

Dated

12 August

2026

Broadland District Council

-and-



**DEED OF PLANNING OBLIGATION  
UNDER SECTION 106  
OF THE TOWN AND COUNTRY PLANNING  
ACT 1990**  
relating to land at  
The Cattle Shed Gunn Street Foulsham Norfolk NR20 5RN

**nplaw**  
Public Sector Legal Expertise

THIS DEED is dated 12 day of August 2026

**PARTIES:**

- (1) **BROADLAND DISTRICT COUNCIL** of The Horizon Centre, Peachman Way, Broadland Business Park, Norwich NR7 0WF (referred to as the "Council")
- (2) [REDACTED] of 2 High House Farm Barns, Gunn Street, Foulsham, Dereham, Norfolk NR20 5RJ (referred to as the "Owner")

together referred to as 'the Parties'

**INTRODUCTION**

- (A) The Council is a local planning authority for the purposes of this deed for the area within which the Site is located.
- (B) The Owner has applied for the Permission and the Council has resolved to grant the Permission provided the Parties enter into this Deed.
- (C) The Owner owns the freehold of the Site which is registered at HM Land Registry under title number NK401368 and held free from encumbrances other than the matters referred to below.

**1. DEFINITIONS**

In this Deed the following expressions have the following meanings:

Act                                      The Town and Country Planning Act 1990 as amended

Catchment Area                      Means the catchment area of the River ~~Wensum~~ <sup>Wensum</sup>, within The Protected Site

11.08.2026  
CW.

Commencement                      The date on which a material operation as defined in section 56(4) of the Act is first carried out, except (for the purposes of this Deed only) operations consisting of:

- site clearance
- demolition
- archaeological investigations
- ground surveys
- removal of contamination or other adverse ground conditions
- erection of temporary fences
- temporary display of site notices and/or advertisements

and 'Commence' and 'Commenced' will be construed accordingly

|                                   |                                                                                                                                                                                                                                               |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Completion Notice                 | Means the notice submitted to the Council confirming that the Property PTP has been installed and is operational, such notice to include a copy of the building control certificate which approves the installation of the Property PTP       |
| Development                       | The Development of the Site in accordance with the Permission                                                                                                                                                                                 |
| Dwelling                          | A dwelling to be built on the Site as part of the Development                                                                                                                                                                                 |
| Maintenance and Monitoring Report | Means the report to be prepared by the Owner which has been submitted to and approved by the Council to secure the details of the measures required for maintaining and monitoring the Property PTP until the expiry of the Management Period |
| Management Period                 | A period of 90 years from the date of Occupation of the final Dwelling to be Occupied                                                                                                                                                         |

|                     |            |                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Monitoring Fee      |            | The sum of £4,500 towards the Council's costs of monitoring compliance with the Owner's obligations in this Deed                                                                                                                                                                                                                                                         |
| Nitrogen Mitigation |            | Measures to reduce the discharge of nitrogen to the Catchment Area to mitigate the effects of increased nitrogen levels in the Protected Site caused by the Development in line with Natural England requirements at date of this Deed                                                                                                                                   |
| Nutrient<br>Report  | Assessment | Means the report dated 14 February 2025 appended to this Deed at Appendix 2 which contains the assessment methodology and location for the Property PTP and the calculation of the volume of Nitrogen Mitigation and Phosphorus Mitigation provided by the installation of the Property PTP and which may be revised from time to time subject to the Council's approval |
| Nominated Officer   |            | The senior officer of the Council responsible for development management or other officer of the Council notified to the Owner                                                                                                                                                                                                                                           |
| Occupation          |            | Occupation of the Site, or any part of it, for any purpose authorised by the Permission, but excluding occupation for the purposes of: <ul style="list-style-type: none"> <li>• construction</li> <li>• internal and external refurbishment</li> <li>• decoration</li> <li>• fitting-out</li> <li>• marketing</li> <li>• installation of services</li> </ul>             |



and 'Occupy' and 'Occupied' will be construed accordingly

|                        |                                                                                                                                                                                                                                                                                                     |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Permission             | The planning permission to be granted by the Council for demolition of a barn adjoining a cartshed and the erection of 2 self-build dwellings and allocated reference number 2024/3311                                                                                                              |
| Phosphorus Mitigation  | Measures to reduce the discharge of phosphorus to the Catchment Area to mitigate the effects of increased phosphorus levels in the Protected Site caused in line with Natural England requirements at the date of this Deed                                                                         |
| Plan                   | The plan appended to this Deed at Appendix 1                                                                                                                                                                                                                                                        |
| PTP                    | Means package treatment plant                                                                                                                                                                                                                                                                       |
| Property PTP           | A treatment plant of the model and specification set out within the approved Nutrient Assessment Report and the Property PTP Specification to be installed on the Site in accordance with the Nutrient Assessment Report unless otherwise agreed in writing by the Council                          |
| Property Specification | PTP The detailed specification for the decommissioning and removal of the existing septic tank and the installation and management of the Property PTP to be agreed with the Council together with any revisions to the specification as may be agreed in writing between the Council and the Owner |

|                  |                                                                                                                                                                                                            |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Protected Site   | Means the Broads SAC/Broadland Ramsar Site                                                                                                                                                                 |
| Service Engineer | A person who is suitably qualified and approved by the manufacturer of the PTP for the purposes of fulfilling the management and maintenance of the PTP in accordance with the manufacturer's requirements |
| Site             | The land known as The Cattle Shed Gunn Street Foulsham Norfolk NR20 5RN and registered at HM Land Registry under title number NK401368 shown edged red on the Plan                                         |
| Blue Land        | Means the land edged blue on the Plan                                                                                                                                                                      |
| Trigger          | The Commencement date and any trigger or threshold in this Deed linked to the taking of specified steps, payment of money, or linked to the prohibition of a specified action                              |
| Working Day      | Any day which is not a Saturday, a Sunday, a bank holiday or a public holiday in England                                                                                                                   |

## **2. LEGAL BASIS**

- 2.1. This Deed is made pursuant to section 106 of the Act and, to the extent that it does not contain planning obligations, under section 111 of the Local Government Act 1972, section 1 of the Localism Act 2011, section 93 of the Local Government Act 2003, and any and all other enabling powers.
- 2.2. The covenants and obligations contained in this Deed create planning obligations for the purposes of section 106 of the Act enforceable by the Council

and relate to the Site and to the extent that any provision is not capable of being made pursuant to section 106 of the Act it is made pursuant to section 111 of the Local Government Act 1972, section 1 of the Localism Act 2011, section 93 of the Local Government Act 2003 and any and all other enabling powers.

- 2.3. Covenants given by more than one party can be enforced against them individually or jointly.
- 2.4. A reference to an act of Parliament includes any later modification or re-enactment, including any statutory instruments made under that act, and reference to a gender or person includes all genders or classes of person.
- 2.5. Any covenant in this Deed not to do something includes an obligation not to allow or permit it to be done.
- 2.6. References to any party to this Deed shall include successors in title to that party and to any person deriving title through or under that party and in the case of the Council the successors to their respective statutory functions.
- 2.7. Representatives of the Council may enter the Site at any reasonable time to ascertain whether the terms of this Deed are being or have been complied with provided that:
  - 2.7.1. they do not enter any individual Dwelling; and
  - 2.7.2. they adhere to all reasonable health and safety requirements.
- 2.8. This Deed is conditional upon:
  - 2.8.1. The grant of the Permission; and
  - 2.8.2. The Commencement of Development,

save for the provisions of this clause and clauses 4.4 and 4.10 which shall come into effect immediately on completion of this Deed and any obligation contained in this Deed which must be performed prior to Commencement of the Development which shall come into effect immediately on the grant of the Permission.

### **3. COVENANTS**

- 3.1. The Owner covenants with the Council for himself and his successors in title to observe and perform the obligations and stipulations contained in this Deed.
- 3.2. The Council covenant with the Owner to comply with its respective requirements contained in this Deed.

### **4. OTHER PROVISIONS**

- 4.1. No person will be liable for any breach of this Deed if he no longer has an interest in the Site (unless the breach occurred before he disposed of his interest).
- 4.2. The Owner confirms that he is the owner of the Site with full power to enter into this Deed and that there is no person or body with an interest in the Site whose consent is necessary to make this Deed binding on all interests in the Site.
- 4.3. The covenants, restrictions and requirements contained in this Deed shall not be enforceable against:
  - 4.3.1. any statutory undertaker or other person who acquires any part of the Site or an interest in it for the purposes of the supply of electricity gas water telecommunications or highways in connection with the Development of the Site;
- 4.4. On completion the Owner will pay the Council's reasonable legal costs in connection with this Deed.
- 4.5. If any payment due to the Council is paid late interest will be added from the date payment is due to the date of payment at the rate of 4% above the base lending rate of the Bank of England from time to time.
- 4.6. All payments under this Deed are exclusive of value added tax (VAT) and any VAT due must also be paid (save in respect of clause 4.4). The Council will

provide a VAT invoice where VAT is charged.

- 4.7. No provisions of this Deed shall be enforceable under the Contracts (Rights of Third Parties) Act 1999.
- 4.8. If any provision of this Deed is held to be invalid, illegal or unenforceable it will not affect the remaining provisions.
- 4.9. No waiver, express or implied, by the Council of any breach or failure to perform or observe any of the covenants, terms or conditions of this Deed constitutes a continuing waiver, nor prevents the Council from enforcing any of the provisions in this Deed.
- 4.10. If the Permission is quashed revoked or expires before Commencement then, save for clause 4.4, this Deed will cease to have effect (insofar only as it has not already been complied with).
- 4.11. Subject to clause 4.12, nothing in this Deed prohibits or limits the right to develop any part of the Site in accordance with a planning permission (other than the Permission) granted after the date of this Deed.
- 4.12. If the Permission is subject to an application under Section 73 of the Act for the removal or amendment of any condition attached to the Permission then the obligations in this Deed shall also apply to the new planning permission resulting from such application if so agreed by the Council (acting in its absolute discretion).
- 4.13. This Deed is registrable as a local land charge by the Council.
- 4.14. Following the performance and satisfaction of all the obligations contained in this Deed the Council will, upon the written request of the Owner, cancel all relevant entries contained in the Register of Local Land Charges.
- 4.15. An agreement, approval, consent or expression of satisfaction required by the Owner from the Council under the terms of this deed must be given in writing and shall not be unreasonably withheld or delayed.

- 4.16. The provisions of this Deed (other than this clause which takes immediate effect) will be of no effect until this Deed has been dated.
- 4.17. Nothing contained or implied in this Deed will fetter, prejudice or affect the rights, discretions, powers, duties and obligations of the Council in the exercise of any of its functions as local authority.

## **5. DISPUTES**

- 5.1. If any dispute is not resolved between the Parties, any of the Parties may refer it for determination by an expert. The expert will be appointed by agreement between the parties or, in default of agreement, by the President for the time being of the Royal Institution of Chartered Surveyors and the expert's decision shall be final and binding.
- 5.2. The expert is to be replaced by a fresh appointee in the event that they become at any time unable or unwilling for any reason to proceed to discharge their functions. The fresh appointee is to be appointed in the manner prescribed in this clause.
- 5.3. The expert is to make their decision within 6 weeks of being appointed.
- 5.4. The costs of appointing the expert are to be shared equally by the parties to the dispute except where the expert takes the view that one party has acted unreasonably. In that case the expert has binding discretion as to apportionment of the costs.
- 5.5. Nothing in this clause will apply to the recovery of liquidated sums or prevent the parties from commencing or continuing court proceedings.

## **6. NOTIFICATIONS**

- 6.1. Any notice or written communication given under this Deed is validly given if hand delivered or sent by recorded delivery post to the address set out at the

beginning of this Deed, unless written notification of another address has been received.

6.2. The Owner will notify the Nominated Officer in writing of the relevant

6.2.1. anticipated Triggers seven days in advance of each anticipated date,

6.2.2. actual Triggers within seven days of each actual date.

6.3. If the Owner disposes of his interest in all or part of the Site he will notify the Nominated Officer within 7 days of the name and address of the new owner and sufficient details to identify the Site or part of the Site.

## **7. JURISDICTION**

This Deed is governed by and interpreted in accordance with the law of England and Wales.

## **SCHEDULE 1**

### **Owner Covenants**

#### **Part 1**

The Owner with the full intention to bind the Site hereby covenants with the Council as follows:

1. To pay the Monitoring Fee to the Council prior to the Commencement of the Development and not to Commence the Development until the Monitoring Fee has been paid to the Council
2. Not to Commence the Development until the Property PTP Specification has been approved by the Council
3. To decommission and remove the existing package treatment plant from the Blue Land and not to Occupy or allow Occupation of any Dwelling until the existing package treatment plant has been decommissioned and removed from the Blue Land.
4. To install the Property PTP in accordance with the Property PTP Specification and not to Occupy or allow the Occupation of any Dwelling until such installation has taken place
5. To submit the Completion Notice to the Council prior to Occupation and not Occupy or allow Occupation until the Completion Notice has been submitted to and validated by the Council
6. To submit the Maintenance and Monitoring Report to the Council prior to Occupation of any Dwelling and not to Occupy any Dwelling until the Maintenance and Monitoring Report have been submitted to and approved by the Council

#### **Part 2**

The Owner with the full intention to bind the Site hereby covenants with the Council from the date of the Council's validation of the Completion Notice until the expiration of the Management Period as follows:

1. To operate and maintain the Property PTP in accordance with the Property PTP Specification and ensure that its operation meets the level of Phosphorus Mitigation and



Nitrogen Mitigation indicated in the Nutrient Assessment Report unless otherwise agreed in writing with the Council

2. Subject to paragraph 8 of this Part 2 Schedule 1, not to do anything which may cause or permit the Property PTP to function less effectively or cease functioning
3. Procure and maintain servicing to the Property PTP (at least once every twelve months or such other period as specified by the approved Maintenance and Monitoring Report) by an Service Engineer to ensure that its operation meets the level of Phosphorus Mitigation and Nitrogen Mitigation indicated in the Nutrient Assessment Report unless otherwise agreed in writing with the Council
4. Keep up-to-date records of all maintenance and monitoring undertaken to the Property PTP by the Owner and Service Engineer in accordance with the Property PTP Specification and submit any information required to be submitted to the Council in terms of on-going monitoring of the performance of the Property PTP as set out in the approved Maintenance and Monitoring Report to the Council together with any other records which may reasonably be required by the Council on an annual basis unless otherwise agreed in writing by the Council
5. Provide any other information reasonably required by the Council on request which relates to the installation, operation, management and maintenance of the Property PTP
6. If the Owner becomes aware that the Property PTP is failing to meet the level of Phosphorus Mitigation and/or Nitrogen Mitigation indicated in the Nutrient Assessment Report, the Owner shall remedy the said failure within 30 Working Days of becoming aware of such failure
7. Renew or replace the Property PTP at the end of its operational life with an alternative package treatment plan in accordance with paragraph 8 of this Part 2 Schedule 1
8. To retain the Property PTP as installed and not to replace the Property PTP with another package treatment plant or any other form of Phosphorus Mitigation or Nitrogen Mitigation unless
  - i. the Owner has submitted a plan for another package treatment plant or any other form of Phosphorus Mitigation or Nitrogen Mitigation Replacement Plan ("**Replacement Plan**") to the Council which demonstrates that any such Replacement Plan and/or its implementation shall provide at least the same amount of Phosphorus Mitigation and Nitrogen Mitigation indicated in the Nutrient Assessment Report at the Site at the date of Council's approval of the Replacement Plan; and

- ii. the Council has approved in writing the plan for the Replacement Plan submitted by the Owner;
- 9. Where a plan for a Replacement Plan is approved in writing by the Council, reference in this Schedule to the Property PTP shall where appropriate if the Replacement Plan provides for another package treatment plan be read as reference to the Replacement Plan or, where more than one plan for a Replacement Plan is approved in writing by the Council, reference in this Schedule to the Property PTP shall be read as reference to the latest Replacement Plan as approved by the Council.

## **Schedule 2**

### **Council Covenants**

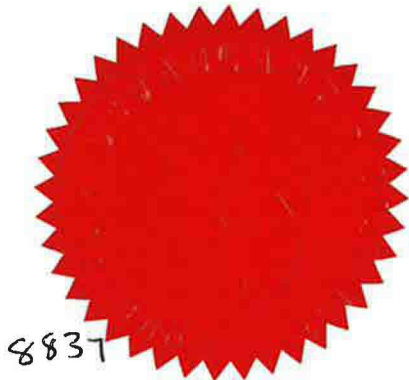
The Council Covenants with the Owner as follows:

1. Unless stated otherwise, where the approval, satisfaction, agreement, confirmation or consent of the Council or any officer of the Council is required for any purpose under or in connection with the terms of this Deed such approval, satisfaction, agreement, confirmation or consent shall not be unreasonably withheld or delayed
2. The Council shall confirm to the Owner in writing whether or not a Maintenance and Monitoring Report submitted to the Council for approval under paragraph 6 of Part 1 of Schedule 1 is approved by the Council within 30 Working Days of receipt of such a proposed Maintenance and Monitoring Report and in the event the Council considers that a submitted Maintenance and Monitoring Report is not satisfactory the Council shall provide the Owner with written reasons for not considering a submitted Maintenance and Monitoring Report to be satisfactory. The Owner is then permitted to submit a revised Maintenance and Monitoring Report and the Council will confirm if it is satisfactory within 30 Working Days of receipt of the revised Maintenance and Monitoring Report
3. Following receipt of a Replacement Plan from the Owner pursuant to Paragraph 8 of Schedule 1 Part 2 of this Schedule the Council shall confirm to the Owner in writing whether or not the Replacement Plan is approved within 30 Working Days receiving the Replacement Plan from the Owner and in the event the Council does not approve the Replacement Plan the Council shall provide the Owner with written reasons for not approving the Replacement Plan. The Owner is then permitted to submit a revised Replacement Plan and the Council will confirm if it approved within 30 Working Days of receipt of the revised Replacement Plan

IN WITNESS whereof the parties hereto have executed this document as a Deed on the day and year first before written.

THE COMMON SEAL OF  
**Broadland District Council**  
was affixed hereto in the presence of: )  
)  
)

Authorised Signatory:



and this deed has been duly and properly executed  
in accordance with the constitution of Broadland District Council

Executed and sealed by



1 OLD POST OFFICE STREET  
FAKENHAM.....  
NORFOLK.....  
NR21 9BL.....

## **APPENDIX 1**

### **Plan**

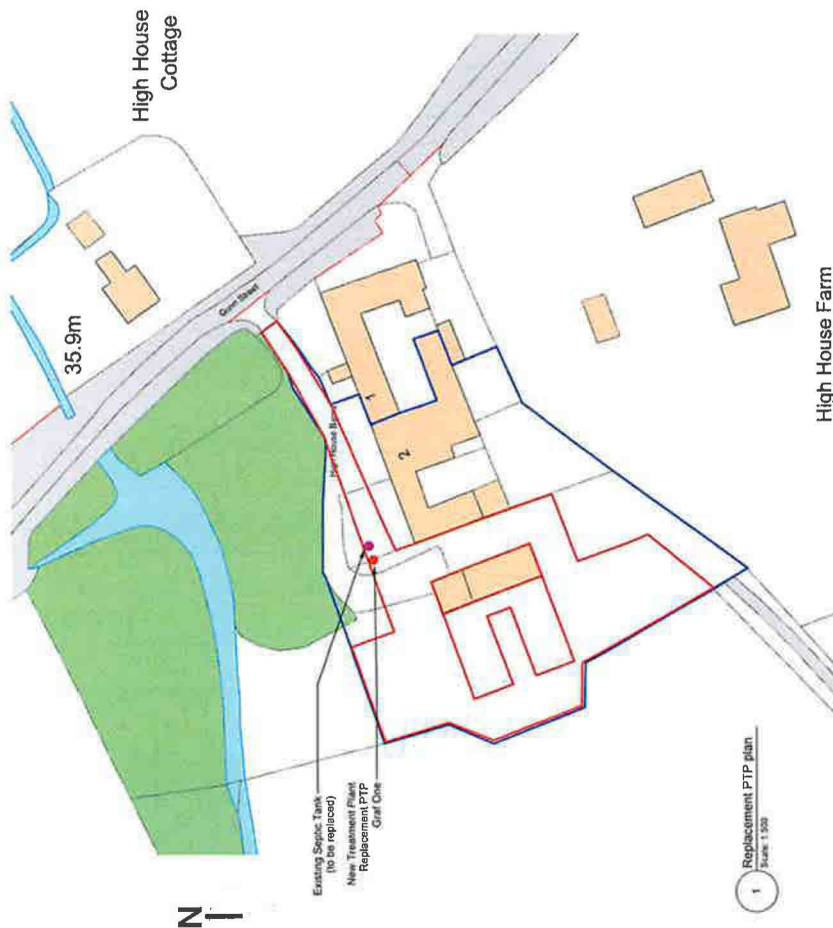
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Any construction work carried out prior to receiving all necessary approvals is a breach of the contract.

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DATE: 01/10/2021



High House Farm  
Licence number 100022432

DATE: 01/10/2021

**Clayland architects**

The Clayland Group  
1, The Clayland Group  
1, The Clayland Group

CONTRACT  
The Clayland Group

The Clayland Group  
Gum Street  
Foulsham  
Norfolk  
NR20 5RN

REVISIONS  
Replacement PTP Plan

SCALE: 1:500  
DATE: 01/10/2021  
DRAWING NUMBER: A1 09  
JOB NUMBER: 2207  
CLIENT: Foulsham

8837

**APPENDIX 2**  
**Nutrient Assessment Report**



**Structural Civil Building  
Engineers**

## **Nutrient Neutrality Assessment and Mitigation Strategy**



|                        |                                                                      |
|------------------------|----------------------------------------------------------------------|
| <b>Project Ref:</b>    | <b>218943</b>                                                        |
| <b>Document Ref:</b>   | <b>218943-XX-XX-RP-C-00001</b>                                       |
| <b>Site:</b>           | <b>The Cattle Shed, Gunn Street, Foulsham,<br/>Norfolk, NR20 5RN</b> |
| <b>Client:</b>         | <b>[REDACTED]</b>                                                    |
| <b>Prepared By:</b>    | <b>Matthew Herring MEng CEng MICE</b>                                |
| <b>Date of Report:</b> | <b>14<sup>th</sup> February 2025</b>                                 |
| <b>Revision:</b>       | <b>P04</b>                                                           |
| <b>Status Code:</b>    | <b>S3</b>                                                            |



## Document Issue Record

The table below provides a record of document issue and revision history:

| Revisions |             |             |            |             |          |
|-----------|-------------|-------------|------------|-------------|----------|
| Rev       | Description | Prepared By | Checked By | Approved By | Date     |
| P1        | Approval    | MH          | MR         | MR          | 09.06.23 |
| P2        | Approval    | MH          | MR         | MR          | 04.12.23 |
| P3        | Approval    | MH          | JL         | MR          | 27.02.24 |
| P4        | Approval    | MH          | JL         | MR          | 14.02.25 |

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## 1 INTRODUCTION

Canham Consulting Ltd have been commissioned by Ian Brown to produce a Nutrient Neutrality Assessment and Mitigation Strategy in support of the development of The Cattle Shed in Foulsham, Norfolk. This redevelopment covering the change of use from an agricultural building to two dwellings is subject to change of use application ref 2022/1014 with Broadland District Council. A plan of the development can be found in Appendix A.

The site location can be seen in Figure 1 below.

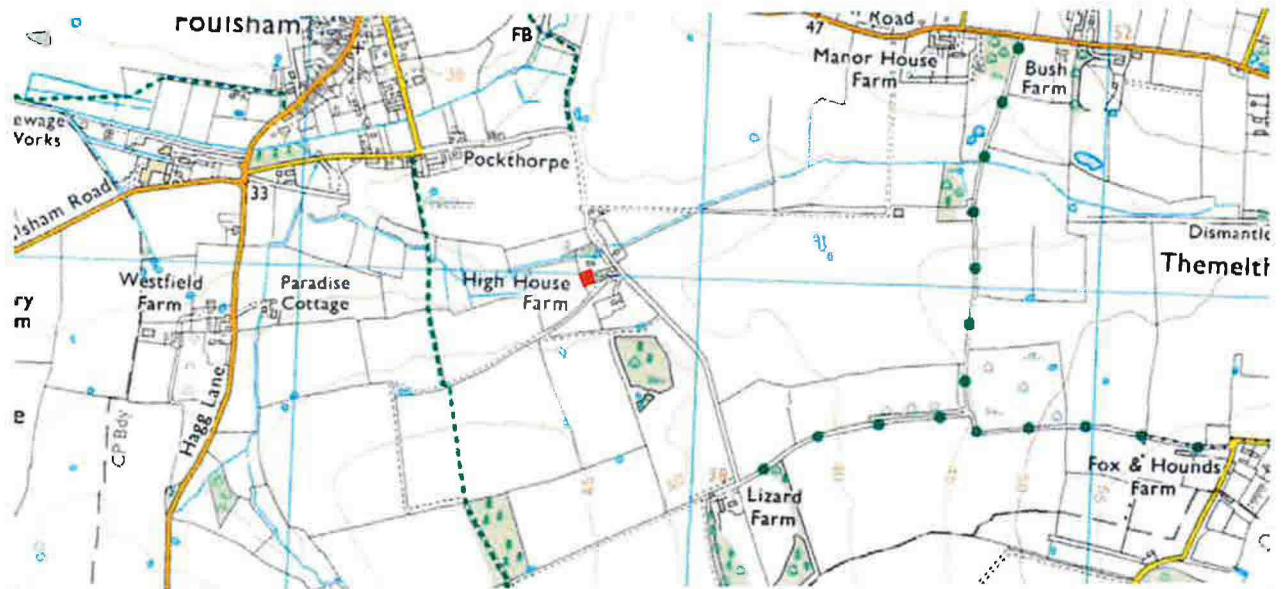


Figure 1 – The Cattle Shed Location

The site is in the catchment of The River Wensum and based on the purpose as two family homes with overnight accommodation, is therefore subject to nutrient neutrality requirements relating to phosphorus and nitrogen.

The site area consists of a total area of 610m<sup>2</sup>, inclusive of the barn footprint of 339m<sup>2</sup>. The two newly developed plots cover areas of 154m<sup>2</sup> and 150m<sup>2</sup> for Plot 1 and 2 respectively. The remaining site area is taken up by gardens and hardstanding totalling 306m<sup>2</sup> with the areas being classified appropriately for the given uses in the current and proposed scenarios for the Nutrient Neutrality calculations.

## **2 NUTRIENT NEUTRALITY CALCULATION**

Based on the Cranfield University Soilscape webtool as recommended by the Norfolk Calculator, the soils at site are classified as loamy and sandy soils with naturally high groundwater (Soilscape 23). The annual rainfall for this site was sourced from the Norfolk Calculator at 675-700 mm/yr.

The existing and proposed site layouts and planning statement are included in Appendix A. This shows the areas, and the established land uses which we have used within the calculator.

A Nutrient calculation was undertaken via the Norfolk Calculator; this was introduced in September 2022. The results of the calculator are included in Appendix B but the key aspects are as outlined in the Sections below.

### **2.1 Existing Scenario**

The proposed development consists of a single barn conversion. The Calculator suggests we base our assessment on a water usage of 110 litres/person/day which is reliant on the developer ensuring that water saving devices are installed as such however, we have used 120 litres/person/day which is the accepted default in the Natural England calculator which has been confirmed as appropriate from a legal standpoint.

There is no current sewage treatment plant on site, and the intention is to form a system involving a Graf One2Clean sewage treatment plant which discharges to the adjacent ditch which then flows to the River Wensum post treatment of the Nitrogen and Phosphorus concentrations.

Based on the existing land use being a combination of industrial and mixed, the nutrient export loads from wastewater can be confirmed as follows (see Appendix B for calculation):

- Total Phosphorus (TP) - 0.04kg/year
- Total Nitrogen (TN) - 0.75kg/year

### **2.2 Proposed Scenario**

The proposed site will feature the Medium Density Residential area covering the 610m<sup>2</sup> footprint. Based on the assumption of Medium Density Residential land, we have established a calculation as below.

These figures were inputted into Stage 3 of the Norfolk Calculator and resulted in the Stage 4 outputs as follows below. In each instance, the rates for the current scenario are the same as post 2030 due to the use of the sewage treatment plants.



| Detail                                       | Current    |            |
|----------------------------------------------|------------|------------|
|                                              | TP (kg/yr) | TN (kg/yr) |
| TP/TN Loading from additional population     | 0.26       | 1.30       |
| TP/TN load from land use change              | -0.02      | -0.38      |
| TP/TN budget for site                        | 0.24       | 0.92       |
| Total TP/TN Budget for site (inc 20% buffer) | 0.29       | 1.10       |

Table 1: Stage 4 Norfolk Calculator Outputs

Based on the output from the Norfolk Calculator as evidenced in Appendix B, there is a need for some form of mitigation; covering both phosphorus and nitrogen with 0.29kg/year and 1.10kg/year needing mitigation respectively.

In the next Section, we will explore how to address the Phosphorus and Nitrogen Mitigation.

### 3 PHOSPHORUS AND NITROGEN MITIGATION

The proposed mitigation strategy is to upgrade an existing septic tank to a Graf One2Clean sewage treatment plant which functions as a biological tank and does not need chemical dosing and therefore has a lesser maintenance obligation than some alternative sewage treatment plants on the market. The septic tank is at the adjacent farmhouse which is in the same River Wensum catchment at 2 High House Barns, Gunn Street, Foulsham, NR20 5RN.

This system will result in treatment of the following amounts of nitrogen and phosphorus (the Graf One2Clean performance certificate is included in Appendix C):

- Phosphorus Discharge Level - 1.6mg/l
- Nitrogen Discharge Level – 7.9mg/l

The developer will upgrade the adjacent farmhouse septic tank at 2 High House Barns which sits upstream in the River Wensum catchment (see Figure 2 below showing The Cattle Shed as red point and adjacent farmhouse as yellow point).

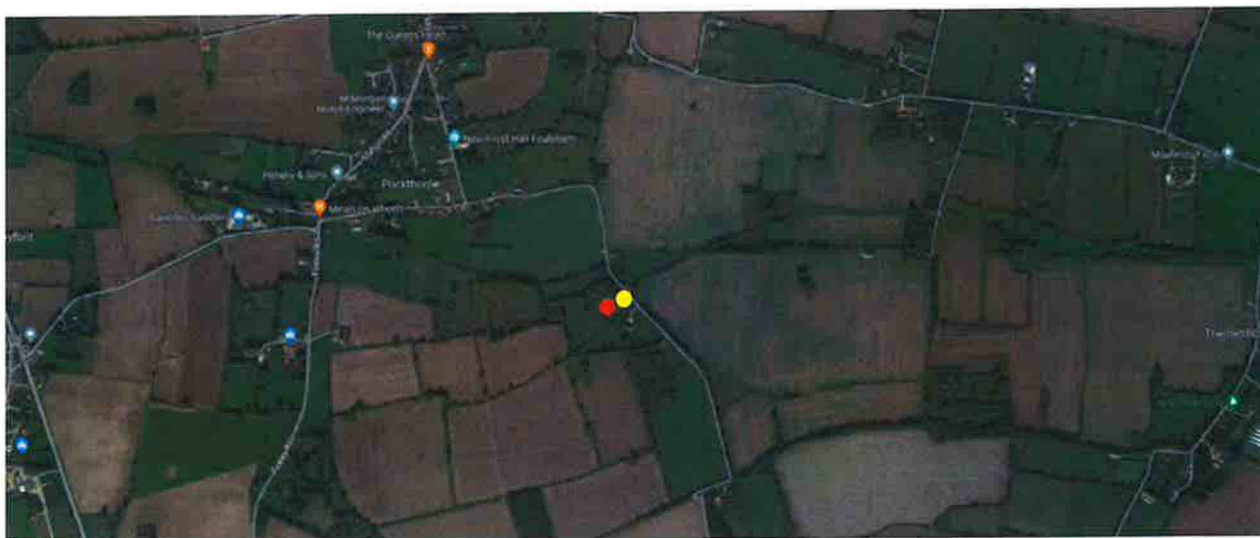


Figure 2 – The Cattle Shed position relative to septic tank swap

Upgrading of a septic tank to a higher specification system with the ability to establish nutrient removal is an acceptable mitigation strategy as agreed previously between Nutrient Neutral, Natural England and Wiltshire LPA (January 2022) for Planning Application number 20/06557/OUT.

Installation of the Graf One2Clean in place of the septic tank will clearly benefit both phosphorus and nitrogen discharges. The magnitude of saving has been established as shown in Table 2 below. Discharge concentrations from the septic tank are based on the default concentrations provided within the Natural England generic calculator guidance document and the Graf One2Clean concentration is from the test certificate included as Appendix C.

| Item                  | Phosphorus Load (kg/yr)      | Nitrogen Load (kg/yr)      |
|-----------------------|------------------------------|----------------------------|
| Septic Tank           | 1.26                         | 10.47                      |
| Graf One2Clean        | 0.17                         | 0.86                       |
| Saving Due to Upgrade | Phosphorus Reduction (kg/yr) | Nitrogen Reduction (kg/yr) |
|                       | 1.09                         | 9.61                       |

Table 2: Nutrient Savings Due to Upgrade

The wastewater upgrade outlined in Table 2 is based on a load of 132.2 litres/person/day assuming that none of the existing property infrastructure upstream of the plant will be modified. The calculation is included in Appendix D to back up the numbers in Table 2. This gives rise to the following values for Total Phosphorus and Nitrogen.

| Item                              | Total Phosphorus (kg/year) | Total Nitrogen (kg/year) |
|-----------------------------------|----------------------------|--------------------------|
| Total Budget (Table 1)            | 0.29                       | 1.10                     |
| Total Mitigation/Saving (Table 2) | 1.09                       | 9.61                     |
| Net Total                         | -0.80                      | -8.51                    |

Table 3: Net Totals per Year

The ultimate result of comparing the calculated figures from Tables 1 and 2 shows that the Total Phosphorus and Total Nitrogen would both be well below zero as a result of this mitigation and therefore in line with the Nutrient Neutrality requirements, delivering more credit than required to achieve neutrality overall; potentially enabling the developer to benefit on other developments to which 2 High House Barns and septic tank/sewage treatment system swap sits in the same catchment.

## **4 SEWAGE TREATMENT PLANT MAINTENANCE/MANAGEMENT**

The aspects outlined below will be applicable to the Graf One2Clean plant at 2 High House Barns and The Cattle Shed.

### **4.1 Graf One2Clean System Installations**

On installation the new package treatment system will comply with current British Standards (BS EN 12566 for small sewage treatment plants) and shall be installed in compliance with current building regulations (Building Regulations Part H2: wastewater treatment systems and cesspools) and any manufacturer guidelines.

### **4.2 System Maintenance**

The treatment systems will be managed in accordance with the Environment Agency requirements and will be undertaken by each individual landowner, by way of third-party agreements with a specialist.

The treatment plants will be desludged every two years, in line with manufacturer guidelines unless more frequent desludging is needed; this process will be undertaken by an appropriately registered waste carrier.

At the time of desludging, the package treatments will be subject to an inspection of the condition to ensure they are functioning appropriately in line with manufacturer recommendations. The inspections will be carried out by a competent person, ideally an individual or company registered on the British Water's list of accredited service engineers.

### **4.3 Transfer of Ownership**

If the properties are sold, the new operator (the owner or person responsible for the sewage treatment plant) will be informed in writing that a sewage discharge is in place and is related to a phosphorus mitigation strategy as part of Nutrient Neutrality requirements. The following details will be transferred:

- Description and location of the treatment plant, drainage system and sampling point.
- Details of any testing and maintenance undertaken.
- Details of maintenance requirements.
- Any records of correspondence relating to the system.



## **5 SUMMARY**

The proposed development of The Cattle Shed, Foulsham will be able to demonstrate Nutrient Neutrality through installation of a Graf One2Clean sewage treatment plant at the adjacent farmhouse at 2 High House Barns, Foulsham. The plant will be in place of their current septic tank and will therefore enable greater nutrient capture.

Both installations will be in the same River Wensum catchment.

It is worth noting that the occupancy of The Cattle Shed will only be allowed once the performance of the treatment plants have been established in line with the required limits; thereby demonstrating nutrient neutrality.

## **Appendix A**

### **Proposed Development Plans**

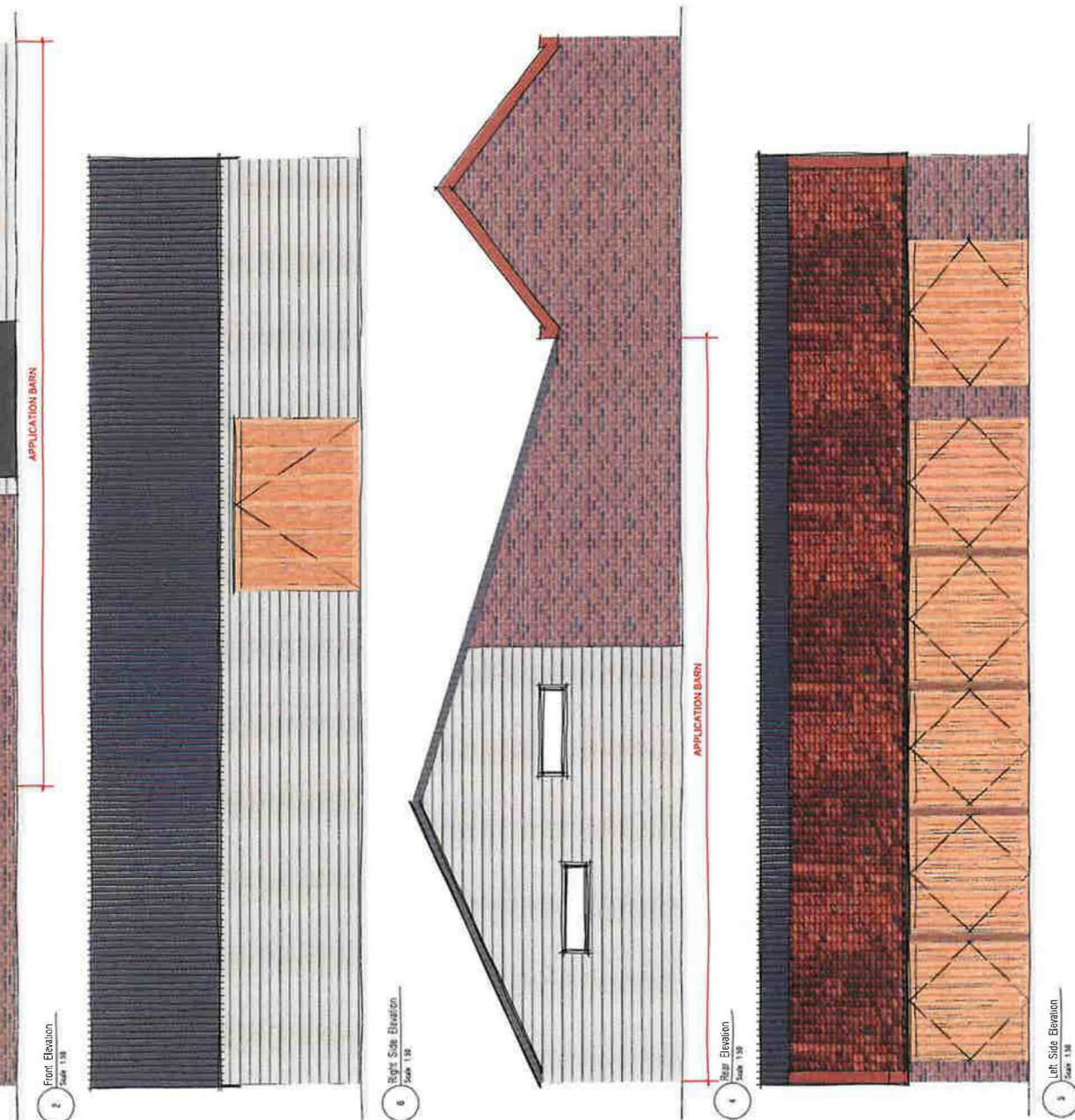
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| LOCATION | BROWN BARBERSHOP, 1000 W. 10TH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |       |    |    |   |
| REMARKS  | 22207<br>22202<br>22201<br>22200<br>22199<br>22198<br>22197<br>22196<br>22195<br>22194<br>22193<br>22192<br>22191<br>22190<br>22189<br>22188<br>22187<br>22186<br>22185<br>22184<br>22183<br>22182<br>22181<br>22180<br>22179<br>22178<br>22177<br>22176<br>22175<br>22174<br>22173<br>22172<br>22171<br>22170<br>22169<br>22168<br>22167<br>22166<br>22165<br>22164<br>22163<br>22162<br>22161<br>22160<br>22159<br>22158<br>22157<br>22156<br>22155<br>22154<br>22153<br>22152<br>22151<br>22150<br>22149<br>22148<br>22147<br>22146<br>22145<br>22144<br>22143<br>22142<br>22141<br>22140<br>22139<br>22138<br>22137<br>22136<br>22135<br>22134<br>22133<br>22132<br>22131<br>22130<br>22129<br>22128<br>22127<br>22126<br>22125<br>22124<br>22123<br>22122<br>22121<br>22120<br>22119<br>22118<br>22117<br>22116<br>22115<br>22114<br>22113<br>22112<br>22111<br>22110<br>22109<br>22108<br>22107<br>22106<br>22105<br>22104<br>22103<br>22102<br>22101<br>22100<br>22099<br>22098<br>22097<br>22096<br>22095<br>22094<br>22093<br>22092<br>22091<br>22090<br>22089<br>22088<br>22087<br>22086<br>22085<br>22084<br>22083<br>22082<br>22081<br>22080<br>22079<br>22078<br>22077<br>22076<br>22075<br>22074<br>22073<br>22072<br>22071<br>22070<br>22069<br>22068<br>22067<br>22066<br>22065<br>22064<br>22063<br>22062<br>22061<br>22060<br>22059<br>22058<br>22057<br>22056<br>22055<br>22054<br>22053<br>22052<br>22051<br>22050<br>22049<br>22048<br>22047<br>22046<br>22045<br>22044<br>22043<br>22042<br>22041<br>22040<br>22039<br>22038<br>22037<br>22036<br>22035<br>22034<br>22033<br>22032<br>22031<br>22030<br>22029<br>22028<br>22027<br>22026<br>22025<br>22024<br>22023<br>22022<br>22021<br>22020<br>22019<br>22018<br>22017<br>22016<br>22015<br>22014<br>22013<br>22012<br>22011<br>22010<br>22009<br>22008<br>22007<br>22006<br>22005<br>22004<br>22003<br>22002<br>22001<br>22000<br>21999<br>21998<br>21997<br>21996<br>21995<br>21994<br>21993<br>21992<br>21991<br>21990<br>21989<br>21988<br>21987<br>21986<br>21985<br>21984<br>21983<br>21982<br>21981<br>21980<br>21979<br>21978<br>21977<br>21976<br>21975<br>21974<br>21973<br>21972<br>21971<br>21970<br>21969<br>21968<br>21967<br>21966<br>21965<br>21964<br>21963<br>21962<br>21961<br>21960<br>21959<br>21958<br>21957<br>21956<br>21955<br>21954<br>21953<br>21952<br>21951<br>21950<br>21949<br>21948<br>21947<br>21946<br>21945<br>21944<br>21943<br>21942<br>21941<br>21940<br>21939<br>21938<br>21937<br>21936<br>21935<br>21934<br>21933<br>21932<br>21931<br>21930<br>21929<br>21928<br>21927<br>21926<br>21925<br>21924<br>21923<br>21922<br>21921<br>21920<br>21919<br>21918<br>21917<br>21916<br>21915<br>21914<br>21913<br>21912<br>21911<br>21910<br>21909<br>21908<br>21907<br>21906<br>21905<br>21904<br>21903<br>21902<br>21901<br>21900<br>21899<br>21898<br>21897<br>21896<br>21895<br>21894<br>21893<br>21892<br>21891<br>21890<br>21889<br>21888<br>21887<br>21886<br>21885<br>21884<br>21883<br>21882<br>21881<br>21880<br>21879<br>21878<br>21877<br>21876<br>21875<br>21874<br>21873<br>21872<br>21871<br>21870<br>21869<br>21868<br>21867<br>21866<br>21865<br>21864<br>21863<br>21862<br>21861<br>21860<br>21859<br>21858<br>21857<br>21856<br>21855<br>21854<br>21853<br>21852<br>21851<br>21850<br>21849<br>21848<br>21847<br>21846<br>21845<br>21844<br>21843<br>21842<br>21841<br>21840<br>21839<br>21838<br>21837<br>21836<br>21835<br>21834<br>21833<br>21832<br>21831<br>21830<br>21829<br>21828<br>21827<br>21826<br>21825<br>21824<br>21823<br>21822<br>21821<br>21820<br>21819<br>21818<br>21817<br>21816<br>21815<br>21814<br>21813<br>2181 |     |       |    |    |   |

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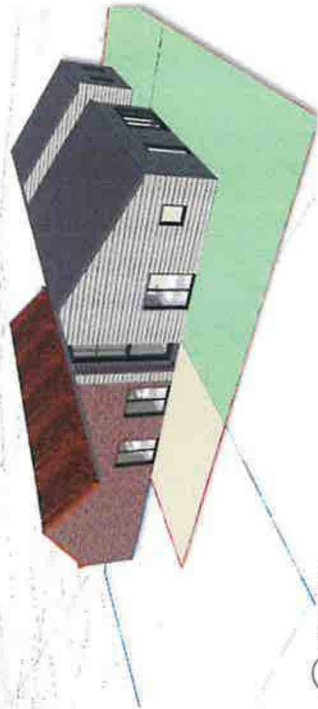
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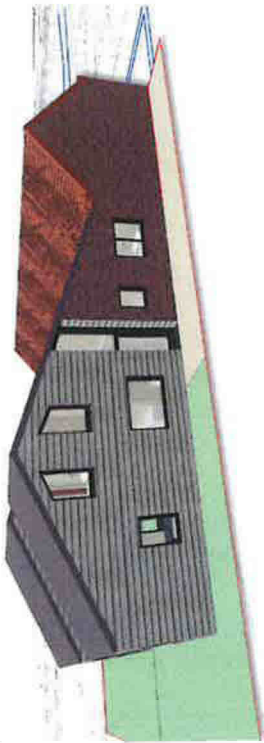
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2 3D Perspective  
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3 3D Perspective  
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| 12 | 10/12/2018 | Finalised plans submitted | 10/12/2018 |
| 11 | 10/12/2018 | Finalised plans submitted | 10/12/2018 |
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# PLANNING

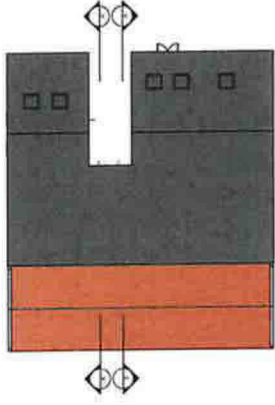
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The Quay Shed  
Gunn Street  
Foulsham  
Norfolk  
NR23 5RN  
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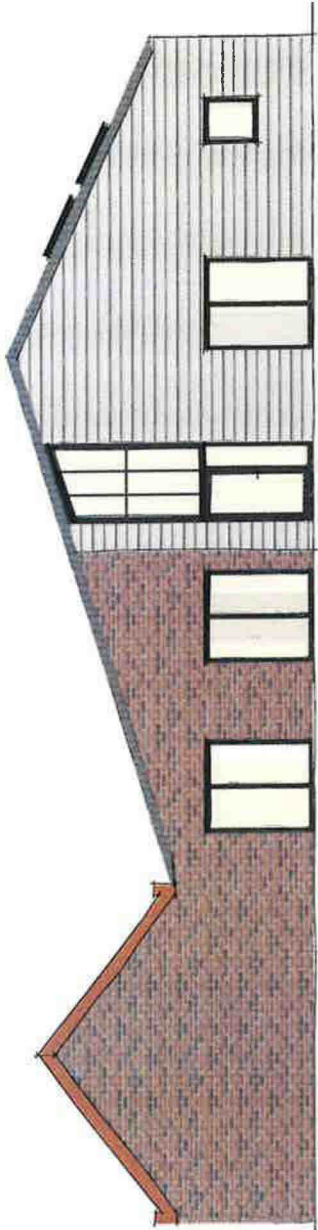
7 Roof Plan  
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5 Section A-A - Courtyard Elevation  
Scale 1:100



6 Section B-B - Courtyard Elevation  
Scale 1:100



1 Front Elevation  
Scale 1:50



2 Right Side Elevation  
Scale 1:50



3 Rear Elevation  
Scale 1:50



4 Left Side Elevation  
Scale 1:50

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| 1   | 20/03/2023 | Initial Design |
| 2   | 20/03/2023 | Final Design   |

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| 1   | 20/03/2023 | Initial Design |
| 2   | 20/03/2023 | Final Design   |

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## **Appendix B**

### **Norfolk Calculator Outputs**

**Stage 1** Calculate nutrient load (kg/year) derived from the development as a result of increased population

Note: This calculation should only include the additional units resulting from the proposed development, including any development that will result in overnight accommodation. For land not currently in residential use, this will be the total units proposed by the development. However, for land already in residential use, this should only be the increase in units.

The user should input the relevant number of dwellings into options a, b or c below. In the case of residential developments, only option a is required.

| 1. | Calculate the additional population                                                          | Value | Unit             |
|----|----------------------------------------------------------------------------------------------|-------|------------------|
| a  | Number of dwellings proposed                                                                 | 2     | dwellings        |
|    | Average occupancy                                                                            | 1.88  | persons/dwelling |
| b  | Number of additional rooms above 6 residents (e.g. geners) for houses in multiple occupation | 0     | dwellings        |
|    | Average occupancy                                                                            | 1.65  | persons/dwelling |
| c  | Number of rooms in a hotel or guest house proposed                                           | 0     | dwellings        |
|    | Average occupancy                                                                            | 1.65  | persons/dwelling |
|    | Number of weeks open per year (1-52)                                                         |       | Weeks            |
|    | Average occupancy rate (1-100)                                                               |       | %                |
| d  | Number of bedspaces in student accommodation                                                 | 0     | dwellings        |
|    | Average occupancy                                                                            | 1     | persons/dwelling |
|    | Number of weeks open per year (1-52)                                                         |       | Weeks            |
|    | Average occupancy rate (1-100)                                                               |       | %                |
|    | <b>Total population increase generated by the development</b>                                | 4     | Persons          |

|    |                                                       |     |                   |
|----|-------------------------------------------------------|-----|-------------------|
| 2. | Wastewater volume generated                           | 120 | Litres/person/day |
|    | Water use per person                                  | 450 | Litre/day         |
|    | <b>Wastewater volume generated by the development</b> |     |                   |

Please select how the sewage from the proposed development will be handled, noting that a development must be handled by either a water recycling centre or on-site treatment plants, and cannot be handled by both. Consideration of wastewater loading is not required where a site drains to a WRC that does not drain in to the River Wensum or the Broads catchments

Is sewage to be handled by water recycling centre? No

TP budget that would exit the Water Recycling Centre (WRC) after treatment

Note: If the sewage is to be treated by WRCs then the user should select "Yes" in the list above. If package treatment plants are to be used instead, then the user should select "No" above.

This is the process of collecting wastewater from houses and guiding it, via the sewage network, to a WRC (also known as sewage works). The nutrient concentration of the influent is calculated by multiplying the number of people by the expected water usage per day. The nutrient concentration within the effluent is calculated by applying the discharge level of the appropriate WRC. The nutrient loading is expressed in kg/year.

| Confirm receiving WRC and discharge level      | Value                              | Unit |
|------------------------------------------------|------------------------------------|------|
| Select the WRC the development will connect to | Whittingham Water Recycling Centre |      |
| Phosphorus WRC discharge level                 | 0.90                               | mg/l |
| Nitrogen WRC discharge level                   | 25.00                              | mg/l |

Note: Please use the drop down list to select the WRC that the proposed development will be connected to. If the WRC is not known, then please select 'Unknown' from the drop down list.

The 2030 permit limits are included for guidance purposes only and cannot be relied upon until the Levelling Up and Regeneration Bill is passed into legislation.

| Calculate the nutrient load discharged by the WRC | Value | Unit    |
|---------------------------------------------------|-------|---------|
| TP discharged by WRC                              | 0.00  | kg/year |
| TN discharged by WRC                              | 0.00  | kg/year |

Is sewage to be handled by on-site treatment plants? Yes

TP budget for On-site treatment plants

Note: If the sewage is to be treated by on-site treatment plants then the user should select "Yes" in the list above. If wastewater treatment works are to be used instead, then the user should select "No" above.

On-site treatment plants are pre-manufactured treatment facilities used to treat wastewater in smaller communities or on individual properties. This concept is defined as decentralised wastewater treatment. The nutrient loading is calculated by multiplying the number of people by the expected loading per person. The nutrient loading is calculated by applying the reduction efficiency. The nutrient loading is expressed in kg/year.

| Calculate nutrient load after treatment    | Value                                                      | Unit |
|--------------------------------------------|------------------------------------------------------------|------|
| Select the type of On-site treatment works | Package treatment plant (user-defined)                     |      |
| Phosphorus discharge level                 | Please enter effluent concentration in cell to right: 1.60 | mg/l |
| Nitrogen discharge level                   | Please enter effluent concentration in cell to right: 7.90 | mg/l |

Note: The user must input the reduction efficiency of the PTP. The efficiency of the PTP used must be evidenced. The evidence should include the test result documents from the lab (in English) and/or measured effluent concentrations from real world applications. If the efficiency is unknown then a precautionary default value can be used

| Calculate loading from wastewater with on-site treatment plants | Value | Unit    |
|-----------------------------------------------------------------|-------|---------|
| TP discharged by on-site treatment plant                        | 0.26  | kg/year |
| TN discharged by on-site treatment plant                        | 1.30  | kg/year |

4. Additional population load

| Value                              | Unit |
|------------------------------------|------|
| Current                            | 0.26 |
| Post 2030                          | 0.26 |
| TP load from additional population | 1.30 |
| TN load from additional population | 1.30 |

## Stage 2 Calculate existing (pre-development) nutrient load from current land use of the development

Note: Where development sites include existing areas that are to be retained, these areas can be excluded from the calculations in both Stages 2 and 3.

1. Identify current land uses of the development site Value Unit

The user should select the value from the following drop-down list that applies to the development. Use the links below or navigate to the 'Introduction' tab to find instructions on how this information can be acquired.

Select the Catchment

Select the soil drainage type

Select annual average rainfall band

Within Nitrate Vulnerable Zone (NVZ)

Wensum  
Impermeable -  
drained for arable  
675-700  
No

mm/yr

[Note: Use the Link in the introduction tab to find the appropriate catchment](#)

[Note: Use the criteria table in the introduction tab to identify if the soil type](#)

[Note: Rainfall can be identified using the map on the Rainfall tab](#)

[Note: Use the Link in the introduction tab to find out whether the development is in a Nitrate Vulnerable Zone \(NVZ\)](#)

2. Input the area of the existing land use type(s)

TP loading TN loading

High density residential

Medium density residential

Low density residential

Commercial / Industrial

Urban open space

Dairy

Lowland grazing

Mixed

Poultry

Pigs

Horticulture

Cereals

General arable

Allotments and city farms

Woodland (e.g. conifer, mixed, broad-leaved)

Greenspace

Shrub / heathland / bracken / bog

Water

Hectares

Hectares

Hectares

Hectares

Hectares

Hectares

Hectares

Hectares

Hectares

Hectares

Hectares

Hectares

Hectares

Hectares

Hectares

Hectares

Hectares

Hectares

Hectares

Sum total

0.061

Hectares

0.04

0.75

Kg/yr

3. Calculate loading from current land usage

Value

Unit

TP load from proposed land usage

0.04

Kg/yr

TN load from proposed land usage

0.75

Kg/yr

**Stage 3****Calculate nutrient load for the proposed development**

*Note: This section should include all land uses within the proposed development. Where the proposed scheme is to create new wetlands, woodlands, nature reserves, etc. within the development site area, then this should be included within this section. Any offsite mitigation should not be included below, and should instead be inputted in the mitigation stages (if mitigation is required).*

| 1. | Identify proposed land uses of the development site | Value | Unit     |
|----|-----------------------------------------------------|-------|----------|
|    | High intensity urban land                           | 0.061 | Hectares |
|    | Medium intensity urban land                         |       | Hectares |
|    | Low intensity urban land                            |       | Hectares |
|    | Commercial / Industrial                             |       | Hectares |
|    | Open urban space                                    |       | Hectares |
|    | Allotments and city farms                           |       | Hectares |
|    | Woodland (e.g. conifer, mixed, broad-leaved)        |       | Hectares |
|    | Green space                                         |       | Hectares |
|    | Shrub / heathland / bracken / bog                   |       | Hectares |
|    | Water                                               |       | Hectares |

|    |                          |  |            |
|----|--------------------------|--|------------|
| 2. | Designed Wetlands / SuDS |  |            |
|    | Wetland / SuDS area      |  | Hectares   |
|    | TP Banking coefficient   |  | kg/ha/year |
|    | TN Banking coefficient   |  | kg/ha/year |

*Note: Please input the banking coefficient (i.e. the nutrient removal amount in kg/ha/yr) calculated for the designed wetland / SuDS. The calculated value should be justifiable with supporting evidence.*

|                               |              |                 |
|-------------------------------|--------------|-----------------|
| <b>Sum total of land uses</b> | <b>0.061</b> | <b>Hectares</b> |
|-------------------------------|--------------|-----------------|

*Note: The sum total of land uses must equal the development site area inputted in Stage 2 - the box will colour red if the areas do not match. Wetland refers to specific wetland related to a watercourse. For more information, please refer to the land use definitions in the help tab.*

| 3. | Calculate loading from proposed land usage | Value | Unit    |
|----|--------------------------------------------|-------|---------|
|    | TP load from proposed land usage           | 0.02  | kg/year |
|    | TN load from proposed land usage           | 0.36  | kg/year |

| Stage 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         |           |         |                               |                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------|---------|-------------------------------|----------------------------------------|
| Calculate the net change in nutrient load from the proposed development                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         |           |         |                               |                                        |
| Note: This stage calculates the net change in TP and TN load to the catchment from the proposed development. This is derived by calculating the difference between the load calculated for the proposed development (wastewater, urban area, open space, etc.) and that for the existing land uses. The nutrient budget for the site has been calculated under current and post-2030 WRC permit levels, where applicable. The nutrient budgets under proposed Post 2030 permit limits are for guidance purposes only until the permit limits are put into legislation. |         |           |         |                               |                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Current | Post 2030 | Summary | 2                             |                                        |
| 1. Identify the load from additional population                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Value   | Value     | Unit    | Onsite treatment plant        | Package treatment plant (user-defined) |
| TP Loading from additional population                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.26    | 0.26      | kg/year | Current TP discharge concentr | 1.60                                   |
| TN Loading from additional population                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1.30    | 1.30      | kg/year | Current TN discharge concentr | 7.90                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |           |         | Post 2030 TP discharge conce  | 1.60                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |           |         | Post 2030 TN discharge conce  | 7.90                                   |
| 2. Calculate net change in nutrient load from land use change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Value   | Value     | Unit    | TP current land use           | 0.04                                   |
| TP load from land use change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | -0.02   | -0.02     | kg/year | TP proposed land use          | 0.02                                   |
| TN load from land use change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | -0.38   | -0.38     | kg/year | TN current land use           | 0.75                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |           |         | TN proposed land use          | 0.36                                   |
| 3. Calculate nutrient budget for the development site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Value   | Value     | Unit    |                               |                                        |
| TP budget for the site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.24    | 0.24      | kg/year |                               |                                        |
| TN budget for the site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.92    | 0.92      | kg/year |                               |                                        |
| 4. Calculate precautionary buffer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Value   | Value     | Unit    |                               |                                        |
| Buffer amount                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 20      | 20        | %       |                               |                                        |
| TP Precautionary buffer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.05    | 0.05      | kg/year |                               |                                        |
| TN Precautionary buffer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.18    | 0.18      | kg/year |                               |                                        |
| Note: The figures used throughout this model are based on scientific research, evidence and modelled catchments and represent the best available evidence. However, it is important that a precautionary buffer is used that recognises the uncertainty with these figures and ensures, with reasonable certainty, that there will be no adverse effect on site integrity. As such, a 20% precautionary buffer added to the nutrient budget.                                                                                                                           |         |           |         |                               |                                        |
| 5. Total nutrient budget for the development site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Value   | Value     | Unit    |                               |                                        |
| Total Phosphorus budget for the site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.29    | 0.29      | kg/year |                               |                                        |
| Total Nitrogen budget for the site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1.10    | 1.10      | kg/year |                               |                                        |
| Current TP loading                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |           |         |                               |                                        |
| Development will generate additional Phosphate (Mitigation required) - Please progress to 'Mitigation current' tab                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |           |         |                               |                                        |
| Post 2030 TP loading                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |           |         |                               |                                        |
| Development will generate additional Phosphate (Mitigation required) - Please progress to 'Mitigation - post 2030' tab                                                                                                                                                                                                                                                                                                                                                                                                                                                 |         |           |         |                               |                                        |
| Current TN loading                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |           |         |                               |                                        |
| Development will generate additional Nitrate (Mitigation required) - Please progress to 'Mitigation - current' tab                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |           |         |                               |                                        |
| Post 2030 TN loading                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |           |         |                               |                                        |
| Development will generate additional Nitrate (Mitigation required) - Please progress to 'Mitigation - post 2030' tab                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |           |         |                               |                                        |



## **Appendix C**

### **Graf One2Clean Performance Certificate**





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 <sub>5</sub>     |       | 98.0 %     | 7 mg/l   |
|                                          | SS                   |       | 96.3 %     | 14 mg/l  |
|                                          | NH <sub>4</sub> -N** |       | 98.3 %     | 0.5 mg/l |
|                                          | N <sub>tot</sub> **  |       | 87.0 %     | 7.9 mg/l |
|                                          | P <sub>tot</sub>     |       | 80.2 %     | 1.6 mg/l |
| Electrical consumption                   | 0.63                 | kWh/d |            |          |

\*at a test influent of  $\geq 300$  mg/l BOD<sub>5</sub> (mean)  
\*\*determined for temperatures  $\geq 12^{\circ}\text{C}$  in the bioreactor

Performance tested by:

**PIA – Prüfinstitut für Abwassertechnik GmbH**

(PIA GmbH)

Hergenrather 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 - teste*

Elmar Lancé

November 2014

## **Appendix D**

### **Septic Tank to Graf One2Clean Comparison (using Norfolk Calculator)**

**Stage 1**

**Calculate nutrient load [kg/year] derived from the development as a result of increased population**

Note: This calculation should only include the additional units resulting from the proposed development, including any development that will result in overnight accommodation. For land not currently in residential use, this will be the total unit proposed by the development. However, for land already in residential use, this should only be the increase in units.

The user should input the relevant number of dwellings into options a, b or c below. In the case of residential developments, only option a is required.

|           |                                                                                             |               |                           |
|-----------|---------------------------------------------------------------------------------------------|---------------|---------------------------|
| <b>a</b>  | Calculate the additional population                                                         |               |                           |
| *         | Number of dwellings proposed                                                                | Value<br>1    | Unit<br>dwellings         |
|           | Average occupancy                                                                           | 1.08          | persons/dwelling          |
| <b>b</b>  | Number of additional rooms above 6 residents (not guests) for houses in multiple occupation | Value<br>1.65 | Unit<br>persons/dwelling  |
|           | Average occupancy                                                                           | 1.65          | persons/dwelling          |
| <b>c</b>  | Number of rooms in a hotel or guest house proposed                                          | Value<br>1.85 | Unit<br>persons/dwelling  |
|           | Average occupancy                                                                           | 1.85          | persons/dwelling          |
|           | Number of weeks open per year (1-52)                                                        | Weeks %<br>%  | %                         |
| <b>d</b>  | Number of bedspaces in student accommodation                                                | Value<br>1    | Unit<br>dwellings         |
|           | Average occupancy                                                                           | 1             | persons/dwelling          |
|           | Number of weeks open per year (1-52)                                                        | Weeks %<br>%  | %                         |
|           | Average occupancy rate (1-100)                                                              | Persons<br>2  | Persons                   |
|           | Total population increase generated by the development                                      |               |                           |
| <b>2.</b> | Wastewater volume generated                                                                 | Value<br>132  | Unit<br>litres/person/day |
|           | Water use per person                                                                        | 248           | litres/day                |
|           | Wastewater volume generated by the development                                              |               |                           |

Please select how the sewage from the proposed development will be handled, noting that a development must be handled by either a water recycling centre or on-site treatment plants, and cannot be handled by both. Consideration of wastewater loading is not required where a site drains to a WRC that does not drain in to the River Merisau or the Broad catchments

Is sewage to be handled by water recycling centre?

No

TP budget that would cut the Water Recycling Centre (WRC) after treatment

Note: If the sewage is to be treated by WRCs then the user should select "Yes" in the list above. If package treatment plants are to be used instead, then the user should select "No" above.

This is the process of collecting wastewater from houses and guiding it, via the sewage network, to a WRC (also known as sewage works). The nutrient concentration of the influent is calculated by multiplying the number of people by the expected water usage per day. The nutrient concentration within the effluent is calculated by applying the discharge level if the appropriate WRC. The nutrient loading is expressed in kg/year.

|                                                |                                   |      |
|------------------------------------------------|-----------------------------------|------|
| Confirm receiving WRC and discharge level      | Value                             | Unit |
| Select the WRC the development will connect to | Additional Water Recycling Centre |      |
| Phosphorus WRC discharge level                 | Current discharge<br>1.57         | mg/l |
| Nitrogen WRC discharge level                   | 25.00                             | mg/l |
|                                                | Post 2030 discharge<br>1.57       | mg/l |
|                                                | 25.00                             | mg/l |

Note: Please use the drop down list to select the WRC that the proposed development will be connected to. If the WRC is not known, then please select 'Unknown' from the drop down list.

The 2030 permit limits are included for guidance purposes only and cannot be relied upon until the Leveling Up and Regeneration Bill is passed into legislation.

Calculate the nutrient load discharged by the WRC

|                      |               |                 |
|----------------------|---------------|-----------------|
| TP discharged by WRC | Value<br>0.00 | Unit<br>kg/year |
| TN discharged by WRC | 0.00          | kg/year         |

Additional population load

|                                    |               |                 |
|------------------------------------|---------------|-----------------|
| TP load from additional population | Value<br>0.00 | Unit<br>kg/year |
| TN load from additional population | 0.00          | kg/year         |

**Stage 2**

**Calculate nutrient load [kg/year] derived from the development as a result of increased population**

Note: If the sewage is to be treated by on-site treatment plants then the user should select "Yes" in the list above. If wastewater treatment works are to be used instead, then the user should select "No" above.

On-site treatment plants are pre-manufactured treatment facilities used to treat wastewater in smaller communities or on individual properties. This concept is defined as decentralised wastewater treatment. The nutrient effluent is calculated by multiplying the number of people by the expected loading per person. The nutrient effluent is calculated by applying the reduction efficiency. The nutrient loading is expressed in kg/year.

|                                            |                                   |      |
|--------------------------------------------|-----------------------------------|------|
| Calculate nutrient load after treatment    | Value                             | Unit |
| Select the type of On-site treatment works | Default single-source septic tank |      |
| Phosphorus discharge level                 | 11.60                             | mg/l |
| Nitrogen discharge level                   | 96.90                             | mg/l |

Note: The user must input the reduction efficiency of the PTP. The efficiency of the PTP used must be evidenced. The evidence should include the test result documents from the lab (in English) and/or measured effluent concentrations from real world applications. If the efficiency is unknown then a precautionary default value can be used

Calculate loading from wastewater with on-site treatment plants

|                                          |               |                 |
|------------------------------------------|---------------|-----------------|
| TP discharged by on-site treatment plant | Value<br>1.05 | Unit<br>kg/year |
| TN discharged by on-site treatment plant | 8.72          | kg/year         |

## Stage 4

## Calculate the net change in nutrient load from the proposed development

Note: This stage calculates the net change in TP and TN load to the catchment from the proposed development. This is derived by calculating the difference between the load calculated for the proposed development (wastewater, urban area, open space, etc.) and that for the existing land uses. The nutrient budget for the site has been calculated under current and post-2025 WRC permit levels, where applicable. The nutrient budgets under proposed Post 2030 permit limits are for guidance purposes only until the permit limits are put into legislation.

| 1.                                                                             | Identify the load from additional population                                                                               | Current |         | Post 2030 |         | Summary                       |                                   |
|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------|---------|-----------|---------|-------------------------------|-----------------------------------|
|                                                                                |                                                                                                                            | Value   | Unit    | Value     | Unit    | No. of dwellings              | 1                                 |
| TP Loading from additional population<br>TN Loading from additional population |                                                                                                                            | 1.05    | kg/year | 1.05      | kg/year | Onsite treatment plant        | Default single-source septic tank |
|                                                                                |                                                                                                                            | 8.72    |         | 8.72      |         | Current TP discharge concentr | 11.60                             |
|                                                                                |                                                                                                                            |         |         |           |         | Current TN discharge concentr | 96.30                             |
|                                                                                |                                                                                                                            |         |         |           |         | Post 2030 TP discharge concei | 11.60                             |
| 2.                                                                             | Calculate net change in nutrient load from land use change<br>TP load from land use change<br>TN load from land use change | 0.00    | kg/year | 0.00      | kg/year | Post 2030 TN discharge concei | 96.30                             |
|                                                                                |                                                                                                                            | 0.00    |         | 0.00      |         | TP current land use           | 0.00                              |
|                                                                                |                                                                                                                            |         |         |           |         | TP proposed land use          | 0.00                              |
|                                                                                |                                                                                                                            |         |         |           |         | TN current land use           | 0.00                              |
| 3.                                                                             | Calculate nutrient budget for the development site<br>TP budget for the site<br>TN budget for the site                     | 1.05    | kg/year | 1.05      | kg/year | TN proposed land use          | 0.00                              |
|                                                                                |                                                                                                                            | 8.72    |         | 8.72      |         |                               |                                   |
|                                                                                |                                                                                                                            |         |         |           |         |                               |                                   |
|                                                                                |                                                                                                                            |         |         |           |         |                               |                                   |

4. Calculate precautionary buffer  
Buffer amount  
TP Precautionary buffer  
TN Precautionary buffer

| Value | Unit    |
|-------|---------|
| 20    | %       |
| 0.21  | kg/year |
| 1.74  | kg/year |

Note: The figures used throughout this model are based on scientific research, evidence and modelled catchments and represent the best available evidence. However, it is important that a precautionary buffer is used that recognises the uncertainty with these figures and ensures, with reasonable certainty, that there will be no adverse effect on site integrity. As such, a 20% precautionary buffer added to the nutrient budget.

5. Total nutrient budget for the development site  
Total Phosphorus budget for the site  
Total Nitrogen budget for the site

| Value | Unit    |
|-------|---------|
| 1.26  | Kg/year |
| 10.47 | Kg/year |

## Current TP loading

Development will generate additional Phosphate (Mitigation required) - Please progress to 'Mitigation current' tab

## Post 2030 TP loading

Development will generate additional Phosphate (Mitigation required) - Please progress to 'Mitigation - post 2030' tab

## Current TN loading

Development will generate additional Nitrate (Mitigation required) - Please progress to 'Mitigation - current' tab

## Post 2030 TN loading

Development will generate additional Nitrate (Mitigation required) - Please progress to 'Mitigation - post 2030' tab

Stage 1

Calculate nutrient load (kg/year) derived from the development as a result of increased population

Note: This calculation should only include the additional units resulting from the proposed development, including any development that will result in overnight accommodation, for land not currently in residential use. This will be the total units proposed by the development. However, for land already in residential use, this should only be the increase in units.

The user should input the relevant number of dwellings into options a, b or c below. In the case of residential developments, only option a is required.

1. Calculate the additional population

a. Number of dwellings proposed

Average occupancy

Value

Unit

1

dwellings

persons/dwelling

1.88

b. Number of additional rooms above 6 residents (full guests) for houses in multiple occupation

Average occupancy

Value

Unit

1.65

dwellings

persons/dwelling

c. Number of rooms in a hotel or guest house proposed

Average occupancy

Value

Unit

1.65

dwellings

persons/dwelling

d. Number of bedspaces in student accommodation

Average occupancy

Value

Unit

1

dwellings

persons/dwelling

Total population increase generated by the development

Persons

2

2. Wastewater volume generated

Water use per person

Value

Unit

132

Litres/person/day

Wastewater volume generated by the development

Value

Unit

248

Litres/day

3a. Is sewage to be handled by water recycling centre?

No

3b. TP budget for On-site treatment plants

Yes

Please select how the sewage from the proposed development will be handled, noting that a development must be handled by either a water recycling centre or on-site treatment plants, and cannot be handled by both. Consideration of wastewater loading is not required where a site drains to a WRC that does not drain into the River Wensum or the Broad catchments.

Note: If the sewage is to be treated by WRCs then the user should select "Yes" in the list above. If package treatment plants are to be used instead, then the user should select "No" above.

This is the process of collecting wastewater from houses and guiding it, via the sewage network, to a WRC (also known as sewage works). The nutrient concentrations of the effluent is calculated by multiplying the number of people by the expected water usage per day. The nutrient concentration within the effluent is calculated by applying the discharge level of the appropriate WRC. The nutrient loading is expressed in kg/year.

Confirm receiving WRC and discharge level

Select the WRC the development will connect to

Phosphorus WRC discharge level

Nitrogen WRC discharge level

Note: Please use the drop down list to select the WRC that the proposed development will be connected to. If the WRC is not known, then please select 'Unknown' from the drop down list.

The 2030 permit limits are included for guidance purposes only and cannot be relied upon until the Levelling Up and Regeneration Bill is passed into legislation.

Value

Unit

1.57

mg/l

25.00

mg/l

1.57

mg/l

25.00

mg/l

Calculate the nutrient load discharged by the WRC

TP discharged by WRC

TN discharged by WRC

Value

Unit

0.00

kg/year

0.00

kg/year

0.00

kg/year

0.00

kg/year

4. Additional population load

TP load from additional population

TN load from additional population

Value

Unit

0.14

kg/year

0.72

kg/year

0.14

kg/year

0.72

kg/year

3a. Is sewage to be handled by water recycling centre?

No

3b. TP budget for On-site treatment plants

Yes

Please select how the sewage from the proposed development will be handled, noting that a development must be handled by either a water recycling centre or on-site treatment plants, and cannot be handled by both. Consideration of wastewater loading is not required where a site drains to a WRC that does not drain into the River Wensum or the Broad catchments.

Note: If the sewage is to be treated by on-site treatment plants then the user should select "Yes" in the list above. If wastewater treatment works are to be used instead, then the user should select "No" above.

On-site treatment plants are pre-manufactured treatment facilities used to treat wastewater in smaller communities or on individual properties. This concept is defined as decentralised wastewater treatment. The nutrient loading is calculated by multiplying the number of people by the expected loading per person. The nutrient loading is calculated by applying the reduction efficiency. The nutrient loading is expressed in kg/year.

Calculate nutrient load after treatment

Select the type of On-site treatment works

Phosphorus discharge level

Nitrogen discharge level

Note: The user must input the reduction efficiency of the PTP. The efficiency of the PTP used must be evidenced. The evidence should include the test result documents from the job (in English) and/or measured effluent concentrations from real world applications. If the efficiency is unknown then a precautionary default value can be used

Value

Unit

1.50

mg/l

7.50

mg/l

Calculate loading from wastewater with on-site treatment plants

TP discharged by on-site treatment plant

TN discharged by on-site treatment plant

Value

Unit

0.14

kg/year

0.72

kg/year

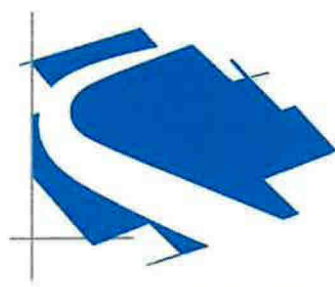
Version 2.2

27/02/2024



| Stage 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         |           |                               |                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------|-------------------------------|----------------------------------------|
| Calculate the net change in nutrient load from the proposed development                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         |           |                               |                                        |
| Note: This stage calculates the net change in TP and TN load to the catchment from the proposed development. This is derived by calculating the difference between the load calculated for the proposed development (wastewater, urban area, open space, etc.) and that for the existing land uses. The nutrient budget for the site has been calculated under current and post-2025 WRC permit levels, where applicable. The nutrient budgets under proposed Post 2030 permit limits are for guidance purposes only until the permit limits are put into legislation. |         |           |                               |                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Current | Post 2030 | Summary                       |                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Value   | Value     | No. of dwellings              | 1                                      |
| 1. Identify the load from additional population                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |           | Onsite treatment plant        | Package treatment plant (user-defined) |
| TP Loading from additional population                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.14    | 0.14      | Current TP discharge concentr | 1.60                                   |
| TN Loading from additional population                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.72    | 0.72      | Current TN discharge concentr | 7.90                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |           | Post 2030 TP discharge conce  | 1.60                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |           | Post 2030 TN discharge conce  | 7.90                                   |
| 2. Calculate net change in nutrient load from land use change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |         |           | TP current land use           | 0.00                                   |
| TP load from land use change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.00    | 0.00      | TP proposed land use          | 0.00                                   |
| TN load from land use change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.00    | 0.00      | TN current land use           | 0.00                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |           | TN proposed land use          | 0.00                                   |
| 3. Calculate nutrient budget for the development site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |           |                               |                                        |
| TP budget for the site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.14    | 0.14      |                               |                                        |
| TN budget for the site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.72    | 0.72      |                               |                                        |
| 4. Calculate precautionary buffer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |           |                               |                                        |
| Buffer amount                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 20      | 20        |                               | %                                      |
| TP Precautionary buffer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.03    | 0.03      |                               | kg/year                                |
| TN Precautionary buffer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.14    | 0.14      |                               | kg/year                                |
| Note: The figures used throughout this model are based on scientific research, evidence and modelled catchments and represent the best available evidence. However, it is important that a precautionary buffer is used that recognises the uncertainty with these figures and ensures, with reasonable certainty, that there will be no adverse effect on site integrity. As such, a 20% precautionary buffer added to the nutrient budget.                                                                                                                           |         |           |                               |                                        |
| 5. Total nutrient budget for the development site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |           |                               |                                        |
| Total Phosphorus budget for the site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.17    | 0.17      |                               | kg/year                                |
| Total Nitrogen budget for the site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.86    | 0.86      |                               | kg/year                                |
| Current TP loading                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |           |                               |                                        |
| Development will generate additional Phosphorus (Mitigation required) - Please progress to 'Mitigation - current' tab                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |           |                               |                                        |
| Post 2030 TP loading                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |           |                               |                                        |
| Development will generate additional Phosphorus (Mitigation required) - Please progress to 'Mitigation - post 2030' tab                                                                                                                                                                                                                                                                                                                                                                                                                                                |         |           |                               |                                        |
| Current TN loading                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |           |                               |                                        |
| Development will generate additional Nitrate (Mitigation required) - Please progress to 'Mitigation - current' tab                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |           |                               |                                        |
| Post 2030 TN loading                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |           |                               |                                        |
| Development will generate additional Nitrate (Mitigation required) - Please progress to 'Mitigation - post 2030' tab                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |           |                               |                                        |





# Canham Consulting

## Structural Civil Building Engineers

### **Canham Consulting Ltd**

**The Old School, School Lane, Thorpe St Andrew,  
Norwich, Norfolk, NR7 0EP**

**Tel: 01603 430650**

**Email: [mail@canhamconsulting.co.uk](mailto:mail@canhamconsulting.co.uk)  
[www.canhamconsulting.co.uk](http://www.canhamconsulting.co.uk)**

