



Response regarding matters of nutrient neutrality for planning application PL/2026/00843

Site: Land at Whitlocks, Bishopstone, Wiltshire

Date: 18th September 2026

1 BACKGROUND

This document has been prepared in response to comments issued by the Wiltshire Council Ecology Team, dated 2nd September 2026, regarding the Nutrient Neutrality Assessment & Mitigation Strategy (NNAMS) for the proposed development at Land at Whitlocks, Bishopstone.

The proposed development comprises the erection of nine dwellings and lies within the River Avon SAC nutrient neutrality catchment. A NNAMS (June 2026) was submitted demonstrating that the development can achieve nutrient neutrality. Natural England has reviewed the approach and raised no objection, deferring to Wiltshire Council as the Competent Authority.

Wiltshire Council has requested clarification on three aspects of the assessment:

- Provision of the completed Excel nutrient budget calculator.
- Clarification regarding the bespoke surface water runoff methodology.
- Further evidence supporting the proposed reduced water consumption rate of 95 litres/person/day (l/pd) (comprising 85 l/p/d plus a 10 l/p/d precautionary buffer).

2 RESPONSE TO ECOLOGY COMMENTS

2.1 Completed Nutrient Neutrality Calculator

Wiltshire Council has requested the completed nutrient neutrality calculator as an Excel document in addition to the PDF document submitted with the NNAMS.

We have attached this document and would note that calculator also includes summarises the surface water runoff assessment and SuDS assessment as detailed below.

2.2 Surface Water Runoff Methodology

The Modified Rational Method (MRM) has used for the post-development land use calculations. The use of the MRM has been discussed with Natural England via its Discretionary Advice Service (DAS) for the site.

Wiltshire Council has queried why the MRM has been utilised within the post development runoff calculations but not the pre-development land use calculations and has requested clarification regarding consistency with Natural England calculator guidance and whether the approach has been agreed with Natural England.

The MRM is integral to the existing Natural England nutrient budget calculators. The method assesses the site-specific factors that determine the volume of surface runoff from a site. Areas that do not generate direct surface runoff do not contribute to the surface water phosphorus export calculated.

As detailed in the Natural England Nutrient Neutrality Generic Methodology (NECR459, November 2022), a percentage impervious area (PIMP) of 80% is applied within the Natural England nutrient calculators. The surface water runoff component is then incorporated within the phosphorus export assumptions and urban export coefficients used by the Natural England nutrient calculators.

The assumed 80% hardstanding is not representative of all residential development, and therefore overestimates the phosphorus export from new development where the PIMP is less than 80%. The MRM allows a more site-specific assessment to be undertaken by using the actual proportion of impervious area at the site.

For phosphorus, the value for PIMP was set as 80%, as this has been suggested as the proportion of impervious surfaces once urban creep (the paving over of pervious surfaces) reaches a maximum. The use of an 80% PIMP value, while high, accounts for the potential increases in impervious surfaces that may occur over the lifetime of a development. Research has also suggested that non-paved gardens account for between 19-27% of the entire urban area. As gardens are the primary type of permeable surface within residential areas, the use of an 80% PIMP value is considered to be precautionary as an area with 19% coverage by non-paved gardens would indicate that around 80% of the remaining urban residential area would be impermeable surfaces.

Figure 1: Extract from Natural England Nutrient Neutrality Generic Methodology

The surface water assessment for Bishopstone has been refined using the MRM to quantify the proportion of rainfall expected to generate direct surface runoff from the development. We have prepared this additional standalone assessment using the best available information for the site and incorporating updated site-specific parameters.

The previously submitted assessment used the full Wallingford equation, incorporating PIMP, the soil index and the Urban Catchment Wetness Index (UCWI). The revised assessment instead applies the simplified form of the MRM set out within the Natural England Nutrient Neutrality Generic Methodology (NECR459). This approach uses site-specific PIMP and rainfall data, with rainfall used to derive the catchment wetness index, and therefore avoids the need to determine a site-specific soil index. The simplified approach has been adopted as it more closely reflects the methodology used by Natural England for calculating urban surface water runoff within nutrient neutrality assessments.

The Natural England nutrient budget calculator necessarily adopts a simplified approach to surface water runoff and does not provide a direct mechanism for incorporating a site-specific runoff result derived from an MRM assessment.

Accordingly, the MRM has been undertaken as a standalone hydrological assessment to estimate the proportion of annual rainfall expected to generate direct surface runoff at the site. For transparency, the detailed calculations are presented within separate workbooks.

U = catchment wetness index. Calculated by (use 41 if rainfall over 760 mm):

$$U = -129.5 + (0.424 * R) - (2.28 * 10^{-4} * R^2) - (4.56 * 10^{-8} * R^3)$$

Figure 2: Extract from Natural England Nutrient Neutrality Generic Methodology

$$Pr = 0.829 * PIMP + 0.078 * U - 20.7$$

$PIMP$ = the percentage of land that is impervious (whole number)

Figure 3: Extract from Natural England Nutrient Neutrality Generic Methodology

The calculations use the MRM equation and Event Mean Concentrations (EMCs) set out in Appendix 2, *Derivation of urban nitrogen and phosphorus runoff coefficients*, of the Natural England Nutrient Neutrality Generic Methodology (NECR459).

Research into diffuse pollution in urban environments has produced values called event mean concentrations (EMCs) that describe the average concentration of nitrogen and phosphorus in urban runoff during rainfall events. For the purposes of this methodology, the EMCs (Mitchell, G., (2005))⁷ detailed in Table 22 were used. See [Part 2.1.C](#) for a definition of the land use types in Table 12.

Table 12: EMC's for nitrogen and phosphorus for three key types of urban land use

Land use	Nitrogen event mean concentration (mg N/l)	Phosphorus event mean concentration (mg N/l)
Residential	2.85	0.41
Commercial/industrial	1.52	0.30
Open urban land	1.68	0.22

The EMCs were combined with a standard method for calculating urban runoff which requires only rainfall as an input. The HR Wallingford Modified Rational Method was used, as shown in equation 1.

Figure 4: Extract from Natural England Nutrient Neutrality Generic Methodology

Proposed hardstanding areas have been derived from the site layout plan (ref.: PL01 B). The total site area comprises a northern area covering 1.05 ha, and an area of land to the south covering 0.24 ha. This northern area comprises 0.63 ha of residential land and 0.42 ha of greenspace. The total impermeable area of the residential development in the northern area

is approximately 3,640 m², comprising roofs and hardstanding areas such as roads and driveways. This represents a PIMP of 57.78% for 0.63 ha of residential land.

The MRM identifies a percentage runoff of 30.40%, indicating that this percentage of annual rainfall at the site is expected to generate direct surface runoff. The remaining 69.60% of annual rainfall does not contribute to direct surface runoff due to infiltration, interception, evaporation and surface storage.

Using the bespoke MRM calculations and the EMC for residential land, the calculated post-development land use export is 0.73 kg TP/yr before the application of SuDS treatment. An additional small export from the greenspace areas is 0.01 kg TP/yr resulting in a total post-development land use export of 0.74 kg TP/yr.

According to the Flood Risk Assessment (IMA Transport Planning, January 2026), surface water runoff from hardstanding areas will discharge to ground via permeable paving or soakaways. As stipulated in CIRIA guidance¹, where infiltration to ground is appropriately designed and the relevant infiltration criteria are satisfied, phosphorus within infiltrated surface water can be assumed to be removed from the surface water environment. As demonstrated in the previous NNAMS, the proposed infiltration measures satisfy the relevant criteria for infiltration to ground.

Therefore, the post-development export of 0.73 kg TP/yr from the residential area is reduced to 0.00 kg TP/yr. The small export of 0.01 kg TP/yr from the greenspace areas remains.

The MRM method was not used for the pre-development land use assessment as areas were accurately measured in GIS and where hardstanding or buildings were present this was classed as commercial/industrial land. Areas within the commercial/industrial area that are not hardstanding or are permeable were classed as greenspace. Therefore, the assessment adopted a precautionary approach.

The land use exports are summarised in the conclusion below, and the calculator is attached.

2.3 Water Use

The council has asked for further evidence to provide assurance on the proposed water use of 85 l/p/d.

The developer is content for the optional higher Building Regulations water use of 110 l/p/d to be used in the nutrient budget calculations. Therefore, the water use has been revised to 120 l/p/d which incorporates the recommended Natural England precautionary buffer of 10 l/p/d.

The revised wastewater loading for the selected Fuji Clean system is summarised in the conclusions below and in the calculator attached.

¹ Bradley, J., Haygarth, P., Stachyra, K. and Williams, P. (2022). Using SuDS to reduce phosphorus in surface water runoff. CIRIA C808. London: CIRIA. ISBN 978-0-86017-952-8.

3 CONCLUSIONS

The revised calculator is attached the nutrient budget for the site is presented below.

Stage	Loading
	kg TP /yr
Wastewater loading	0.57
Pre-development land use	0.41
Post-development land use (using MRM)	0.74
Post-development land use (using MRM and inc. SuDS)	0.01
Land use change	-0.39
Nutrient budget	0.18
20% buffer	0.03
Final nutrient budget	0.21

The revised nutrient budget is 0.21 kg TP/yr. The developer will provide mitigation for this amount through the purchase of nutrient credits from the local authority scheme or a recognised credit provider.

Attachments:

1. Natural England Nutrient Neutrality budget calculator for the River Avon SAC
2. MRM assessment