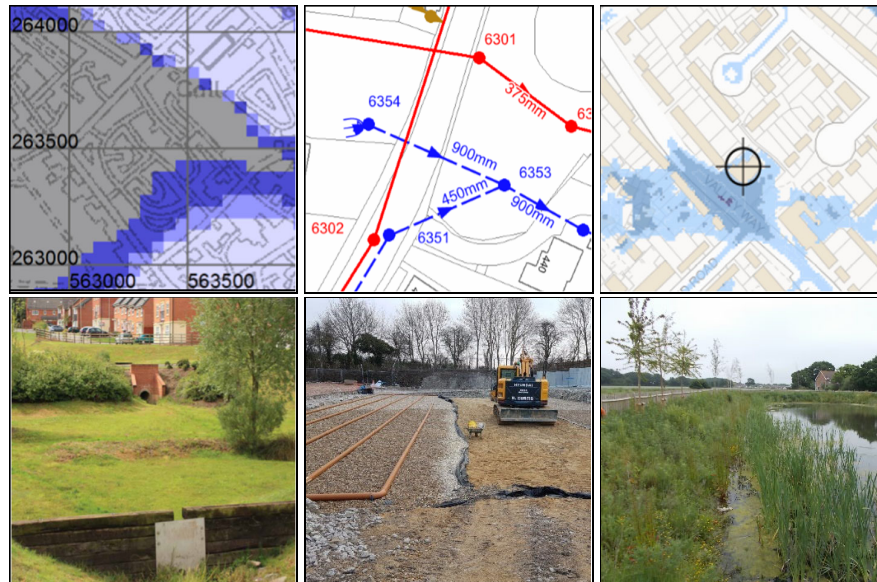




Nutrient Assessment & Budget

**Highlands Farmhouse, Highlands Farm,
Collingbourne Ducis, Wilts**

Reference: 25073

Issue: **Date:**

1	11/4/2025	To NE 16/03/2022 methodology with replacement NE calculator August 2024
2	11/7/2025	Site plan updated and to NE calculator May 2025

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C	Nutrient Assessment & Mitigation
D	Conditions & Limitations

1. Introduction

- 1.1 Instructions were received from Fowler Architecture and Planning to undertake an assessment of the nutrient impact for development of a replacement dwelling at Highlands Farmhouse, Highlands Farm, Collingbourne Ducis, Wilts.
- 1.2 This assessment has been undertaken by A P Traves BSc CEng MIStructE MCIHT.
- 1.3 The client's attention is drawn to the conditions and limitations contained in Appendix D.

2. Development Description & Location

- 2.1 The site is some 0.48 Ha of residential urban fabric at Highlands Farmhouse, Highlands Farm, Collingbourne Ducis, Wilts. The site is indicated on Fowler Architecture and Planning location plan 240203-01 contained in Appendix A of this report.
- 2.2 It is proposed to demolish the existing dwelling and construct a replacement dwelling on the site. The proposed layout is shown on Fowler Architecture and Planning site plan 240203-103 contained in Appendix A of this report.

3. Background to Nutrient Assessment

- 3.1 The background to the issue is set out in current Natural England- Nutrient Neutrality Generic Methodology dated 1 February 2022 (NE-gen1). NE- gen1 was issued to LPAs on 16 March 2022 and the calculator was replaced in January 2024 to take account of upgrade of public Wastewater Treatment Works (WwTW) defined by the Levelling Up and Regeneration Act 2023. The calculator was replaced again in May 2024 then May 2025 to reflect further scheduling from the Levelling Up and Regeneration Act 2023.
- 3.2 The Hampshire Avon Special Area of Conservation (SAC) is protected under the Water Environment Regulations and the Conservation of Habitats and Species Regulations. There are high levels of phosphorus nutrients in these waters and the evidence indicates these nutrients are causing eutrophication of the waters (excess mats of dense green algae which deplete oxygen as these subsequently decay)
- 3.3 The total nutrient content comes from a number of component parts:
 - i. Agricultural use of fertilisers, particularly in the latter half of the 20th century
 - ii. General coastal background content
 - iii. Nutrient within final discharge from sewage treatment works
 - iv. Diffuse urban rainfall runoff from urban surfaces
- 3.4 Since the late 1980's and early 1990's the agricultural sector has reduced the nutrient content in applied fertiliser by around 35%. However, the Chalk aquifers which underly the region and which are the dominant source of river flows into The Solent contain a massive amount of legacy nitrogen mainly in the form of soluble nitrate, from decades of previous agricultural practice. It is anticipated that it will take decades from now for the nutrient content in groundwater to gradually reduce.
- 3.5 It has been recognised by the Environment Agency, water companies and OFWAT for some time that improvement of the Total Phosphorus (TP) content of discharge needs to be addressed. The water industry works in 5 year spending cycles/programmes referred to as Asset Management Plans (AMPs) and these three parties agree between them how much investment (which comes from increases in sewage bills) can be made in any AMP and what will be delivered in terms of improvement for the investment permitted (affordable). It is not practicable to strip 100% of the Phosphorus from the sewage, and the previously upgraded treatment works typically operate to a new TP permit level of around 1 mg/L compared to typical value of around 8 mg/L for traditional works without TP permit limits.

- 3.6 Treatment works upgrades are difficult and complex to plan and deliver in the context of three of the main constraints:
- There is little space at most works for the finished new infrastructure
 - The existing works has to continue to operate during the upgrade and there is little room for this and the working space needed to construct the new infrastructure.
 - The investment cashflow is regulated by OFWAT against bill increases and notwithstanding this there are a finite number of specialists to plan and deliver this so there can only be a limited rate at which the upgrades are delivered.
- 3.7 The introduction of WwTW upgrades through the Levelling Up and Regeneration Act 2023 appears to have been programmed to match the AMP cycle in that the initial tranche of upgrades have been scheduled in January 2024 which coincides with Price Review 2024 (PR24) in which OFWAT and the water industry agree the AMP8 2025-2030 works programme. The initial tranche of upgrades now required have to be delivered by 2030 which coincides with the end of the AMP8 period. It seems likely that the Secretary of State would in future review and update scheduling in the year preceding the next PR ie in 2028 for PR 2029 as the Levelling Up and Regeneration Act requires a minimum period of 7 years allowed for upgrades from scheduling which would coincide with the period of the impending AMP at that time ie AMP9 2030-2035.
- 3.8 The NE-Avon-v1 methodology is aimed at planning permissions for proposed developments and does not address agricultural practice or the water industry AMP process. The NE-Avon-v1 methodology is built off a single fundamental premise. This assumes that persons at work or using non-residential offices and commercial/retail premises must also live in the catchment. In the round this is a reasonable basis on which to look at the total sewage volume. However in zero rating commercial development from phosphorus loading it inherently means that residential developers fund the Phosphorus nutrient mitigation of all non-residential commercial development in the region.
- 3.11 Natural England nutrient assessment methodology NE-Avon-v1 considers phosphorus for:
- 1) Land use with regard to phosphorus contained in surface water run-off and infiltration.
 - 2) Sanitation with regard to nutrient content in the final treated discharge from the WwTW serving the development.
- The assessment compares pre and post development quantities on nutrient for the land use (1) and sanitation (2) to establish a final figure and then adds a 20% buffer to this.
- 3.12 Natural England advise the NE-Avon-v1 methodology is advised for all types of development that would result in a net increase in population served by a wastewater system, including new houses, student accommodation, tourism attractions and tourist accommodation.

4. Derivation of Sewage Load

- 4.1 The NE-Avon v1 methodology used a blunt 2.4 average household occupancy and 110 litres per person per day (LPD) for housing.
- 4.2 NE-Avon-v1 now recognises that water consumption on sites varies:
- Building Regulations maximum 125 LHD
 - Building Regulations higher standard 110 LHD
 - Higher standard by water efficiency calculation
- NE-gen1 directs that the level of proposed water usage is increased by 10 LPD *“to account for changes to less water efficient fittings through the lifetime of the development”*. This direction is contrary to the industry direction of travel, Southern Water’s own water supply policies which NE recognise in their February 2022 advice note regrading water neutrality within the Sussex North Water Supply Zone and associated Frequently Asked Questions document (December 2021) in which this demonstrates explicit awareness of Southern Water’s Target 100 *“to reduce water consumption in Southern Water’s whole water supply*

area in the long term (not just Sussex North), as set out in their Water Resources Management Plan.” The evidence therefore points to a long term reduction in use NOT a long term increase.

- 4.3 There is a further fundamental error in that sewage load is less than not equal to water use. Water efficiency calculations include a 5 LPD for external use that is not returned to the sewer so does not form part of the sewage load. In water metered properties sewage bills are calculated at 95% of the water supply volume in recognition of this.
- 4.4 The calculations attached to this report have been undertaken on the basis of 110 LPD unless a water efficiency calculation has been provided to us and is attached. A +10 LPD has been added as directed by Natural England. The liability and accountability for the impact of this direction rest with Natural England as current evidence set out in 4.2 and 4.3 above indicates their current approach is unsound.

5. Wastewater Treatment Works

- 5.1 The site is remote from the public sewer.
- 5.2 The existing dwelling is currently served by septic tank which it is proposed to replace.
- 5.3 It is proposed to install a new Package Treatment Plant (PTP) to serve the foul water load from the replacement dwelling proposed.
- 5.4 The applicant proposes to install a Graf One2Clean (biological) PTP with a certified performance for TP of 1.6 mg/L. The subsequent nutrient assessment calculations are based on use of Graf One2Clean (biological) treatment plant. The associated performance certification for the Graf One2Clean (biological) is contained in Appendix B.

6. Land Use Component

- 6.1 The site comprises 0.48 Ha of existing residential urban fabric. The proposed development is located within this fabric so there will inherently be no change in nitrogen from that land use component as a result of the proposed development.
- 6.2 The applicant does not propose to use SUDS to provide a reduction in the post development figure from the base calculation load in surface water runoff to which 6.1 relates. This part of the calculator is therefore not applicable.

7. Nutrient Assessment

- 7.1 The NE-gen 1 sewage loading, WwTW performance for TP and land use component are included in the calculations contained in Appendix C.
- 7.2 There is no deductible allowance for TP in the water supply to the site.
- 7.3 The calculations demonstrate an existing nutrient discharge of 1.22 KgTP/yr (unbuffered) from the existing dwelling on the current septic tank, and a post development discharge of 0.17 KgTP/yr (unbuffered) for the replacement dwelling served by the proposed Graf One2Clean PTP. The proposed development would therefore yield a net **nutrient reduction of 1.05 KgTP/yr (unbuffered)**. Application of the 20% buffer to nutrient reductions is not applicable.

8. Mitigation

- 8.1 **The proposed development will yield a net phosphorus nutrient reduction of 1.05 KgTP/yr and the proposed development therefore exceeds the balance point to achieve neutrality and no mitigation is required.**

Appendix A



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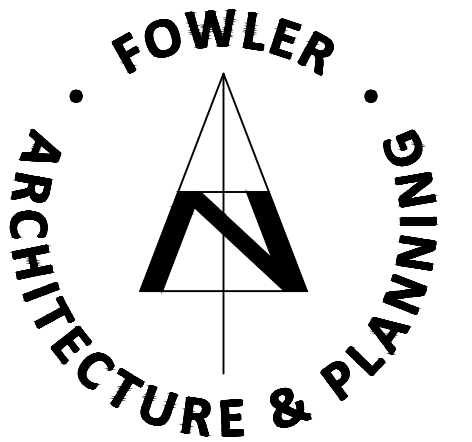
revisions
Contractors, Sub Contractors and Suppliers are to check all relevant dimensions and levels of site and buildings before commencing any shop drawings or building work.
This drawing is copyright and may not be reproduced in any part of form without the written consent of Fowler Architecture and Planning

project
HIGHLANDS FARM
Collingbourne Ducis
preliminary

drawing
Location Plan

scale
1:1250@A2
drawn by
DC
date
June 2026

240203-01
drawing no
rev



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Appendix B



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

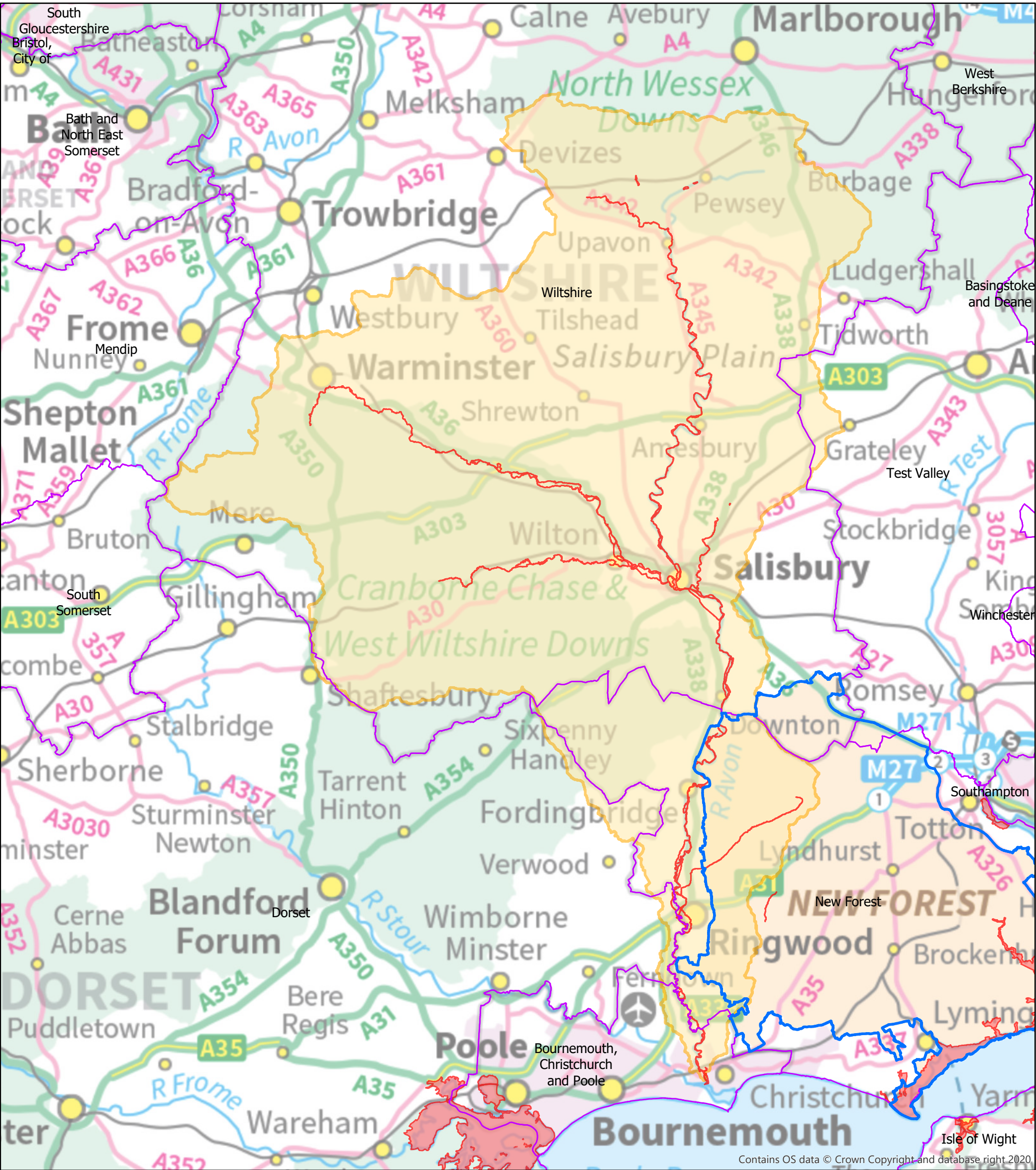
November 2014

Appendix C

Existing dwelling on existing septic tank

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):	02/01/2022	
Average occupancy rate (people/dwelling or people/unit):	2.40	
Water usage (litres/person/day):	120	
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):	288.00	
Annual wastewater TP load (kg TP/yr):	1.22	
Not applicable		
Not applicable	Not applicable	
Not applicable		
Not applicable	Not applicable	

Total nutrient budget calculations	
Description of values generated	Values generated
Wastewater TP load (kg TP/year):	1.22
Net land use TP change (kg TP/year):	0.00
TP budget:	1.22
TP budget + 20% buffer:	1.46
Annual nutrient budget	
The total annual phosphorus load to mitigate is (kg TP/yr):	1.46
Not applicable	
Not applicable	Not applicable
Not applicable	
Not applicable	Not applicable



European protected sites requiring nutrient neutrality strategic solutions

Scale: 1:280,000

**Component SSSIs of
River Avon SAC**

- Local Authorities
- SSSI subject to nutrient neutrality strategy
- Nutrient neutrality SSSI catchment
- National Parks



replacement dwelling on 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):	01/05/2026			
Average occupancy rate (people/dwelling or people/unit):	2.40			
Water usage (litres/person/day):	120			
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):	288.00			
Annual wastewater TP load (kg TP/yr):	0.17			
Not applicable				
Not applicable	Not applicable			
Not applicable				
Not applicable	Not applicable			

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):	750.1 - 800		
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)	Notes on data
Residential urban land	0.48	0.74	Not applicable
		0.00	Not applicable
		0.00	Not applicable
		0.00	Not applicable
		0.00	Not applicable
		0.00	Not applicable
		0.00	Not applicable
		0.00	Not applicable
		0.00	Not applicable
		0.00	Not applicable
		0.00	Not applicable
		0.00	Not applicable
		0.00	Not applicable
		0.00	Not applicable
		0.00	Not applicable
		0.00	Not applicable
		0.00	Not applicable
		0.00	Not applicable
		0.00	Not applicable
Totals:	0.48	0.74	

SuDS information							
New land use type(s) within SuDS catchment area - user inputs required	SuDS catchment area (ha) - user inputs required	Percentage of flow entering the SuDS (%) - user inputs required	Annual phosphorus inputs to SuDS feature(s) (kg T/yr)	Name of SuDS feature(s) - user inputs required	TP removal rate for features - user specified (%) - user inputs required	Annual phosphorus load removed by SuDS (kg TP/yr)	Notes on data
			0.00			0.00	Not applicable
			0.00			0.00	Not applicable
			0.00			0.00	Not applicable
			0.00			0.00	Not applicable
			0.00			0.00	Not applicable
			0.00			0.00	Not applicable
			0.00			0.00	Not applicable
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			0.00			0.00	Not applicable
			0.00			0.00	Not applicable
			0.00			0.00	Not applicable
			0.00			0.00	Not applicable
			0.00			0.00	Not applicable
			0.00			0.00	Not applicable
Totals:	0.00		0.00			0.00	

APPLICANT DOES NOT SEEK ANY DISCOUNT TO THE FUTURE LAND USE IMPACT (STAGE 3)

Total nutrient budget calculations	
Description of values generated	Values generated
Wastewater TP load (kg TP/year):	0.17
Net land use TP change (kg TP/year):	0.00
TP budget:	0.17
TP budget + 20% buffer:	0.20
Annual nutrient budget	
The total annual phosphorus load to mitigate is (kg TP/yr):	0.20
Not applicable	
Not applicable	Not applicable
Not applicable	
Not applicable	Not applicable

Replacment dwelling on 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):	01/02/2026	
Average occupancy rate (people/dwelling or people/unit):	2.40	
Water usage (litres/person/day):	120	
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):	288.00	
Annual wastewater TP load (kg TP/yr):	0.17	
Not applicable		
Not applicable	Not applicable	
Not applicable		
Not applicable	Not applicable	

SuDS information							
New land use type(s) within SuDS catchment area - user inputs required	SuDS catchment area (ha) - user inputs required	Percentage of flow entering the SuDS (%) - user inputs required	Annual phosphorus inputs to SuDS feature(s) (kg T/yr)	Name of SuDS feature(s) - user inputs required	TP removal rate for features - user specified (%) - user inputs required	Annual phosphorus load removed by SuDS (kg TP/yr)	Notes on data
			0.00			0.00	Not applicable
			0.00			0.00	Not applicable
			0.00			0.00	Not applicable
			0.00			0.00	Not applicable
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			0.00			0.00	Not applicable
			0.00			0.00	Not applicable
			0.00			0.00	Not applicable
			0.00			0.00	Not applicable
Totals:	0.00		0.00			0.00	

APPLICANT DOES NOT SEEK ANY DISCOUNT TO THE FUTURE LAND USE IMPACT (STAGE 3)

Total nutrient budget calculations	
Description of values generated	Values generated
Wastewater TP load (kg TP/year):	0.17
Net land use TP change (kg TP/year):	0.00
TP budget:	0.17
TP budget + 20% buffer:	0.20
Annual nutrient budget	
The total annual phosphorus load to mitigate is (kg TP/yr):	0.20
Not applicable	
Not applicable	Not applicable
Not applicable	
Not applicable	Not applicable

Appendix D

CONDITIONS AND LIMITATIONS OF NITROGEN NUTRIENT ASSESSMENT

May 2020

Aqua Callidus Consulting Ltd is constituted as a limited liability company in accordance with the Companies Act 1989 (with registered number 11390910 and with its registered office at Kintyre House, 70 High Street, Fareham, Hants, PO16 7BB).



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6. Unless stated otherwise the nitrogen assessment is based on site specific information provided by the client and manufacturers and wastewater companies public information on the performance of wastewater treatment plants and works. No liability is accepted for the accuracy of such third party information.
7. Unless stated otherwise the nitrogen assessment is undertaken as a desktop assessment and no site visit has been made.