

Technical Note

Project: Southfield, Parsons Lane,
Crockerton, BA12 8AR

Date: 23rd October 2025

Subject: Nutrient neutrality

Author: Nicola French

1.0 Background

- 1.1. This Technical Note has been prepared to provide information to Wiltshire Council (WC) in relation to submission of an application for Permission in Principle for the erection of two dwellings on paddock land to the south of the garden of Southfield, Parsons Lane, Crockerton, BA12 8AR. The information is provided under Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations).
- 1.2. In January 2024, Defra issued a policy paper¹ notifying the designation of sensitive river catchments sensitive to nutrient pollution. This includes the River Avon Special Area of Conservation (SAC), identified as being in unfavourable condition on account of phosphorous pollution². The implication of this is that any local planning authority within the catchment of the Hampshire Avon cannot grant consent for new residential development unless it can be shown to be net phosphorous neutral. A phosphorous calculation is therefore required to ensure that WC has sufficient information to carry out an appropriate assessment to consider impacts of the application on the River Avon SAC, required to approve the RMA.
- 1.3. This note takes full account of all information provided by WC on the Council's dedicated nutrient neutrality website³ and a guidance paper on the use of septic tanks for mitigation prepared by the Somerset Authorities affected by nutrient neutrality with respect to the Somerset Moors & Levels Special Protection Area (SPA)⁴. The note also draws on the calculator and guidance resources on the Government website *Tools and resources for calculating nutrient neutrality*⁵, most recently updated on 27th May 2025.

¹ January 2024, DEFRA. The Designation of Sensitive Catchment Areas Notice 2024

² <https://www.gov.uk/government/publications/notice-of-designation-of-sensitive-catchment-areas-2024/notice-of-designation-of-sensitive-catchment-areas-2024>

³ <https://www.wiltshire.gov.uk/planning-bio-phosphorous-nitrogen-mitigation>

⁴ The Somerset Authorities, August 2022. Advice Note – Considering Package Treatment Plants and Septic Tanks as part of nutrients mitigation in Somerset.

⁵ <https://www.gov.uk/government/collections/tools-and-resources-for-calculating-nutrient-neutrality>

2.0 Phosphorous budget

2.1. **Box 1** below sets out the parameters and assumptions used to assess the additional nutrient loading that will be generated by the two new dwellings.

Box 1: Assumptions relevant to the assessment of additional nutrient loading for x2 dwellings at Southfield, Parsons Lane

- **New overnight accommodation:** x2 residential dwellings
- **Occupancy:** 2.4 people based on accepted average occupancy figures
- **Total wastewater produced by single person:** 120 litres per day
- **Method of waste processing:** the proposed residential dwellings are in a rural location where connection to an existing mains sewer system is not possible. Instead, the dwellings will be served by a Graf One2Clean system. This system does not rely on dosing with ferric sulphate or other inorganic compound to optimise phosphate removal. The system is effective at stripping phosphorous from the treated effluent without dosing and certified at 1.6mg TP per litre (**see Appendix 1**).
- **Land use:** the red line area of the development scheme is predominantly a grass paddock, best described as **lowland**. Both plots are served by an existing private access that currently serves neighbouring properties and is best described as **residential urban**.
- **Land use budget:** The total area of the x2 plots is 0.32ha. The access track extends to 0.07ha.
- **Proposed development:** once developed, the land uses and associated areas will change to the **residential urban** land use category (0.39ha).

2.2. The most recent Natural England Phosphorous Calculator for the River Avon has been used to calculate the nutrient load generated by the new dwellings.

Water infrastructure information		
Description of required information	Data entry column - user inputs required	Additional data entry column - user inputs may be required
Date of first occupancy (dd/mm/yyyy):	01/01/2027	
Average occupancy rate (people/dwelling or people/unit):	2.40	
Water usage (litres/person/day):	120	
Development proposal (dwellings/units):	2	
Wastewater treatment works:	Package Treatment Plant user defined	
Current wastewater treatment works P permit (mg TP/litre):	Enter value in cell C10	1.6
Not applicable	Not applicable	
Not applicable	Not applicable	
Final calculation of nutrient load from wastewater		
Description of values generated	Values generated	
Wastewater nutrient loading		
Additional population (people):	4.80	
Wastewater by development (litres/day):	576.00	
Annual wastewater TP load (kg TP/yr):	0.34	

- 2.1 The calculations show that the treatment of foul from the x2 new residential units will generate 0.34 kg of Total phosphorous per year once occupied. Note that the 20% buffer has not been applied at this stage. Rather it is applied to the final calculation once the overall budget for the site is established.
- 2.3. To address the overall net nutrient budget for the scheme, it is important to also consider how rates of phosphorous leaching from the ground will change in response to a changed land use. Stages 2 & 3 of the calculation assess the Total phosphorous loading to the water environment that is currently taking place and compares this to the loading that will occur once the new residential units are occupied. Both stages are set out below, using the categorisations and land area set out in Box 1.

Current land use information			
Description of required information	Data entry column - user inputs required		
Operational catchment:	Avon Hampshire		
Soil drainage type:	Freely draining		
Annual average rainfall (mm):	950.1 - 1,000		
Within nitrate vulnerable zone (NVZ):	Yes		
Current land uses			
Existing land use type(s) - user inputs required	Area (ha) - user inputs required	Annual phosphorus export (kg TP/yr)	
Lowland	0.32	0.04	
Residential urban land	0.07	0.14	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	

Future land uses		
New land use type(s) - user inputs required	Area (ha) - user inputs required	Annual phosphorus export (kg TP/yr)
Residential urban land	0.39	0.76
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
Totals:	0.39	0.76

- 2.4. Finally, the calculator generates a net phosphorous loading for the scheme to take account of both loading from treated foul and the change of use of the land for development. This is set out in Stage 4, below.

Total nutrient budget calculations	
Description of values generated	Values generated
Wastewater TP load (kg TP/year):	0.34
Net land use TP change (kg TP/year):	0.59
TP budget:	0.93
TP budget + 20% buffer:	1.11
Annual nutrient budget	
The total annual phosphorus load to mitigate is (kg TP/yr):	1.11

- 2.5. The calculations show that the two new residential units will result in a net loading of **1.11kg** of total phosphorous per year once built and occupied.
- 2.6. To ensure net nutrient neutrality, **mitigation is required** to address the additional nitrogen and phosphorous load that the unit will generate.

3.0 Mitigation

- 3.1. Southfield is within the same family ownership and lies immediately adjacent to the development plot on which the two new residential units are proposed (see plan at **Appendix 2**). It is served by an existing septic tank of concrete construction, installed between 40 and 45 years ago (**Appendix 3**). It is emptied on 3-month intervals.
- 3.2. The existing septic tank drains to ground and does not meet the small-scale thresholds guidance i.e. it's nutrient load to the water environment is material and cannot be discounted (see **Appendix 4**). This is because it sits within 200m of other private drainage services.
- 3.3. Note too that upgrade of this septic tank for use as an offset for the 2 new residential dwellings proposed at Southfield is also consistent with recent advice from Natural England. This states that septic tank / PTP upgrades that discharge to ground can only be used for development where it too, also discharges to ground. In this instance, both the existing and proposed tanks will drain to ground.

- 3.4. Replacement of the existing septic tank at Southfield with a new PTP will reduce nutrient loading to the water environment. This saving can be used as an offset against which to balance the nutrient budget of the proposed new dwellings. The expectation of this arrangement is that the treatment of foul water from the new residential units and Southfield, all using a modern PTP, will result in a smaller nutrient loading than the old septic tank serving just Southfield alone, at the current time. If a net reduction in nutrient loading can be shown, and assuming that this can be properly secured, this will allow WC to conclude that the planning application will not adversely affect the integrity of the River Avon SAC alone or in combination with other projects.
- 3.5. The River Avon nutrient calculator can be used to calculate an estimate of the nutrient loading of the existing septic tank to the water environment. Assuming a default septic tank setting, the standard occupancy rate and a daily water usage of 150 litres per person (advised as appropriate by Natural England because an existing property is very unlikely to have the water saving features required of new build by Building Regulations), the nutrient calculator calculates that the tank will release **1.53kg** of TP/year (see Stage 1 below).

Water infrastructure information	
Description of required information	Data entry column - user inputs required
Date of first occupancy (dd/mm/yyyy):	01/01/2026
Average occupancy rate (people/dwelling or people/unit):	2.40
Water usage (litres/person/day):	150
Development proposal (dwellings/units):	1
Wastewater treatment works:	Septic Tank default
Current wastewater treatment works P permit (mg TP/litre):	11.60
Not applicable	Not applicable
Not applicable	Not applicable
Final calculation of nutrient load from wastewater	
Description of values generated	Values generated
Wastewater nutrient loading	
Additional population (people):	2.40
Wastewater by development (litres/day):	360.00
Annual wastewater TP load (kg TP/yr):	1.53

- 3.6. Stages 2 & 3 of the calculator are not relevant to this calculation as the replacement of the old septic tank for new provision in the adjacent development plot does not involve a change of land use. Furthermore, advice received from Natural England is that it is not appropriate to apply the 20% buffer to this calculation, because it works in the other direction to the assessment of the loading from the proposed solution. This would mean that inclusion of the 20% buffer would result in a less precautionary calculation. Stage 4 is therefore excluded from this assessment, to leave the final loading of the existing septic tank to the water environment as **1.53kg** of TP/year.

3.7. To establish whether the proposed mitigation strategy is effective, the question arises as to whether this figure is more or less than the nutrient loading that will arise from the two proposed new dwellings in conjunction with the new loading that will arise from Southfield once the existing septic tank is replaced with a new Graf One2Clean system.

3.8. Stage 1 sets out the loading for the existing dwelling using a new PTP.

Water infrastructure information		
Description of required information	Data entry column - user inputs required	Additional data entry column - user inputs may be required
Date of first occupancy (dd/mm/yyyy):	01/01/2026	
Average occupancy rate (people/dwelling or people/unit):	2.40	
Water usage (litres/person/day):	150	
Development proposal (dwellings/units):	1	
Wastewater treatment works:	Package Treatment Plant user defined	
Current wastewater treatment works P permit (mg TP/litre):	Enter value in cell C10	1.6
Not applicable	Not applicable	
Not applicable	Not applicable	
Final calculation of nutrient load from wastewater		
Description of values generated	Values generated	
Wastewater nutrient loading		
Additional population (people):	2.40	
Wastewater by development (litres/day):	360.00	
Annual wastewater TP load (kg TP/yr):	0.21	

3.9. Stages 2 & 3 of the calculator are not relevant to this calculation as the replacement of the old septic tank for new provision does not involve a change of land use.

3.10. Stage 4, on the following page, concludes the calculation of nutrient loading with the application of a 20% buffer to the results of stage 1:

Total nutrient budget calculations	
Description of values generated	Values generated
Wastewater TP load (kg TP/year):	0.21
Net land use TP change (kg TP/year):	0.00
TP budget:	0.21
TP budget + 20% buffer:	0.25
Annual nutrient budget	
The total annual phosphorus load to mitigate is (kg TP/yr):	0.25

3.11. This shows that the existing property with a new PTP will load 0.25kg/TP to the water environment per year.

3.12. To calculate the overall loading to the environment of the treatment of foul from the x2 new residential units and the adjacent existing property, with all using the Graf

One2Clean PTP, together with the land use change associated with the planning application, it is necessary to sum the outputs of both calculator results, as follows:

Total loading of phosphorous = $0.25 + 1.11 = 1.36\text{kg TP/year}$

- 3.13. Table 1 below compares the nutrient loading deriving from the two new dwellings together with the existing property, all with an upgraded PTP, and compares this to the existing situation whereby the existing property is served by an old septic tank.

Scenario	Existing dwelling	Proposed dwellings + existing, with new PTP	Difference in nutrient loading
Total phosphorous	1.53kg of TP/year	1.36kg of TP/year	Saving of 0.17 kg TP per year

- 3.14. Table 1 clearly shows that the treatment of foul from Southfields as an existing property using its own new PTP, together with the treated foul from the x2 new dwellings, will result in a smaller nutrient loading to the water environment than is currently occurring from the old septic tank of Southfields alone. This is because the proposed new PTPs will be more effective in the strip of nutrients than the existing septic tank. The overall result of installing the Graf One2Clean PTP to treat the foul from the three properties will be a **net overall reduction** in nutrient loading to the water environment. In other words, the combined treatment of foul from the new dwellings along with foul from the existing Southfields using the new PTP will result in a better than nutrient neutral solution.

4.0 Conclusion

- 4.1. A nutrient budget calculated in line with the current Natural England guidance and calculator for x2 new residential dwellings at Southfield, Parsons Lane, Crockerton, BA12 8AR shows that the proposed scheme will generate a surplus of 1.11 kg TP. To mitigate this additional loading, an existing septic tank that serves the adjacent property within the same family ownership and which is currently discharging 1.53kg of TP per year to the water environment, will be upgraded to a new PTP. The increased efficiency of nutrient stripping of the new PTPs in treating the foul from all properties will mean that the overall nutrient loading to the environment will reduce, such that the scheme inclusive of mitigation, will achieve a better than nutrient neutral net budget.
- 4.2. The new PTP arrangements will be installed and functional for all properties prior to the first occupation of the new dwelling.

- 4.3. A legal agreement will be used to secure the PTP arrangements to serve the three dwellings, the requirement to secure a full and functioning system for first occupation of the new dwelling, and to ensure that the PTP is regularly maintained according to the manufacturers recommendation thereafter.
- 4.4. This will ensure that the proposal will not adversely affect the integrity of the River Avon SAC, either alone or in combination with other plans and projects, allowing WC to conclude a positive appropriate assessment under the provisions of the Habitats Regulations.

NF061125

Appendix 1
Performance Certification: Graf One2Clean



Prüfinstitut für
Abwassertechnik
GmbH

PERFORMANCE RESULTS

Otto Graf GmbH

Carl-Zeiss-Str. 2 - 6, 79331 Teningen, Germany

EN 12566-3

Small wastewater treatment systems for up to 50 PT

Small wastewater treatment system one2clean

SBR plant in one two-zone polypropylene tank

Test report PIA2014-216B14.01.e

Nominal organic daily load*	0.27	kg/d	
Nominal hydraulic daily load	0.75	m³/d	
Material	polypropylene		
Treatment efficiency (nominal sequences)		Efficiency	Effluent
	COD	94.2 %	43 mg/l
	BOD ₅	98.0 %	7 mg/l
	SS	96.3 %	14 mg/l
	NH ₄ -N**	98.3 %	0.5 mg/l
	N _{tot} **	87.0 %	7.9 mg/l
	P _{tot}	80.2 %	1.6 mg/l
Electrical consumption	0.63	kWh/d	

*at a test influent of ≥ 300 mg/l BOD₅ (mean)

**determined for temperatures $\geq 12^{\circ}\text{C}$ in the bioreactor

Performance tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH

(PIA GmbH)

Hergenrath Weg 30

52074 Aachen, Germany

This document replaces neither the declaration
of performance nor the CE marking.



Notified Body
No.: 1739



Certified according to
ISO 9001:2008



Deutsche
Akkreditierungsstelle
D-PL-17712-01-00

Prüfinstitut für Abwassertechnik GmbH

Geprüft - tested - testé

Elmar Lancé

November 2014

Appendix 2
Evidence for existing septic tank at Southfield

Appendix 2
Evidence of septic tank at Southfield



Photo's to show man hole cover over septic tank of concrete construction and area of drainage field. The presence of nettles is indicative of high nutrient levels synonymous with a drainage field.

Appendix 3

Assessment of Southfield septic tank against small scale thresholds

Appendix 3: Assessment of septic tank serving Southfield against the small scale threshold criteria¹

For a septic tank to meet the small scale thresholds, all of the following conditions must be met:

Threshold	Threshold met	Comment
The drainage field is more than 50m from the designated site boundary (or sensitive interest feature)	Yes	The drainage field at Southfield is approximately 600m distant to the closest part of the River Avon SAC.
The drainage field is more than 40m from any surface water feature e.g. ditch, drain, watercourse, and	Yes	Google Maps shows that a tributary of the River Wylfe is the closest surface water feature, which lies 140m to the south.
The drainage field in an area with a slope no greater than 15%, and	Yes	
The drainage field is in an area where the high-water table groundwater depth is always at least 2m below the surface, and	Unlikely but not certain	Information not available.
The drainage field will not be subject to significant flooding, e.g. it is not in flood zone 2 or 3, and	Yes	The septic tank lies in flood zone 1
There are no other known factors which would expedite the transport of phosphorus for example fissured geology, insufficient soil below the drainage pipes, known sewer flooding, conditions in the soil/geology that would cause remobilisation phosphorus, presence of mineshafts, etc. and	Unlikely but not certain	Information not available.
To ensure that there is no significant in combination effect, the discharge to ground should be at least 200m from any other discharge to ground and	No	The septic tank lies within 200m of a number of neighbouring residential properties who are also served by a private drainage system.
The percolation test has been performed of the proposed location of the drainage field with the resulting value lying within the required range under the Building Regulations 2010, which specify an average Vp value of between 12 & 100	Unknown	Information not available.
Conclusion: the septic tank that serves Southfield does not meet all of the small scale thresholds and cannot therefore be considered a small-scale private drainage. It is therefore appropriate to upgrade for purposes of offsetting the additional nutrient loading that the 2 new residential units will generate.		

¹ Taken from Somerset Council Interim Guidelines Quick Guide: Conditions that must be met to fulfil the Interim guidelines on small scale thresholds