

TECHNICAL NOTE – SUBMISSION VERSION

Project: Land north of Woodcroft Farm

Date: 20 March 2024

Subject: Nutrient budget for Woodcroft Farm (outline application for up to 190 units)

1.0 Introduction

- 1.1 Land north of Woodcroft Farm, Lovedean, Hampshire (Site HDN1) has been allocated in the 2021 -2040 East Hampshire District Council draft Local Plan for housing. East Hampshire District Council published a Position Statement and Mitigation Plan for Nutrient Neutral Development in May 2022. The position statement sets out the Council's approach to new development which is likely to have an adverse effect on the integrity of sites within the Solent National Sites Network (NSN).
- 1.2 The position statement notes that the southern parishes in East Hampshire District Council are served by Budds Farm Wastewater Treatment Works. Any new development draining to Budds Farm Wastewater Treatment works in the East Hampshire Rivers catchment would be likely to lead to a significant effect on the following NSN sites:
- Chichester & Langstone Harbours Special Protection Area (SPA)
 - Chichester & Langstone Harbours Ramsar site
 - Solent Maritime Special Area of Conservation (SAC)
 - Solent and Southampton Water SPA
 - Solent and Southampton Water Ramsar
 - Portsmouth Harbour SPA
 - Portsmouth Harbour Ramsar
- 1.3 NSN sites receive statutory protection under the Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitats Regulations'). The Habitats Regulations afford a high level of protection to sites that hold significant populations of certain bird species (SPAs). They also afford the same level of high protection to tracts of land supporting habitats or rare species (other than birds) considered scarce or vulnerable at a European community level (SACs).
- 1.4 Ramsar sites are designated as wetlands of international importance that are afforded similar legislative protection to SPAs and SACs. The government has issued policy statements relating to the special status of Ramsar sites. This extends the same protection afforded to SPAs and SACs to Ramsar sites.
- 1.5 Under the Habitats Regulations, East Hampshire District Council (EHDC) is a competent authority, responsible for ensuring that development management decisions do not adversely affect the integrity of SAC, SPA and Ramsar sites. In line with current Natural

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England guidance adverse effects on integrity can only be avoided if new residential development is nitrogen neutral.

- 1.6 Mitigation is required for all applications that lead to an increase in overnight accommodation within the relevant catchments. The EHDC position statement notes that “many outline applications do not include detail regarding the scale and mix of the proposed development – this is addressed during the reserved matters stage. In such cases a legal agreement which secures the methodology to calculate the full avoidance and mitigation package will need to be secured prior to the granting of any outline planning permission. This ensures that the nutrient mitigation is calculated once the scale of development is known and prior to the commencement of the development.”
- 1.7 When submitting planning applications, applicants will need to submit the following information:
- i. A site-specific nutrient budget, using Natural England’s most up to date methodology and calculator; and
 - ii. If the application site’s pre-development use is classified as an agricultural use within the calculator, evidence of the farm type for the past 10 years will need to be submitted to support the nutrient budget. This evidence could for example take the form of historic/aerial photographs or deeds of agreement.
- 1.8 Artemis Ecological Consulting have been appointed by Grainger to prepare a site-specific nutrient budget for land north of Woodcroft Farm (based on up to 190 residential units) for submission alongside an outline planning application.
- 2.0 Nitrogen neutrality calculations for land north of Woodcroft Farm using the Solent Nutrient Budget Calculator (January 2024)**
- 2.1 The nitrogen neutrality calculations used to assess the nitrogen loading arising from proposed development are based on the most recent Natural England guidance and version of the calculator used when assessing the nutrient loading to Solent sites in the National Site Network (NSN). The most recent update to the calculator was issued in January 2024.
- 2.2 The Natural England calculator generates a nitrogen budget for a scheme with reference to two sources of potential nitrogen loading:
- the residual load of nitrogen in treated foul water discharged into the water environment (for residential schemes alone).
 - the change of land use from the existing, baseline uses to the developed land use.

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- 2.3 The steps taken to calculate the nitrogen budget for the proposed development using the Natural England calculator are set out below. Box 1 sets out the key assumptions used in the calculations.

Box 1: Assumptions relevant to the assessment of additional nitrogen loading deriving from 190 residential units

- Number of new dwellings: 190
- Residential occupancy for the new dwelling: 2.4 occupants per dwelling (in line with Natural England and EHDC guidance).
- Annual rainfall 750.1-800mm. Sourced from <https://nrfa.ceh.ac.uk/data/station/spatial/42019> and cross-checked with data for Clanfield from <https://en.climate-data.org/europe/united-kingdom/england/clanfield-69302/> (accessed 20/03/24)
- Total waste water produced by single person: 120 litres per person per day. This reflects guidance in the Nutrient Neutrality Generic Methodology, which states that the water consumption rate used within any nutrients budget(s) should be 10 litres/person/per day higher than the rate secured. This is in line with the precautionary approach and accounts for potential changes to less water efficient fittings throughout the lifetime of the development.
- East Hampshire District Council have a planning condition that would be applied to any permission issued ensuring a water use per person standard of 120 litres/person/day is secured. The wording of the condition is as follows:
- *The development hereby permitted shall not be occupied until:*
 - a) *A water efficiency calculation in accordance with the Government's National Calculation Methodology for assessing water efficiency in new dwellings has been undertaken which demonstrates that no more than 120 litres of water per person per day shall be consumed within the development, and this calculation has been submitted to, and approved in writing by, the Local Planning Authority; all measures necessary to meet the agreed water efficiency calculation must be installed before first occupation and retained thereafter;*
 - b) *A mitigation package addressing the additional nutrient input arising from the development has been submitted to, and approved in writing by, the Local Planning Authority. Such mitigation package shall address all of the additional nutrient load imposed on protected European Sites by the development when fully occupied and shall allow the Local Planning Authority to ascertain on the basis of the best available scientific evidence that such additional nutrient loading will not have an adverse effect on the integrity of the protected European Sites, having regard to the conservation objectives for those sites; and*
 - c) *All measures forming part of that mitigation package have been provided to the Local Planning Authority and shall be implemented in full in accordance with an agreed timetable.*
- Deductible loading: it is appropriate to include for deductible loading in the calculation

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because water supplied to the development is taken from within the Solent catchment.

- Method of waste processing: all foul will be treated at Budds Farm WWTW.
- Land use budget:
 - Baseline
 - Freely draining: Lowland grazing 2.18ha, woodland 0.03ha, shrub 0.07ha, residential urban land 0.04ha and open urban land 0.05ha.
 - Impeded drainage: Lowland grazing 4.42ha, woodland 0.85ha, shrub 0.27ha and residential urban land 0.69ha.
 - Developed
 - Freely draining: Residential urban land 1.3ha, woodland 0.03ha, shrub 0.07ha, water 0.09ha and greenspace 0.89ha.
 - Impeded drainage: Residential urban land 3.66ha, water 0.02ha, woodland 0.85ha, shrub 0.26ha and greenspace 1.43ha.

2.4 The most recent Natural England Nitrogen Calculator for the Solent has been used to calculate the nutrient load generated by the treated foul from the 190 new dwelling proposed in this application on the basis of the parameters set out in Box 1. Stage 1 below shows the amount of additional nitrogen that will be generated by treated foul water arising from the new housing.

Stage 1: calculation of nitrogen loading from new residential development (190 units)

Water infrastructure information		
Description of required information	Data entry column - user inputs required	Additional data entry column - user inputs may be required
Date of first occupancy (dd/mm/yyyy):	01/06/2025	
Average occupancy rate (people/dwelling or people/unit):	2.40	
Water usage (litres/person/day):	120	
Development proposal (dwellings/units):	190	
Include deductible acceptable loading?	Yes	
Wastewater treatment works:	Budds Farm WwTW	
Current wastewater treatment works N permit (mg TN/litre):	7.70	
Not applicable	Not applicable	
Not applicable	Not applicable	
Final calculation of nutrient load from wastewater		
Description of values generated	Values generated	
Wastewater nutrient loading		
Additional population (people):	456.00	
Wastewater by development (litres/day):	54720.00	
Annual wastewater TN load (kg TN/yr):	138.51	
Not applicable		
Not applicable	Not applicable	
Not applicable		
Not applicable	Not applicable	

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Overall change in nitrogen loading from changed land use

- 2.6 To calculate the overall change in nitrogen loading that will occur due to the changed land uses arising from the proposed development, it is necessary to consider the total nitrogen load of stage 2, relative to the total nitrogen load of stage 3.
- 2.7 Addition of stages 2 (freely draining and soils with impeded drainage pre-development) shows that the baseline nitrogen load from site is:

$$29.24 + 44.21 = \mathbf{73.45\text{kg TN per year.}}$$

- 2.8 Addition of stages 3 shows that when the development is built out the site will be generating a nitrogen load of:

$$21.73 + 60.64 = \mathbf{82.37\text{kg TN per year.}}$$

Stage 4: calculation of nitrogen loading for completed development

- 2.9 Stage 4 of the nitrogen calculations draws together Stages 1, 2 & 3 to provide a nitrogen budget for the application as a whole. The Natural England calculator assumes a single soil type for the whole site and is not designed to provide a summary for sites where soil types are split, as is the case for this application. It is therefore necessary to calculate the final stage by hand, but the calculator provides the equation to complete, as follows:

$$\left(\text{Stage 1} - \text{Stage 2} + \text{Stage 3} \right) \times 1.2 = \text{Stage 4}$$

Precautionary buffer (20%)

- 2.10 Application of this equation to the outputs of Stages 1, 2 and 3 for the Woodcroft Farm application generates the following:

$$(138.51 - 73.45 + 82.37) \times 1.2 = \mathbf{+176.92\text{kg TN/year.}}$$

- 2.11 The nitrogen calculations show that the completed residential development will increase nitrogen loading into the protected sites of the Solent NSN. In the absence of mitigation the proposed development would not be nitrogen neutral.

- 2.12 The updated version of the nutrient calculator includes a provision to calculate the reduction in levels of nutrients in surface water run-off that can be achieved when surface water from future land uses is directed through SUDS features or SuDS management trains. The current masterplan shows approximately 0.11ha of SuDS would be required as part of the scheme.
- 2.13 The calculator allows the catchment area of each SuDS feature to be inputted along with the percentage of surface water flow that will be directed through the SuDS feature along with the anticipated nutrient removal rate.
- 2.14 Guidance on the design of SuDS to reduce nitrogen in surface water runoff has been produced by CIRIA (Bradley, J. 2022). The guidance details the design options that can be used to reduce nitrogen concentrations in surface water runoff. The design of the SuDS treatment train must be in accordance with CIRIA C753 and could remove 30% of the nitrogen in surface water runoff.
- 2.15 The exact design of the SUDS features would be a matter for a reserved matters application. Until the full detail of the SUDS features are known they cannot be relied on to provide nutrient mitigation. Therefore SuDS have not been included in the current calculations but they could be included at reserved matters and the nutrient budget updated accordingly.

3.0 Mitigation

- 3.1 The proposed scheme will not be able to achieve nutrient neutrality without further mitigation. This would be delivered through the purchase of nitrogen credits (each credit equivalent to 1kg/N) delivered by an off-site provider such as the scheme at Warnford Park or the one operated by Hampshire and Isle of Wight Wildlife Trust.
- 3.2 As noted in paragraphs 2.12-2.15, further opportunities to provide some additional nutrient mitigation on-site do exist through the design of appropriate SuDS treatment trains to reduce the nitrogen loading in surface water runoff generated by the completed scheme. At this stage it is not determined if this is a viable option for this site. The applicant would have the opportunity to include SuDS treatment trains as mitigation at reserved matters stage.
- 3.3 The applicant has also identified land immediately north of the application site to enable the delivery of a 10% biodiversity net gain. There is the option to use this land to deliver some nutrient mitigation where land uses changes (from the current land use of lowland grazing to green space) will reduce the current baseline level of nitrogen leaching providing some mitigation. It is noted that land required to deliver biodiversity net gain is secured for 30 years and the requirement for land identified for nutrient

mitigation is in perpetuity. There will be a need to secure the long-term management of this land for nutrient mitigation beyond 30 years if it is proposed as mitigation.

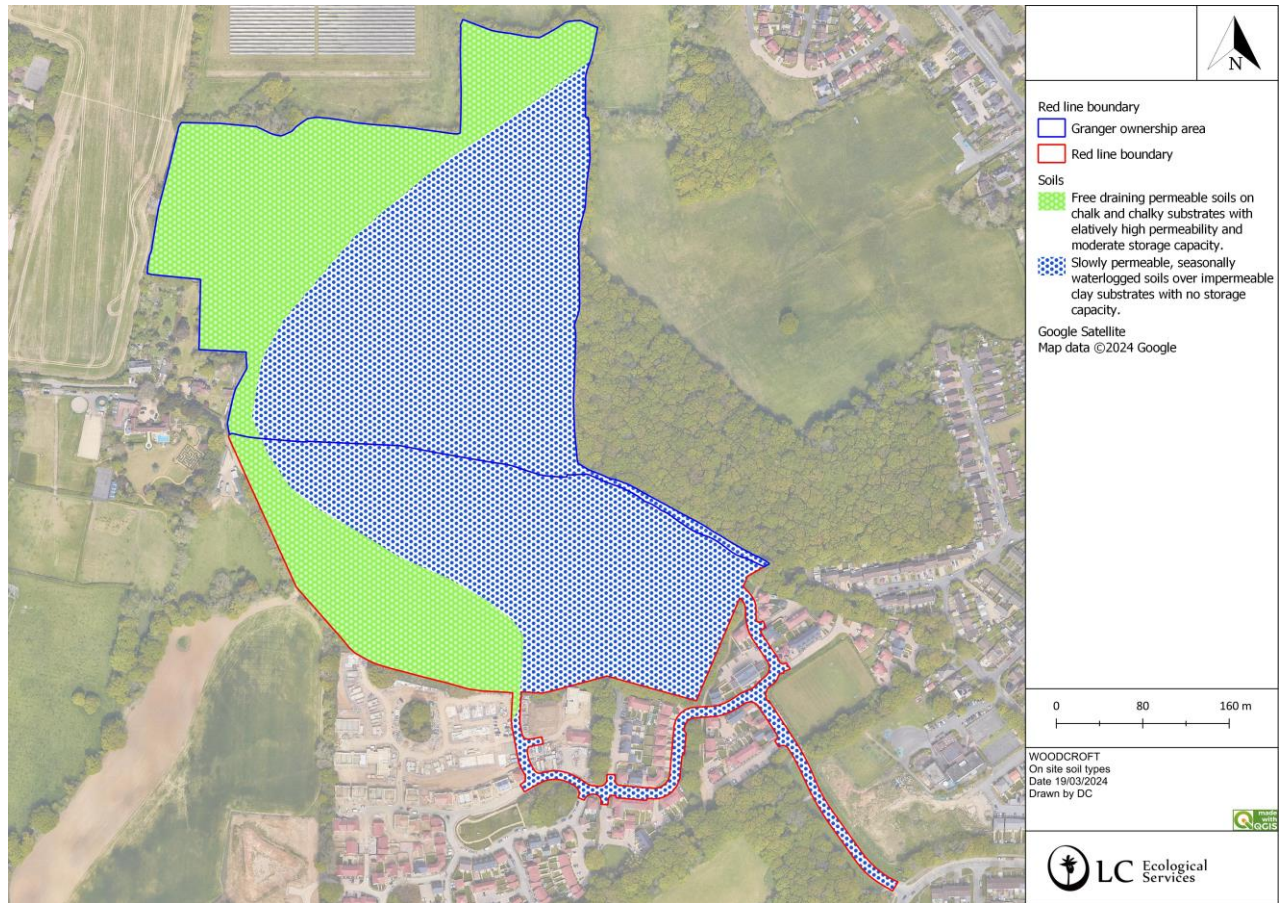
- 3.4 The impacts arising from increased nutrient loading associated with new housing only occur once the housing is occupied. For this outline application the local authority will have to be satisfied that mitigation is deliverable through the routes identified. Further updates to the nutrient budget would be required to support any future reserved matters applications and these will cover any on-site mitigation (delivered via SuDS treatment of surface water), off-site mitigation using land controlled by Grainger north of the application site and identification of an appropriate off-site provider for purchase of nutrient credits.

4.0 Conclusion

- 4.1 Initial calculations based on a 190 unit scheme have identified the need for additional mitigation to off-set the predicted increase in nutrient nitrogen entering the protected sites of the Solent following treatment. It would be possible to off-set this increase through the purchase of nitrogen credits through an approved provider. Purchasing credits to the equivalent value of 176.92 kg/TN/yr would be required in the absence of any other mitigation.
- 4.2 Options to provide some nutrient mitigation as part of the scheme exist, through designing SuDS to reduce nitrogen loads in surface water or through securing land off-site in perpetuity. Both these options could be delivered as part of the mitigation package. Further details of any additional mitigation measures to be included as part of the scheme will be provided at reserved matters stage, alongside an updated nutrient budget for the site.

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Appendix 1: Soils information



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