

Maidstone Borough Council

**Maidstone Local Plan
Review Habitats
Regulations Assessment
Reg.19 HRA Report
Addendum**

Draft report

Prepared by LUC

March 2022

Maidstone Borough Council

Maidstone Local Plan Review Habitats Regulations Assessment

Reg.19 HRA Report Addendum

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Chapter 1

Introduction

1.1 This addendum report sets out supplementary information for the Habitats Regulation Assessment (HRA) of Maidstone Borough Council's (MBC) Local Plan Review (Regulation 19).

1.2 LUC was commissioned by MBC to carry out an HRA of its Local Plan Review. The HRA of the Local Plan Review (Regulation 19) was completed in September 2021 and published for consultation alongside the Local Plan Review. Natural England, as a statutory consultee, provided comments on the Local Plan Review and the HRA, advising that additional information would be required with the HRA. The additional information is required to provide the sufficient level of scientific certainty required at the Appropriate Assessment stage and enable Natural England to agree with the conclusion that there would be no adverse effects on the integrity of:

- North Downs Woodland Special Area of Conservation (SAC), due to air pollution from vehicles; and
- Stodmarsh SAC, Special Protection Area (SPA) and Ramsar site, due to a decrease in water quality from nutrient enrichment.

1.3 Natural England's comments in respect of these issues are provided in **Appendix A**.

1.4 This addendum report presents additional work that has been undertaken to assess these impacts, and the implications of that work on the HRA conclusions.

Chapter 2

Water quality at Stodmarsh SAC and SPA/Ramsar

2.1 The findings of the Local Plan Review HRA at Reg. 19 stage in relation to water quality and quantity were:

The Appropriate Assessment concluded no adverse effect on integrity as a result of increased pressure on water abstraction and treatment in relation to all European sites, provided that the following safeguards and mitigation measures are required by the plan and successfully implemented:

- Policy SP14a: “developers to ensure that new developments incorporate measures where appropriate to [within a list of criteria i to viii]:

(iv) Control pollution to protect ground and surface waters where necessary and mitigate against the deterioration of water bodies and adverse impacts on Groundwater Source Protection Zones, and/or incorporate measures to improve the ecological status of water bodies as appropriate; Major developments will not be permitted unless they can demonstrate that new or existing water supply, sewage and wastewater treatment facilities can accommodate the new development. Wastewater treatment and supply infrastructure must be fit for purpose and meet all requirements of both the permitting regulations and the Habitats Regulations (for example in relation to nutrient neutrality at Stodmarsh).”
- New wastewater treatment works are planned at Heathlands Garden Settlement, to serve the garden community and other new development in Lenham (broad location), with constructed wetlands to provide additional treatment, including of surface water; as set out in Appendix E.

Provided that Natural England is supportive of the policy requirements and mitigation measures developed and agreed in relation to nutrient neutrality at sites affecting Stodmarsh SAC and SPA/Ramsar before the Local Plan is adopted, then it can be concluded that there will not be an AEOI from the LPR. This could be verified during the Examination process and confirmed in an HRA Addendum and/or Adoption Statement.

2.2 Appendix E of the Reg. 19 HRA Report is a Nutrient Neutrality Assessment for Heathlands Garden Community, prepared by Ramboll in September 2021.

2.3 Natural England confirmed (**Appendix A**) that further information would be required before they would support the conclusions of no adverse effects on integrity at Stodmarsh SAC and SPA/Ramsar.

2.4 In response, Arcadis (March 2022) has prepared a technical note, setting out updated nutrient budget calculations and associated mitigation proposals to demonstrate that

nutrient neutrality can be achieved at the proposed Heathlands Garden Community and Lenham Broad Site Allocations. The technical note is provided in **Appendix B**.

2.5 The information requested by Natural England and where it can be located within the technical note is set out in **Table 2.1**.

Table 2.1: Location of information requested by Natural England

Information requested by Natural England	Where this information has been provided in the Arcadis technical note (see Appendix B)
Information and evidence to support assumptions used, including assumptions on occupancy rates and their long term stability and removal rates for wetlands.	Section 4 – Nutrient Budget Assessment
Information on the location of the proposed wetlands to ensure the areas of mitigation are draining relevant areas of mitigation land/ WwTW so will function effectively.	Section 5.2 – Wetland Locations
Clarity on the size of the wetlands being proposed. In order to be effective wetland's need to be at least 2 hectares in size as explained in Natural England's Nutrient Neutrality Methodology (November 2020).	Section 5.2 – Wetland Locations
Any additional hydraulic loading or nutrient loading calculations undertaken for wetlands or bespoke mitigation.	Section 5.3 – Hydraulic Loading
Clarification of how long term management of any mitigation land, in particular wetland, will be secured.	Section 6 – Implementation and Maintenance
Maps, locations, or identification of how any mitigation that is not within the council's ownership will be secured.	Appendix A – Report Figures Section 6 – Implementation and Maintenance (securing land outside council ownership)
Any information on winter maintenance programmes or other information material to water quality assessment that may impact the efficacy of proposed nutrient removal systems.	Section 5.2 – Wetland Locations (linking wetlands together to improve efficiency) Section 6 – Implementation and Maintenance

2.6 The technical note concludes that:

This Technical Note demonstrates that Heathlands GC Framework Masterplan and associated Lenham Broad Site Allocations in the Maidstone Local Plan can achieve nutrient neutrality through the provision of a new Onsite WwTW serving the proposed development, accompanied by the proposed four interlinked constructed wetlands system, protecting the integrity of the downstream Stodmarsh designated sites and thereby can meet the required tests under the Habitats Regulation Assessment.

2.7 Natural England has been consulted on the contents of the technical note and raised no major concerns; however, the nutrient neutrality methodology has recently been updated and the nutrient assessment calculations will need to be updated. It is expected that this will not alter the likelihood that mitigation can be achieved.

2.8 Since Natural England is supportive of the policy requirements and mitigation measures developed and agreed in relation to nutrient neutrality at sites affecting Stodmarsh SAC and SPA/Ramsar, subject to the calculations being updated, it is expected that there will not be an adverse effect on integrity at this site from the Local Plan Review.

Chapter 3

Air Pollution at North Downs Woodland SAC

3.1 The findings of the Local Plan Review HRA stated, in relation to air pollution, that:

The Appropriate Assessment concluded no adverse effect on integrity as a result of increased air pollution in relation to Medway Estuary and Marshes SPA/Ramsar and The Swale SPA/Ramsar, due to the scale of nitrogen deposition impact and characteristics of the sites.

Nitrogen deposition at North Downs Woodlands SAC has the potential for adverse effects on integrity, due to the impact of the LPR in combination with other plans and projects, on traffic flows the A229, A249 and Detling Road.

Mitigation could include measures such as reducing speeds on affected roads or reducing nitrogen deposition from other sources such as agriculture. Provided that a mitigation strategy is developed and agreed with Natural England before the Local Plan Review is adopted, then it can be concluded that there will not be adverse effects on the integrity of the SAC. This could be verified during the Examination process and confirmed in an HRA Addendum and/or Adoption Statement.

3.2 Natural England's Reg. 19 consultation response (**Appendix A**) states that it cannot support a conclusion of no adverse effects on the integrity of North Downs Woodland SAC due to there not being the sufficient level of scientific certainty required at the appropriate assessment stage, as the mitigation strategy had not been developed and agreed at the time.

3.3 In response, work has begun on a mitigation strategy to minimise air pollution from vehicles that would arise as a result of the Local Plan Review to the extent that there would be no adverse effects on integrity. To demonstrate this, the mitigation strategy will need to ensure that air pollution associated with development provided by the Local Plan Review in combination with that provided by other relevant plans and programmes does not prevent the site's conservation objectives (in relation to air quality) being met.

3.4 The conservation objectives¹ for the site are to *“Ensure that the integrity of the site is maintained or restored as*

¹ European Site Conservation Objectives for

North Downs Woodlands Special Area of

appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:

- The extent and distribution of the qualifying natural habitats;
- The structure and function (including typical species) of the qualifying natural habitats; and
- The supporting processes on which the qualifying natural habitats rely.”

3.5 Supplementary advice for the site² provides further detail on how this can be achieved and sets a target for air quality: “Maintain as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).”

3.6 As set out in the HRA Report, the relevant critical loads for this site, within 200m of roads (A249, A229, and Detling Road) are for *Taxus baccata* woods of the British Isles and *Asperulo-Fagetum* beech forests, which have a critical load of 5-15 kg N/ha/yr and 10-20 kg N/ha/yr respectively. Nitrogen deposition for woodland habitat within this SAC is currently at a minimum of 26.7 kg N/ha/yr and a maximum of 31.6 kg N/ha/yr³, which exceeds the critical loads. APIS Source Attribution Data shows that road transport is responsible for 25% of contributions to nitrogen deposition (KgN/ha/yr) from local sources, with a similar proportion arising from agricultural sources.

3.7 Since air pollutants are already above site relevant critical loads, to avoid an adverse effect on integrity, the Local Plan Review should not result in screening thresholds being exceeded, either alone or in combination with other plans or projects; ie should not exceed an increase of 1,000 AADT traffic flow or 1% of critical load at the SAC.

3.8 Jacobs, who carried out the traffic modelling and air quality assessment for the HRA of the Local Plan Review have been commissioned to identify and test feasible mitigation measures for air pollution at North Downs Woodland SAC. A memorandum summarising this work so far is provided in **Appendix C**.

3.9 Transport, air quality and ecological consultants from Jacobs, in discussion with Maidstone Borough Council have identified a suite of feasible mitigation measures that will reduce nitrogen deposition in proximity to the A249, A229 and Detling Road.

3.10 The mitigation measures to be explored and tested through traffic modelling and air quality assessment are:

- Speed management along Boxley Road and A229; and
- Boxley Road low or zero emission zone;
- Strengthening promotion of sustainable transport within policies (and updating modal share assumptions); and
- Tree planting along the sides of the roads.

3.11 The traffic model will also be updated to reflect changes since the assessment prepared for the 2021 HRA:

- Updated assumptions on electric vehicle usage within Defra’s Emission Factor Toolkit (EFT version 11); and
- Removal of Binbury Park development from traffic model (previously included as an application had been submitted but not recommended for approval).

3.12 Further details on these mitigation measures and updates to the model are provided in **Appendix C**.

3.13 The removal of Binbury Park from the model, in particular, is expected to have a significant effect on modelled nitrogen deposition. The Jacobs memorandum states that: “Comparing the 2037 traffic scenarios with and without the Binbury Park, result shows reductions in traffic along the A249 from around 300 to 500 total vehicles per hour for both directions in the AM Peak and 400 to 700 total vehicles per hour for both directions in the PM Peak [a reduction on the traffic flows presented in the September 2021 HRA]. Although the air quality assessment is yet to be completed, it is believed that these reductions in traffic due to the removal of Binbury Park will reduce the impacts of nitrogen emission and the associated increase in nitrogen deposition to the North Downs Woodland SAC along the A249.”

3.14 The mitigation measures and updates are yet to be modelled; however, the intention of the Council is to agree a mitigation strategy with Natural England before the Local Plan Review is adopted. This will be agreed and referenced in a Statement of Common Ground between MBC and Natural England. Once the mitigation strategy has been agreed, it will be possible to conclude that there will not be adverse effects on the integrity of North Downs Woodland SAC as a result of air pollution from traffic.

Conservation:
<http://publications.naturalengland.org.uk/file/5579173532008448>

² European Site Conservation Objectives:
Supplementary advice on conserving and

restoring site features
North Downs Woodlands Special Area of Conservation (SAC):
<http://publications.naturalengland.org.uk/file/5280120969625600>
³ Up to date at March 2022

Chapter 4

Conclusions

4.1 In response to comments from Natural England on the Local Plan Review (Regulation 19) HRA, further work has been undertaken in relation to nutrient neutrality at Stodmarsh SAC, SPA and Ramsar site, and air pollution at North Downs Woodland SAC.

4.2 It is considered that there are no major issues outstanding, with regards the issues raised by Natural England. However, the nutrient calculations will need to be revised in line with the updated nutrient neutrality methodology. Based on the work undertaken to date, it is expected that it will be possible to demonstrate certainty of mitigation such that there will not be an adverse effect on the integrity of Stodmarsh SAC, SPA and Ramsar site from the Local Plan Review.

4.3 The mitigation strategy to address air pollution from traffic at North Downs Woodland SAC is in preparation and further work is required to test the identified suite of mitigation measures and update the traffic modelling and air quality assessment. The intention of the Council is to agree the mitigation strategy with Natural England before the Local Plan Review is adopted. Once agreed, it will be possible to conclude that there will be no adverse effects on the integrity of North Downs Woodland SAC from the Local Plan Review.

4.4 The HRA will be updated prior to the adoption of the Local Plan Review, to reflect the air quality mitigation strategy, once agreed.

Appendix A

Natural England's Reg.19 representation

A.1 Natural England provided comments on the Local Plan Review (Regulation 19), on 10 December 2021. Comments relevant to the HRA are reproduced below:

Stodmarsh SAC, SPA and Ramsar

The appropriate assessment concludes for the Stodmarsh SAC, SPA and Ramsar site that your authority is able to ascertain that the local plan will not result in adverse effects on integrity. Having considered the assessment, and the measures proposed to mitigate for any adverse effects, it is the advice of Natural England that it is not possible to ascertain that the proposal will not result in adverse effects on the integrity of the Stodmarsh SAC, SPA and Ramsar site due to there not being the sufficient level of scientific certainty required at the appropriate assessment stage.

Natural England advises that the following further additional information is required in order to have the certainty required that the mitigation provided to ensure nutrient neutrality for the Stodmarsh SAC, SPA and Ramsar site is sufficient:

- Information and evidence to support assumptions used, including assumptions on occupancy rates and their long term stability and removal rates for wetlands.
- Information on the location of the proposed wetlands to ensure the areas of mitigation are draining relevant areas of mitigation land/ WwTW so will function effectively.
- Clarity on the size of the wetlands being proposed. In order to be effective wetland's need to be at least 2 hectares in size as explain in Natural England's Nutrient Neutrality Methodology⁴ (November 2020)
- Any additional hydraulic loading or nutrient loading calculations undertaken for wetlands or bespoke mitigation.
- Clarification of how long term management of any mitigation land, in particular wetland will be secured.

⁴ Natural England (2020) Advice on Nutrient Neutrality for New Development in the Stour Catchment in Relation to Stodmarsh Designated Sites - For Local Planning Authorities

November 2020,
https://maidstone.gov.uk/__data/assets/pdf_file/0004/377239/Stodmarsh-Nutrient-Neutral-Methodology-NOV-2020.pdf

- Maps, locations, or identification of how any mitigation that is not within the council's ownership will be secured.
- Any information on winter maintenance programmes or other information material to water quality assessment that may impact the efficacy of proposed nutrient removal systems. - Without this information we do have sufficient certainty to agree with the conclusion of no adverse impact on integrity. However we hope this information is helpful and are very willing to work with Maidstone Borough Council to ensure that the Appropriate Assessment can have the sufficient evidence to conclude no adverse impact on integrity once this further information is provided.

North Downs Woodlands SAC

The appropriate assessment concludes for the North Downs Woodland SAC that your authority is able to ascertain that the proposal will not result in adverse effects integrity. Having considered the assessment, and the measures proposed to mitigate for any adverse effects, it is the advice of Natural England that it is not possible to ascertain that the proposal will not result in adverse effects on the integrity of North Downs Woodland SAC due to there not being the sufficient level of scientific certainty required at the appropriate assessment stage.

The mitigation for the North Downs Woodland SAC is that a 'mitigation strategy may need to be agreed with Natural England as it may not be sufficient to simply minimise traffic from new development'. It is Natural England's opinion that to say a mitigation strategy will be agreed, is not enough certainty at this stage of a local plan. We are very willing to work with Maidstone Borough Council to ensure there is a sufficient, evidence based, mitigation strategy for North Down Woodlands SAC, which has been agreed by all relevant consultees. However, this must be done before the local plan can proceed.

Appendix B

Technical note: Heathlands and Lenham Broad Locations - Nutrient neutrality assessment and mitigation proposals

B.1 Technical note prepared by Arcadis, March 2022.

SUBJECT
Heathlands GC and Lenham Broad - Nutrient
Neutrality Assessment and Mitigation Proposals

DATE
18 March 2022

DEPARTMENT
Water Management & Resilience

COPIES TO

Jason Hobbs (Homes England)
Philip Coyne (Maidstone BC)
Helen Garnett (Maidstone BC)
Kevin Radford (Mace)

TO
Amy Croombs (Natural England) and Kate Chandler
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OUR REF
10054034-AUK-XX-XX-RP-CW-0001-P2

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1. Introduction

This technical note has been prepared on behalf of Homes England and Maidstone Borough Council (MBC) to summarise Arcadis's latest findings of the nutrient budget calculations and associated mitigation proposals to demonstrate that Nutrient Neutrality can be achieved at the proposed Heathlands Garden Community (GC) Framework Masterplan and Lenham Broad Site Allocations, to inform Maidstone Local Plan Review - Draft Plan for submission (Regulation 19) Habitats Regulations Assessment. A location plan of is provided in **Appendix A Figure 1**.

Arcadis have been appointed by Homes England in February 2022 to review and redevelop the previous Nutrient Neutrality Assessment¹, as part of Maidstone Local Plan Review, which was subsequently rejected by Natural England (NE) in their letter (dated 10th December 2021). This is because NE advised MBC that it is not possible to ascertain that the Local Plan will not result in adverse effects on the integrity of Stodmarsh Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar site, and the North Downs Woodlands SAC, due to there not being the sufficient level of scientific certainty at the Appropriate Assessment stage. In the absence of enough certainty to ensure no adverse effects on the integrity of internationally designated sites, NE determined that the Maidstone Local Plan to be unsound due to not being based on proportionate evidence and therefore not justified.

NE's letter is appended in **Appendix B** of this Technical Note, and it states that the following additional information is required to demonstrate that the proposed Local Plan Site Allocations are nutrient neutral to avoid an adverse impact on the Stodmarsh SAC, SPA and Ramsar sites:

- Information and evidence to support assumptions used, including assumptions on occupancy rates and their long-term stability and removal rates for wetlands.
- Information on the location of the two proposed wetlands to ensure the areas of mitigation are draining relevant areas of mitigation land/ Wastewater Treatment Works (WwTW) so will function effectively.
- Clarity on the size of the wetlands being proposed. In order to be effective, wetlands need to be at least 2 hectares in size as explained in Natural England's Nutrient Neutrality Methodology (November 2020)
- Any additional hydraulic loading or nutrient loading calculations undertaken for wetlands or bespoke mitigation.
- Clarification of how long-term management of any mitigation land, in particular wetland will be secured.
- Maps, locations, or identification of how any mitigation that is not within the council's ownership will be secured.
- Any information on winter maintenance programmes or other information material to water quality assessment that may impact the efficacy of proposed nutrient removal systems.

¹ Ramboll, Heathlands Garden Community Nutrient Neutrality Assessment, September 2021. Available at: <https://drive.google.com/file/d/1jtF3oRuq7AN1EQ4cUstFfg-wpEVB4VnN/view>

Therefore, this Technical Note aims to address the above key points based on the following guidance and clarifications received, including our recent experience in undertaking similar nutrient neutrality assessments and Habitat Regulation Assessments for Local Plans and Strategic Site Allocations:

- NE's published latest guidance on Nutrient Neutrality for new development in the Stour Valley Catchment in relation to the Stodmarsh Designated Sites for Local Planning Authorities, November 2020².
- Consultation meeting held on 25th February 2022 between MBC, NE, Homes England and Arcadis, to discuss the key requirements stated above and the best approach to remove NE's objection. During this consultation, NE confirmed that their stated requirement on mitigation wetlands needing to be at least 2 ha in size is no longer an essential criterion although any wetlands smaller than 2 ha should be still preferably linked to nearby wetlands where this is possible. Also, the currently assumed occupancy rate of 2.4 as per NE's published guidance is acceptable for the current Local Plan / Heathlands Framework Masterplan Stage and further details on occupancy rates, development phasing, detailed wetland designs/nutrient removal rates etc. can be provided at the subsequent planning application stages provided that the current design assumptions and mitigation proposals include sufficient precautionary buffers.

Whilst finalising this Technical Note NE has published on the 16th March its new nutrient neutrality guidance (including a nutrient budget calculator) to the impacted Local Authorities in the Stodmarsh catchment area, but the implications of this new guidance has not been looked at by this Technical Note. It is expected that this will be addressed by an addendum to this Technical Note, if needed.

2. Background to the Issue

Excessive nutrient levels (nitrogen and phosphorous) can negatively impact on the Stodmarsh SAC, SPA and Ramsar site. The site is also designated as a Site of Special Scientific Interest (SSSI) and National Nature Reserve (NNR). Information has recently emerged related to existing water quality impacts (eutrophication) on the designated sites, caused by high nutrient levels including nitrogen and in particular phosphorus. NE believes that the latter originates mainly from the permitted wastewater discharges into the River Stour and a detailed Water Industry National Environment Programme (WINEP) investigation is currently underway by Southern Water, which will report its findings in 2022.

However, increased nutrient enrichment can arise from both, point and non-point sources (also called 'diffusive pollution sources'):

- Point source pollution: Pollution that comes from contaminants that enter a waterway from a single identifiable source such as stationary locations or fixed facilities. Examples are discharges from a WWTW or industrial plants and fish farms.
- Non-point source pollution: Pollution from widespread including human activities with no specific point of discharge or entry into receiving watercourses. Examples are leaching out of nitrogen compounds from fertilized agricultural lands and losses from atmospheric deposition.

As stated in NE advice to planning authorities, proposed developments that would result in a net increase in population served by a wastewater system should be nutrient neutral to remove uncertainty as to whether they might contribute to the unfavourable water quality at Stodmarsh, and thus facilitate their compliance with the Conservation of Habitats and Species Regulations (CHSR) (2017). In practice, this means that the key nutrients (nitrogen and/or phosphorus) from all surface water runoff and wastewater generated by the proposed development must be less than or equal to the nutrients generated by the existing land uses and wastewater discharges. Any development being approved for development through the planning process that is not nutrient neutral could be deemed to contravene the CHSR and the approving planning authority be at risk of judicial review because of an objection by NE.

² Natural England, Advice on Nutrient Neutrality for New Developments in the Stour Catchment in Relation to Stodmarsh Designated Sites – for Local Planning Authorities, November 2020. Available at: <https://www.ashford.gov.uk/media/l3dgnfyu/stodmarsh-nutrient-neutral-methodology-november-2020.pdf>

The Heathlands GC and associated Lenham Broad Site Allocations lie at the north-western edge of the Upper Great Stour catchment and therefore falls under the NE requirements. Development at the proposed Local Plan Site Allocations must therefore be nutrient neutral, and where this is not the case, mitigation must be provided on-site or through other means (such as off-site mitigation or financial contribution to third party strategic schemes) to comply with NE’s nutrient neutrality requirements and be compliant with the CHSR. In order to demonstrate a site’s nutrient neutrality, NE has developed a methodology of assessment which also provides guidance on potential options for mitigation.

Therefore, to overcome the current objection to Maidstone Local Plan from NE as highlighted in Section 1 above, this nutrient neutrality method has been applied and is discussed in more detail in Section 4 first to calculate a nutrient budget for the Heathlands GC and impacted Lenham Broad Site Allocations, and then to inform the nutrient mitigation proposals and maintenance requirements that are discussed in Section 5 and Section 6 respectively.

The Water Framework Directive (WFD) (Commission of the European Communities, 2000) also establishes a framework for a European-wide approach to action in the field of water policy. The Environment Agency (EA) Catchment Data Explorer website has water quality data relating to the WFD targets for 2027. Based on the most recent water quality data recorded in 2019, the Upper Great Stour that the proposed Site Allocations lie was classified as ‘Bad’ for Ecological Status and ‘Fail’ for Chemical Status. The overall waterbody was classified as a ‘Bad’ rating. Therefore, there is some risk that the development proposals can also be potentially constrained by the current WFD status in the Upper Great Stour, which is an important consideration although not directly linked to this Nutrient Neutrality Assessment and associated Habitat Regulation Assessment.

3. Proposed Development

The Heathlands GC Framework Masterplan³ for the proposed garden village includes up to 5000 new residential homes and associated non-residential uses/infrastructure, covering an area of 148.02ha with a further 184.6ha as dedicated Suitable Area of Natural Green (SANG), giving a total area of 332.62ha.

The Heathlands GC Framework Masterplan looks to deliver a new district centre, local centre as well as employment opportunities and two new primary schools. A summary of the approximate land budget for each land use type is outlined in Table 1.

Table 1 Indicative Land Budget at Heathlands GC Framework Masterplan

Land Use Type	Area (ha)
Developable Area	137.72
Primary Road	9.60
Existing Development	0.05
Existing Road	0.65
Open Space	166.21
SuDS Drainage	18.39
Total	332.62

³ Maidstone Borough Council & Homes England, Heathlands Garden Community Framework Masterplan – Pre-Reg19 Submission, August 2021. Available at: <https://drive.google.com/file/d/1wyRTM0GloQnM8kiabwJljYuDYaXR3G8K/view>

As shown in **Appendix A Figure 1**, several other sites within the vicinity of Lenham are also currently proposed, as part of the emerging Maidstone Local Plan⁴ and Lenham Neighbourhood Plan⁵. Proposed Lenham Broad Site Allocations are summarised in Table 2 overleaf, which gives a total of 844 housing units in the emerging Local Plan supply balance. These Lenham Broad sites (including Heathlands GC) fall within the catchment of existing Southern Water Lenham WwTW, therefore increasing the nutrient load into the impacted receiving River Stour catchment.

The existing Lenham WwTW does not have capacity to take additional load from the total 5,844 houses, and this is recognised by MBC and Homes England by making provision for constructing a new WwTW at Heathlands GC, whilst giving opportunity to also service the needs of Lenham Broad Site Allocations. The existing Lenham WwTW will be retained and continue to provide its service to the Lenham area. The existing permit requires that the WwTW discharges effluent with a maximum concentration of 1 mg/l of total phosphorus ('TP') but does not contain limits in terms of total nitrogen ('TN'). It is also expected that the TP permit limit at Lenham WwTW will be reduced to 0.5 mg/l by 2024.

Table 2 Lenham Broad Site Allocations

Site No.	Site Name	Total Site Area (ha)	Local Plan Supply Balance (Housing Units)	Within Stour Catchment (Yes/ No)
1	Land South of Old Ashford Road	11.89	85	Yes
2	Land West of Headcorn Road and north of leading green	3.96	57	Yes
3	Land East of Old Ham Lane and South of the Railway	9.65*	230	Only 1.35ha is within Stour Catchment.
4	Land West of Headcorn Road	3.84	45	Yes
5	Land West of Old Ham Lane and North of the Railway	18.6*	275	No
6	William Pitt Field	1.88*	50	No
N/A	Tanyard Farm, Old Ashford Road	3.52	102	Yes

*Site number 3, 5 and 6 have not been included in the nutrient neutrality calculations for Heathlands GC and Lenham Broad Allocations as they fall outside of the Upper Great Stour Catchment. Note, the

⁴ Maidstone Borough Council, Local Plan Review – Draft Plan For Submission (Regulation 19), October 2021. Available at: <https://localplan.maidstone.gov.uk/home/documents/local-plan-review-documents/regulation-19/LPR-Regulation-19-Documents-25.10.21-Final-Copy.pdf>

⁵ Lenham Parish Council, Lenham Neighbourhood Plan 2017-2031, July 2021. Available at: <https://localplan.maidstone.gov.uk/home/documents/neighbourhood-plans/lenham/r19-20-adoption/Lenham-neighbourhood-plan-FINAL-SUBMISSION-LNP2-WEBSITE.pdf>

1.35ha of Site 3 which does fall within the Upper Great Stour Catchment has been included in the calculations.

4. Nutrient Budget Assessment

4.1 Overview

The excel calculation files used for the nutrient loading and budget assessment is attached in **Appendix C**, which includes the following information along with the key assumptions and parameters used in the calculations:

- Worksheet 1 – Key Input Data
- Worksheet 2 – Nutrient Budget Calculations for the Albion Water Onsite WwTW option. These are largely based on the previous consultation and nutrient neutrality assessment undertaken by Ramboll, using a Total Phosphorus (TP) permit standard of 0.5mg/l and Total Nitrogen (TN) permit standard of 15 mg/l
- Worksheet 3 – Nutrient Budget Calculations for an alternative Severn Trent Connect Onsite WwTW option. These are based on more recent consultation by Arcadis, using a more tighter TP discharge permit standard of 0.1 mg/l and TN of 7.2 mg/l
- Worksheet 4 – Wetland Mitigation Requirement Summary for both Albion Water and Severn Water Onsite WwTW options
- Worksheet 5 – Existing Land Type Information Used in the Assessment
- Worksheet 6 – Proposed Land Use Type Information Used in the Assessment
- Worksheet 7 – Proposed Wetland Details and Preliminary Hydraulic Loading Assessment

The nutrient budget assessment in **Worksheet 2** (Albion Water Option) and **Worksheet 3** (Sevent Trent Connect Option) follows the following principal four-staged approach described in NE's published nutrient neutrality guidance:

- **Stage 1** - Calculate the developments' total nutrients loading that would be discharged (via wastewater treatment works) into the Stour catchment;
- **Stage 2** - Calculate existing (pre-development) nutrients loading from the current land use of the development site;
- **Stage 3** - Calculate nutrients loading for the future land uses proposed for the development site; and
- **Stage 4** - Calculate change in total nutrients loading as a result of the proposed development

A summary of the nutrient loading for Stages 1 - 3 and the nutrient budget estimated at Stage 4 is given below.

4.2 Stage 1 Future WwTW Nutrient Loading

The increased population for the total 5844 new dwellings is 14025.6 persons, with the assumed occupancy rate of 2.4. The total wastewater volume generated by the development is 1542816 l/d (or 1542.8 m³/d) using a Per Capita Consumption (PCC) rate of 110 l/p/d, as per the NE guidance.

The assumed discharge permit standards for the TP and TN based on the consultations undertaken to date with potential New Appointment Variation (NAV) companies, together with the resultant nutrient loading for potential onsite WwTW options assessed are shown in Table 3 below.

Table 3 Existing Land Types and Nutrient Loss Rates within Heathlands GC

Description	Albion Water Onsite WwTW Option	Severn Trent Connect Onsite WwTW Option
TN permit	15 mg/l	7.2 mg/l
TP permit	0.5 mg/l	0.1 mg/l
90% of TN permit	13.5 mg/l	6.48 mg/l
90% of TP permit	0.45 mg/l	0.09 mg/l
Daily wastewater TN load	20828016 mg/ TN/day	9997447.68 mg/ TN/day
Daily wastewater TP load	694267.20 mg/TP/year	138853.44 mg/TP/year
Annual wastewater TN load	7602.23 kg/ TN/year	3649.07 kg/ TN/year
Annual wastewater TP load	253.41 kg/TP/year	50.68 kg/TP/year

As highlighted before, TP and TN permit levels for the Albion Water option are taken as per the information presented in Ramboll's Nutrient Neutrality Assessment, based on their preliminary consultations undertaken with NAV. However, Ramboll's report also recognizes that potentially lower levels could be achieved, and this will be pursued through the later stages of masterplanning and design of the Garden Community.

Arcadis have undertaken more recent consultations with Severn Trent Connect (see Appendix D), who have also agreed in principle that they could provide the required levels of nutrient removal to aid the proposed developments with meeting NE's Nutrient Neutrality requirements. A detailed design of the facility has not yet been commissioned, however Severn Trent Connect have proposed to construct a state-of-the-art wastewater treatment plant utilising a batch-type process, which can also optimise space savings. The process achieves TP levels near the technically achievable limit without addition of chemical flocculation and removal, however the process will be configured to allow for bolt-on technologies to meet the most stringent permits (up to 0.1mg/l TP if required). Furthermore, process parameters can be adjusted to achieve reduction of Total Nitrogen to 7.2mg/l if required. The footprint of the facility is likely to be less than 9,600m² based on developments of similar sizes; this assumes the facility will be built in multiple stages for the efficient deployment of capital over the duration of the developments. The optimal number of phases will be determined during the outline design process, in consultation with EA, Homes England and MBC.

4.3 Stage 2 Baseline Land Use Nutrient Loading

The existing land use within the area impacted by Heathlands Framework Masterplan boundary is predominately agricultural use or greenfield in nature although it includes 25ha of existing urban development including roads, residential and extractive industry. **Appendix A Figure 2** shows the existing land type categories for the proposed Site Allocations. This information is also summarised for the Heathlands Framework Masterplan and Lenham Broad Sites in Table 4 and Table 5 below respectively, along with their assumed nutrient loss rates, as per NE's published guidance.

Table 4 Existing Land Types and Nutrient Loss Rates within Heathlands GC

Existing Land Type	Area (ha)	Average Nitrogen Loss Rate - Kg/ha/year	Total (TN) -	Average Phosphorus Loss Rate - Kg/ha/year	Total (TP) -
Arable - Cereals	244.44		27.3		0.36
Lowland Grazing Livestock	18.16		12.2		0.24
Woodland	15.17		5.0		0.02
Arable - General Cropping	10		27.9		0.28
Other Grassland/Greenfield - Open space (grassland/scrub, not in agricultural use)	26.18		5		0.14
Mixed Urban Area - (roads, non-agricultural residential development, extractive industry)	18.67		14.3		0.83
Total Area	332.62				

Table 5 Existing Land Types and Nutrient Loss Rates within Lenham Broad Sites

Lenham Broad Developments	Existing Land Type	Area (ha)	Average Nitrogen Loss Rate - Kg/ha/year	Total (TN) -	Average Phosphorus Loss Rate - Kg/ha/year	Total (TP) -
Site 1	Arable - Cereals	11.89		27.3		0.36
Site 2	Woodland	3.96		5		0.02
Site 3	Arable - Cereals	1.35		27.3		0.36
Site 4	Woodland	0.10		5		0.02
	Open Grazing, not in agricultural use	3.74		12.2		0.24
Tanyard Farm, Old Ashford Road	Arable - Cereals	3.52		27.3		0.36
Total Area		24.56				

4.4 Stage 3 Future Land Use Nutrient Loading

Appendix A Figure 3 shows the proposed land use types at Heathlands GC (based on the currently published Framework Masterplan), including the latest wetland proposals identified during this study. This information is summarised in Table 6 below, along with their assumed nutrient loss rates as per NE's published guidance. Table 7 then summarises the similar information for the impacted Lenham Broad Site Allocations within the Stour Catchment.

Table 6 Proposed Land Types and Nutrient Loss Rates Within Heathlands Framework Masterplan

Proposed Land Type	Area (ha)	Average Total Nitrogen Loss Rate - Kg/ha/year	Total (TN) - Kg/ha/year	Average Total Phosphorus Loss Rate - Kg/ha/year	Total (TP) - Kg/ha/year
Urban Area	148.02	14.3		0.83	
Suitable Alternative Natural Greenspace (SANG), including SuDS	125.89	5		0.14	
Community Farm/Allotment	2.27	23.5		0.28	
Mitigation Woodlands	40.53	5		0.02	
Mitigation Wetlands ¹	15.91 ²	N/A		N/A	

Total Area 332.62

¹ Assumed no loss rates for TN and TP for wetlands to avoid double counting as they are included as mitigation measures.

² The total proposed wetland area is 21.21ha, however, only 75% of this is taken as effective treatment area to account for the required earth reprofiling and bunds.

Table 7 Proposed Land Types and Nutrient Loss Rates Within Lenham Broad Developments

	Proposed Land Type	Area (ha)	Average Total Nitrogen Loss Rate - Kg/ha/year	Total (TN) - Kg/ha/year	Average Total Phosphorus Loss Rate - Kg/ha/year	Total (TP) - Kg/ha/year
Site 1	Urban Area	4.37	14.3		0.83	
	Suitable Alternative Natural Greenspace (SANG)	7.52	5		0.14	
Site 2	Urban Area	2.81	14.3		0.83	
	Suitable Alternative Natural Greenspace (SANG)	1.15	5		0.14	
Site 3	Urban Area	1.31	14.3		0.83	
	Suitable Alternative Natural Greenspace	0.04	5		0.14	

	Proposed Land Type	Area (ha)	Average Total Nitrogen Loss Rate - Kg/ha/year	Average Total Phosphorus (TP) Loss Rate - Kg/ha/year
	(SANG)			
Site 4	Urban Area	3.59	14.3	0.83
	Suitable Natural (SANG) Alternative Greenspace	0.25	5	0.14
Tanyard Farm, Old Ashford	Urban Area	3.06	14.3	0.83
	Suitable Natural (SANG) Alternative Greenspace	0.46	5	0.14
	Total Area	24.56		

4.5 Stage 4 Nutrient Budget

Table 8 below summarises the estimated nutrient budget requirement for WwTW options, which includes a 20% buffer as per the Natural England's guidance.

It also shows the calculations for the following three situations for each WwTW option:

- Combined nutrient load from both WwTW and land use discharges
- Nutrient load from WwTW discharges only
- Nutrient load from Land Use discharges only

This was to better understand the influence of WwTW and land use runoff for identifying the best locations for the mitigation wetlands that is being discussed in Section 5.

Table 8 Nutrient Budget Assessment Summary for WwTW Options

WwTW Option	Combined Load From WwTW and Land Use		WwTW Load Only		Land Use Load Only	
	TN (Kg/year)	TP (Kg/year)	TN (Kg/year)	TP (Kg/year)	TN (Kg/year)	TP (Kg/year)
Albion Water	3728	353	9123	304	-5394*	49
Severn Trent Connect	-1016	110	4379	61	-5394*	49

*Negative values mean that there is a net reduction in nutrients and there is no need to provide any offsetting mitigation measures

5. Preliminary Nutrient Mitigation Options

5.1 Nutrient Mitigation

Table 9 below summarises the indicative total area of the new wetlands required to offset the nutrient loading surplus shown in Table 8. Whilst wetlands are considered to be an effective nature-based nutrient mitigation solution that can provide multiple benefits they are opposite of wastewater treatment batch type processes in terms of space requirements.

Table 9 Mitigation Wetland Requirement Summary for WwTW Options

WwTW Option	Combined Load From WwTW and Land Use		WwTW Load Only		Land Use Load Only	
	TN ¹ (Kg/year)	TP ² (Kg/year)	TN ¹ (Kg/year)	TP ² (Kg/year)	TN ¹ (Kg/year)	TN ² (Kg/year)
Albion Water	4.0	29.4	9.8	25.3	N/A	4.1
Severn Trent Connect	N/A	9.1	4.7	5.1	N/A	4.1

¹ Assumed TN removal rate of 93 g/m²/yr for both wastewater and stormwater discharges, which is a well-accepted figure as a Median Removal rate.

² Assumed TP removal rate of 1.2 g/m²/yr for both wastewater and stormwater discharges, which is a well-accepted figure as a Median Removal rate.

The above highlights that Severn Trent Connect option requires a significantly lesser amount of wetlands compared to Albion Water option due to the higher wastewater quality standards being applied. This is an important factor as wetlands (as a process treatment) have limitations in terms of the final effluent quality provided (which will depend on the levels of C/N/P required). The stricter are these levels, the more alternative treatment to complement wetlands performance may be required. It also shows that with Severn Trent Connect option the wetland mitigation is more evenly split for removing TP between WwTW and Land Use discharges. Whereas, with Albion Water option, approximately 88% of the wetland requirement is associated with removing TP from WwTW discharges.

Also, as highlighted in Section 2, the most recent water quality data recorded in 2019, the WFD status for the Upper Great Stour was classified as 'Bad' for Ecological Status and 'Fail' for Chemical Status. The overall waterbody was classified as a 'Bad' rating. The Environment Agency will use WFD compliance as a key requirement when determining the new discharge permitting standards for the WwTW, which also means that there is clear risk of a very tight discharge permit may be needed for the extra discharges from the proposed Onsite WwTW.

The currently applied TP and TN values with Severn Trent Connect option are more in line with such a tight future discharge permit although detailed discussions with the EA permitting team is yet to take place to confirm this. Therefore, Severn Trent Connect onsite WwTW option is clearly the more favourable option for achieving nutrient neutrality as well as addressing WFD compliance unless Albion Water can also achieve a higher TP and TN standards than what is currently being assumed.

5.2 Wetland Proposals and Site Conditions

Arcadis team has currently identified potential locations to provide up to 21.21ha of new wetlands within the Heathlands Framework Masterplan, as illustrated in **Appendix A Figure 3**. The drainage zones and proposed wetland locations are also provided in **Appendix A Figure 4**.

Worksheet 7 of the excel calculation files in Appendix C and Table 10 overleaf summarise the hydraulic loading estimates and other key information related to the proposed wetlands. In line with Natural England's guidance, wetland sizes have been optimised where possible to maximise their nutrient removal efficiency by interlinking them and integrating them with wider SuDS and drainage network, to collectively provide a larger wetland area whilst maintaining sufficient base flow through the system.

Four separate main wetland areas have been identified at strategic locations to ensure that the discharges from the onsite WwTW and different drainage zones are suitably intercepted and treated. This demonstrates that it is technically feasible to accommodate the required wetland areas shown in Table 9 to ensure that the entire Heathlands Framework Masterplan and Lenham Broad Site Allocations are fully nutrient neutral.

Wetland 1 is placed near to the currently proposed Onsite WwTW location and provide additional tertiary treatment to the WwTW discharges. It also provides further water quality treatment to the land use runoff from the surrounding SuDS network that serves Drainage Zones A and C in Heathlands GC. It is currently envisaged that this would be mainly an offline wetland system although some parts in the low-lying areas adjoining River Upper Great Stour can be designed as online features, if needed to maximise wider benefits. For example, this would then enable treating some runoff from the existing urban and agricultural areas north of High Speed 1 Rail Line (i.e., upstream Wetland 1 wider catchment) as well as the Lenham Broad Site Allocations (e.g., Drainage Zones A1 and A2).

Wetland 2 is located at the eastern end of Heathlands GC immediately north of High Speed 1 Rail Line and provides further water quality treatment to the land use runoff from the surrounding SuDS network that serves Drainage Zones B, including upstream Wetland 2 wider catchment.

Wetland 3 is in the proposed country park south of M20 and mainly provides further water quality treatment to the land use runoff from Drainage Zones D and H. However, it also has the potential to treat agricultural runoff from the upstream wider River Great Stour Catchment (including Drainage Zones D1, D2 and D3) provided that the EA, Kent County Council (KCC) and NE would agree to divert some flows into this interlinked wetland system (i.e., when the river is not at flood conditions) and remove nutrients, prior to discharging treated flows back to the River Great Stour at the eastern end of the country park. This can also enhance amenity and ecological benefits of the wetlands and country park. However, this would require an abstraction licence from the Environment Agency, who may potentially object to this proposal if this can exacerbate the existing low flow conditions and negative ecological impacts in the River Upper Great Stour. As a minimum, the extra Dry Weather Flow discharge (1543 m³/d or 18 l/s) from the Onsite WwTW can be abstracted from River Great Stour into the Wetland 3.

Alternatively, discharges from the onsite WwTW and a large part of Heathlands GC SuDS network can be treated at Wetland 3, but this would require some pumping and micro-tunnelling under M20 and High Speed 1 Rail Line to construct the required discharge pipelines. If pumping into this wetland is complicated in terms of civil engineering and cost constraints, there may be possibility to improve other wetlands without increasing the required area. Recent advancements on Wetlands/Reedbeds are the so-called Forced Bed Aeration (FBA) with which we can improve the treatment capacity up to 15 times. <https://armreedbeds.co.uk/projects/forced-bed-aeration/>. There is also some potential to relocate the Onsite WwTW to the country park area, if the tanker access etc. can be provided through the existing road network over M20, which needs further investigation at the detailed masterplanning stage.

Wetland 4 is located at the most eastern end of the country park area and mainly provides further water quality treatment to the land use runoff from Drainage Zones E, E1, G and I, including the downstream

Wetland 4 wider catchment. This will require diversion of some low flows from the existing tributary into the Wetland 4 and return the treated flows back to the Upper Great Stour at the downstream end of this wetland. This wetland location falls within the River Stour Internal Drainage Board Jurisdiction and will require their approvals to this proposal as well as an abstraction licence from the Environment Agency to divert low flows. This area has also been designated as “good quality, semi-improved grassland” under Natural England’s Priority Habitat Inventory (PHI)⁶. This dataset provides a generalised map of the priority datasets within an area. In this case, the creation of Wetland 4 would mean that a large portion of this habitat would be lost. However, the wetland itself can be designed to provide an improved alternative wetland habitat in this area. The inclusion of this wetland also highly supports the developments aim for biodiversity net gain.

A review of the underlying bedrock geology (Figure 1) shows that the southern half of the Proposed Development is underlain by Lower Greensands, which is a highly productive aquifer. A review of Cranfield Soilsapes⁷ mapping shows that the underlying soil in the southern half of the Proposed Development freely draining, slightly acidic soils. The northern part of the Proposed Development is underlain by slowly permeable, seasonally wet slightly acid but base-rich loamy and clayey soils.



Figure 1: Bedrock Geology

Wetlands 3, 4 and part of wetland 1 are in the southern portion of the site where underlying ground is Lower Greensands. These wetlands are strategically located in this manner to provide the optimal effect for treating nutrients whilst responding to the existing masterplan constraints and opportunities as well as the site topography that dictate the drainage routes. However, permeable ground conditions associated with Lower Greensands are not favourable to retain the permanent water required in the proposed wetlands to maintain wetland plants and provide sufficient treatment for efficient nutrient removal. Therefore, it is essential that a detailed ground investigation is carried out prior to any detailed design to determine the ground conditions in the immediate zone that will be impacted by the proposed

⁶ Natural England (2021). Priority Habitat Inventory (England). Available at: <https://data.gov.uk/dataset/4b6ddb7-6c0f-4407-946e-d6499f19fcde/priority-habitat-inventory-england>
⁷ Cranfield Soil and Agrifood Institute. Soilsapes. Available at: <http://www.landis.org.uk/soilsapes>

wetlands and whether they also require an artificial impermeable membrane (clay or geomembrane) to restrict water from freely percolating into the underlying soils.

On the other hand, the northern half of the Proposed Development is underlain by Gault formation, which are rocks with essentially no groundwater, and slowly permeable, clayey soils. The majority of Wetland 1 and all of wetland 2 are underlain by this rock and soil type and therefore these conditions are more favourable for wetlands. However, as mentioned above, these proposed wetland areas would still be subject to a ground investigation as part of detailed design preparation, to determine the underlying soils and geology.

5.3 Hydraulic Loading

5.3.1 Stormwater Wetlands

Preliminary hydraulic loading calculations have been undertaken in line with EA's Guidance Manual for Constructed Wetlands, R&D Technical Report P2-159/ TR2 to provide treatment storage for the 15 mm first flush runoff from the contributing stormwater catchments. The estimated treatment depth is shown in the table below, which demonstrates that the preliminary proposals are technically feasible and able to provide sufficient level of treatment volume to accommodate the proposed development.

Table 10 Proposed Wetland Details Summary

Wetland Location Ref.	Indicative Wetland Footprint Area * (ha)	Storm Treatment Depth (m)	Average Wetland Depth (m)	Contributing Key Storm Drainage Zones	Comments
Wetland 1	6.07	0.43 (0.36**)	1.00m	Drainage Zones A, A1, A2 and C	Wetland 1 is made up of four smaller interlinked wetlands. W1a = 3.3ha, W1b = 1.1ha, W1c = 0.69ha and W1d = 0.96ha. Appendix A Figure 5 shows how these wetlands are connected around the WwTW.
Wetland 2	4.86	0.26 (0.24**)	0.85	Drainage Zone B	
Wetland 3	4.92	0.10	0.75	Drainage Zones D, D1, D2, D3 & H	
Wetland 4	5.36	0.16 (0.08**)	0.75	Drainage Zones E, E1, G & I	
Total Area	21.21				

*Only 75% of this total footprint area is taken as effective treatment area as providing effective treatment area for all four wetland locations when undertaking hydraulic loading calculations at this initial planning stages (i.e., as a precautionary basis) to account for the earthworks required for forming the wetlands and any shallow bunds.

** Values given in brackets denote the estimated treatment depths if wider drainage zones are not intercepted at the proposed wetlands

As highlighted before, the proposed offline storm wetlands are distributed across the Heathlands Framework Masterplan so that they are strategically located in the downstream section of the contributing catchment, prior to discharging flows to the receiving watercourses. In addition, upstream of these proposed wetlands there will be a series of linked SuDS features that will work together to provide further source control and water quality treatment, prior to discharging to the main wetlands. **Appendix A Figure 5** shows how the proposed wetland areas are broken down and linked to form the four major wetland areas. As mentioned previously, the calculated area for the required wetlands should be considered as a rough guide and indicative at this stage. Further analysis and design will be undertaken during the outline planning application and detailed design phase.

The current Heathlands Framework Masterplan includes over 18.39ha of such open surface SuDS features, which will help to maintain the required permanent baseflow within the proposed wetlands, ensuring the efficacy of their nutrient removal. However, some proposed wetland areas in this technical note overlaps with the current SuDS areas, which means 7.34ha of SuDS will still fall outside the four main wetland areas. Some of these remaining SuDS areas are sufficiently large features to create further multifunctional wetland areas during the detailed masterplanning stages so that they can provide both flood attenuation during large events and water quality treatment during more frequent events.

Similarly, the water permanently stored in proposed wetlands and SuDS can form a part of a rainwater recycling strategy for non-potable usage within Heathlands Garden Community to reduce potable water consumption. Therefore, this also enables the ability to circulate stored stormwater within the proposed linked SuDS and wetlands system to maintain sufficient baseflow for treatment efficacy, during periods of dry weather as required.

5.3.2 Wastewater Wetland

Table 9 showed that with Severn Trent Connect option, approximately 5.0ha of wetland area will be treated to sufficiently remove TP and TN from the extra wastewater discharges. Wetland 1 has a total footprint area of 6.1ha and can accommodate this requirement and there is some flexibility to extend this wetland at the detailed masterplanning stage, if more treatment area is essential. As mentioned in Section 5.2, wastewater discharges from the later development phases can be pumped to Wetland 3 in the country park although this will require micro-tunnelling under M20 and High Speed 1 Rail Line to construct the required discharge pipelines. Otherwise, onsite WwTW will need to be relocated in the country park area as well as constructing outfall sewers under M20 and High Speed 1 Rail Line, subject to the availability of suitable tanker access through the existing road network over M20.

Worksheet 7 of the excel calculation files in Appendix C shows that over 5 days of Hydraulic Retention Time (HRT) and a Hydraulic Loading Rate (HLR) of 0.06m/day can be achieved with the predicted total Dry Weather Flow wastewater volume of 1543m³/day from the proposed Site Allocations, if we were to only use Wetland Area W1a, which has an effective treatment area of 2.48ha for treating WwTW discharges (i.e., provided that it has an effective treatment depth of > 0.3m).

On the other hand, if the entire Wetland Area W1, which has an effective treatment area of 4.55ha is used for treating the WwTW discharges, then up to 12 days of HRT and HLR of 0.03m/day can be achieved with an effective treatment depth of 0.4m. The treated effluent from the onsite WwTW can be routed through the proposed Wetland 1a and spread among the surrounding wetlands (1b, 1c and 1d), prior to discharging to the Upper Great Stour although this may potentially involve small scale pumping facilities subject to available gravity drainage falls.

HRT's of 5-30 days and HLRs of <0.1m/day have been recommended (Wu et al., 2015). Shallow water depths (<0.5m) are also recommended to increase the contact time between effluent and wetland

sediment, whilst also keeping water oxygenated through good contact with the atmosphere (Wu et al., 2015). Therefore, this shows that recommended HRT and HLR can be achieved at Wetland W1 to provide effective treatment for sediment and nutrient removal from the wastewater discharges from the Onsite WwTW.

As highlighted before, only 75% of total wetland footprint area at Wetland 1 is taken as providing effective treatment area for all four wetland locations when undertaking hydraulic loading calculations at this initial planning stages (i.e., as a precautionary basis) to account for the earthworks required for forming the wetlands and any shallow bunds.

6. Implementation and Maintenance

An integrated water management solutions (e.g. SuDS, nutrient mitigation wetlands, floodplain enhancement, rainwater harvesting) will be designed and implemented ahead of each development phase, as well as working as a wider blue-green infrastructure network across the phases once the development has been completed. This creates a localised and self-sufficient water and nutrient management strategy for each phase, as well as an interconnected larger blue-green network.

A Maintenance Plan will be prepared, which should follow the recommended maintenance requirements for each of the SuDS components and nutrient mitigation wetlands as set out in CIRIA SuDS Manual⁸. Opportunities to combine landscaping maintenance with SuDS and wetlands maintenance should be identified to reduce the lifetime costs of the drainage system. The full details of adoption and maintenance arrangements and requirements for the proposed wetlands and SuDS will be confirmed ahead of discharging any relevant planning conditions.

The potential options for long-term ownership and maintenance of SuDS and wetlands are a 'Company Limited by Guarantee' or a 'Community Interest Company' as the preferred Governance Body, to ensure that those assets within the Governance Body are 'locked' and safeguarded for use in perpetuity, so any transfer of land ownership should require that specific terms and conditions are met.

A Company Limited by Guarantee would be the most flexible option and would not preclude the body being converted to a Community Interest Company at a later date, if that were ultimately to be a preference. Assets of a Company Limited by Guarantee could be transferred to other third-party bodies in the longer term, which could include charitable or other bodies as appropriate to the operation and management of assets. For those items which are identified as being the responsibility of the Governance Body (e.g., strategic parks and open space), long-term stewardship and governance can be undertaken by a new body established for this purpose.

The long-term adoption and management of the onsite WwTW, including the associated sewer infrastructure and wastewater wetland system will be provided by the appointed NAV. Based on our project experience on undertaking similar projects, Severn Trent Connect and Albion Water are also happy to adopt wetlands and strategic SuDS systems similar to those currently proposed at Heathlands GC.

Section 106 money should be allocated to ensure that suitable funds for maintenance activities of the proposed SuDS, wetlands and blue-green infrastructure would be available for the lifetime of the development.

Plants have an important role in wetland systems, which can directly affect the wastewater quality by improving various removal processes and consumption of phosphorous, nitrogen, and other elements⁹. Various studies have concluded that plants along the wetland system can lead to higher percentage of

⁸ Ciria, The SuDS Manual, available at https://www.susdrain.org/resources/SuDS_Manual.html

⁹ Vymazal, J. (2007) Removal of nutrients in various types of constructed wetlands. Science of the Total Environment, 380, 48–65

nitrogen and phosphorus being removed. One study concluded 15-80% and 24-80%¹⁰ reduction for nitrogen and phosphorus whereas another concluded 14.29%-51.89% and 10.76%-34.17%¹¹ respectively; there is a close relationship between nutrient content and increase in phytomass; the rapid increase in phytomass during the third and fourth months corresponded with high nutrient levels.

Since plants store significant amounts of nutrient and trace elements during their growth, periodic harvesting of the above-ground plant parts is a recommended practice to remove significant amounts of nutrients (mainly during the first 5 months of growth) from the wastewater flowing into the wetlands. Wetland plant species with high phytomass productivity and a well-developed root system and ability to withstand flooding are most productive in nutrient removal. Plant harvesting in wetlands generally has a positive effect on nutrient removal such as TN, TP, COD, and BOD.

Therefore, this method could be recommended as best wetland management practice to improve and maintain nutrient removal in constructed wetlands. Maintenance should also look to achieve ~20% open water, which is recommended as optimal pollutant removal (Almuktar et al. 2018). However, it should be noted that one study on the River Ingol wetland¹², where no maintenance has taken place five years after the construction, is still performing well with high levels of nutrient removal.

7. Summary

This technical note confirms that Heathlands GC Framework Masterplan and Lenham Broad Site Allocations in the emerging Maidstone Local Plan, can achieve Nutrient Neutrality based on the proposals presented in this Technical Note. This will be achieved mainly by:

- Direct treatment mitigation with the proposed Severn Trent Connect onsite WwTW option (based on average household occupancy rate of 2.4, Per Capita Consumption (PCC) rate of 110 l/p/d, TP limit of 0.1 mg/l and TN limit of 7.2 mg/l)
- Direct mitigation, which includes up to 21.21ha of onsite wastewater and stormwater wetlands, and 40.53ha of new onsite woodland planting
- Indirect mitigation, which includes changing existing agricultural land use to a lower nutrient use, such as stormwater SuDS, SANG and ecology/landscape mitigation

The proposed Heathlands GC Framework Masterplan and Lenham Broad Site Allocations will result in a net reduction in nutrients discharged from the Site. This is because the proposed onsite stormwater wetland areas in Heathlands GC can intercept and remove the nutrients from the proposed Site Allocations as well as the nutrients from some existing agricultural and urban areas outside the Heathlands GC.

No offsite wetland mitigation measures have been proposed as part of this Technical Note. However, there is a need to divert some low flows from the existing watercourses to the proposed onsite wetlands, which will need further discussion with the EA, KCC, NE and River Stour Internal Drainage Board.

At this stage of Local Plan and relatively early masterplanning, the nutrient budget estimates and requirements for the proposed wetland and woodland mitigation measures have been undertaken based on the median nutrient removal rates and nutrient export rates that are published in NE's Stodmarsh Nutrient Neutrality Guidance, along with other precautionary assumptions and approaches detailed in their guidance and in this document. There is also sufficient flexibility in the Heathlands GC Framework

¹⁰ Greenaway, M. and Woolley, A., 2001. Changes in plant biomass and nutrient removal over 3 years in a constructed wetland in Cairns, Australia. *Water Science and Technology*, 44(11-12), pp.303-310. <https://iwaponline.com/wst/article-abstract/44/11-12/303/7971/Changes-in-plant-biomass-and-nutrient-removal-over>

¹¹ Wu, H., Zhang, J., Li, C., Fan, J. and Zou, Y., 2013. Mass balance study on phosphorus removal in constructed wetland microcosms treating polluted river water. *CLEAN—Soil, Air, Water*, 41(9), pp.844-850. https://onlinelibrary.wiley.com/doi/pdf/10.1002/clen.201200408?casa_token=5uNWbphEaCEAAAAA:aXq7j7oblsZESaihpAEfRD4G4EmxYoib8COihJzawswb54OjN3mJ9_iIJ3bxq_88Ghc-wFWRzw8eA00m

¹² Cooper, R.J., Hawkins, E., Locke, J., Thomas, T. and Tosney, J., 2020. Assessing the environmental and economic efficacy of two integrated constructed wetlands at mitigating eutrophication risk from sewage effluent. *Water and Environment Journal*, 34(4), pp.669-678. <https://onlinelibrary.wiley.com/doi/epdf/10.1111/wej.12605>

Masterplan for locating the onsite WwTW and wetlands to maximise their optimal performance. The full details of adoption and maintenance arrangements, including the detailed designs for the proposed onsite WwTW, wetlands and SuDS will be confirmed ahead of discharging any relevant future planning conditions.

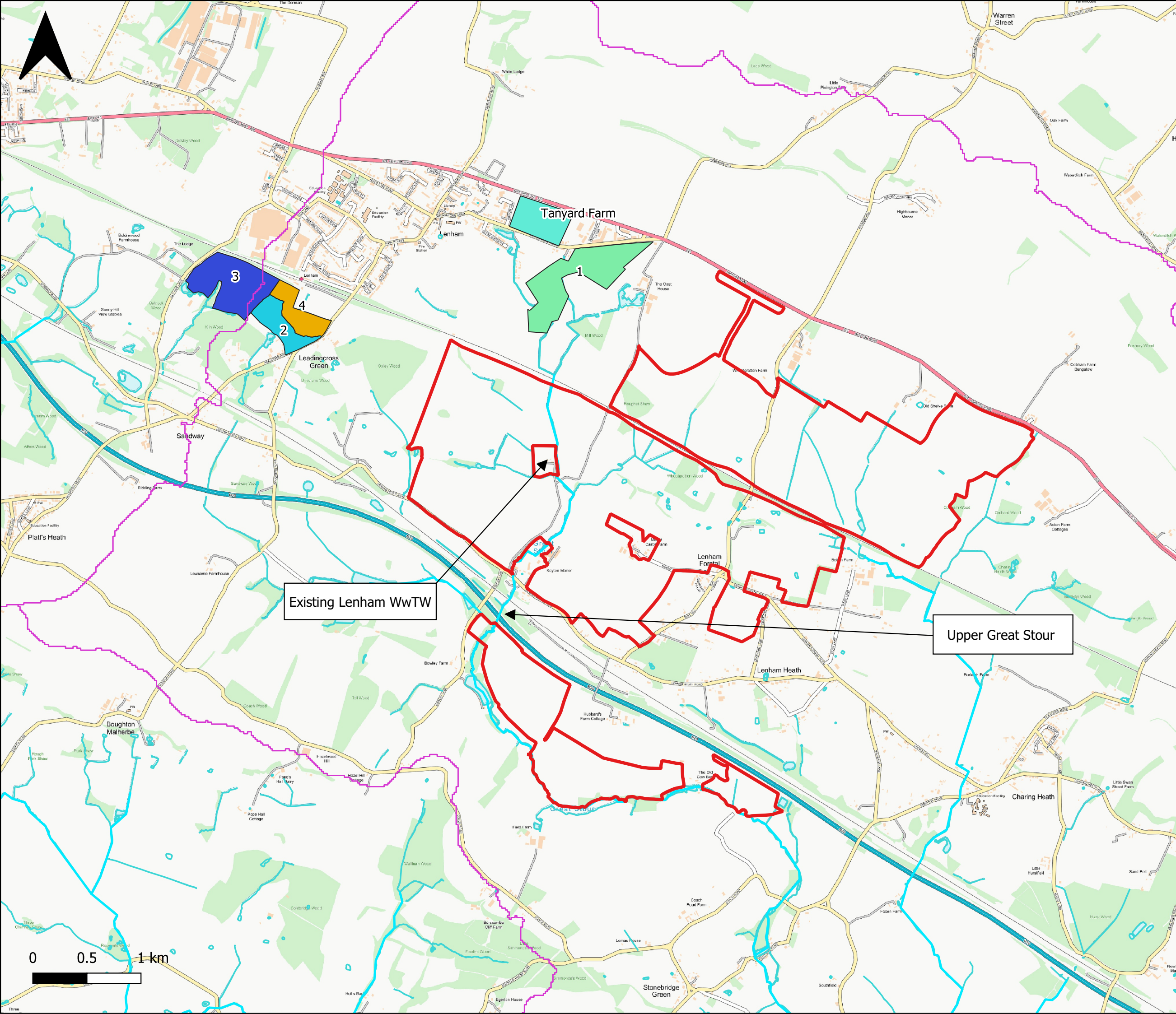
This Technical Note demonstrates that Heathlands GC Framework Masterplan and associated Lenham Broad Site Allocations in the Maidstone Local Plan can achieve nutrient neutrality through the provision of a new Onsite WwTW serving the proposed development, accompanied by the proposed four interlinked constructed wetlands system, protecting the integrity of the downstream Stodmarsh designated sites and thereby can meet the required tests under the Habitats Regulation Assessment.

This Technical Note has addressed all the key concerns raised by NE in relation to appropriate wetland sizing and locations, the preliminary hydraulic loading calculations, information on maintenance requirements to maintain the long-term nutrient removal efficiency of the proposed wetlands. A Statement of Common Ground between NE and MBC is also currently being prepared with the view to pass this updated Nutrient Neutrality Assessment (prepared by Arcadis) and the accompanying updated Regulation 19 Habitat Regulation Assessment Report (prepared by LUC) to enable the formal submission of Maidstone New Local Plan.

The implications of NE's new nutrient neutrality guidance and the nutrient budget calculator can also be looked at through an addendum to this Technical Note, if needed. Homes England and MBC (in consultation with NE, EA, Severn Trent Connect and Albion Water) to continue developing the proposed onsite WwTW and wetland designs, maintenance and delivery programmes, and the associated cost estimates, as part of the detailed masterplan preparation for Heathlands GC.

APPENDIX A

Report Figures



Legend

- Heathlands GC Boundary
- Great Upper Stour WFD Catchment

Lenham Broad Site Allocations

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- Tanyard Farm

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London
EC3M 4BY

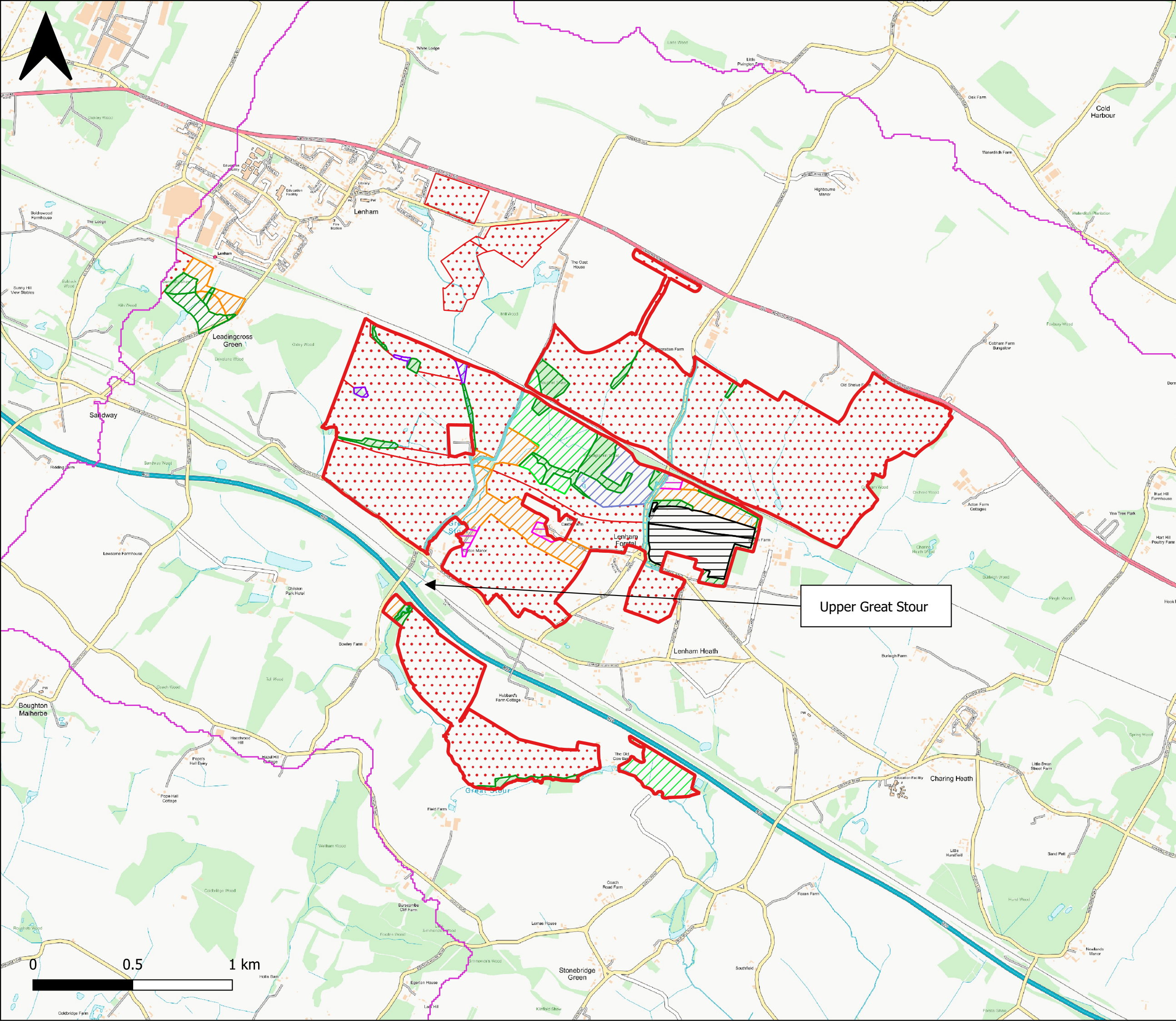
Existing Lenham WwTW

Upper Great Stour

Heathlands Garden Community Nutrient Mitigation

Appendix A Figure 1: Location Plan

Scale	Original Size	Datum	Grid
1:18,000	A3	mAOD	OSGB 27700



Legend

- Heathlands GC Boundary
- Arable - cereals and general cropping
- Lowland grazing
- Grassland - agriculture
- Grassland - non agriculture
- Land Type - Woodland
- Scrub - non agricultural

Urban

- Industrail
- Open Urban
- Residential
- Great Upper Stour WFD Catchment

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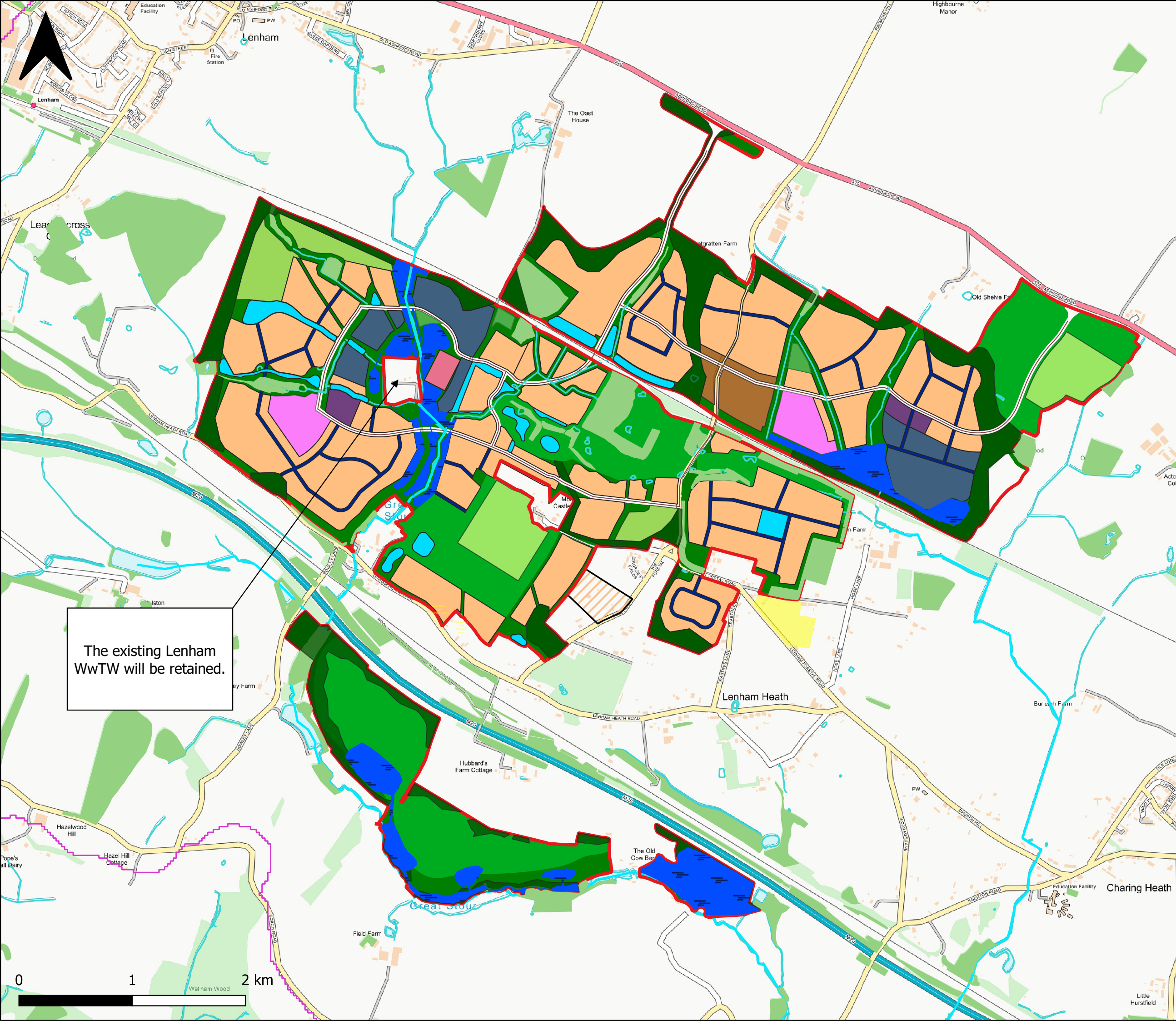
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Upper Great Stour

Heathlands Garden Community Nutrient Mitigation

Appendix A Figure 2: Land Use Types

Scale	Original Size	Datum	Grid
1:18,000	A3	mAOD	OSGB 27700



Legend

- Heathlands GC Boundary
- Housing Development Parcels
- Potential Housing Development Parcel
- Roads
- District Centre
- Local Centre
- Employment
- Education
- Proposed Wetlands
- SuDS
- Proposed On-Site WwTW Compound
- Sport pitches
- Open Space
- Structural Planting
- Woodlands

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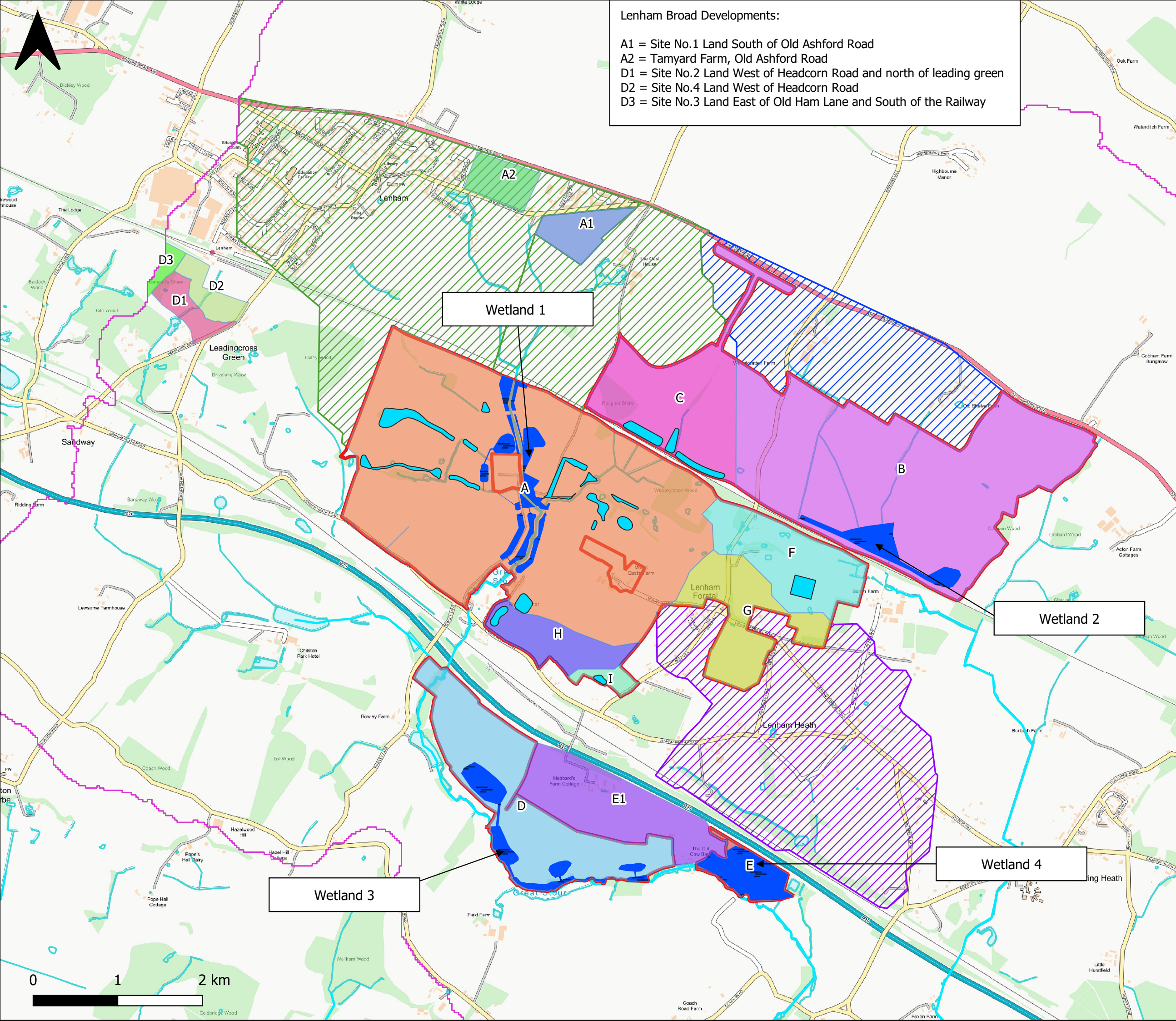
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The existing Lenham WwTW will be retained.

Heathlands Garden Community Nutrient Mitigation

Appendix A Figure 3: Proposed Land Use Types at Heathlands GC

Scale	Original Size	Datum	Grid
1:12,000	A3	mAOD	OSGB 27700



Lenham Broad Developments:
 A1 = Site No.1 Land South of Old Ashford Road
 A2 = Tamyard Farm, Old Ashford Road
 D1 = Site No.2 Land West of Headcorn Road and north of leading green
 D2 = Site No.4 Land West of Headcorn Road
 D3 = Site No.3 Land East of Old Ham Lane and South of the Railway

- Legend**
- Heathlands GC Boundary
 - Proposed Wetlands copy
 - SuDS
 - Wetland 1 wider catchment
 - Wetland 2 wider catchment
 - Wetland 4 wider catchment
 - Great Upper Stour WFD Catchment

- Drainage Zones**
- | | |
|---|--|
| A | D3 |
| A1 | E |
| A2 | E1 |
| B | F |
| C | G |
| D | H |
| D1 | I |
| D2 | |

Only proposed land use types for the proposed site allocations that fall within the Upper Great Stour catchment are shown in this figure.

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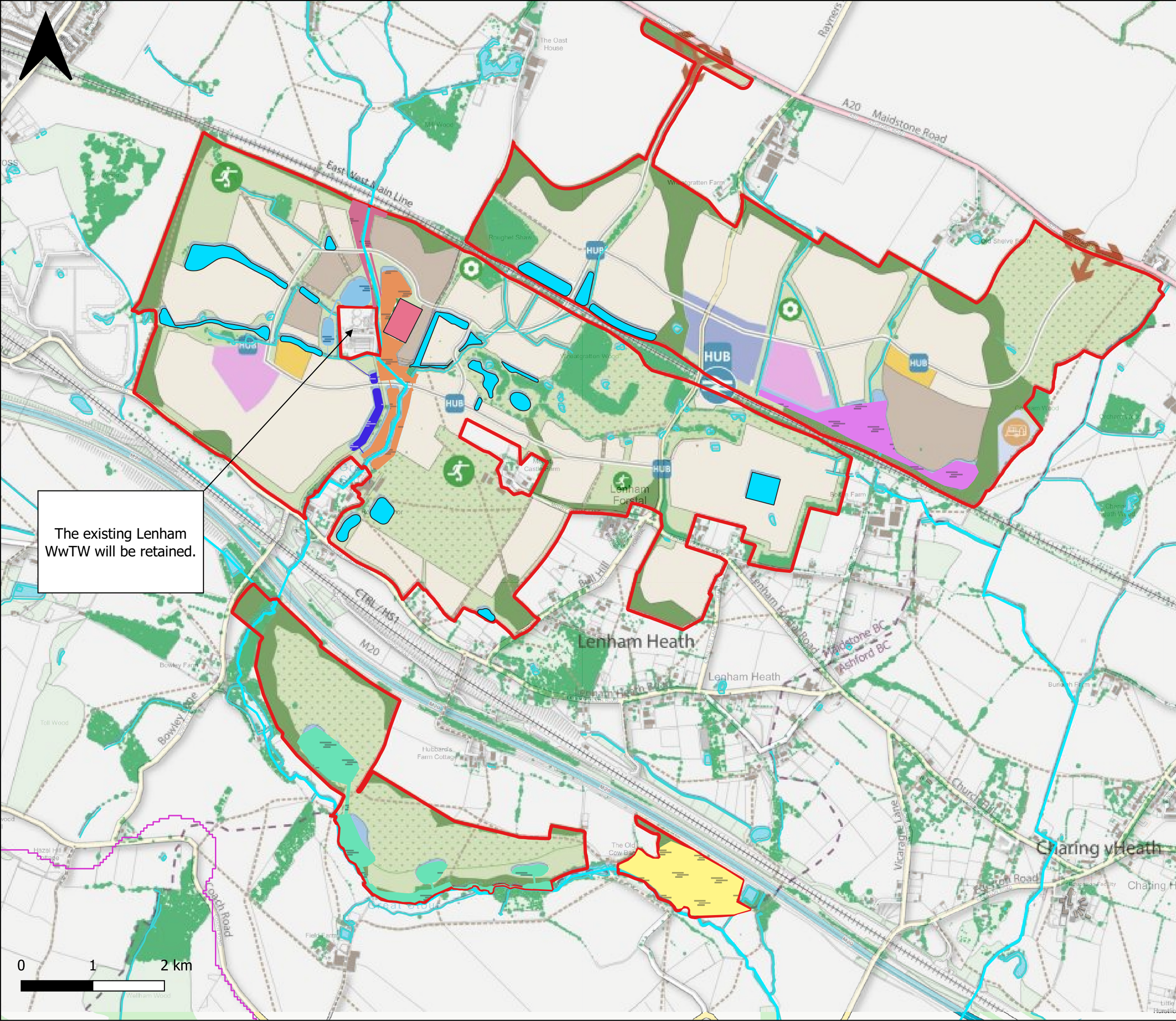
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Heathlands Garden Community Nutrient Mitigation

Appendix A Figure 4: Drainage Zones

Scale	Original Size	Datum	Grid
1:15,000	A3	mAOD	OSGB 27700



The existing Lenham WwTW will be retained.

Legend

- Heathlands GC Boundary
- SuDS
- Proposed On-Site WwTW Compound

Proposed Wetlands

- W1a
- W1b
- W1c
- W1d
- W2
- W3
- W4

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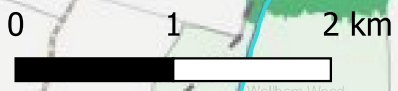
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Heathlands Garden Community Nutrient Mitigation

Appendix A Figure 5: Proposed Wetlands and SuDS at Heathlands GC



Scale	Original Size	Datum	Grid
1:12,000	A3	mAOD	OSGB 27700

APPENDIX B

Natural England Response Letter

Date: 10 December 2021
Our ref: 372493



Maidstone Borough Council
Maidstone House
King Street
Maidstone
Kent

Customer Services
Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

ME15 6JQ

T 0300 060 3900

BY EMAIL ONLY

Dear Rob Jarman,

**Maidstone Borough Council's Local Plan Review - Draft Plan for submission (regulation 19)
Maidstone Local Plan Review Habitats Regulations Assessment Regulation 19 HRA Report
Sustainability Appraisal of Maidstone Local Plan Review**

Thank you for your consultation on the above dated 28 October 2020 which was received by Natural England on the same date.

Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

In reviewing Maidstone Borough Council's Local Plan, Natural England has reviewed the following additional material to inform our response:

- **Maidstone Borough Council's Local Plan Review - Draft Plan for submission (regulation 19)**
- **Maidstone Local Plan Review Habitats Regulations Assessment Regulation 19 HRA Report**
- **Sustainability Appraisal of Maidstone Local Plan Review**
- **Lenham Maidstone Nutrient Impact Assessment**
- **Maidstone Local Plan Review – Stage 2 Air Quality Report**
- **Heathland Garden Settlement – Associated documents**
- **Lidsing Garden Settlement – Associated documents**
- **Transport and Air Quality Topic Paper**

Please note that we have not provided comments on all policies, but have provided advice on the environmental issues within Natural England's remit, the absence of comments should not be taken as Natural England supporting them. I hope the information provided in this response is helpful.

Summary of Natural England's Advice and Position

Adverse Effects on Integrity of Internationally Designated Sites

Natural England notes that the Appropriate Assessment section of the Habitat Regulation Assessment for Maidstone's Local Plan concludes that the Local Plan will not result in adverse effects on the integrity of any internationally designated sites. Having considered the assessment, and the measures proposed to mitigate for any adverse effects, it is the advice of Natural England that it is not possible to ascertain that the Local Plan will not result in adverse effects on the integrity of Stodmarsh Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar site, and the North Downs Woodlands SAC, due to there not being the sufficient level of scientific certainty at the appropriate assessment stage.

Therefore in the absence of enough certainty to ensure no adverse effects on the integrity of internationally designated sites, Natural England determines the Maidstone Local Plan to be **unsound** due to **not being based on proportionate evidence** and therefore not **justified**.

Further information is provided in paragraphs 3.1 and 3.2 of this letter, detailing the appropriate level of scientific certainty required to conclude no adverse effect on integrity. We hope the this information is helpful and we welcome the opportunity to continue working with your authority to work towards achieving a sound local plan.

Adverse Impacts on Kent Downs Area of Outstanding Natural Beauty (AONB)

Natural England considers that there is currently insufficient information provided to demonstrate that policy LPRSP4(B) Lidsing Garden Community is deliverable without resulting in a major adverse impact on the special qualities of the Kent Downs AONB. This policy, which includes the development of a new arm to the M2 Junction 4, is likely to constitute major development in an AONB, and therefore should be assessed against the three tests for major development listed in paragraph 177 of the National Planning Policy Framework (NPPF) to justify the exceptional circumstances. Currently the policy provides no justification against the 'Major Development' tests and neither demonstrates that exceptional circumstances apply or that it would be in the public interest. Therefore, at present, it is **not consistent with national policy** and consequently **unsound**.

To be clear, Natural England do not object to the principle of development in this location. There are further comments provided in paragraph 1.2 of this letter explaining the further information required to demonstrate that Lidsing Garden Community is deliverable without resulting in a major adverse impact on the Kent Downs AONB, which we hope is helpful. We welcome the opportunity to continue working with your authority to work towards achieving a sound local plan.

1 Comments on Site Allocations

1.1 LPRSP4(A): Heathlands Garden Settlement

- Heathlands Garden Settlement is a large strategic site in the immediate foreground of the Kent Downs AONB and is therefore likely to impact the setting of the AONB. It is noted that it's stated that there will be a sensitive transition between the AONB and Heathlands with a heathland landscape. However, due to the scale of this allocation and the existing local landscape character, Natural England has concerns regarding the impact of this allocation on the setting of the Kent Downs AONB. The Sustainability Appraisal states that the delivery of this allocation would be likely to have an adverse effect on the Kent Downs AONB through impacts to its setting and that the proposal is located in an area that has high landscape sensitivity.
- We note that a landscape and visual appraisal has been undertaken, however Natural England recommend that, in order to determine if this site is suitable for an allocation of this

size, a landscape capacity and sensitivity study should be undertaken as well. The findings of this study should provide information on the significance of landscape and visual effects, particularly with regards to the extent and nature of development which can be accommodated within this site. It is difficult to see how a development could proceed at present, given the requirements that developments should not have a significant adverse impact on the setting of the Kent Downs AONB, as per Policy LPRSP9. Therefore this allocation should only proceed if there is sufficient evidence that it will not have a significant adverse impact on the setting of the Kent Downs AONB. In addition the proposal will need to comply with paragraph 176 of the NPPF¹ (2021) which states that *'the scale and extent of development within all these designated areas should be limited, while development within their **setting** should be sensitively located and designed to avoid or minimise adverse impacts on the designated areas'*.

- We advise that advice is sought from the Kent Downs AONB unit on this policy. Their knowledge of the site and its wider landscape setting, together with the aims and objectives of the Kent Downs AONB, will be invaluable.
- In addition, further information is required, to ensure that the proposal will be nutrient neutral and therefore will not have an adverse impact on Stodmarsh SAC, SPA and Ramsar. This includes:
 - Information and evidence to support assumptions used, including assumptions on occupancy rates and their long term stability and removal rates for wetlands.
 - Information on the location of the two proposed wetlands to ensure the areas of mitigation are draining relevant areas of mitigation land/ WwTW so will function effectively.
 - Clarity on the size of the wetlands being proposed. In order to be effective wetland's need to be at least 2 hectares in size as explain in Natural England's Nutrient Neutrality Methodology (November 2020)
 - Any additional hydraulic loading or nutrient loading calculations undertaken for wetlands or bespoke mitigation.
 - Clarification of how long term management of any mitigation land in particular wetland and other types of SUDS will be secured.
 - Maps, locations, or identification of how any mitigation that is not within the council's ownership will be secured.
 - Any information on winter maintenance programmes or other information material to water quality assessment that may impact the efficacy of proposed nutrient removal systems.

1.2 LPRSP4(B) – Lidsing Garden Community

- Lidsing Garden community is a large strategic site which incorporates a new arm to the M2 Junction 4, which would be located within the Kent Downs AONB. We therefore consider that this represents **major development in an AONB**.
- Paragraph 176 of the NPPF, provides clear guidance that *'Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to these issues'* and that *'The scale and extent of development within these designated areas should be limited'*. And paragraph 177 also states that major development in AONBs should be *'refused unless exceptional circumstances are demonstrated, with assessment against the following criteria:*
 - *The need for the development, including in terms of any national considerations, and the impact of permitting it, or refusing it, upon the local economy;*
 - *The cost of, and scope for, developing outside the designated area, or meeting the*

¹https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

- need for it in some other way; and*
 - *Any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated.*
- As this proposal represents major development in an AONB the proposal should therefore be **assessed against the three tests for major development** listed above from paragraph 177 of the NPPF to justify the exceptional circumstances. The Landscape Impact Assessment itself states that '*land to the south of the M2 has a high landscape sensitivity due to its designated. Development should be avoided/restricted in this area to respond to the objectives of the AONB*'. Currently the policy provides no justification against the 'Major Development' tests and the policy neither demonstrates that exceptional circumstances apply or that it would be in the public interest. Therefore, at present, it is **not consistent with national policy**.
- In addition the majority of the proposal lies in the setting of the Kent Downs AONB, impacting views out from the Kent Downs AONB. Consequently the proposal has the potential to have a major adverse impact on the purposes of designation of the Kent Downs AONB. It is pleasing to see that Policy LPRSP4(B) includes a provision that a landscape-led approach should be taken for the development to ensure that there are positive enhancements to the Capstone Valley and Kent Downs AONB. However the Sustainability Appraisal still concludes that residual minor negative effects are anticipated as a result of this proposal in relation to environmental impact due to the impacts on the AONB.
- Natural England therefore recommends that, in order to determine if this site is suitable for an allocation of this size, a landscape capacity and sensitivity study should be undertaken. The findings of this study should provide information on the significance of landscape and visual effects, particularly with regards to the extent and nature of development which can be accommodated within this site.
- In addition, we advise that advice is sought from the Kent Downs AONB unit on this allocation. Their knowledge of the site and its wider landscape setting, together with the aims and objectives of the Kent Downs AONB will be invaluable.

1.3 LPRSP5(C) - Lenham broad location for housing growth

- A significant area of Lenham is within the setting of Kent Downs AONB, therefore all development must conserve and enhance the character of the Kent Downs AONB as per policies in LPRSP9. Although LPSP5(c).7 states that the development should incorporate appropriate landscape treatment which ensures that developments can be satisfactorily assimilated into the surrounding area, Natural England advises that stronger wording is required to ensure the character of AONB is conserved and enhanced.
- In addition, Natural England previously recommend in our Regulation 18 response that an additional policy is added that there will be a masterplan approach, which is informed by a Landscape and Visual Impact Assessment (LVIA) in line with the Guidelines for Landscape and Visual Impact Assessment (GLVIA 3rd edition). It is therefore disappointing that this has not been incorporated into the policy. A masterplan approach should be taken to ensure that the policy complies with both paragraph 176 of the NPPF and the policies in the Maidstone local plan including LPRSP9. The masterplan should be used to inform the design parameters including views into and from the AONB.
- In addition, we advise that advice is sought from the Kent Downs AONB unit on this allocation. Their knowledge of the site and its wider landscape setting, together with the aims and objectives of the Kent Downs AONB will be invaluable..

1.4 LPRSP6(B) – Harrietsham

- Harrietsham is within the setting of the Kent Downs AONB, therefore all developments in this area must be designed to conserve and enhance the character of the Kent Downs AONB in accordance with policies in LPRSP9. Natural England advises that additional landscape information is sought to indicate how the development of this site may impact the AONB, and if mitigation will be sufficient to ensure no adverse impacts on the setting of the Kent Downs AONB.
- In addition, we advise that advice is sought from the Kent Downs AONB unit on this allocation. Their knowledge of the site and its wider landscape setting, together with the aims and objectives of the Kent Downs AONB will be invaluable.

1.5 LPRSP6(C)– Headcorn

- As noted in paragraph 6.105, Headcorn is surrounded on three sides by the functional floodplain of the River Beult and its tributaries. The River Beult is designated as a Site of Special Scientific Interest (SSSI) due to being one of just a few in England that retains a characteristic flora and fauna. Therefore, there is potential for allocations in this area to have a negative impact on the SSSI. In line with policy LPRSP14A.6.iii. developments should not be permitted that have an adverse effect on the designated site or its interest features. In order to ensure this, we recommend an additional policy in LPRSP6(C), along the lines of 'development will only be permitted if it will not have an adverse effect on the River Beult SSSI and will support the conservation objectives of the River Beult action plan ².

1.6 LPRSP6(D) - Lenham

- Lenham is within the setting of the Kent Downs AONB, therefore all developments in this area must be designed to conserve and enhance the character of the Kent Downs AONB in accordance with policies in LPRSP9. Natural England advises that additional landscape information is sought to indicate how the development of this site may impact the AONB, and if mitigation will be sufficient to ensure no negative impacts on the setting of the AONB.
- In addition, we advise that advice is sought from the Kent Downs AONB unit on this allocation. Their knowledge of the site and its wider landscape setting, together with the aims and objectives of the Kent Downs AONB will be invaluable.

1.7 LPRSP6(E) – Marden

- The village of Marden is in the RSPB's Turtle Dove Friendly Zone (TDFZ), areas identified by the RSPB as being the best habitat for European turtle doves. Therefore, Natural England with the help of the RSPB, have invested a significant amount of public money in multiple higher tier agri-environment schemes specifically targeting turtle doves, as well as other red-listed farm birds in Marden. Allocations in Marden consequently have the potential to negatively impact the objectives of this project. Any potential development in the Marden area should therefore be mindful of this, and, as per policy LPRSP14A.4.a, 'provide an Ecological Impact Assessment of development sites and any additional land put forward for mitigation purposes to take full account of the biodiversity present'. There should be mitigation and compensation which contributes to the targets for increasing red listed farmland birds.
- In addition, this proposal has the potential to have recreational impacts on the Marden Meadow SSSI. In line with policy LPRSP14A.6.iii. developments should not be permitted that

²https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/734380/Improving_the_River_Beult_SSSI_Non-Technical_Summary.pdf#:~:text=Water from the Beult catchment contributes to flooding, stakeholders to better manage water in this catchment.

have an adverse effect on the designated site or its interest features. In order to ensure this, we recommend that the ecological impact assessment assesses recreational impacts on the SSSI and any mitigation recommend is completed.

1.8 LPRSP6(F) – Staplehurst

- Staplehurst is adjacent to The River Beult SSSI, designated due to being one of just a few rivers in England that retains a characteristic flora and fauna. Therefore, there is potential for allocations in this area to have a negative impact on the SSSI. In line with policy LPRSP14A.6.ii, 'developments will only be permitted where it is not likely to have an adverse effect on the designated site or its interests'. In order to ensure this, we recommend an additional policy in LPRSP6(F), along the lines of 'development will only be permitted if it will not have an adverse effect on the River Beult SSSI and will support the conservation objectives of the River Beult action plan³.
- In addition as per paragraph 7.162, all new developments should incorporate SuDS. The incorporation of multi-functional SuDS for this allocation should help to help mitigate the surface water run-off whilst providing multiple other benefits for biodiversity. Natural England therefore recommends additional policy wording to ensure that high quality SuDS will be incorporated into this development.

1.9 LPRSP7(C) – Sutton Valance

- Sutton Valance is within the setting of the Kent Downs AONB, therefore all developments in this area must be designed to conserve and enhance the character of the Kent Downs AONB in accordance with policies in LPRSP9. Natural England advises that additional landscape information is sought to indicate how the development of this site may impact the AONB, and if mitigation will be sufficient to ensure no negative impacts on the setting of the AONB.
- In addition, we advise that advice is sought from the Kent Downs AONB unit on this allocation. Their knowledge of the site and its wider landscape setting, together with the aims and objectives of the Kent Downs AONB will be invaluable.

1.10 LPRSP7(D) – Yalding

- Yalding is adjacent to The River Beult SSSI, designated due to being one of just a few rivers in England that retains a characteristic flora and fauna. Therefore, there is potential for allocations in this area to have a negative impact on the SSSI. In line with policy LPRSP14A.6.ii., developments will only be permitted where it is not likely to have an adverse effect on the designated site or its interests. In order to ensure this, we recommend an additional policy in LPRSP7(D), along the lines of 'development will only be permitted if it will not have an adverse effect on the River Beult SSSI and will support the conservation objectives of the River Beult action plan⁴. Also, as per policy LPRSP14A.4.a, 'provide an Ecological Impact Assessment of development sites and any additional land put forward for mitigation purposes to take full account of the biodiversity present'. An ecological impact assessment should be completed for this proposal which takes into account any impact this application could have on the River Belt SSSI

³https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/734380/Improving_the_River_Beult_SSSI_Non-Technical_Summary.pdf#:~:text=Water from the Beult catchment contributes to flooding,stakeholders to better manage water in this catchment.

⁴https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/734380/Improving_the_River_Beult_SSSI_Non-Technical_Summary.pdf#:~:text=Water from the Beult catchment contributes to flooding,stakeholders to better manage water in this catchment.

1.11 LPREMP1(4) - Woodcut farm

- In December 2020, Natural England objected to an application to vary the conditions of the Woodcut Farm allocation as it contradicted to the criteria in the Maidstone Local Plan (2017). Therefore we support the inclusion of paragraph 7.66 which includes the same criteria for the development. Specifically that the area to the east of the stream will have a maximum footprint of 5,000m² with heights restricted to a maximum of 12m, and the buildings to the west of the stream will have a maximum footprint of 2,500m² and 8m in height.
- However we note that in the 2017 Maidstone Local Plan, there was the criteria for units to be orientated end-on to predominant views to and from the Kent Downs AONB in order to reduce landscape impacts on the AONB. This however, is not included in this plan and we therefore advise that it should be added.

1.12 LPRSAEMP1: Former Syngenta Works

- This proposal in Yalding is adjacent to The River Beult SSSI, designated due to being one of just a few rivers in England that retains a characteristic flora and fauna. Therefore, there is potential for allocations in this area to have a negative impact on the SSSI. In line with policy LPRSP14A.6.ii, 'developments will only be permitted where it is not likely to have an adverse effect on the designated site or its interests'. In order to ensure this, we recommend an additional policy in LPRSAEMP1, along the lines of 'development will only be permitted if it will not have an adverse effect on the River Beult SSSI and will support the conservation objectives of the River Beult action plan. Also, as per policy LPRSP14A.4.a, 'provide an Ecological Impact Assessment of development sites and any additional land put forward for mitigation purposes to take full account of the biodiversity present'. An ecological impact assessment should be completed for this proposal which takes into account any impact this application could have on the River Belt SSSI.

1.13 LPRSA260 -Ashford Road, Lenham

- This site in Lenham is within the setting of the Kent Downs AONB, therefore all developments in this area must be designed to conserve and enhance the character of the Kent Downs AONB in accordance with policies in LPRSP9. Natural England advises that additional landscape information is sought to indicate how the development of this site may impact the AONB, and if mitigation will be sufficient to ensure no negative impacts on the setting of the AONB.
- In addition, we advise that advice is sought from the Kent Downs AONB unit on this allocation. Their knowledge of the site and its wider landscape setting, together with the aims and objectives of the Kent Downs AONB will be invaluable.

1.14 LPRSA273 - Land between Maidstone road and Whetsted road

- This sites forms part of the Paddock Wood extension, which is a large allocation within the setting of the High Weald AONB. Although it is on the edge of an existing settlement, it is still a significant extension to the existing settlement, and may impact the setting of the AONB. The allocation must therefore be designed to conserve and enhance the character of the High Weald AONB in accordance with policy LPRSP9. It is advised that additional landscape information is provided to indicate how the development of this site may impact the AONB, and how this may inform a mitigation scheme.
- In addition, we advise that advice is sought from the High Weald AONB unit on this allocation. Their knowledge of the site and its wider landscape setting, together with the aims and objectives of the High Weald AONB will be invaluable.

1.15 LPRSA285 – Land at Dickley Court

- This site in Lenham is within the setting of the Kent Downs AONB, therefore all developments in this area must be designed to conserve and enhance the character of the Kent Downs AONB in accordance with policies in LPRSP9. Natural England advises that additional landscape information is sought to indicate how the development of this site may impact the AONB, and if mitigation will be sufficient to ensure no negative impacts on the setting of the AONB.
- In addition, we advise that advice is sought from the Kent Downs AONB unit on this allocation. Their knowledge of the site and its wider landscape setting, together with the aims and objectives of the Kent Downs AONB will be invaluable.

2 Policies in Maidstone Local Plan

2.1 LPRSP9: Development in the Countryside

- Natural England strongly supports the supporting text to this policy, in particular its efforts to conserve and enhance the Kent Downs AONB as per paragraphs 6.132 – 6.136. As well as the commitment to conserve and enhance the High Weald AONB in paragraph 6.137.
- In addition Natural England strongly supports policies 3 and 4 in LPRSP9. However, we recommend that an additional policy is added to LPRSP9, along the lines of ‘New developments in the AONB will be refused, unless in exceptional circumstances and will require high quality designs in order to ensure the AONB is conserved and enhanced’
- Natural England also recommend that the High Weald AONB management plan is added to the list of documents at the bottom of this policy that will be taken into account when decision making.

2.2 LPRSP12: Sustainable Transport

- Transport infrastructure, in particular new transport infrastructure such as roads and cycle routes, has the potential to provide for wildlife as well as providing valuable Green Infrastructure opportunities. For example, highway verges and embankments can be important habitats in their own right, but also provide valuable connecting habitat, contributing to the overall coherence of the ecological network. We would therefore recommend additional policy wording to acknowledge these benefits and seek opportunities to include Green Infrastructure provision. This should be in addition to appropriate mitigation of environmental impacts.

2.3 LPRSP13: Infrastructure Delivery

- Natural England strongly supports the inclusion of a policy on open space development. We agree with paragraph 7.120, that the adequate provision of open spaces within the borough is critical to the health and enjoyment of local residents.
- Open space and the associated Green Infrastructure have multiple benefits for both people and nature. It is therefore good to see in LPRSP13.7.ii. that ‘*all new developments should make a contribution, either on site, or where not feasible, off-site to improving the borough’s open space*’. These open spaces should be designed alongside green-blue infrastructure and biodiversity features in order to link with the wider benefits for both people and nature. Natural England therefore recommends that additional policy wording should be added, along the lines of ‘open spaces should be designed in accordance with, and contribute to, the borough’s green infrastructure strategies in order to deliver multiple benefits.’

2.4 LPRSP14(A) - Natural Environment

- It is pleasing to see in policy LPSP14(A).1.a that developers will ensure that new developments will deliver a minimum 20% on site biodiversity Net Gain on new residential developments whilst having regard to Biodiversity Opportunity Areas and/or Nature Recovery Networks. We strongly support this effort to go beyond the minimum 10% target set out in the Environment Act and are committed to supporting Maidstone Borough Council in this ambition
- Natural England support paragraphs 7.153 and 7.157 which take into account Natural England's advice on Nutrient Neutrality. However policy LPSSP14A.2, states that '**major developments will not be permitted unless they can demonstrate that new or existing water supply, sewage and wastewater treatment facilities can accommodate the new development**'. We advise that clarity is added to this policy, or an additional policy is created, which states that **all** new developments are required to demonstrate that they can achieve net nutrient neutrality in the stour catchment as per paragraph 7.153.
- It is pleasing to see LPRSP14(A).5 that 'any required publicly accessible open space should be designed as part of the overall green and blue infrastructure and layout of a site'. However, in addition to this Natural England recommends a policy is added along the lines of 'When opportunities arise, Green Infrastructure will be retrofitted into existing urban environments'. The integration of high quality green and blue infrastructure can provide a number of key benefits for both people and nature. Green and blue infrastructure should be identified and promoted with the local plan, seeking opportunities to create, maintain and enhance resilient and coherent ecological networks across the district, including the protection and recovery of priority species and habitats. This should be supported by an up-to-date evidence base, including mapping of ecological networks and opportunity areas within the district. We refer to the document: Green Infrastructure Planning and Delivery in Kent and Medway (KCC, September 2017)⁵, which you may find useful in developing Green Infrastructure ambitions for the district. In addition Natural England released a Green Infrastructure mapping database⁶ in December 2021 which you may find useful to understand the current baseline of Green Infrastructure in Maidstone. It is pleasing to see in paragraph 7.139 that a Green and Blue Infrastructure strategy will be completed. We look forward to being consulted on this and supporting the council in its future ambitions with Green and Blue Infrastructure
- Detailed comments on Policy LPRS14(A).7 in relation to air quality impacts on the North Downs Woodland SAC are included in paragraph 3.2 of this letter. It is Natural England's opinion, that currently this policy does not have enough scientific evidence to be certain that there will be no adverse effects on the integrity of North Downs Woodland SAC. This policy should reference a suitably evidenced based air pollution mitigation strategy for North Downs Woodland SAC which has been agreed by all relevant consultees.
- It is pleasing to see in paragraph 7.162 that all new developments should include the implementation of Sustainable Drainage Systems (SuDS), these serve to reduce flood risk and water pollution in line with the aims of the National Planning Policy Framework (NPPF)⁷. We suggest that in addition, the local plan should encourages relevant larger developments to replace antiquated surface drainage systems such as gully pots with SuDS wherever appropriate. As these have significantly reduced impacts on surrounding water quality and contribute to Green Infrastructure and natural capital.
- Paragraph 7.144 discusses the importance of soils, as a fundamental element of the

⁵ https://www.kent.gov.uk/_data/assets/pdf_file/0014/50306/Green-infrastructure-infrastructure-needs-and-requirements-GIF.pdf

⁶ <https://designatedsites.naturalengland.org.uk/GreenInfrastructure/Map.aspx>

⁷ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

ecosystem and that the council will avoid the degradation of soil and ensure soil functions are maintained as appropriate. However, there is no policy on soils in LPSSP14, this was pointed out in Natural England Regulation 18 response and so it is disappointing to see no additional policy added to LPRSP14 to protect soils in the area. Soil is a valuable, finite multi-functional resource which underpins our wellbeing and prosperity. As such, decisions about development should take full account of the impact on soils, their intrinsic character and the sustainability of the many ecosystem services they deliver. The plan should safeguard the long term capability of best and most versatile agricultural land (Grades 1, 2 and 3a in the Agricultural Land Classification) as a resource for the future in line with NPPF paragraph 174. We therefore recommend a policy is included in LPSSP14 along the lines of 'Ensure soil resources are conserved and managed in a sustainable way. By avoiding development that would disturb or damage soils of high environmental value.

2.5 Policy LPRSP14(C) Climate change

- Natural England welcomes the inclusion of a policy on climate change, and the commitment to balance the growth proposed in the borough with the need to respond to the climate change and biodiversity emergencies. The Local Plan should, in considering climate change adaption, also recognise the role of the natural environment to deliver measures to reduce the effects of climate change. It is therefore pleasing to see in LPRSP14(C).5 that blue-green infrastructure will be required to be integrated into qualifying new developments in order to mitigate urban heat islands enhance urban biodiversity, and to contribute to reduced surface water run off through the provision of SuDS. However it would be useful to have clarity on what developments will qualify, in order to ensure that whenever it is feasible developments will mitigate against the effects of climate change. In addition, we suggest that the opportunities to retrofit nature based solutions within existing urban areas are taken and a policy added to encourage this.

2.6 Policy LPRSP15 – Principles of Good Design

- Natural England supports the inclusion of a policy on high quality design. However it is disappointing to see no references made to incorporating green infrastructure. For example, the policy should seek to ensure provision of new Green Infrastructure, with links to the existing Green Infrastructure network and provision of access and recreation opportunities. We therefore recommend that an additional policy is added along the lines of 'Ensure that developments incorporate Green Infrastructure into their design which are designed as part of the Green Infrastructure network.

2.7 Policy LPRINF1: Publicly Accessible Open Space and Recreation

- Natural England supports the inclusion of a policy on open space and recreation and the quality standards. In particular standard 1 which states that open spaces will be designed as part of the green infrastructure network and standard 12 that 'all new open spaces will *'provide a Management Plan with adequate resources identified for on-going management and maintenance'*.

3 Habitat Regulation Assessment

3.1 Stodmarsh SAC, SPA and Ramsar

- The appropriate assessment concludes for the Stodmarsh SAC, SPA and Ramsar site that your authority is able to ascertain that the local plan will not result in adverse effects on integrity. Having considered the assessment, and the measures proposed to mitigate for any adverse effects, it is the advice of Natural England that it is not possible to ascertain that the proposal will not result in adverse effects on the integrity of the Stodmarsh SAC, SPA and

Ramsar site due to there not being the sufficient level of scientific certainty required at the appropriate assessment stage.

- Natural England advises that the following further additional information is required in order to have the certainty required that the mitigation provided to ensure nutrient neutrality for the Stodmarsh SAC, SPA and Ramsar site is sufficient:
 - Information and evidence to support assumptions used, including assumptions on occupancy rates and their long term stability and removal rates for wetlands.
 - Information on the location of the proposed wetlands to ensure the areas of mitigation are draining relevant areas of mitigation land/ WwTW so will function effectively.
 - Clarity on the size of the wetlands being proposed. In order to be effective wetland's need to be at least 2 hectares in size as explain in Natural England's Nutrient Neutrality Methodology⁸ (November 2020)
 - Any additional hydraulic loading or nutrient loading calculations undertaken for wetlands or bespoke mitigation.
 - Clarification of how long term management of any mitigation land, in particular wetland will be secured.
 - Maps, locations, or identification of how any mitigation that is not within the council's ownership will be secured.
 - Any information on winter maintenance programmes or other information material to water quality assessment that may impact the efficacy of proposed nutrient removal systems.
- Without this information we do have sufficient certainty to agree with the conclusion of no adverse impact on integrity. However we hope this information is helpful and are very willing to work with Maidstone Borough Council to ensure that the Appropriate Assessment can have the sufficient evidence to conclude no adverse impact on integrity once this further information is provided.

3.2 North Downs Woodlands SAC

- The appropriate assessment concludes for the North Downs Woodland SAC that your authority is able to ascertain that the proposal will not result in adverse effects integrity. Having considered the assessment, and the measures proposed to mitigate for any adverse effects, it is the advice of Natural England that it is not possible to ascertain that the proposal will not result in adverse effects on the integrity of North Downs Woodland SAC due to there not being the sufficient level of scientific certainty required at the appropriate assessment stage.
- The mitigation for the North Downs Woodland SAC is that a '*mitigation strategy may need to be agreed with Natural England as it may not be sufficient to simply minimise traffic from new development*'. It is Natural England's opinion that to say a mitigation strategy will be agreed, is not enough certainty at this stage of a local plan. We are very willing to work with Maidstone Borough Council to ensure there is a sufficient, evidence based, mitigation strategy for North Down Woodlands SAC, which has been agreed by all relevant consultees. However, this must be done **before** the local plan can proceed.

I hope the advice provided in this letter is useful, and we look forward to continuing our engagement with your authority to work towards achieving a sound local plan. For any points of clarification please contact me at amy.croombs@naturalengland.org.uk.

Yours sincerely
Amy Croombs
Lead Adviser – Sustainable Development

⁸ <https://www.ashford.gov.uk/media/13dgnfyu/stodmarsh-nutrient-neutral-methodology-november-2020.pdf>

APPENDIX C

Nutrient Loading and Budget Calculations

Note - Excel calculations are provided separately

APPENDIX D

Severn Trent Connect Letter

Severn Trent Connect
2 St Johns Street
Coventry
CV1 2LZ
ST-Connect.co.uk

01 March 2022

AGREEMENT IN PRINCIPLE FOR THE PROVISION OF REGULATED SEWERAGE AND SEWAGE DISPOSAL SERVICES TO HEATHLANDS GARDEN COMMUNITY AND LENHAM BROAD DEVELOPMENTS.

Dear Renuka,

Following our conversation on Friday 25th February and the review of subsequent information relating to the above developments, I am pleased to agree in principle that ST Connect could provide the required levels of nutrient removal to aid the proposed developments with meeting Natural England's Nutrient Neutrality requirements.

[ST Connect](#)

ST Connect are an Ofwat-regulated water company appointed by the Secretary of State to provide wastewater and surface water management services in England and Wales. We have a strong track record for owning and operating wastewater treatment assets and are part of the wider Severn Trent Group, which in its portfolio has one of the UK's largest water and sewerage companies.

We are familiar with the Kent region and the local environmental challenges to developments resulting from both a chronic lack of available sewerage capacity, and nutrient pollution; as a result we are helping a number of clients to develop effective wastewater management strategies. The company is well placed to do this, given our experience and effective relationships with the statutory environmental regulators.

[Wastewater treatment](#)

Foul sewage from all domestic and commercial properties will be collected and conveyed through a separate foul-only sewerage system to an onsite WwTW. Surface water shall be managed separately in accordance with the surface water drainage plans. Following treatment to standards agreed by the Environment Agency (in consultation with Natural England), final effluent will be discharged into a drainage system connecting into the River Great Stour.

A detailed design of the facility has not yet been commissioned, however ST Connect will propose to construct a state-of-the-art wastewater treatment plant utilising a batch-type process. The process achieves Total Phosphorus (TP) levels near the technically achievable limit without addition of chemical flocculation and removal, however the process will be configured to allow for bolt-on technologies to meet the most stringent permits (up to 0.1mg/l TP if required). Furthermore, process parameters can be adjusted to achieve reduction of Total Nitrogen to 7.2mg/l if required.

The footprint of the facility is likely to be less than 9,600m² based on developments of similar sizes; this assumes the facility will be built in multiple stages for the efficient deployment of capital over the duration of

ST Connect

the developments. The optimal number of phases will be determined during the outline design process, in consultation with Homes England and Maidstone Borough Council.

Next steps

We would welcome a meeting with Maidstone Borough Council and Homes England to introduce ST Connect, and discuss the end-to-end journey for providing sewerage and sewage disposal services to the proposed developments.

We look forward to helping advise and develop the wastewater and surface water strategy for these developments, and are happy to be able to contribute to Maidstone Borough Council's housing delivery plans in a sustainable way.

Yours sincerely



William Mackveley
General Manager
Severn Trent Connect

Appendix C

Memorandum: North Downs Woodland SAC – Air quality mitigation

C.1 Memorandum prepared by Jacobs, March 2022.

Subject North Downs Woodland SAC – Air Quality Mitigations

Attention Philip Coyne, Helen Garnett, Claire Weeks

From Melanie Tobias , Hazel Peace

Date March 2022

1. Introduction

1.1 Overview

In September 2021, the Stage 2 Maidstone Local Transport Modelling and Air Quality Assessment were completed to test the impacts of the committed and local plan developments. More information can be found on *Stage 2 Maidstone LP – Initial Options Forecast Report* and *Maidstone LP Review_Stage2_210721_v0.1_FINAL*.

In terms of air quality, results highlighted increases in nitrogen emissions and associated nitrogen deposition on the area of the North Downs Woodland SAC. The map below shows its location which covers the A249, Boxley Road and A229 road network. The map also shows the locations of major developments in the area that were considered during the time of modelling.

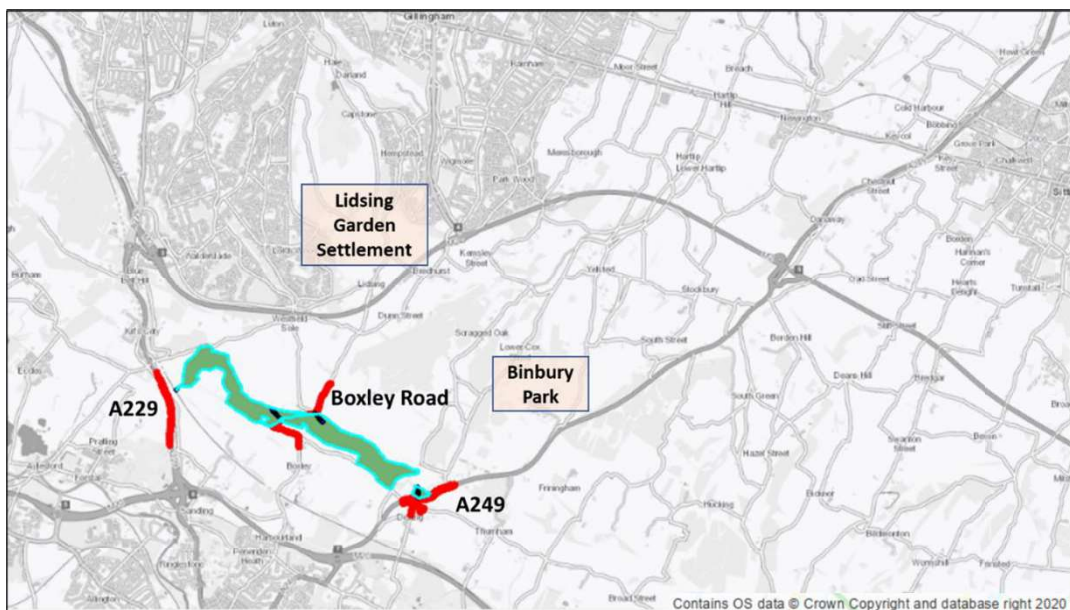


Figure 1: North Downs Woodland SAC

In January 2022, updates were made to the Maidstone Local Transport Model to incorporate changes to the planned developments and one of which was the removal of Binbury Park. The air quality assessment is currently underway to test the impacts of these changes and other mitigations being considered. Some of this work is estimated to be completed in Spring (i.e. updated 'without' Binbury Park and updated electric vehicle projections in 2037).

This note presents the details of feasible mitigation measures that are currently being considered to minimise the air quality impacts of the planned developments in Maidstone to the North Downs Woodland SAC. However, it should be noted that these mitigations are currently being analysed and further work and model testing are still required in order to draw conclusions for this work.

2. Feasible Mitigation Measures

2.1 Impacts of the removal of Binbury Park

As mentioned in Section 1, one of the key changes to the updated Maidstone Local Transport Model is the removal of Binbury Park Development. Based on the work done in 2021, this development is one of the major contributors of traffic increases along the A249, which then leads to the increase in nitrogen emission and the associated increase in nitrogen deposition to the North Downs Woodland SAC.

Comparing the 2037 traffic scenarios with and without the Binbury Park, result shows reductions in traffic along the A249 from around 300 to 500 total vehicles per hour for both directions in the AM Peak and 400 to 700 total vehicles per hour for both directions in the PM Peak. Although the air quality assessment is yet to be completed, it is believed that these reductions in traffic due to the removal of Binbury Park will reduce the impacts of nitrogen emission and the associated increase in nitrogen deposition to the North Downs Woodland SAC along the A249.

2.2 Use of Electric Vehicle

The previous modelling of NO_x and nitrogen deposition were based on Defra's Emission Factor Toolkit version 10.1, which only incorporated increases in the electric vehicle fleet (and other low emission technology) up to 2030. However, towards the end of 2021 Defra released a new version, EFT v11, which incorporates electric vehicle fleet penetration up to 2050¹. Therefore, it is proposed to incorporate this into the updated 2037 air quality modelling for Maidstone Local Transport Modelling and Air Quality Assessment (for the without Binbury Park scenario).

In addition, it is proposed that any new development at the Lidsing Garden Settlement have a planning condition that each residential unit should incorporate at least one rapid electric charging point, which should help to both future proof and also to encourage greater take-up of electric cars. This option would not be modelled.

2.3 Speed Management along Boxley Road and A229

Increases in traffic along Boxley Road and the A229 were also predicted from the 2037 Maidstone Local Transport Model. The increase in traffic along the A229 generally comes from the overall growth between Medway and Gravesham to/from Maidstone and not the local plan. For Boxley Road, the increase in traffic is directly related to the Lidsing Garden Settlement. This additional traffic leads to increased nitrogen emissions and the associated increase in nitrogen deposition in the North Downs Woodland SAC along Boxley Road and the A229.

¹ <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/emissions-factors-toolkit/>

Managing the speeds (either by speed reduction or strict implementation of the speed limit) along Boxley Road, to make the route unattractive to users, should result in reducing the traffic accessing it, however, this will result in the rerouting of traffic elsewhere such as the A229.

Managing the speeds to ensure that emissions of oxides of nitrogen (NO_x) are reduced (the speed versus emission NO_x curve is a lopsided 'U' shape) by speed reduction along key sections of the A229 should result in reduced nitrogen emission and the associated increase in nitrogen deposition, however while this is a major route, this may result in the rerouting of traffic elsewhere.

Speed reduction can be incorporated in the transport and air quality assessment, however, further discussion on the policies and implementation are still required in order to confirm the result of assessment of this scenario.

2.4 Boxley Road low or zero emission zone

In theory, Boxley Road could be closed to through traffic (i.e. resident) with the exception of low or zero emission vehicles, however, this would be hard to police and enforce and so has not been considered further. The exact details of this scenario would need to be agreed.

2.5 Review of Plans and Policies

Increasing the promotion to use sustainable transport together with reviewing the plans and providing better facilities can increase the use of public transport, cycling and walking, however, any increased modal share scenarios will need to be agreed and worked up, before undertaking transport and air quality modelling.

Tree planting, in general, is also to be considered to offset potential impacts.

3. Summary

This note provides a high-level information of the mitigation measures being considered to minimise the air quality impacts of the planned developments in Maidstone to the North Downs Woodland SAC. Whilst the air quality modelling is yet to be completed, it is believed that the combination of these measures will reduce the nitrogen emissions and associated nitrogen deposition on the area of the North Downs Woodland SAC.