

Site:	Land South of Saltmarsh Lane, Hayling Island
Client:	Gillenden Developments
Job Number:	784-B028506
Report Type(s):	Nitrogen Balancing Assessment
File Location:	M:\Projects\784-B028506 South of Salt Marsh Lane\60 Project Output\61 Work in Progress

INTRODUCTION

Tetra Tech was appointed by Gillenden Developments to calculate the change in nutrient outputs from existing to future use associated with the proposed development at Land South of Saltmarsh Lane centred on OS grid reference SU 71256 00208.

The calculations are required in response to recent consultation with Natural England on residential projects in the vicinity of the Solent following the findings of the Integrated Water Management Study for South Hampshire, published by the Partnership for Urban South Hampshire¹. Due to the uncertainty over whether new development can be accommodated by existing wastewater treatment infrastructure without causing harm to coastal European sites, Natural England advise that all residential development should achieve nitrogen neutrality.

The purpose of this assessment is to provide guidance at an early stage relating to the likely impacts of the proposed scheme relating to TN and the potential requirement for mitigation.

This report has been prepared by Consultant Ecologist Emma Taylor and the conditions pertinent to it are provided in Appendix A.

METHODOLOGY

To make the assessment, Version 5 of Natural England's *Advice on Achieving Nutrient Neutrality for New Development in the Solent Region*² for calculating nitrogen budgets was used.

ASSUMPTIONS

The assumptions relevant to this project in addition to those included in the Natural England methodology are provided in Table 1.

¹ PUSH, (2018), Integrated Water Management Study, [online] Available at <https://www.push.gov.uk/wp-content/uploads/2018/07/IWMS-Appendix-1.pdf>, Accessed February 2021 .

² Natural England, (2020), ADVICE ON ACHIEVING NUTRIENT NEUTRALITY FOR NEW DEVELOPMENT IN THE SOLENT REGION, Version 5 – June 2020, [online] Available at <https://www.push.gov.uk/wp-content/uploads/2020/06/Natural-England%E2%80%99s-latest-guidance-on-achieving-nutrient-neutrality-for-new-housing-development-June-2020.pdf>, Accessed February 2021.

Table 1: Project Assumptions

Number of proposed units:	60 dwellings
The total site area:	2.51 ha
The current land uses are:	2.48 ha cereal crops 0.03 ha urban (existing access off Saltmarsh Lane)
The future land uses will be:	2.10 ha urban 0.41 ha open space ¹
The waste water from the site will be treated at this wastewater treatment works (WwTW):	Budds Farm
The consent limit for the WwWT is:	9.7 mg/l TN

1. There are two areas of open space. The central space is 0.25 ha and falls below the 0.5ha threshold in the Natural England guidance to be assessed separately from the urban areas. A further area of 0.41 ha is located along the east, south and west site boundaries. This also falls below 0.5 ha, but can be assessed separately as it is contiguous with other areas of habitat / open space adjacent to the site.

RESULTS

The results using the method for determining the nitrogen budget for the proposals are provided in Table 2. The full workings are shown in Appendix B.

Table 2: Summary of the results

Calculating Total Nitrogen (TN) Load From Development Wastewater	Calculating TN Load From Current Land Use	Calculating TN Load From Future Land Uses	Calculating Net Change in TN From the Development	Apply 20% Buffer
38.910 Kg/TN/yr	77.805 Kg/TN/yr	32.080 Kg/TN/yr	-6.815 Kg/TN/yr	n/a

The calculations show that the development would result in a negative TN budget of -6.815 Kg/TN/yr.

It is therefore considered that the development proposals would have no potential to result in an adverse effect on the integrity of the Solent European sites.

SUMMARY

The proposed development is for up to 60 dwellings on 2.51 ha of predominately cereal crop land. This will result in a net reduction of -6.815 kg/TN/yr and no potential for an adverse effect on the integrity of the Solent European sites.

Document Control			
Revision:	B	Status:	Final
Date:	24 th January 2022		
Prepared by:	Checked by	Approved By:	
Emma Taylor	David West	David West	

APPENDIX A: REPORT CONDITIONS

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The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. Tetra Tech accept no liability for issues with performance arising from such factors.

APPENDIX B: NUTRIENT BALANCING CALCULATIONS

Table 3: Calculating Total Nitrogen (TN) Load From Development Wastewater (Stage 1)

Step	Measurement	Value	Unit	Explanation
Development proposal	Development types that would increase the population served by a wastewater system	60.000	No. of beds	Development is 66 dwellings.
1	Additional population	144.000	Persons	2.4 persons per dwelling.
2	Wastewater volume generated by development	15840.000	L/day	Persons x 110 litres/day.
3	Receiving WwTW environmental TN permit limit.	9.700	mg/l TN	Budds Farm TN limit
4	Deduct acceptable TN loading (@ 2 mg/l TN) (as defined in Paragraph 4.40)	6.730	mg/l TN	90% of Step 3 - 2mg/l TN
5	TN discharged after WwTW	106603.200	mg/TN/day	Step 2 x Step 4
6	Convert mg/TN to Kg/TN per day	0.107	Kg/TN/day	Step 5 divided by 1,000,000
7	Convert Kg/TN per day to Kg/TN per year	38.910	Kg/TN/yr	Step 6 x 365 days
Total TN load from wastewater: 38.910 Kg/TN/yr				

Table 4: Calculating TN Load From Current Land use (Stage 2)

Step	Measurement	Land use	Value	Unit	Explanation
1	Area of existing Land Use	Cereal crops Urban	2.48 0.03	ha	Area of land lost to development
2	TN leachate value for Land Use	Cereal crops Urban	31.20 14.30	Kg/ha/yr	-
3	TN leachate value for area of Land use	Cereal crops Urban	77.38 0.43	Kg/TN/yr	Step 1 x Step 2
Total TN Leachate value for current land use: 77.805 Kg/TN/yr					

Table 5: Calculating TN Load From Future Land Uses (Stage 3)

Step	Measurement	Value	Unit	Explanation
1	New urban land use area	2.100	ha	Area of development that will change to urban land use
2	TN leachate value from new urban area	30.030	Kg/TN/yr	Step 1 x 14.3 Kg/TN/yr
3	New / retained woodland, PoS or SANG	0.410	ha	Area of development that will be woodland, PoS or SANG
4	TN leachate value from woodland / Pos / SANG area	2.050	Kg/TN/yr	Step 3 x 5 Kg/TN/yr
5	Combined TN leachate values from future land uses	32.080	Kg/TN/yr	Step 2 + Step 4
Total TN Leachate value for future land use: 32.080 Kg/TN/yr				

Table 6: Calculating TN Budget for the Development Proposals (Stage 4)

Step	Measurement	Value	Unit	Explanation
1	Identify TN loads from wastewater	38.910	Kg/TN/yr	Stage 1
2	Calculate the net change in TN leachate value due to land use change	45.725	Kg/TN/yr	Stage 3 – Stage 2
3	Determine nitrogen budget	-6.815	Kg/TN/yr	Step 1 – Step 2
4	Where TN budget is positive add 20% precautionary buffer	n/a	Kg/TN/yr	Step 3 + 20%
Total TN Budget -6.815 Kg/TN/yr				

APPENDIX C: SITE LAYOUT PLAN



0 50
metres
(1:1,250)

Site boundary 2.51ha (6.20acres)

Project
Land South of Saltmarsh Lane

Drawing Title
Illustrative Masterplan

Date 07/10/2021	Scale 1:1,250 at A3	Drawn by CT	Check by SR/ML
Project No 1240	Drawing No 005	Revision E	

Mosaic