

Nutrient Neutrality and Sustainable Drainage for New Developments

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In 2019, The European Court of Justice ruled that any additional nutrient loading to what are classed as “designated sites” (particularly ones that were already in an unfavourable condition) would not be permissible by law. This is applicable to Special Areas of Conservation (SAC), Ramsar, Special Protection Areas (SPA) and potential SPA sites.

The law states that within these catchments any developments must demonstrate that there would be no likely significant nutrient effect on the downstream designated site. This ruling has come to be known as ‘The Dutch Case’.

Designated sites in England and Wales are protected under the Water Framework Directive Regulations (2017) and the Conservation of Habitats and Species Regulations (2017).

This means that all developments in the affected catchment will have to demonstrate what is known as Nutrient Neutrality.

Nutrient Neutrality

The nutrients (specifically nitrogen and/or phosphorus) from all surface water run-off and wastewater generated by the development must be less than or equal to the nutrients generated by the existing land use.

Phosphorus is an essential nutrient necessary for growth and development of plants and animals on which our food supply depends. However, excess Phosphorous in water can speed up eutrophication (a reduction in dissolved oxygen in water bodies caused by an increase of mineral and organic nutrients) of watercourses and water bodies. Surface run-off increase is a major pathway for phosphorus loss from soils and can cause significant Phosphorous deprivation in the soil, moving the Phosphorous into controlled waters.

Nitrogen exists in the soil system in many forms and transforms very easily from one form to another. The nitrogen cycle is biologically influenced. Biological processes, in turn, are influenced by prevailing climatic conditions along with a particular soil’s physical and chemical properties. In a similar process to Phosphates, the Nitrogen in the soil can be lost through increase in surface water run-off, creating Nitrogen deprivation in the soil, and moving the nutrient downstream into controlled waters.

The requirements for developments

Nutrient neutrality ensures that a development does not add to existing nutrient burdens and provides certainty that the scheme is deliverable in line with the requirements of the legislation noted above.

Natural England advises that a nutrient budget is calculated for new developments that have the potential to result in increases of Nitrogen and Phosphorous entering protected water bodies. A nutrient budget calculated according to this methodology and demonstrating nutrient neutrality is suggested to be able to provide sufficient and reasonable certainty that the development does not adversely affect the integrity of the protected sites.

This approach must be tested through the Habitats Regulations Assessment. The information provided by the applicant on the nutrient budget and any mitigation proposed will be used by the local planning authority to make an appropriate assessment of the implications of the development.

Sustainable Design

The developer must demonstrate that the proposal achieves nutrient neutrality through adequate treatment of the surface water system and reduction in water consumption on site. This can be achieved via:

- Sustainable drainage systems with emphasis on green/blue infrastructure and bioretention
- Rainwater harvesting and re-use
- Rainwater retention on site (zero discharge for low order events)
- Introducing separate ponds and wetlands for balancing nutrients

While this should be implemented as part of a sustainable drainage scheme (and include the four pillars of SuDS), this only addresses the surface water element of a proposed system. There is also the foul water discharge from site that cannot be eradicated.

Foul Water

The increase in foul water loads from the development also has an impact on the nutrients in the catchment. Proposed schemes will be assessed for their nutrient budget on foul water, regardless of the final discharge point. If the foul water enters a public sewer that ends up in a treatment plant within the sensitive catchment, this is still considered as having an impact on the nutrient budget and must be offset.

Offset Methods

Nutrient budget can sometimes be balanced by the introduction of a nutrient sink. This is a landscape feature that can absorb nutrients before they enter the downstream watercourse and protected site.

One efficient way of doing this is the introduction of a riparian buffer, a wetland or forest right next to the watercourse, which can filter out nutrient pollution from upstream catchments. Rain gardens are also a smaller method of absorbing nutrients on a riparian basis from residential and other developed areas.

If there is no way for the developer to introduce a nutrient offset scheme on the site, then there is another option available. Land can be purchased and used to obtain a credit to offset the nutrient budget by ensuring it is benefitting the overall nutrient balance in the catchment.

There is some scepticism of developers buying sites for this purpose and so proposals for nutrient credits from the developer do not currently achieve appropriate recognition. Because of this, Local Authorities are buying up low-value agricultural land and taking it out of production to provide a

“nutrient credit” that can be purchased by developers. Local Authorities are also using these land areas to create wetlands (another nutrient credit) that can be purchased.

It should be noted that Natural England will review the proposals and the potential credits gained for the nutrient budget. This has two main stumbling blocks:

Natural England are currently taking a conservative approach to the examination of potential nutrient credits and so the land purchased may be “marked down” and not receive the credit initially thought.

The credit does not become active until the mitigating land use takes effect in the natural environment. So, if there is a long travel time to the sensitive site or the nearest aquifer, there could be a significant delay in obtaining this offset credit.

Summary

Protection of habitat is an important issue, and more consideration does need to be given to how a proposed development affects the overall catchment. However, development must take place to meet housing needs and there will always be associated constraints, such as the increase in foul water discharge.

Incorporating sustainable drainage schemes that also introduce blue/green SuDS that consider nutrient neutrality can only be a good thing. While proposing schemes to offset the increased foul water loads is good in principle, the implementation leaves the developer again at the mercy of the Local Authority, which could create increased tension in Planning.

Written with thanks to [Jo Bradley](#) of [Stormwater Shepherds](#) for providing useful information sources and assistance.

Sources

[Phosphorous Basics](#) – Rishi Prasad, Debolina Chakraborty

[Phosphorus: Transport to and availability in surface waters](#) - Daniel E. Kaiser, Extension nutrient management specialist and Paulo Pagliari, Extension soil scientist

Natural England - [Advice on achieving nutrient neutrality for new development in the Solent region](#)