



LIZARD

Landscape Design and Ecology

NUTRIENT BUDGET ASSESSMENT REPORT

Land Adjacent to Paddock Grange, Homestead Road, Medstead

Prepared by	HS
Checked by	CO
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APPENDICES

Appendix A – Nutrient Discharge of Marsh Ensign Ultra Advanced Domestic Sewage Treatment Plant



SUMMARY

Lizard Landscape Design and Ecology has been commissioned to undertake a Nutrient Budget Calculation & Mitigation Strategy for proposals at Land Adjacent to Paddock Grange, Homestead Road, Medstead.

Calculation of the nutrient budget of the proposals have been undertaken in accordance with the current Natural England advice and using the current River Itchen SAC Nutrient Neutrality Budget Calculator version 2 produced by Natural England in March 2022.

Proposals are for the demolition of the former onsite buildings, and the construction of a new three-bedroom residential dwelling with pond, associated parking, and areas of habitat creation throughout the site. Wastewater from the new dwelling shall discharge into a package treatment plant (Marsh Ensign Ultra Advanced Domestic Sewage Treatment Plant). The plant has a certified discharge of 3.5mg/l mean average phosphorus and total 23 mg/l mean average for Nitrogen.

The scheme shall result in an additional population of 2.4 persons, resulting in an annual increased nitrogen load of 1.93kg TN/yr and increased phosphorous load of 0.32 TP/yr. Given that the proposed land uses shall remain the same, there shall be no increase as result of changes to land type. Once the statutory 20% precautionary buffer is added, the scheme shall result in an increased annual nitrogen load of 2.32kg TN/yr. The scheme shall also cause an increased annual phosphorous load of 0.39 TP/yr.

As the proposals result in an increase in nutrient deposition, mitigation shall be required. As there is no scope for implementation of a mitigation scheme on site, the purchase of credits from an authorised provider shall be required.

Assuming that the above mitigation measures are actioned, the proposals would result in **no likely significant effect** with regards nutrients upon any surrounding statutory designated site.

1.0 INTRODUCTION

1.1 Lizard Landscape Design and Ecology has been commissioned to undertake a Nutrient Budget Calculation & Mitigation Strategy for proposals at Land Adjacent to Paddock Grange, Homestead Road, Medstead.

1.2 Calculation of the nutrient budget of the proposals, when compared to the existing baseline have been undertaken in accordance with the current Natural England advice (Natural England, 2022) and using the current version of the River Itchen SAC Nutrient Neutrality Budget Calculator version 2 produced by Natural England in March 2022.

Site Information

1.3 The site covers c. 0.34ha of former garden area. The site area includes 2no. buildings - a corrugated steel covered timber shed and a dilapidated brick and block building with a failed roof.

Surrounding Landscape

1.4 The surrounding landscape is rural, dominated by arable fields and grazing land interspersed with tree lines, hedgerows, and pockets of woodland. The nearest town is Alton, which is located c. 6km northeast of the site.

Scope of the Survey

1.5 The scope of this assessment is as follows:

- Assess the current baseline nutrient load of the site;
- Assess the likely change in nutrient (specifically nitrogen) load to the wastewater treatment works;
- Assess any proposed mitigation measures to reduce any increases in nutrient load;

1.6 This appraisal and assessment is deemed to be relevant for a maximum of one year due to the possibility of changes in the habitats on-site and the methodology used to calculate nutrient budgets and mitigate for excess nutrients. Should the site conditions, methodologies or proposals alter, the ecologist should be consulted to confirm that the assessment is still valid.

2.0 LEGISLATIVE BACKGROUND

2.1 Conservation of Habitats and Species Regulations (as amended) 2017

2.1.1 Following the Dutch Nitrogen Case ('Dutch-N') which ruled that, where an internationally important site (i.e., SACs, SPAs and Ramsar Sites) is failing to achieve condition due to pollution, the potential for a new development to add to the nutrient load is "necessarily limited". The Dutch-N case has informed the way in which regulation 63 of the Habitats Regulation 2017 should apply to pollution related incidents.

2.1.2 It is Natural England's view that there is a likely significant effect on several internationally designated sites (Special Protection Areas, Special Areas of Conservation and Ramsar sites) due to the increase in wastewater from new developments coming forward. The uncertainty about the impact of new development on designated sites needs to be recognised for all development proposals that are subject to new planning permissions and have inevitable wastewater implications. These implications, and all other matters capable of having a significant effect on designated sites, must therefore be addressed in line with Regulation 63 of the Conservation of Habitats and Species Regulations 2017.

2.1.3 Nutrient neutrality is a means of ensuring development does not add to existing nutrient burdens and aims to provide certainty that the whole scheme is deliverable in line with the requirements of the Conservation of Habitats and Species Regulations 2017 (as amended). The proposals consist of a new dwelling, therefore the proposals would cause an increase in overnight accommodation. As such the proposals must be assessed to determine if they are likely to result in increased nutrient runoff, such that mitigation can be provided, and an Appropriate Assessment undertaken by the LPA.

3.0 METHODOLOGY

3.1 Nutrient Budget Assessment

- 3.1.1 All calculations were carried out using the current version of the River Itchen SAC Nutrient Neutrality Budget Calculator version 2 produced by Natural England in March 2022.
- 3.1.2 The calculations have been based upon the standard maximum water use of 105 litres per person per day, with an average occupancy rate of 2.4 persons.
- 3.1.3 The scheme is proposed to be connected to a package treatment plant (Marsh Ensign Ultra Advanced Domestic Sewage Treatment Plant) which shall serve the new dwelling. The total Phosphorous and total nitrogen discharge rates have therefore been user defined as 3.5mg TP/litre mean average and 23 mg TN/litre mean average respectively. These figures are based upon published test results from the manufacturer (refer to Appendix A).

3.2 Site Evaluation and Assessment

- 3.2.1 A site visit to assess the current habitats present on site was completed on the 3rd November 2023.
- 3.2.2 The proposed land use is based upon the provided proposed site plan (HF Architecture Ltd, November 2023).
- 3.2.3 The site catchment, average rainfall, soil drainage type and presence of nitrate vulnerable zones has been assessed in accordance with the standard site-specific data collection instructions.

4.0 RESULTS & DISCUSSION

4.1 Nutrient Budget Assessment Results

Stage 1 - Calculated Loading

- 4.1.1 The proposals include the construction of 1 no. new dwelling on site. The scheme shall result in an additional population of 2.4 persons, with an average water consumption of 105l/pp/day. This additional population shall result in an annual increased nitrogen load of 1.93kg TN/yr and increased phosphorous load of 0.32 TP/ yr.

Stage 1 Calculated Loading

Additional population	2.4	people
Wastewater by development	252	litres/day
Annual wastewater TP load	0.32	kg TP/yr
Annual wastewater TN load	1.93	kg TN/yr

Figure No. 01 – Calculated Loading

Stage 2 – Existing Land Use

- 4.1.2 The assessment found the site to be located within the Itchen catchment area, and within a Nitrate Vulnerable zone. The underlying soil is classified as freely draining, and rainfall locally is calculated to be 900.1 - 950 mm per year.
- 4.1.3 For the purposes of this calculation, the entire site is considered to have a pre and post development land use of residential urban land. Based upon the above variables, the existing nitrogen export from the land use is calculated as 5.86kg TN/yr and annual phosphorous export as 0.63 TN/yr.

Stage 3 – New Land Use

- 4.1.4 Given that the land use will remain as existing, there shall be no change in nutrient discharge as a result of land use.

Stage 4 – Calculated Outputs

- 4.1.5 Once the statutory 20% precautionary buffer is added, the scheme shall result in an increased annual nitrogen load of 2.32kg TN/yr and increased annual phosphorous load of 0.39 TP/yr.

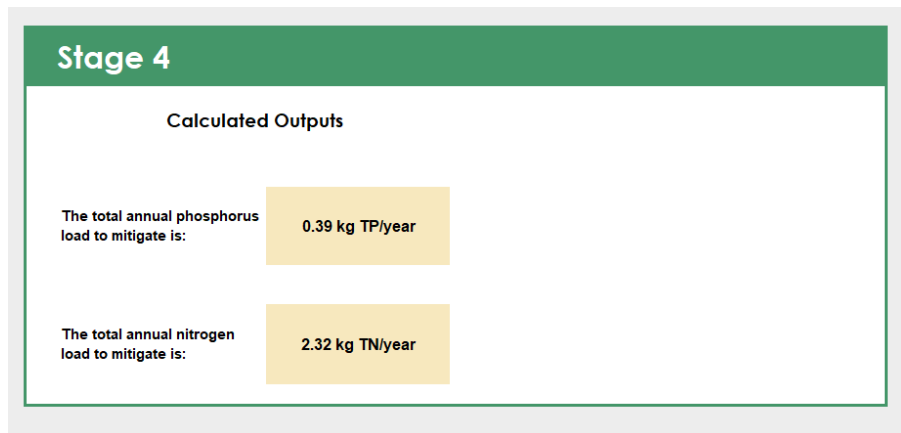


Figure No. 02 – Calculated Outputs

5.0 MITIGATION

- 5.1 As the proposals shall result in an increase in nitrogen and phosphorous deposition, mitigation shall be required. As there is no scope for implementation of a mitigation scheme on site, the purchase of credits from an authorised provider within the Itchen catchment shall be sought.

6.0 CONCLUSIONS

- 6.1 The Nitrate Budget assessment concluded that the proposed development shall cause a small overall increase in nitrogen and phosphorus deposition.
- 6.2 To mitigate against these impacts, the purchase of credits via a strategic scheme shall be pursued to ensure no additional nutrient deposition. Mitigation measures shall need to be secured via S106 agreement or similar.
- 6.3 Once mitigation measures have been actioned; the proposals would result in **no likely significant effect** with regards nutrient input into any surrounding statutory designated site.

7.0 REFERENCES

*CIEEM (2017) Guidelines for Preliminary Ecological Appraisal, 2nd edition.
Chartered Institute of Ecology and Environmental Management, Winchester.*

*CIEEM (2018) Guidelines for Ecological Impact Assessment, 1st edition.
Chartered Institute of Ecology and Environmental Management, Winchester.*

*MAGIC Interactive Map Tool (Accessed 05th November 2023):
www.magic.gov.uk*

*Natural England (2022) Stodmarsh SAC and Ramsar Nutrient Neutrality
Generic Methodology and Budget Calculator version 2.1.*

*Ashford Borough Council (2023) Stodmarsh Nutrient Neutrality. Available
Online (Accessed 15th November 2023)
<https://www.ashford.gov.uk/planning-and-development/nutrient-neutrality/>*

**Appendix A – Nutrient Discharge of Marsh Ensign Ultra Advanced Domestic
Sewage Treatment Plant**



Prüfinstitut für
Abwassertechnik
GmbH

PERFORMANCE RESULTS

Portapura Limited

Etruria, Brightwell Walk, Irthlingborough, NN9 5PJ, UK

EN 12566-3, Annex B

Small wastewater treatment systems for up to 50 PT

Small wastewater treatment system Portapura

Aerated Biomedia system in one GRP tank

Test report PIA2018-308B10

Nominal organic daily load	0.10 kg BOD ₅ /d		
Nominal hydraulic daily load	0.30 m ³ /d		
Material	GRP		
Treatment efficiency (nominal sequences)	Efficiency	Effluent	
	COD	94.9 %	54 mg/l
	BOD ₅	95.8 %	14 mg/l
	N _{tot}	59.6 %	23 mg/l
	NH ₄ -N*	98.1 %	0.7 mg/l
	P _{tot}	54.4 %	3.5 mg/l
	SS	94.5 %	19 mg/l
Electrical consumption	1.8 kWh/d		

*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

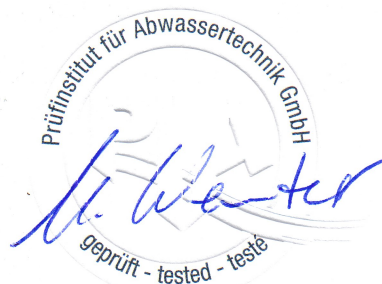
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Certified according to
ISO 9001:2008



Martina Wermter

August 2018