD	59.5%	4 mg/l
TN _b	5.5%	29.6 mg/l
NH ₄ n	24%	0.4 mg/l
Ptot	95.9%	0.2 mg/l
SS	61.1%	4 mg/l

Long-term performance

Designed to retain up to 8.5kg of phosphorus in a 6PE domestic plant (British Water Flows and Load 4), the Marsh Phos-Lite offers reliable performance. Media performance will be assessed at pre-determined intervals and replaced if necessary. The longevity of the media will be influenced by the actual flows and loads entering the plant.

Natural, non-dosing solution

The plant uses Phos-Lite pellets, a natural mineral media, to reduce phosphate levels, simplifying operations and reducing the environmental impact of chemical use.

Cost-effective and low maintenance

The non-dosing approach minimises the need for frequent maintenance and chemical adjustments, leading to cost savings over the plant's lifetime.

Enhanced compliance

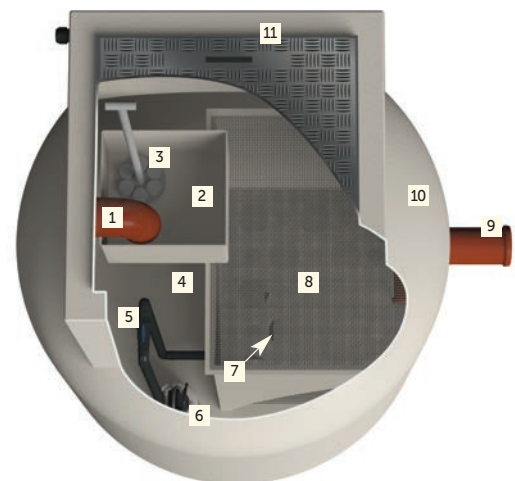
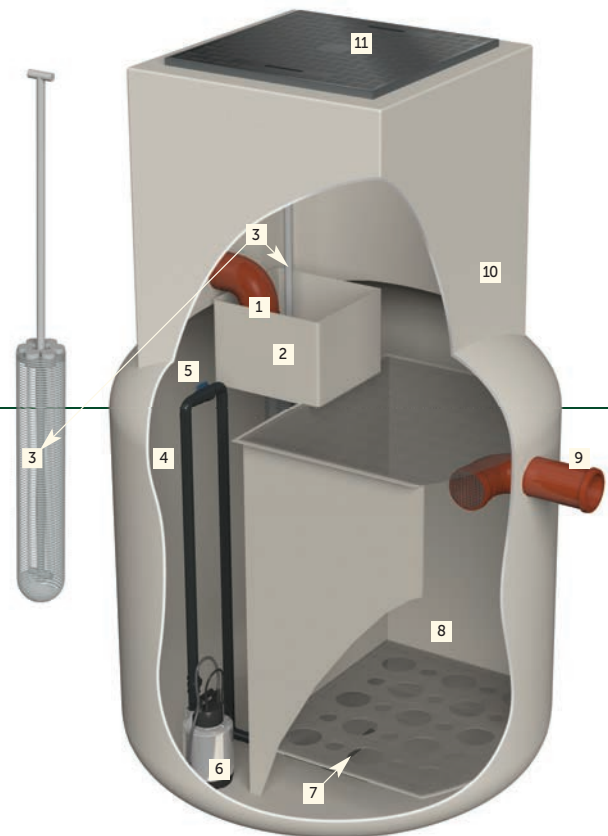
By achieving phosphate levels of 0.2mg/l, the plant ensures compliance with environmental standards, allowing water companies to meet regulatory obligations.

Ease of integration

The plant is designed for seamless integration into existing systems, making it versatile for new installations and retrofits. Builders' merchants will find this product a valuable addition to their offerings, catering to the growing demand for environmentally responsible wastewater treatment solutions.

Material strength and fire safety

Marsh Industries' GRP material successfully meets the requirements of EN ISO 11925-2:2010 standards and is tested for direct flame impingement. All units come with a 25-year structural guarantee.



Key

- | | |
|----------------------|--|
| 1 Inlet | 6 Submersible pump |
| 2 Inlet chamber | 7 Pipework outflow (beneath lower shelf) |
| 3 Filter sock | 8 Phos-Pellet chamber |
| (hidden from view) | 9 Outlet |
| 4 Primary chamber | 10 Heavy duty GRP shell |
| 5 Flow control valve | 11 Access cover |

Specifications

Model	PE	Dia Ø +/-50mm	Height +/-50mm	Inlet		Outlet	
				Invert	Ø	Invert	Ø
PL4	4PE	1200	1865	665*	110	1085	110
PL6	6PE	1200	1865	665*	110	1085	110
PL8	8PE	1200	2139	665*	110	1085	110
PL10	10PE	1200	2139	665*	110	1085	110
PL12	12PE	1500	2284	715*	110	1085	110
PL16	16PE	1500	2284	715*	110	1085	110
PL20	20PE	1500	2284	715*	110	1085	110
PL25	25PE	1500	2284	715*	160	1085	160

* Inlet invert subject to outlet invert on preceding sewage treatment plant

Tank configurations and components are shown for illustration purposes only

Testing and certification

Reliable, tested and trusted

The Marsh Nutra-Lite has undergone rigorous testing and earned accreditation in line with EN12566-3 Annex B standards, while Phos-Lite has achieved accreditation in accordance with EN12566-7 test Annex A. These comprehensive assessments were conducted by Prüfinstitut für Abwassertechnik (PIA) GmbH in Aachen, Germany, for wastewater treatment systems accommodating up to 50 PE. This certification confirms the reliability and effectiveness of the products in meeting the demands of wastewater treatment systems for environmentally sensitive sites. All Marsh systems comply with the UK Forward for BSEN12566-3.

The Marsh Nutra-Lite has achieved accreditation in accordance with EN12566-3 Annex B

the Marsh Phos-Lite has achieved accreditation in accordance with EN12566-7 test Annex A.

For combined Nutra-Lite and Phos-Lite performance see table on page 5



Enhanced structural integrity

40% Stronger GRP Material

Marsh Industries places a significant emphasis on the durability and reliability of its products, as evidenced by the meticulous assessment of structural integrity. In line with the testing protocol outlined in ENISO 179-1/1eA: 2010-11, comprehensive evaluations were conducted to gauge the robustness of Marsh Industries' glass reinforced plastic (GRP) materials in comparison to similar materials used by competing manufacturers.

To establish a comprehensive benchmark, three distinct material samples were subjected to rigorous impact testing. These samples included Marsh GRP material in its original form (consisting of virgin unfilled resin), a variant incorporating calcium fillers, and another variant enriched with sand filler. The testing process involved analysing 12 samples of each material, all measuring 80x10x5mm. The pendulum energy utilised for impact assessment was set at 15J, with an accompanying impact velocity of 3.8m/s.

The findings were resoundingly in favour of Marsh Industries' GRP material, showcasing an impressive 40% increase in strength when compared to the other materials under scrutiny. This outcome underscores the superior quality and structural resilience inherent in Marsh's GRP material.

Material fire safety

Marsh Industries upholds the highest standards in product safety and adherence to regulations, as demonstrated by its material fire resistance testing. The focus of this evaluation was to ascertain the ignitability of products when exposed to direct flame impingement. Rigorous testing procedures were carried out to ensure compliance with EN ISO 11925-2:2010 standard.

The testing regimen encompassed practical scenarios designed to gauge the material's response to flame exposure. Marsh Industries' GRP material successfully passed all aspects of the fire resistance tests, achieving EN ISO 11925-2:2010 standard.

Natural England and the Environment Agency's guide to nutrient neutrality

Nutrient neutrality

Nutrient neutrality is a policy aimed at controlling the levels of nutrients, particularly nitrogen and phosphorus, entering water bodies from human activities. Excessive nutrients from agriculture, wastewater, and urban runoff can cause environmental issues such as eutrophication, leading to algal blooms that damage water quality, biodiversity and ecosystems.

In the UK, this issue has become particularly important in areas with protected habitats, like Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), which are governed by the Habitats Regulations. Natural England and the Environment Agency are key regulatory bodies involved in ensuring that new developments do not increase nutrient pollution in sensitive areas.

Natural England's role

Natural England is responsible for advising local planning authorities on protecting natural environments, particularly designated sites. It provides guidance on nutrient neutrality for new housing and other developments near sensitive water bodies.

Key points

- **Guidance to Local Planning Authorities (LPAs):** Natural England advises LPAs to ensure that development projects demonstrate nutrient neutrality, especially near vulnerable habitats.
- **Nutrient budgeting:** Developers must calculate the nutrient load (nitrogen and phosphorus) that their project will contribute to the water system. Natural England provides frameworks and tools to help assess these impacts.
- **Mitigation:** If nutrient neutrality cannot be demonstrated directly, mitigation measures must be proposed. This can include creating wetlands, woodland planting, or upgrading wastewater treatment processes to reduce nutrient runoff.

The Environment Agency's role

The Environment Agency is responsible for monitoring and regulating water quality in rivers, lakes, and coastal waters. It oversees how water companies, agriculture and urban areas contribute to nutrient pollution, and works to limit these impacts.

Key points

- **Water quality regulation:** The Environment Agency sets and enforces limits on nutrient levels entering water bodies through permits for discharges (eg, from sewage treatment plants).
- **Catchment-based approach:** It often takes a catchment-based approach, focusing on the health of entire river systems to manage nutrient levels.
- **Agricultural regulation:** The Agency also regulates nutrient management in farming, providing guidance on land use and fertiliser application, and promoting sustainable practices to limit runoff into water bodies.

Nutrient neutrality in planning

In areas where nutrient pollution is an issue, new developments must not increase the nutrient load on the environment. LPAs, supported by Natural England's guidance, are required to ensure that planning permissions are granted only if projects can prove nutrient neutrality.

Key points

- **Nutrient Neutrality assessments:** Developers must submit assessments to prove their developments won't add to nutrient levels.
- **Mitigation measures:** If developments would add nutrients to the environment, they must propose mitigations such as buffer zones, sustainable drainage systems (SuDS), or contributions to strategic mitigation schemes.

Impacts on development

Nutrient neutrality has had a significant impact on housing developments in certain regions, particularly around the Solent, Somerset Levels and the River Wye. Delays and increased costs can occur due to the need for nutrient assessments and mitigation strategies.

Long-term goals

Both Natural England and the Environment Agency aim to:

- Improve water quality and protect vulnerable habitats.
- Ensure sustainable development without compromising environmental health.
- Support the creation of mitigation solutions that balance development needs with environmental protection.

Overall, nutrient neutrality regulations, enforced by Natural England and the Environment Agency, play a crucial role in safeguarding sensitive ecosystems from the harmful effects of nutrient pollution.

Marsh Natural Solutions

Enabling development in environmentally sensitive areas

Marsh Industries provides innovative, sustainable, wastewater treatment solutions to support nutrient neutrality. Our 'Natural Solutions' range effectively reduces pollutants and nutrients, such as nitrate, phosphate and ammonia, ensuring compliance with strict standards set by environmental regulators.

As industry leaders, we develop cutting-edge products that meet and exceed regulatory requirements, ensuring cleaner and safer water. Our commitment to research and development keeps us at the forefront of wastewater treatment technology.

Choose **Marsh Natural Solutions** for efficient, sustainable, and compliant wastewater management. Together, we can create cleaner, healthier waterways.

Contact our eco-friendly team on

01933 654582

nat-solutions@marshindustries.co.uk

to discuss your project's unique requirements

Other products *from* Marsh Industries

- Sewage treatment plants
- WellWater™ pump stations
- Septic tanks and cesspools
- Uni:Gem★ septic conversion
- Marsh GMS★ grease traps
- Degrilleur™ trash/debris barrier
- Agri-silage tanks
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- Rainwater harvesting systems
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