Statement of Common Ground

Folkestone & Hythe District Council and Natural England

1. Overview

1.1 This Statement of Common Ground (SCG) has been prepared by Folkestone & Hythe District Council (FHDC) together with Natural England (NE). It reflects the agreed position between the parties.

1.2 The purpose of this SCG is to document the cross-boundary matters being addressed and progress in cooperating to address them. It is the means by which the signatory authorities can demonstrate that their plans are based on effective and ongoing cooperation and that they have sought to produce strategies that as far as possible are based on agreements with other authorities.

1.3 Under section 33A of the Planning and Compulsory Purchase Act 2004 (amended by section 110 of the Localism Act 2011) and in accordance with the National Planning Policy Framework (NPPF) 2019 it is a requirement under the Duty to Cooperate for local planning authorities, county councils and other named bodies to engage constructively, actively and on an ongoing basis in the preparation of development plan documents and other local development documents. This is a test that local authorities need to satisfy at the Local Plan examination stage and is an additional requirement to the test of soundness.

1.4 The Duty to Cooperate applies to strategic planning issues of cross boundary significance. Local authorities all have common strategic issues and, as set out in the National Planning Practice Guidance (NPPG):

> *"local planning authorities should make every effort to secure the necessary cooperation on strategic cross boundary matters before they submit their plans for examination."*

1.5 The statutory requirements of the Duty to Cooperate are not a choice but a legal obligation. Whilst the obligation is not a duty to agree, cooperation should produce effective and deliverable policies on strategic cross boundary matters in accordance with the government policy in the NPPF, and practice guidance in the NPPG.

1.6 FHDC went out to a very limited public consultation on a revision to the Regulation 19 Core Strategy in November/December 2019 to bring it 'in check' with the Government's published figures on housing requirement.

1.7 NE responded to the Regulation 19 Core Strategy Review – submission version dated 11th March 2019, and the response is set out in Appendix A. In summary, within NE's response it is contended that:

> *"... the CSR can be further improved particularly with regard to the garden settlement (Otterpool Park) policies (SS6-9), especially in relation to the Kent Downs Area of Outstanding Natural Beauty (AONB), as well as general policy for green infrastructure (GI) and biodiversity net gain in policy CSD4."*

1.8 This SCG deals solely with the issue of nutrient neutrality. Notwithstanding this, FHDC wishes to work with NE through the examination process to address NE's concerns, while also meeting wider national policy requirements.

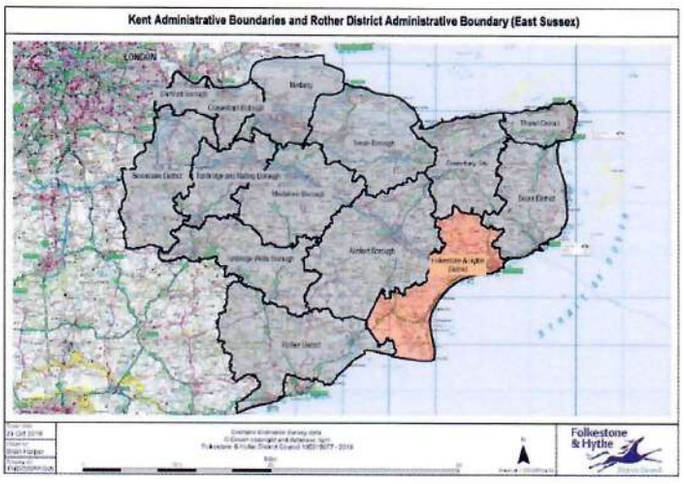
2.0 Strategic matters

2.1 The NPPF defines the topics considered to be strategic matters (para 20). Those strategic matters relevant to FHDC and the NE are explored under suitably-titled headings, and can be summarised as follows:

- Housing
- Nutrient Neutrality and the impact on Habitats Sites[1] (Stodmarsh)

2.2. The geographical relationship of FHDC in the context of Kent (upper tier authority) and neighbouring East Sussex is represented in Figure 2.1.

Figure 2.1. Geographical relationship between FHDC and Kent and East Sussex



[1] Sites covered by Conservation of Habitats and Species Regulations 2017 (as amended) are referred to as 'habitats sites' in the National Planning Policy Framework and Government guidance on HRA.

Housing

2.3 Government policy places much emphasis on housing delivery as a means for ensuring economic growth and addressing the current national shortage of housing. The NPPF is very clear that:

> *"strategic policy-making authorities should establish a housing requirement figure for their whole area, which shows the extent to which their identified housing need (and any needs that cannot be met within neighbouring areas) can be met over the plan period."*

2.4 The Government's new national formula calculated from household formation and housing affordability figures is published regularly by Office for National Statistics, and the most recently published figure for Folkestone & Hythe district currently stands at 738 new homes a year. FHDC's Regulation 19 Plan outlines a housing requirement for 13,284 new homes over plan period (to 2036/37). Meeting this target over the plan period will be provided for by development in Core Strategy Review, Places and Policies Local Plan, existing planning permissions and small sites. Accordingly FHDC is not seeking any assistance from neighbouring authorities to meet its identified housing need.

Table 2.1: Core Strategy Review 2019/20-2036/37– elements of housing supply

Source of housing supply	Number of homes
Current planning permissions and sites under construction (with adjustment for lapsed permissions)	4,274
Places and Policies Local Plan and 2013 Core Strategy sites without planning permission	1,703
Windfall allowance (95 homes a year over 15 years)	1,425
New garden settlement (Core Strategy Review policies SS6-SS9)	5,925
Expansion of Sellindge (Core Strategy Review policy CSD9) (part of allocation without permission)	188
Total Core Strategy Review plan period	**13,515**

2.5 Bringing together the different sources of housing supply outlined above creates the anticipated supply of housing over the Core Strategy Review plan period. This is outlined in Table 2.1. This gives an anticipated housing supply of 13,515 homes over the Core Strategy plan period, exceeding the national minimum requirement of 13,284 homes by around 230 homes and, as a result, the district's housing need requirement can be met in full.

Nutrient neutrality and implications on the Stodmarsh designated site

2.6 As set out Annex 1 of NE's detailed advice dated 15th October 2020:

> *"The Stodmarsh Nutrient Neutral methodology (NNM) we have proposed is one way for competent authorities to satisfy themselves that an adverse effect upon integrity of nutrient impacts of proposals can be avoided with sufficient certainty to meet the HRA tests. An appropriate assessment should be produced for the local plan, or as an additional section in the existing local plan appropriate assessment. Natural England is a statutory consultee with regards to appropriate assessments under the Conservation of Habitats and Species Regulations (2017) as amended. We advise the appropriate assessment should include information on any likely significant effects the planned development could have and how to mitigate those to avoid an adverse effect upon the integrity of any relevant European sites. It is likely the information contained within the above documents (subject to the additional information and changes recommended in this letter) will form an important part of any appropriate assessment/ amendment to the existing local plan appropriate assessment."*

2.7 NE have advised in respect to the nutrient calculation that the following information is included within the updated Appropriate Assessment:

- *All the information, values and assumptions made in the nutrient calculations.*
- *Information and evidence to support assumptions used, especially where these deviate from Natural England's methodological advice (e.g. the Council's evidence on occupancy rates and their long term stability).*
- *Evidence to support any mitigation planned, including source evidence or link if a website or copies of documents are not readily or freely available.*
- *Evidence of types of mitigation (wetlands, proposals) including proposed locations to ensure the areas of mitigation are draining relevant areas of mitigation land/ WwTW so will function effectively.*
- *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 developer's ownership will be secured. In particular, information on mitigation proposals for the allocations other than Otterpool.*
- *Any information on winter maintenance programmes or other information material to water quality assessment that may impact the efficacy of proposed nutrient removal systems.*

Chronology of progress made with Natural England in respect of Nutrient Neutrality

2.8 The below chronology charts progress that has been made by the promoters of the Otterpool Park Garden Settlement, FHDC and NE regarding concerns raised by NE in relation to the excessive nutrient levels (nitrogen and phosphorous) which are impacting on the Stodmarsh Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar site and the impact of the Core Strategy Review and in particular the proposed New Garden Settlement.

- Regulation 19 response was issued by NE to the District Council dated 11th March 2019, and a copy is provided in Appendix A. The Regulation 19 response raised no issue in relation to the matter of nutrient neutrality regarding Stodmarsh designated sites
- The Submission Version of the Core Strategy Review was formally submitted to the Planning Inspectorate on 10th March 2020 for its Examination in Public
- Letter dated 21st May 2020 from Natural England to the District Council titled 'Conservation of Habitats and Species Regulations 2017 as amended - Folkestone & Hythe DC Core Strategy Review Examination and Otterpool Park – nutrient neutrality re Stodmarsh designated sites. A copy of this correspondence is provided in Appendix B
- The District Council formally engaged NE under its Discretionary Advice Service (Charged Advice) dated 18 June 2020.
- The District Council sought technical support from water quality consultants and appointed Urban Edge Environmental Consulting on 9th July 2020. A Technical Note was issued by Urban Edge Environmental Consulting (dated August 2020) that was shared with NE for their review/comment. A copy of the Technical Note is provided in Appendix C. This was supplemented by an updated Nutrient Budget spreadsheet dated 21st September 2020
- NE re-issued advice for development proposals with the potential to increase nutrient impacts to nationally and internationally important wildlife sites within the Stour Valley catchment to all Local Planning Authorities to which the advice refers by letter dated 10th July 2020. A copy of the letter is enclosed in Appendix D. This advice clarified the wastewater treatment works to which the advice applied.
- Advice on Nutrient Neutrality for New Development in the Stour Catchment in Relation to Stodmarsh Designated Sites - For Local Planning Authorities (dated July 2020) and updated again in November 2020. This replaced guidance issued in December 2019. A copy of the November advice is provided in Appendix E

- Officers of the District Council first shared technical reporting with Natural England (by email) on 9th September 2020. There was follow-up correspondence from F&HDC to seek feedback from NE
- Technical information was circulated separately by consultants Arcadis, working on behalf of the promoters of Otterpool Park, to NE on 1st October 2020 (referenced as 'Otterpool updated memo') to summarise the work undertaken on behalf of the promoter side to achieve Nutrient Neutrality at Otterpool Park. A copy of the Technical Memo is enclosed in Appendix F
- A workshop session was hosted by Arcadis on 14th October 2020, and one agenda item was the issue of Nutrient Neutrality. Both NE and officers of F&HDC were in attendance
- NE issued a formal response on 15th October 2020 in accordance with the scope of the Discretionary Advice Service dated 18th June 2020 to provide advice to F&HDC concerning housing proposals and allocations for their local plan specifically with respect to issues around nutrient neutrality. A copy of the letter is enclosed in Appendix G
- A teleconference call with NE was held on Tuesday 20th October 2020 to talk through the advice issued on 15th October 2020
- [redacted] of NE joined a teleconference hosted by [redacted] (on behalf of the District Council) with attendance by officers of the District Council on 28th October 2020, following discussions with officers on the 26th and 27th October
- NE have provided further written advice to the District Council dated 29th October 2020 (Appendix H refers) to advise that *"Folkestone and Hythe District Council have reported significant progress to Natural England following our advice, reporting the aim to ensure safeguards are set out through policy Amendments which will be tabled at the examination."*
- Arcadis issued an updated Technical Note and associated Technical Appendices to NE on 4th November 2020. A copy of the updated Technical Note is enclosed as Appendix I.
- F&HDC issued a revised version of policy CSD5 to NE for their review/comment on 5th November 2020. A copy of the revised policy is enclosed as Appendix J. F&HDC instructed its Sustainability Appraisal consultants to undertake a new Habitats Regulations Assessment based on advice received from NE
- NE responded to the draft revision to policy CSD5 on 19th November 2020. A copy of the correspondence is provided as Appendix K.
- On 2nd December 2020 NE provided a response to the updated Technical Note issued by Arcadis on 4th November. A copy of the response is enclosed as Appendix L.

2.9 Within the response from NE dated 2nd December 2020 it is advised that the calculations and mitigation proposals supporting documents provided above are likely to meet the HRA tests for water quality at the plan level.

3. Actions going forward

Key issue	Agreed action
Nutrient neutrality and implications on the Stodmarsh designated site	FHDC and NE to continue to liaise and work together on this matter going forward, including planning applications

4 Governance arrangements

4.1 The NPPG outlines that the SCG should include governance arrangements for the cooperation process, along with a statement of how it will be maintained and kept up-to-date.

4.2 Officers of FHDC have met virtually with representatives of the NE to discuss cross boundary strategic matters under the Duty to Cooperate. The narrative and outcome of these discussions is demonstrated in this SCG.

4.3 It is intended that the SCG will be updated going forward, particularly as FHDC progresses its Core Strategy Review. The SCG will then be kept under ongoing review and will be updated at key stages in FHDC plan making process and/or when new key strategic issues arise which require amendments to this SCG. If there are any changes of the content of the SCG these matters can be discussed at future Duty to Co-operate meetings.

4.4 It is confirmed by both signatory parties that agreement has been reached on all cross boundary issues referenced within this SCG, specifically nutrient neutrality and implications on the Stodmarsh designated site. Importantly, NE are satisfied with the policy wording following a revision to policy CSD5 (as set out in Appendix K).

4.5 Evidently, discussion of strategic matters under the Duty to Cooperate is an officer-led exercise. The process for reaching agreement and sign-off of SCG includes signatories from both FHDC and NE, as declared under section 5 of this SCG.

5 Signatories/declaration

Signed on behalf of Folkestone & Hythe District Council (Officer)	**Signed on behalf of Natural England**

Position: Strategy & Policy Senior Specialist [redacted]	**Position: Area Manager Sussex and Kent** [redacted]
Date: 03/12/2020	**Date: 03/12/2020**

Appendices

- Appendix_A_Natural_England_CSR_Reg_19_Representation
- Appendix_B_Folkestone_and_Hythe_DC_Natural_England_advice_nutrient_neutrality_Stodmarsh_May_2020_final
- Appendix_C_F&H_Nutrient_Budget_Technical_Note_200824_DRAFT
- Appendix_D_Natural_England's_advice letter_to_Authorities_within_the_Stour_Valley_Catchment
- Appendix_E_Stodmarsh_Nutrient_Neutral_Methodology_November_2020
- Appendix_F_Otterpool_Nutrient_Mitigation_Analysis_Update_Memo_P1
- Appendix_G_201012_UDS_Folkestone_and_Hythe_Nutrients_NE_response_to_queries_FINAL_151020
- Appendix_H_Natural_England_ letter_291020
- Appendix_I_Otterpool_Nutrient_Mitigation_Analysis_Update_Memo_November_P2
- Appendix_J_2020_11_01_Policy_CSD5_Proposed_Modifications
- Appendix_K_Folkstone_Proposed_amended_wording_for_Policy_CSD5_f_NE_191120
- Appendix_L_Otterpool_updated_technical_note_and_NN_calculation_NE_response

APPENDIX A:

NATURAL ENGLAND – REPRESENTATIONS TO FOLKESTONE & HYTHE DISTRICT CORE STRATEGY REVIEW SUBMISSION DRAFT (11 MARCH 2019)

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Date: 11 March 2019
Our ref: 271589

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

T 0300 060 3900

Planning Policy Team
Folkestone and Hythe District Council

BY EMAIL ONLY

Dear Planning Policy Team,

Core Strategy Review – submission
(Regulation 19 of the Planning and Compulsory Purchase Act 2004)

Thank you for your consultation on the above dated 24 January 2019 which was received by Natural England on the same date.

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

Summary

Natural England welcomes several changes made in the Core Strategy Review (CSR) submission following our previous Regulation 18 advice (our letter dated 18 May 2018, ref 243011), which strengthen policy wording and principles for environmental protection and enhancement.

However, we still consider the CSR can be further improved particularly with regard to the garden settlement (Otterpool Park) policies (*SS6-9*), especially in relation to the Kent Downs Area of Outstanding Natural Beauty (AONB), as well as general policy for green infrastructure (GI) and biodiversity net gain in policy *CSD4*. Our detailed comments for these are provided in Annex One.

On the basis of the changes now made to the CSR, and our remaining points raised in this letter being addressed, we consider the Core Strategy Review submission to be sound.

Furthermore, we strongly support the Council in setting out more detailed policy and guidance on green infrastructure and biodiversity net gain in a Supplementary Planning Document (SPD), as indicated by the Council in response to our Regulation 18 advice. We would urge the Council to work with partners including ourselves, the Kent Nature Partnership, other Kent local authorities and stakeholders to develop a county-wide approach to securing net gain through development, underpinned by ecological network mapping.

For any queries relating to the specific advice in this letter please contact me on 02080 268033. For any new consultations, or to provide further information on this consultation please also send your correspondences to consultations@naturalengland.org.uk.

Yours sincerely,

[redacted]

Senior Advisor
Sustainable Development network
Sussex and Kent area

New garden settlement (Otterpool Park)

A key part of Natural England's previous Regulation 18 advice was around the need for the CSR garden settlement policies to elaborate and specify on the need to protect, and where possible, enhance, the views from the Kent Downs AONB.

Whilst there has been some improvement in some of the policy wording, eg in *SS6* and *SS7*, we are disappointed the policies do not go further in the supporting text in emphasising the requirement for a high quality and detailed Landscape and Visual Impact Assessment (LVIA), which will form a critical part of the forthcoming application. As we previously advised, the development presents a significant, new and dramatic insertion of built environment in the setting of the AONB, which is currently an expanse of semi-natural landscape as viewed from the escarpment. This should not be underestimated. The settlement will be clearly visible along a substantial distance of the Downs, a much visited stretch especially along the North Downs Way National Trail.

We urge the garden settlement policies (particularly *SS6*) to expand on the need for considerable detailed assessment to appropriately assess the potential effects and options for mitigation, through the LVIA, which will have implications for location, density and height of buildings. The Masterplan proposals should include exploration of various means of avoiding and mitigating effects which reach beyond planting and landscaping, including suitable colours of roofs and walls, and vegetated green roofs and walls which would also have the additional benefit of providing habitat.

Natural England has already provided some pre-application advice to the Masterplanning team, alongside the AONB Unit, on suitable viewpoints and methodology. However we have urged the need to obtain specific data on proposed location, density and height of built development, in order to be able to ascertain the potential impacts on the views from the AONB. This will also need to consider cumulative impacts of developments including the Sellindge extension and possibly the permanent solution to Operation Stack.

Notwithstanding the above, we consider that polices *SS6-9* set out principles of development for the new garden settlement (Otterpool Park) which:

- Implement significant, effective and appropriate GI that will be secured and managed in the long term which is in line with the aims of the NPPF (20. 91. 150. 171. & 181) and the DEFRA 25 year plan (Chapter 3 Section 3.i.).

- Secure clear biodiversity net gains that are in line with the aims of the NPPF (8. 170. 174. & 175.) and the DEFRA 25 year plan (Chapter 1 Section 1).

- Protect and enhance biodiversity and geodiversity in line with the aims of the NPPF (174.) and the DEFRA 25 year plan (Chapter 1 Section 1), especially in locally important areas such as; Harringe Brooks ancient woodlands, Otterpool Quarry SSSI, Local wildlife sites and other sensitive features.

Our detailed comments on these aspects are given below.

Policy SS6 – New Garden Settlement – Development Requirements

We welcome the strengthening of *SS6* wording upfront which now refers to mitigating impacts on the Kent Downs AONB (our emphasis):

'*It will be a landscape-led development that responds to its setting within the Kent Downs AONB landscape and the adjacent Lympne Escarpment with an emphasis on a network of green and blue spaces including woodland and other planting, open space and recreation that supports healthy living, encourages interaction between residents, enhances local biodiversity and* ***mitigates impacts on views from the scarp of the Kent Downs***.'

We are disappointed to note however the removal of the aspiration for water and carbon neutrality, which are otherwise noble aims for a sustainable development of this scale, and we would urge their reinstatement.

Policy SS7 - New Garden Settlement – Place Shaping Principle

We welcome the strengthened policy wording in this submission which reflects the need for the garden settlement proposals to mitigate impacts on views from the Kent Downs AONB (*principle 1 a*). This is critical in ensuring the scheme will result in a wholly sustainable development.

Similarly, we welcome strengthened wording for a green infrastructure strategy for the scheme, including securing net gain (*principle 1 b*). For the latter, we would suggest the net gain wording is further clarified to read (our addition underlined): '*clear biodiversity net gains over and above residual losses <u>which are accounted for and addressed</u>…*'.

To inform the garden settlement GI strategy, we would encourage the policy to include wording which seeks the Masterplan proposals to include a functional assessment of existing GI assets and then a consideration of the needs of the new community, ie what function is needed and where, and what type of GI is needed to deliver it.

Specific mention is made in policy *SS7* to '*enhancing Harringe Brooks ancient woodland including its ecological connections, future management and community access*', following our previous advice. From having discussed these woods further as part of our pre-application engagement, we would suggest adding 'as appropriate' at the end of this sentence, to allow flexibility in which natural capital assets are prioritised, ie the woods may be best devoted to a wildlife refuge given they support some sensitive wildlife value, and the terrain may also make it unsuitable for public access.

We are particularly pleased to note inclusion of 'future phases' for advanced structural planting in para 4.177, reflecting *principle 1 b i*, and inclusion of *principle 1 b vii* for '*A long-term security and management plan of the Green Infrastructure estate which ensures community involvement and custodianship*.' For the latter, we regard this as a critical plank for the successful longterm management of the GI estate. As we previously advised for the Reg 18 consultation, we consider longterm management is possible and essential for the success of the garden settlement and its sustainability. If responsibility for GI assets is delegated to individual developers over the lifetime of the development, rather than through an overall land management organisation, there is the risk of depletion in quality and quantity of GI across the town, and ultimately its ability to function to its original purposes.

We would however also encourage policy *SS7* to include a specific principle for providing an all-year pollinators network throughout the settlement, as part of the GI strategy, with connection to the wider countryside, given the criticality of pollination as a key provisioning ecosystem service, and bearing in mind the dramatic decline in insects more widely. Such a pollinators network should provide insect habitat all year round to support whole lifecycles, including blossom in the spring to flowering edges and meadows in the summer, and ivy for example in the winter; above all aiming to provide variety in terms of plant species to maximise their benefit for insects.

As we previously advised, whilst we note and welcome reference to enhancement of Otterpool Quarry SSSI, protection should <u>also be sought</u> in this policy for Lympne Escarpment SSSI to the south, which although outside the site boundary, may potentially impacted by ground water contamination.

Policy SS8 - New Garden Settlement - Sustainability and Healthy New Town Principles

We note and welcome *principle 1 a)* which includes strengthened wording for the energy strategy, which will include potential heat, power and energy networks, to take into account the AONB and its setting.

Green infrastructure and biodiversity net gain

Policy CSD4 - Green Infrastructure of Natural Networks, Open Spaces and Recreation

We strongly support this policy's commitment to incorporate and improve GI throughout the district in a long-term and meaningful way.

Previously we suggested amendments to tighten the wording around securing net gain, in the supporting text. We still consider this should be done for the first paragraph of the policy, as follows (our suggestion underlined):

Improvements in green infrastructure (GI) assets in the district will be actively encouraged as will an increase in the quantity of GI delivered by the council working with partners and developers in and around the sub-region, including through ~~pursuing opportunities to secure~~ securing net gains in biodiversity, and positive management of areas of high landscape quality or high coastal/recreational potential.

We also have a number of additional suggestions relating to the supporting text and key principles of *CSD4*, to optimise it in terms of environmental ambition and outcomes:

- *GI definition* – in the supporting text, we would recommend including a fuller definition and description of GI to the effect of the following (eg after or as part of paragraph 5.35):

  Green Infrastructure is a network of green and blue (aquatic) spaces and other environmental features which contribute to the quality of life for residents and the health of flora and fauna. Landscape design, biodiversity enhancements, tree considerations and requirements for multi-functional green space on site are all factors that will form part of the GI of a site and its surroundings. GI will also encompass access to, from and through the site including links to adjacent GI resources (e.g. links to hedges on surrounding land), opportunities for recreation, sustainability (e.g. climate change, pollutant filtration, Sustainable Drainage systems (SuDS), swales, low water demanding planting species, use of FSC sustainably managed timber products and soil products) and community involvement.

  GI has wide-reaching environmental, social and economic benefits of GI, including:

  - *supporting habitats and wildlife,*
  - *people's access, recreation, health and wellbeing;*
  - *health and wellbeing of the local community,*
  - *sense of place,*
  - *attractiveness and economic prosperity of the town for living and working,*
  - *landscape character and mitigation for Kent Downs AONB,*
  - *cleaner air*
  - *sustainable management of soils, and water and flood risk,*
  - *countering climate change*

- *Mitigation hierarchy* – in the supporting text, we suggest a specific paragraph is added to set out the mitigation hierarchy that development needs to follow before net gains can be

secured; as in line with national policy. Suggested wording could be as follows, or to similar effect, perhaps following paragraph 5.45:

As set out in the NPPF, if significant harm to biodiversity cannot be avoided (through modifying the design or locating to an alternative less harmful site), it should be adequately mitigated, or as a last resort, compensated for. This series of sequential, hierarchical steps that need to be taken to limit, as far as possible, the negative impacts on biodiversity from development is known as the mitigation hierarchy. It should be followed for every development.

- *Net gain* – we are also pleased to note strengthened wording in *principle a)* to include achieving net gain over and above residual losses. As net gain should be applied after the mitigation hierarchy is followed for any scheme, we suggest the following underlined suggestion is added to this sentence, for clarity: '*Development must avoid a net loss of biodiversity, and achieve net gain over and above residual loss which is accounted for and addressed'*.

- *Principle c)* should also be expanded to include internationally designated sites (including Special Protection Areas, Special Areas of Conservation and Ramsar sites).

- *Principle d)* should also include specific reference to UK priority habitats.

We welcome the Council's response to our Reg 18 comments about providing further detailed policy and guidance on GI and biodiversity net gain in a Supplementary Planning Document (SPD), however this does not appear to be reflected in the CSR itself. We therefore recommend policy *CSD4* is updated to reflect this key commitment. The SPD should seek to ensure GI and net gain can be secured in as effective a way as possible in the District, ideally in collaboration with other Kent local authorities. Its scope in relation to net gain should include:

- **Biodiversity Metric** – Developers should apply the Defra biodiversity metric 2.0, which provides a clear method for developers to calculate net gains in biodiversity for individual planning proposals. This has recently been updated to include a wider range of habitat types and take into consideration habitat connectivity.

- **Net gain plans** – these are plans which applications would be required to submit with their proposals, potentially as part of their ecological assessment. These plans should clearly set out the ecological issues of the proposal and account for how net gain will be provided over and above the residual losses of the proposal. These net gains can be provide on and/or off site.

- **Approval by council ecologist** – net gain plans should be approved by the Council's ecologist or retained ecologist; we are aware that Folkestone and Hythe District Council currently utilise Kent County Council's ecological service.

Key principles underlining the net gain approach also include:

- **Mitigation hierarchy** – all development proposals should continue to follow the mitigation hierarchy as set in national policy (para 118 of the NPPF), whereby if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused.

- **Impacts on statutory designated sites** – including SSSIs and European sites, including Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites – these will continue to be addressed through their existing legislative protections, ie the

Wildlife and Countryside Act 1981 as amended, and Conservation of Habitats and Species Regulations 2010 as amended (the 'Habitats Regulations').

Net gain should be applied following residual loss in biodiversity of a development proposal having been addressed. It is also based on enhancement and creation of UK priority habitats, listed as required under Section 41 of the NERC Act 2006.

We strongly encourage the Council to work in liaison with fellow Kent local authorities and Kent County Council, the Kent Nature Partnership, Natural England and other stakeholders, in an effort to develop a strategic county-wise approach to securing net gain through development. This should also include producing ecological network mapping (including Biodiversity Opportunity Areas), which is a requirement of the NPPF, in a joined up way which should ultimately identify areas of risk and opportunity for providing net gain in Kent. This is an exciting and developing piece of work which will become critical if net gain through planning is to be mandatory, as intended by government.

Natural England is also very keen to work with the Council on developing its GI/ net gain SPD, and we would be happy to discuss how we can assist further.

Strategic Need B: The challenge to enhance management and maintenance of natural and historic assets

We are pleased to note wording in several points under Strategic need B has been adjusted to focus on enhancement rather than just protection, including:

Aim 4 – to '*conserve and enhance sensitive landscapes'*, a opposed to simply manage.
Aim 3 – altered to include net gain.

We are also pleased to see the inclusion of the Council's commitment to air quality monitoring roadside NO_x at regular intervals over the plan period in order to identify any improving or deteriorating trends. This should be beneficial for designated sites and other habitats sensitive to low air quality.

Lydd Airport

We note the CSR submission refers to the Lydd Airport expansion (in policy *SS1* and paragraph 5.121). We suggest the policy wording is strengthened significantly to ensure that impacts to the Dungeness designated sites do not result from this expansion, as follows (our additions underlined):

- Policy SS1 District Spatial Strategy (p55, bottom paragraph)
  Should development proposals come forward for the further expansion of London Ashford Airport at Lydd, the council will work with the airport, local community and other stakeholders to prepare and adopt an Action Area Plan for the site. Further development at London Ashford Airport will only be permitted where direct and indirect impacts to the Dungeness, Romney Marsh and Rye Bay SSSI, SPA and Ramsar Site and the Dungeness SAC can be avoided or fully mitigated.

- Romney Marsh Area (p47, paragraph 5.121)
  Lydd Airport has been significant in the area for more than 50 years and, by 2019, is expected to have implemented planning consent for extended runways and a new terminal building, to allow passenger flights using aircraft the size of Boeing 737 or Airbus 319, thereby creating up to 200 jobs locally. Should development proposals come forward for the further expansion of London Ashford Airport, the council will work with the airport, local community and other stakeholders to prepare an Action Area Plan for the site. Further

development at London Ashford Airport will only be permitted where direct and indirect impacts to the Dungeness, Romney Marsh and Rye Bay SSSI, SPA and Ramsar Site and the Dungeness SAC can be avoided or fully mitigated.

Habitats Regulations Assessment (HRA)

As a minor note upfront, the HRA makes reference to the Conservation of Habitats and Species Regulations 2010 (para 2.6), which should be updated to the Conservation of Habitats and Species Regulations 2017 (as amended).

We also note the the HRA is based on the housing level which includes the garden settlement allocation of 6,375 homes, for the Local Plan period up to 2036/7, and that this has risen from 5,500 in the Reg 18 consultation. The envisaged ultimate quota for the allocation beyond the plan period is still 10,000 homes, which will need to be assessed and subject to the subsequent Local Plan reviews and associated HRAs, which should be noted in this current CSR.

The CSR and HRA should also emphasise that any forthcoming application for the garden settlement will need to provide supporting information for a project-level HRA.

In combination approach
In our previous Reg 18 advice, we noted that whilst the CSR HRA has clearly included the emerging PPLP for in-combination assessment in terms of air quality, this is less clear for the other impact pathways, principally recreation pressure, on European sites. Whilst the PPLP HRA concluded no adverse effect on integrity for European sites (reiterated in para 1.12 of the CSR HRA), including recreation pressure, with which Natural England concurred, we advise the CSR HRA should make clear the PPLP has been assessed in combination for all impact pathways.

HRA screening
We note the updated HRA now takes account of the recent *People over Wind* judgment where avoidance and mitigation measures cannot be taken into consideration at the screening stage for likely significant effect.

In light of this, we concur with the European sites (including Ramsar sites) identified which may be affected by the CSR, and the screening assumptions as displayed in Table 2.2.

Natural England concurs with the findings of the HRA of no likely significant effect in relation to air quality and recreational impact on the following European sites:

Blean Complex SAC
Dover to Kingsdown Cliffs SAC
Lydden and Temple Ewell Downs SAC
Parkgate Down SAC
Wye and Crundale Downs SAC

Dungeness protected sites – recreational pressure
With regard to recreational pressure, the evidence base for the Sustainable Access and Recreation Management Strategy (SARMS), namely the 2014-15 visitor surveys which have come to light since the adoption of the 2013 Core Strategy, demonstrate the majority of the potential recreational pressure, and increase in pressure, would be from visitors through tourism. The bulk of visitors come from far beyond the Folkestone & Hythe District (approximately 75% of visitors come from up to 87km away).

Natural England envisages the SARMS will enable a series of precautionary measures to be implemented across the protected sites, particularly through stakeholder partnership. However we

consider the appropriate means for funding for the SARMS are still to be discussed and agreed. At this stage we would not advocate developer contributions from local proposals in the district, based on the evidence. We advise that the council, as well as Rother District Council, should address the funding needs through their respective tourism growth plans.

Natural England is due to meet with the Council to discuss the emerging SARMS in more detail, of which its governance and funding will form a key part.

With regard to the garden settlement, given its distance away from the Dungeness protected sites, and that it will provide considerable onsite greenspace provision, we do not consider this allocation will have a likely significant effect on the Dungeness sites through recreational pressure.

Ultimately, we advise the SARMS should not be considered as specific avoidance mitigation for local development coming forward, but that it provides useful policy context against which the CSR can be assessed. We consider the CSR, alone and in-combination with other plans and projects, can be screened out from having a likely significant effect through recreational pressure on the Dungeness protected sites at this stage, and does not need to be taken forward to Appropriate Assessment.

We advise the HRA should be updated to reflect this.

Appropriate Assessment

Folkestone to Etchinghill Escarpment SAC – air quality and recreational pressure
Natural England's advice has not significantly changed since our previous response to the Reg 18 consultation. That is, we concur with the conclusion made of no adverse effect on integrity on the Folkestone to Etchinghill Escarpment SAC for the CSR alone and in-combination, in terms of air quality.

As a precautionary measure however, given this site's proximity to key traffic routes and its vulnerability to air pollution, we support the commitment by the Council to undertake monitoring of air quality along the A20 in proximity to the SAC, to review the situation and enable changes to onsite management where necessary, in conjunction with ourselves.

For recreation pressure, given the garden settlement will provide substantial onsite greenspace and open access, Natural England concurs that the CSR, alone and in-combination, will not have an adverse effect on integrity on this site.

Dungeness, Romney Marsh and Rye Bay Ramsar , Special Protection Area (SPA) and Dungeness SAC – air quality, physical damage/ loss, water quantity/ quality
As we advised in our previous response to the Reg 18 consultation, we concur with the conclusion made of no adverse effect on integrity on the Dungeness sites for the CSR alone and in-combination in terms of air quality, physical damage/ loss and water quantity/ quality.

Sustainability Appraisal (SA)

Following our previous advice to the Reg 18 consultation, the CSR now contains strengthened policy wording for the garden settlement policies, in particular to mitigate impacts on views from the AONB. In light of this, Natural England concurs with the conclusions drawn in the SA.

APPENDIX B:

NATURAL ENGLAND – LETTER TO FOLKESTONE & HYTHE DISTRICT COUNCIL REGARDING NUTRIENT NEUTRALITY AND STODMARSH DESIGNATED SITES (21 MAY 2020)

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Date: 21 May 2020

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

T 0300 060 3900

[redacted]

Folkestone and Hythe District Council

BY EMAIL ONLY

Dear all,

Conservation of Habitats and Species Regulations 2017 as amended

Folkestone & Hythe DC Core Strategy Review Examination and Otterpool Park – nutrient neutrality re Stodmarsh designated sites

Following the call we had on Wednesday 13 May to discuss water quality issues and the implications for Folkestone and Hythe District Council's Core Strategy Review, and Otterpool Park, as agreed I am writing to provide Natural England's advice to date on these matters.

I hope that this information is helpful, and we would be happy to provide further advice through our Discretionary Advice Service, discussed further below.

Summary

Information has recently emerged relating to existing water quality impacts (eutrophication) on the Stodmarsh European designated sites (Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar site), caused by high nutrient levels including nitrogen and in particular phosphorous. The latter originates mainly from permitted wastewater discharges into the River Stour (River Stour catchment).

This has implications for the Otterpool Park application, and the Council's Core Strategy Review which we note is currently submitted for Examination.

In line with the Conservation of Habitats and Species Regulations 2017 as amended (the 'Habitats Regulations'), we advise the Council will need to assess the water quality issues for new plans and proposals which may contribute to nutrient levels in the Stour catchment, as part of the Habitats Regulations Assessment (HRA).

As we discussed, this will need to include the supporting HRA for the Core Strategy Review Examination, which should identify all allocations including Otterpool Park garden town which may discharge into the Stour catchment. The Otterpool Park application will also need to address the water quality issues through the Water Cycle Study and accompanying information for the HRA.

Please see further detailed advice in the Annex below, which includes the context of existing water quality impacts adversely affecting Stodmarsh, and recent information which identifies the Sellindge

wastewater treatment works (WwTW) as a contributor to these impacts. We also include advice on potential mitigation options, in particular the use of nature-based solutions.

Also attached with this letter is the latest published Natural England guidance on nutrient neutrality in relation to the Stodmarsh designated sites. Please note this guidance is currently being updated, which we will provide you with as soon as it is finalised.

Natural England is keen to work closely with the Council to address these issues in particular to support the Core Strategy Review Examination and the Otterpool Park application.

We can provide this advice through our Discretionary Advice Service, and encourage the Council to also engage with other key stakeholders including the Environment Agency, Kent CC and Southern Water, and other neighbouring local authorities as appropriate.

Please do contact me to discuss further.

With best wishes,

[redacted]

Senior Advisor
Sustainable Development network
Sussex and Kent area

Annex - Natural England's detailed advice on nutrient neutrality issues affecting Stodmarsh designated sites

I wish to draw your attention to environmental risks which we advise will need to be addressed in the Otterpool Park application, and the Core Strategy Review, which is currently submitted for Examination.

Need for Appropriate Assessment

Information has emerged relating to existing water quality impacts (eutrophication) on the Stodmarsh European designated sites, caused by high nutrient levels including nitrogen and in particular phosphorous. The latter originates mainly from permitted wastewater discharges into the River Stour (River Stour catchment). This has implications for the Otterpool application, and the Core Strategy Review Examination.

Your authority will be aware of CJEU's judgment on the Coöperative Mobilisation case (often referred to as the '*Dutch Nitrogen cases'*. This ruling focuses on air quality matters; however it has application to other areas of Habitats Regulations Assessment (HRA), most notably water quality, where there are close similarities with exceeded environmental benchmarks, development pressures and reliance on strategic plans for reducing loading to the water environment.

The Stodmarsh sites are currently failing the agreed nutrient standards (as set out in Natural England's published guidance on nutrient neutrality in relation to Stodmarsh[1]). As such, Natural England advises that new plans or projects which could contribute to the nutrient levels cannot be excluded from having a likely significant effect on the Stodmarsh sites, and will need to be examined through appropriate assessment.

We advise this assessment should take into account existing nutrient and conservation status of the receiving waters. Where an appropriate assessment for new plans/ projects intends to rely on existing and proposed measures that will, over time, achieve favourable condition of the Stodmarsh sites, there must be sufficient certainty about those measures and their benefits in terms of their effectiveness, timeframe, enforceability, implementation, permissions and funding (for example).

For Stodmarsh, wastewater treatment works (WwTWs) discharging into the River Stour and its surrounds are subject to an investigation of their impacts and connection with the Stodmarsh designated sites, under the Environment Agency Water Industry National Environment Programme (WINEP). The WINEP is due to report in 2022, and will identify what improvements need to be made, eg changing permitting levels, infrastructure improvements, or new treatment works, in order to restore the sites to favourable condition and remove the contribution of existing wastewater to the sites' failure of conservation objectives. Currently, there is no existing plan to address the existing failures at the Stodmarsh sites.

Natural England has worked constructively with Southern Water to add the assessment of planned growth to the investigation. Until the WINEP work is complete, uncertainty remains for future housing developments that discharge additional wastewater into the Stour catchment which add to the existing adverse effect. Before the WINEP investigation can report, Natural England is advising local authorities which may be affected to take a precautionary approach when addressing this uncertainty.

[1] Natural England *Advice on Nutrient Neutrality for New Development in the Stour Valley Catchment in Relation to Stodmarsh Designated Sites – for Local Planning Authorities* (December 2019)

To help local authorities, Natural England has set out a nutrient neutral methodology as a way of calculating whether mitigation is required for water quality impacts, for calculating the scale of the mitigation required, and advise on types of mitigation that may enable the competent authority to have confidence that an adverse effect has been avoided. More information on this is provided further below.

Sellindge WwTW

Natural England has recently received a more detailed scope of the WINEP study from Southern Water of WwTWs to be examined due to their known contribution to the phosphorous and nitrogen loading in the River Stour at Stodmarsh. These include the Sellindge WwTW which are now a named works in the investigation. As such, there is an impact pathway with Otterpool Park, if wastewater is to be discharged via Sellindge WwTWs or an onsite treatment works, into the East Stour.

Natural England understands that the Sellindge WwTW is due to be upgraded by 2024 to address its discharge of phosphorous, which is contributing to the existing Water Framework Directive (WFD) river phosphorous failures of good ecological status in the Stour catchment. However, projected permit values for the proposed upgrades at Sellindge treatment works up until 2045 and the contribution of these permits to the phosphorous sources (Source Apportionment Geographical Information System (SAGIS)) are based on modelling for population equivalence which does not take account of the Otterpool Park garden town proposals. Natural England is aware there is a disparity of proposed growth in the Stour catchment including Otterpool and the future modelled growth for the WFD upgrades. Natural England has agreed with Southern Water Services more accurate growth values should be included in the company's WINEP investigation.

Nutrient Neutrality

One way for competent authorities to address the uncertainty for new development proposals is for schemes to achieve 'nutrient neutrality', to ensure they do not add to the existing nutrient burden on the designated sites, and to give certainty that schemes are deliverable in line with the Habitats Regulations.

Natural England has provided a method to calculate nutrient neutrality, set out in Natural England's Stodmarsh nutrient neutrality guidance note (latest published version December 2019), attached to this letter. This guidance is currently being updated to reflect changes to the similar Solent methodology which has been agreed across government (MHCLG, Defra, the EA and NE), and to clarify the catchment and WwTWs identified in the more detailed scope for the WINEP Study, as recently received by Natural England.

Natural England's advice to Folkestone and Hythe District Council on the Core Strategy Review and Otterpool Park

For the Core Strategy Review, which is currently submitted for Examination, Natural England advises the HRA needs to be updated to address the water quality impacts affecting the Stodmarsh sites. This will need to include all allocations which propose discharge into wastewater treatment works within the catchment, including the Otterpool Park scheme. This should include calculation of the nutrient budget for all affected allocations with respect to nitrogen and phosphorous, with all mitigation options outlined, along with the fundamental principle that each scheme must achieve nutrient neutrality in order to provide certainty of avoiding adverse effect on integrity of the designated sites.

The Council may wish to discuss this with other local authorities who are undergoing similar assessments of their Local Plans review, such as Canterbury in the Stour catchment or Chichester District Council in the Solent.

For the Otterpool Park application, the Water Cycle Study should be updated to incorporate assessment of water quality of discharges into the Stour catchment on the Stodmarsh designated sites, using best available data, and set out necessary mitigation measures to achieve nutrient neutrality. This will need to be considered in the HRA of any application. As the development will be phased, budgets and mitigation could be assessed for each phase, with calculations revised over time to take account of changes (eg WwTW upgrades, change to evidence base etc). For the outline application, this will need to have an overall nutrient budget for the scheme with mitigation measures for the whole scheme which provide the level of certainty described above. However, it is acceptable to include phasing of the mitigation measures and break clauses should the level of certainty of restoration of Stodmarsh sites change, for example following the WINEP investigation report in 2022.

We advise a number of options should be assessed, including all options proposed for discharge of wastewater including via the Sellindge WwTW, any proposed new onsite treatment works, or via West Hythe WwTW out to sea. For the latter, this option would exclude possible impacts on Stodmarsh. However the Council should be aware Natural England is undertaking a review of coastal sites in Kent for nutrient impacts in our three year plan to identify whether sites are found to be failing because of high nutrient levels, which may have implications for longer term future development. We can provide the Council with further information on this.

Mitigation for high nutrient levels can take a number of forms including:

- **Upgrades to existing WwTWs** – this can only be secured through the water industry regulatory process via their regulators (OFWAT and Environment Agency). The upgrades needed for existing wastewater will be assessed in the WINEP investigation that will be finalised by 2022. The upgrade measures are not yet certain and we cannot yet confirm the timetable over which upgrades to remove the adverse effect will be achieved, or if these upgrades are achievable using conventional technologies. Natural England has encouraged the company to ensure that the proposed upgrades take account of future growth.

- **New onsite WwTW** (for large schemes such as Otterpool) – the developers could identify an inset provider or agree with the water company a new WwTW to make use of novel technology to treat waste water such as drinking water technologies. These would need to be permitted and regulated by the Environment Agency and would still need to meet the requirements of the Habitats Regulations, the Water Framework Directives and other environmental standards. This would need to be sufficiently certain at the time of permitting to meet the requirements listed above.

- **Nature based solutions: interceptor wetlands** – wetlands can be effective at uptake of nutrients. They include storm interceptor wetlands (eg as part of SuDS strategies) and interceptor wetlands to take effluent from WwTWs before discharge into watercourses. Wetlands need to be appropriately designed and located to be effective and this can only be assessed on a case by case basis. The solution should be sufficiently certain at the time of permitting to meet the requirements listed above.

- **Nature-based solutions: offsetting** – through change in land use, eg converting agricultural land (high phosphorous and nitrogen inputs) to woodland or semi-natural grassland such as chalk grassland (no additional nutrient inputs and low natural discharge).

Natural England strongly encourages the use of nature-based solutions for permissions before the WINEP has reported, in particular the use of wetlands, and for this to be delivered strategically given the issue is affecting a number of districts and developments in the Stour catchment. In addition to helping meet the requirements of the Habitats Regulations, wetlands can deliver a number of additional benefits which contribute to the Government's 25 Year Environment Plan targets.

APPENDIX C:

URBAN EDGE ENVIRONMENTAL CONSULTING – FOLKESTONE & HYTHE DISTRICT LOCAL PLAN NUTRIENT BUDGET TECHNICAL NOTE (AUGUST 2020)

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Technical Note

URBAN EDGE ENVIRONMENTAL CONSULTING

Project	Folkestone & Hythe Local Plan Nutrient Budget	**Date**	August 2020
Note	Nutrient Budget	**Ref**	
Author	Giulia Civello	**Page**	1 of 16
Status	DRAFT		

1. Introduction

There are high levels of nitrogen (N) and phosphorus (P) entering the Stour catchment with sound evidence of eutrophication within the Stodmarsh site. Stodmarsh is internationally designated as a Special Area of Conservation (SAC) and a Special Protection Area (SPA). The site is also designated at the national level as a Site of Special Scientific Interest (SSSI) and as a National Nature Reserve (NNR) in parts. These nutrient inputs are currently thought to derive from household waste water and agricultural sources, although recycling of nutrients within the lake habitats cannot be ruled out[1].

There is uncertainty as to whether new housing growth will further deteriorate the designated sites. Natural England has advised that one way to address this uncertainty is for new development to achieve nutrient neutrality. This provides certainty that new development is deliverable in line with the Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitats Regulations') and in light of recent case law and will not adversely affect the integrity of the Stodmarsh SAC/SPA.

UEEC has been instructed by Folkestone & Hythe District Council ('the Council') to complete a nutrient budget for the Folkestone & Hythe Local Plan (2020 to 2037), including all development conferred by the Plan which drains into the Stour catchment either directly via land use run off or indirectly via the effluent of a waste water treatment works (WWTW).

2. Methodology

A nutrient budget, including both N and P, has been calculated using the Natural England Stodmarsh methodology dated July 2020[2]. The budget takes account of nutrients from two sources:

[1] Natural England (2020): *Advice on Nutrient Neutrality for New Development in the Stour Catchment in Relation to Stodmarsh Designated Sites - For Local Planning Authorities*. July 2020

[2] *Ibid*

a. Net increase in population associated with development increasing the amount of nutrients discharged into the Stour catchment via WWTW; and
b. Changes in land use associated with development affecting the amount of nutrients leaching directly into the water environment.

The nutrient budget calculation presented in Annex 1 to this note includes all allocations in the Local Plan which would result in a net increase in population served by a wastewater system draining into the Stour catchment, including new homes and tourist accommodation. It also includes additional allocations which are located within the Stour catchment but are not served by a wastewater system draining into the Stour catchment. Figure A2.1 in Annex 2 shows all those allocations included in the nutrient budget in relation to the Stour operational catchment areas. Figure A2.2 in Annex 2 shows the location of the Stodmarsh designated sites.

Stage 1

Stage 1 of the methodology calculates the net additional population for each allocation site, the waste water volume associated with this additional population and the subsequent amount of N and P discharged from the WWTWs per year.

Population numbers

Proposed net dwellings numbers for each residential development site were provided by the Council as presented in the Core Strategy Review – Submission Draft (February 2020) and the Places and Policies Local Plan - Submission Draft (February 2018). The net additional population has been calculated by multiplying the dwelling numbers by 2.18 (average dwelling occupancy for the District provided by the Council).

With regard to Otterpool Park, the Council's housing trajectory for the plan period to 2037 assumes that housing will be delivered as part of the Outline Planning Application (ref) up to 5,925 dwellings[3]. However it is feasible that the full housing quota of the Outline Planning Application (8,500 dwellings) and a further 1,500 dwellings on residual land beyond the Outline Planning Application Boundary could come forward within the plan period. Therefore the following two Otterpool population scenarios have been included in the nutrient budget on a precautionary basis:

- Scenario 1 – 8,500 dwellings delivered within the Outline Planning Application Boundary; and
- Scenario 2 – 10,000 dwellings delivered within wider masterplan area.

Windfall development has also been accounted for in the nutrient budget. Windfall sites are defined in the National Planning Policy Framework (NPPF) as *"Sites which have not been specifically identified as available in the Local Plan process. They normally comprise previously-developed sites that have unexpectedly become available."*.

The Core Strategy Review puts forward an allowance for windfall development (sites of 1 to 9 homes) of 95 homes a year for the District. This figure has been based on the Council's analysis of historic windfall rates

[3] Recently updated the profiling for housing delivery generated a value of 6,097 occupations at Otterpool Park by 2037

from 2012-2018. Early years in the plan period have been discounted to avoid double-counting with sites with current planning permissions. For the remaining 15 years of the plan period this leaves a windfall delivery of 95 homes a year, leading to a total of 1,425 units for the plan period for the entire District.

An assessment has been undertaken of the historic windfall data against the Stour catchment areas supplied by Natural England (as shown in Figures A2.1 and A2.2 in Annex 2). The historic data show that an average of 8 homes a year have come forward from windfall development within the Stour catchment areas. If this is applied to the 15 year period of windfall delivery, it suggests that an additional 120 homes will come forward from windfall delivery within the plan period within the catchment area.

Waste water treatment works and permit levels

The only WWTW serving Folkestone & Hythe District which discharges into the Stour catchment is Sellindge WWTW. Sellindge has a Total P permit level of 1mg/l OSM annual mean with a tightened level of 0.5 mg/l by 2024 under the water company's water industry Asset Management Plan. This tightened value has been applied in the budget in line with the Natural England methodology. Sellindge has no Total N permit level. In the absence of a N permit level, the Natural England methodology advises that a proxy figure of 27mg/l should be applied.

At this stage three waste water treatment options are being considered for Otterpool Park:

- Option 1: Development served by upgraded Sellindge WWTW;
- Option 2: New on-site facility draining to East Stour; and
- Option 3: Development served by West Hythe WWTW.

All three options are included within the nutrient budget at Annex 1. Likely N and P permit levels for a new on-site facility in Option 2 have been provided by future operator Albion Water and are set at 0.3 mg/l for P and 9mg/l for N.

Stage 2

Stage 2 of the methodology adjusts the N / P load to offset existing nutrients from current land use. There are three main land use categories in the Natural England methodology: agricultural land, urban and non-agricultural greenfield land. The Natural England methodology provides different nitrogen loads for different farm types, where arable agriculture has a much higher nitrogen load than animal grazing for example.

The total area of each development site was taken from a GIS shapefile of all sites provided by the Council and cross-checked against the site areas noted in the Local Plan. In the few instances where the site areas provided in the Local Plan differed from the areas calculated from the shapefile, the shapefile area has been applied.

The total site area was then divided between the land use categories based on measurements made in ArcGIS supported by aerial photography and site descriptions provided in the Local Plan. Each area was multiplied by the average nitrate / phosphate load for that particular land use and then summed to provide the total annual N / P load from current land uses (kg/ha/yr).

For Otterpool scenario 1 (8,500 dwellings) existing land use types have been taken from the schedule of areas provided by Arcadis to the Council on 16 July 2020; however the 'mixed' land use category has been split into two: urban land and non-agricultural greenfield as these two land use types have different nutrient loading factors in the Natural England methodology. The split between urban and non-agricultural greenfield land was based on existing land use survey information provided by Arcadis in ArcGIS shapefile format.

For Otterpool scenario 2 (10,000 dwellings) existing land use types beyond the red line boundary for the outline planning application but within the wider masterplan area were taken from the existing land use survey information provided by Arcadis in ArcGIS shapefile format where available. For non-surveyed areas, existing land use assumptions were made based on aerial photography and ArcGIS measurements.

For allocation CSD9, total areas for Phase 2 Site A and B were taken from Council drawing 1038/SPO/JH dated 30 August 2019.

Allocation ND4 is located on the Etchinghill Golf Course; this has been categorised as urban land due to the higher nutrient loading associated with fertiliser use.

Site allocations ND5 (Land at Barrow Hill) and ND6 have been excluded from the budget to avoid double counting as they fall within the Otterpool wider masterplan area and outline planning application boundary respectively.

Windfall sites

In order to factor the windfall dwelling numbers into the calculations it was necessary to establish:

a. Whether these dwellings will come forward on greenfield or brownfield land; and
b. The area of land these developments will cover.

With regard to point a, an assessment of the greenfield/brownfield split in windfall delivery from the historic sites within the Stour catchment area has been undertaken. Approximately 68% of windfall development has been delivered on previously developed sites and 32% on greenfield sites within the Stour catchment area. Applying these percentages to the anticipated future delivery suggests that of the additional 120 homes to come forward from windfall development within the plan period, 82 would be delivered on previously developed land and 38 on greenfield land.

With regard to point b, an average population density of 1.637 was applied. This was derived from the 2018 mid-year population estimates published by Kent County Council[4]. Population figures for the wards of North Downs East and North Downs West, which align most closely to the Stour catchment areas in the District, were averaged and applied.

[4] https://www.kent.gov.uk/__data/assets/pdf_file/0018/8145/Mid-year-population-estimates-ward-level-population.pdf

Stage 3

Having calculated the nutrient load from current land use, Stage 3 goes on to calculate the nutrient load from proposed land use that will not be received by a WWTW. A number of assumptions have been made to inform this stage of the calculations as set out in the paragraphs below.

Open space provision

Open space provision has been calculated using the emerging Local Plan standard of 2.98ha per 1,000 people for developments over 20 dwellings. This equates to 0.00289 ha of open space per person. Because not all open provision is necessarily green space, 90% of 0.00289 ha per person has been applied (0.002601 ha/pp). The remaining 10% is assumed to be hardstanding and therefore falls into the urban land category. Given the nutrient load for urban land is higher than open space this approach ensures a precautionary scenario in terms of the nutrient budget.

For developments under 20 dwellings a precautionary assumption that no open space will be provided has been made. This includes windfall development as windfall sites typically provide between 1 and 9 dwellings.

Proposed urban area

New urban area is then calculated by subtracting the open space provision from the total site area. It is assumed that new urban area and new open space are mutually exclusive. There is a possibility that some developments may embed open space areas within the urban elements of the site for example a green amenity roof space on top of a residential block. However for the purpose of these calculations, we have assumed that in most cases open spaces and urban areas do not overlap in plan terms.

As for Stage 2, the area within each land use category is then multiplied by the average nitrate / phosphate load for that particular land use and then summed to provide the total annual nutrient load from proposed land uses (kg/ha/yr).

Allocation ND8 (Site 2: Land adjoining 385 Canterbury Road, Densole) provides for allotments if there is demand or to remain as agricultural land. Therefore an average farm type nutrient load has been applied for this allocation in line with Natural England's guidance.

Proposed land use areas for Otterpool scenarios 1 and 2 have been taken from the quantum of land use areas provided on pages 47 and 49 of the Design and Access Statement[5].

Stage 4

The final stage in the process is to calculate the net change in total nitrogen and phosphorus load to the Stour catchment resulting from the proposed development allocated in the emerging Local Plan. This has been derived by calculating the difference between the total nitrogen/ phosphorous load calculated for the

[5]https://www.folkestone-hythe.gov.uk/media/772/Design-and-Access-Statement/pdf/Design_and_Access_Statement1.pdf?m=637019967171300000

proposed development (Stages 1 and 3) and that for the existing land uses (Stage 2). A 20% precautionary buffer has been applied for all allocations with a nutrient surplus in line with Natural England's guidance. This recognises that there is uncertainty in the figures input into the budget and, in Natural England's view, ensures reasonable certainty that there will be no adverse effects on site integrity.

3. Results

The total nutrient budgets for the Folkestone & Hythe Local Plan are presented in Table 3.1. For both nitrogen and phosphorus a positive indicates a surplus of that nutrient in the District and therefore mitigation will be required to achieve nutrient neutrality and avoid any impact to the Stodmarsh internationally designated sites.

Table 3.1: Folkestone & Hythe Nutrient Budget

Site	Nitrogen Budget (inc. 20% precautionary buffer) (kg/TN/yr)	Phosphorus Budget (inc. 20% precautionary buffer) (kg/TP/yr)
Site allocations	954.25	38.82
Windfall development	798.87	40.67
Otterpool Scenario 1: 8,500 dwellings		
Otterpool Option 1	17,208.66	527.61
Otterpool Option 2	335.20	366.91
Otterpool Option 3	-5,746.90	125.86
Otterpool Scenario 2: 10,000 dwellings		
Otterpool Option 1	22,197.93	632.49
Otterpool Option 2	2,346.60	443.43
Otterpool Option 3	-5,134.18	159.84
LOCAL PLAN TOTALS:		
With Otterpool Scenario 1: 8,500 dwellings		
Otterpool Option 1	18,961.78	607.11
Otterpool Option 2	2,088.33	446.41
Otterpool Option 3	-3,993.78	205.36
With Otterpool Scenario 2: 10,000 dwellings		
Otterpool Option 1	23,950.83	711.98
Otterpool Option 2	4,099.73	522.93
Otterpool Option 3	-3,381.06	239.34

Nitrogen

As shown in Table 3.1, there is a large difference in the nitrogen budget between the different Otterpool options. This is solely associated with the different waste water treatment options as the changes in land use remain the same across all three options.

Option 1 would see the development discharge to the Sellindge WWTW. Given that there is no nitrogen permit in place at the facility, and there is no indication that a nitrogen permit would be put in place in the future, the nitrogen surplus is 17,208.66 kg/TN/yr for the outline planning application development (Scenario 1: 8,500 dwellings) and 22,197.93 kg/TN/yr for the entire masterplan (Scenario 2: 10,000 dwellings).

Option 2 would see the development discharge to a new waste water treatment works within the Otterpool development. The future operators (Albion Water) have advised that a likely nitrogen permit of 9mg/l would be implemented. Applying this permit value significantly decreases the nitrogen surplus to 335.20 kg/TN/yr for the outline planning application development (Scenario 1: 8,500 dwellings) and 2,346.60 kg/TN/yr for the entire masterplan (Scenario 2: 10,000 dwellings).

In nitrogen budgeting terms Option 3 provides the best waste treatment solution. This option would see the development discharge to the Hythe WWTW which does not discharge into the Stour catchment and therefore there is a nitrogen deficit for the option overall associated with the change in land use, removing large areas of agricultural land with a high nitrogen loading to urban and non-agricultural greenfield land which has a significantly lower nitrogen loading. The deficit is equal to -5,746.90 for the outline planning application development (Scenario 1: 8,500 dwellings) and -5,134.18 kg/TN/yr for the entire masterplan (Scenario 2: 10,000 dwellings).

For the Local Plan as a whole, measures would be required to mitigate the nitrogen surplus in all scenarios, expect with the adoption of Otterpool Option 3. The nitrogen deficit associated with Otterpool Option 3 will more than balance the nitrogen surplus associated with the development of site allocations and windfall development, and in this case no mitigation would be required.

Phosphorus

There is a less marked difference in the phosphorus budget between the three Otterpool options as shown in Table 3.1. This is because the Sellindge WWTW (Option 1) has a phosphorus permit in place, which will be tightened to 0.5mg/l by 2024, thereby significantly reducing the phosphorus content of waste water discharged from the facility.

Provision of an on-site waste water treatment works at Otterpool (Option 2) would further reduce the phosphorus budget, given that a lower phosphorus budget of 0.3mg/l is expected to be in place. As for nitrogen, Option 3, discharge to Hythe WWTW, provides the best waste water treatment solution in phosphorus budgeting terms, although there is still a small phosphorus surplus associated with changes in land use at the Otterpool site.

The changes in land use at the Otterpool site do not confer such a significant reduction in phosphorus as they do for nitrogen, as the phosphorus loading associated with agricultural land is relatively lower for phosphorus than for nitrogen.

For the Local Plan as a whole, measures would be required to mitigate the phosphorus surplus in all scenarios.

4. Mitigation

There are a number of options which could be used to mitigate a nitrogen and phosphorus surplus in the District to demonstrate no adverse effect to the integrity of the Stodmarsh internationally designated sites. Mitigation can be through direct measures or indirect measures also known as offsetting.

Direct measures include:

- Creation of wetlands which act as interceptors and remove a proportion of the nitrogen/ phosphorous in water through natural processes.
- WWTW upgrades to increase nutrient removal capacity and thereby reduce the effluent nutrient loading.

Indirect measures, also known as 'offset' measures include:

- Removal of land within the catchment area from nitrogen/ phosphorous intensive uses, such as crops or intensive livestock systems that result in an excess of nitrogen or phosphorous lost to the water environment, and conversion to less nutrient intensive uses such as open space, SANGs, woodland.

Some of these measures can be delivered within individual development sites (on-site), for example creation of wetlands to remove nutrients from site run off, or increasing the open space provision on agricultural or urban land within the site boundary. Other measures will be off-site, for example the acquisition, or support to others in acquiring, agricultural land elsewhere within the Stour river catchment area and converting to less nutrient intensive uses, or the creation of wetlands to reduce nutrients in the effluent flowing from WWTWs.

At the Local Plan stage, it is more difficult to account for on-site options as detailed design proposals for individual site allocations are still unknown. Therefore the focus is on off-site measures.

For all options, the mitigation outcome needs to be 'in perpetuity': secured for the duration over which the development causing the impact will be operational, generally 80-120 years for housing. This could include monitoring by condition. However, the mitigation strategy itself may change over time and the Council may decide to implement a staged mitigation strategy, for example starting with the purchase of nutrient intensive agricultural land, before subsequently developing wetlands or alternative habitats on that land.

As an indication of the extent of mitigation required for the Folkestone & Hythe Local Plan, Table 4.1 sets out the amount of agricultural land which would need to be removed from agricultural use to mitigate the

nutrient surplus for each scenario / option. This land will need to be additional to the agricultural land allocated as part of the Local Plan and will need to fall within the Stour operational catchment

Table 4.1: Agricultural land mitigation

	Nitrogen Budget (kg/TN/yr)	Area of ag land required to mitigate Nitrogen budget (ha)*	Phosphorus Budget (kg/TP/yr)	Area of ag land required to mitigate Phosphorus budget (ha)*
Local Plan With Otterpool Scenario 1: 8,500 dwellings				
Otterpool Option 1	18,961.78	806.88	607.11	2,168.23
Otterpool Option 2	2,088.33	88.86	446.41	1,594.31
Otterpool Option 3	-3,993.78	N/A	205.36	733.42
Local Plan With Otterpool Scenario 2: 10,000 dwellings				
Otterpool Option 1	23,950.83	1,019.19	711.98	2,542.80
Otterpool Option 2	4,099.73	174.46	522.93	1,867.59
Otterpool Option 3	-3,381.06	N/A	239.34	854.78
Positive figures indicate surplus nutrients and hence mitigation is required. Negative figure indicates a nutrient deficit and so no mitigation required.				

**Assumes an average nitrogen load for the catchment area of 23.5 kg/ha and an average phosphorus load of 0.28kg/ha. These figures are purely indicative and are provided to give the Council a tangible measure of the nutrient surplus calculated.*

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Annex 1 – Nutrient Budget

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Allocation (site) information						Stage1 Calculate TN in kilograms per annum derived from the development that would exit the WWTW after treatment (Only applicable to WWTWs which drain into the Stour - Sellindge is only applicable facility for Folkestone & Hythe)							Stage 2 Adjust Nitrogen load to offset existing nitrogen from current land use								Stage 3 Adjust Nitrogen load to account for land uses with the proposed development										Stage 4 Calculate the net change in the Total Nitrogen load that would result from the development			
Policy number	Site address	Existing use	Site area (ha)	Greenfield / brownfield	Sub-catchment area	Development proposal (No. residential dwellings)	Equivalent population (Dwellings*2.18) (No. persons)	Wastewater volume generated by development (No. persons * 110litres) (litres/day)	Receiving WWTW	Receiving WWTW environmental permit limit (90%) or av. discharge for TN (mg/litre)	TN discharged after WWTW treatment (((90% of permit limit or av.discharge)* WW volume generated by development) /1,000,000) (kg/TN/day)	Annual WW TN load (kg/TN/yr)	Total area of current ag-land (ha)	Farm type / nitrate loss (kg/ha/yr)	N load - current ag-land use (Area * nitrate loss) (kg/yr)	Total area of current non-ag greenfield land (ha)	N load - current non-ag greenfield land (kg/yr)	Total area of current urban land (ha)	N load - current urban land (kg/yr)	Total N load from current land uses (kg/N/yr)	Retained ag land (ha)	Assumed farm type / nitrate loss (kg/ha/yr)	N load - retained ag land (kg/ha/yr)	Proposed urban land area (ha)	N load - proposed urban land (kg/yr)	Proposed open space and GI (ha)	N load - Proposed open space and GI (kg/yr)	Proposed allotment land (ha)	N load - Proposed allotment land (kg/yr)	Total N load from proposed land uses (kg/N/yr)	N load from WW (kg/N/yr)	N load from change in land use (kg/N/yr)	N budget (kg/N/yr)	20% precautionary buffer applied where N budget is positive
ND4	Land east of Broad Street, Lyminge	Forms part of Etchinghill Golf Course	2.1	Greenfield	Little Stour and Wingham	30	65.4	7194	Hythe	N/A	N/A	0	0.00	0.00	0.00	0.00	0.00	2.10	30.03	30.03	0.00	0.00	0.00	2.02	28.91	0.08	0.39	0.00	0.00	29.30	0.00	-0.73	-0.73	N/A
ND5	The Piggeries, Main Road Sellindge	Former Piggery and areas of scrub	0.31	Brownfield	Upper Stour Catchment	5	10.9	1199	Sellindge	27	0.0324	11.8161	0.00	0.00	0.00	0.00	0.00	0.31	4.43	4.43	0.00	0.00	0.00	0.31	4.43	0.00	0.00	0.00	0.00	4.43	11.82	0.00	11.82	14.18
ND5	Land West of Jubilee Cottage, Swan Lane, Sellindge	Cereal farm land	0.92	Greenfield	Upper Stour Catchment	15	32.7	3597	Sellindge	27	0.0971	35.4484	0.92	27.30	25.12	0.00	0.00	0.00	0.00	25.12	0.00	0.00	0.00	0.92	13.16	0.00	0.00	0.00	0.00	13.16	35.45	-11.96	23.49	28.19
ND5	Silver Spray	Residential dwelling, out-buildings and garden which is bordered by hedgerow, trees and fencing in part	0.45	Brownfield	Upper Stour Catchment	5	10.9	1199	Sellindge	27	0.0324	11.8161	0.00	0.00	0.00	0.00	0.00	0.45	6.44	6.44	0.00	0.00	0.00	0.45	6.44	0.00	0.00	0.00	0.00	6.44	11.82	0.00	11.82	14.18
ND8	Site 1: Land adjoining 385 Canterbury Road, Densole	Open field bounded by mature hedgerows and trees	1.53	Greenfield	Little Stour and Wingham	25	54.5	5995	Broomfield Bank	N/A	N/A	0.0000	0.00	0.00	0.00	1.53	7.65	0.00	0.00	7.65	0.00	0.00	0.00	1.46	20.95	0.07	0.33	0.00	0.00	21.27	0.00	13.62	13.62	16.35
ND8	Site 2: Land adjoining 385 Canterbury Road, Densole	Open field bounded by mature hedgerows and trees	1.3	Greenfield	Little Stour and Wingham	0	0	0	Broomfield Bank	N/A	N/A	0.0000	0.00	0.00	0.00	1.30	6.50	0.00	0.00	6.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.55	0.00	24.05	24.05	28.86
ND9	Etchinghill Nursery, Etchinghill	Former plant nursery, with disused horticultural buildings and an adjoining field	1.91	Greenfield	Little Stour and Wingham	30	65.4	7194	Hythe	N/A	N/A	0.0000	0.00	0.00	0.00	1.79	8.94	0.12	1.76	10.69	0.00	0.00	0.00	1.83	26.20	0.08	0.39	0.00	0.00	26.59	0.00	15.89	15.89	19.07
ND10	Land adjacent to the Golf Course, Etchinghill	Open, flat field inc. section of golf club access road	0.7	Greenfield	Little Stour and Wingham	8	17.44	1918.4	Hythe	N/A	N/A	0.0000	0.00	0.00	0.00	0.67	3.37	0.03	0.38	3.74	0.00	0.00	0.00	0.70	10.01	0.00	0.00	0.00	0.00	10.01	0.00	6.27	6.27	7.52
CSD9	Sellindge: Second Phase – Site A land to the west of phase 1	Non-agricultural greenfield, incl. one dwelling	9.06	Greenfield	Upper Stour Catchment	188	409.84	45082.4	Sellindge	27	1.2172	444.2871	0.00	0.00	0.00	8.98	44.90	0.08	1.14	46.04	0.00	0.00	0.00	8.57	122.57	0.49	2.44	0.00	0.00	125.01	444.29	78.97	523.25	627.90
CSD9	Sellindge: Second Phase – Site B land east of phase 1	Agricultural land including small woodland belt	18.91	Greenfield	Upper Stour Catchment	162	353.16	38847.6	Sellindge	27	1.0489	382.8431	17.16	27.30	468.47	1.05	5.25	0.70	10.01	483.73	0.00	0.00	0.00	18.49	264.39	0.42	2.11	0.00	0.00	266.49	382.84	-217.23	165.61	198.73
Windfall development	n/a	Non-agricultural greenfield	42.61	Greenfield	n/a	32	69.76	7673.6	Sellindge	27	0.2072	75.6233	0.00	0.00	0.00	42.61	213.07	0.00	0.00	213.07	0.00	0.00	0.00	42.61	609.39	0.00	0.00	0.00	0.00	609.39	75.62	396.32	471.94	566.33
Windfall development	n/a	Previously developed	109.20	Brownfield	n/a	82	178.76	19663.6	Sellindge	27	0.5309	193.7848	0.00	0.00	0.00	0.00	0.00	109.20	1561.56	1561.56	0.00	0.00	0.00	109.20	1561.56	0.00	0.00	0.00	0.00	1561.56	193.78	0.00	193.78	232.54
Otterpool Park / North Downs new settlement to 2036/37																																		
Scenario 1: Up to 8,500 dwellings delivered within the Outline Planning Application Boundary																																		
Option 1	Development served by upgraded Sellindge WWTW	Predominantly mixed ag land with some other grassland and roads	585.22	Greenfield	Upper Stour Catchment	8,500	18530	2038300	Sellindge	27	55.0341	20087.4465	484.29	Cereals, Hay Cut (General copping), Lowland grazing	10702.28	83.16	415.80	17.76	253.97	11372.04	0.00	0.00	0.00	290.22	4150.15	295.00	1475.00	0.00	0.00	5625.15	20087.45	-5746.90	14340.55	17208.66
Option 2	New on site facility draining to East Stour	Predominantly mixed ag land with some other grassland and roads	585.22	Greenfield	Upper Stour Catchment	8,500	18530	2038300	New on site facility	8.1	16.5102	6026.2340	484.29	Cereals, Hay Cut (General copping), Lowland grazing	10702.28	83.16	415.80	17.76	253.97	11372.04	0.00	0.00	0.00	290.22	4150.15	295.00	1475.00	0.00	0.00	5625.15	6026.23	-5746.90	279.34	335.20
Option 3	Development served by West Hythe WWTW	Predominantly mixed ag land with some other grassland and roads	585.22	Greenfield	Upper Stour Catchment	8,500	18530	2038300	Hythe	N/A	N/A	0	484.29	Cereals, Hay Cut (General copping), Lowland grazing	10702.28	83.16	415.80	17.76	253.97	11372.04	0.00	0.00	0.00	290.22	4150.15	295.00	1475.00	0.00	0.00	5625.15	0.00	-5746.90	-5746.90	N/A
Scenario 2: Up to 10,000 dwellings delivered within the Outline Planning Application Boundary and on residual land outside the planning application boundary																																		
Option 1	Development served by upgraded Sellindge WWTW	Predominantly mixed ag land with some other grassland, small settlements and roads	765	Greenfield	Upper Stour Catchment	10,000	21800	2398000	Sellindge	27	64.7460	23632.2900	540.65	Cereals, Hay Cut (General copping), Lowland grazing	11785.04	158.40	792.00	65.94	942.94	13519.98	55.00	23.50	1292.50	381.00	5448.30	329.00	1645.00	0.00	0.00	8385.80	23632.29	-5134.18	18498.11	22197.73
Option 2	New on site facility draining to East Stour	Predominantly mixed ag land with some other grassland, small settlements and roads	765	Greenfield	Upper Stour Catchment	10,000	21800	2398000	New on site facility	8.1	19.4238	7089.6870	540.65	Cereals, Hay Cut (General copping), Lowland grazing	11785.04	158.40	792.00	65.94	942.94	13519.98	55.00	23.50	1292.50	381.00	5448.30	329.00	1645.00	0.00	0.00	8385.80	7089.69	-5134.18	1955.50	2346.60
Option 3	Development served by West Hythe WWTW	mixed ag land with some other grassland, small settlements	765	Greenfield	Upper Stour Catchment	10,000	21800	2398000	Hythe	N/A	N/A	0	540.65	Cereals, Hay Cut (General copping), Lowland grazing	11785.04	158.40	792.00	65.94	942.94	13519.98	55.00	23.50	1292.50	381.00	5448.30	329.00	1645.00	0.00	0.00	8385.80	0.00	-5134.18	-5134.18	N/A

Allocation (site) information						Stage1 Calculate TP in kilograms per annum derived from the development that would exit the WWTW after treatment (Only applicable to WWTWs which drain into the Stour - Sellindge is only applicable facility for Folkestone & Hythe)							Stage 2 Adjust Phosphorus load to offset existing phosphorus from current land use								Stage 3 Adjust phosphorus load to account for land uses with the proposed development										Stage 4 Calculate the net change in the Total Phosphorus load that would result from the development			
Policy number	Site address	Existing use	Site area (ha)	Greenfield / brownfield	Sub-catchment area	Development proposal (No. residential dwellings)	Equivalent population (Dwellings*2.18) (No. persons)	Wastewater volume generated by development (No. persons * 110litres) (litres/day)	Receiving WWTW	Receiving WWTW environmental permit limit (90%) or av. discharge for TP (mg/litre)	TP discharged after WWTW treatment (((90% of permit limit or av.discharge)* WW volume generated by development) /1,000,000) (kg/TP/day)	Annual WW TP load (kg/TP/yr)	Total area of current ag-land (ha)	Farm type / phosphorus loss (kg/ha/yr)	P load - current ag-land use (Area * phosphorus loss) (kg/yr)	Total area of current non-ag greenfield land (ha)	P load - current non-ag greenfield land (kg/yr)	Total area of current urban land (ha)	P load - current urban land (kg/yr)	Total P load from current land uses (kg/P/yr)	Retained ag land (ha)	Assumed farm type / phosphorus loss (kg/ha/yr)	P load - retained ag land (kg/ha/yr)	Proposed urban land area (ha)	P load - proposed urban land (kg/yr)	Proposed open space and GI (ha)	P load - Proposed open space and GI (kg/yr)	Proposed allotment land (ha)	P load - Proposed allotment land (kg/yr)	Total P load from proposed land uses (kg/P/yr)	P load from WW (kg/P/yr)	P load from change in land use (kg/P/yr)	P budget (kg/P/yr)	20% precautionary buffer applied where P budget is positive
ND4	Land east of Broad Street, Lyminge	Forms part of Etchinghill Golf Course	2.1	Greenfield	Little Stour and Wingham	30	65.4	7194	Hythe	N/A	N/A	0.0000	0.00	0.00	0.00	0.00	0.00	2.10	1.74	1.74	0.00	0.00	0.00	2.02	1.68	0.08	0.01	0.00	0.00	1.69	0.00	-0.05	-0.05	N/A
ND5	The Piggeries, Main Road Sellindge	Former Piggery and areas of scrub	0.31	Brownfield	Upper Stour Catchment	5	10.9	1199	Sellindge	0.45	0.0005	0.1969	0.00	0.00	0.00	0.00	0.00	0.31	0.26	0.26	0.00	0.00	0.00	0.31	0.26	0.00	0.00	0.00	0.00	0.26	0.20	0.00	0.20	0.24
ND5	Land West of Jubilee Cottage, Swan Lane, Sellindge	Cereal farm land	0.92	Greenfield	Upper Stour Catchment	15	32.7	3597	Sellindge	0.45	0.0016	0.5908	0.92	0.36	0.33	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.92	0.76	0.00	0.00	0.00	0.00	0.76	0.59	0.43	1.02	1.23
ND5	Silver Spray	Residential dwelling, out-buildings and garden which is bordered by hedgerow, trees and fencing in part	0.45	Brownfield	Upper Stour Catchment	5	10.9	1199	Sellindge	0.45	0.0005	0.1969	0.00	0.00	0.00	0.00	0.00	0.45	0.37	0.37	0.00	0.00	0.00	0.45	0.37	0.00	0.00	0.00	0.00	0.37	0.20	0.00	0.20	0.24
ND8	Site 1: Land adjoining 385 Canterbury Road, Densole	Open field bounded by mature hedgerows and trees	1.53	Greenfield	Little Stour and Wingham	25	54.5	5995	Broomfield Bank	N/A	N/A	0.0000	0.00	0.00	0.00	1.53	0.21	0.00	0.00	0.21	0.00	0.00	0.00	1.46	1.22	0.07	0.01	0.00	0.00	1.23	0.00	1.01	1.01	1.21
ND8	Site 2: Land adjoining 385 Canterbury Road, Densole	Open field bounded by mature hedgerows and trees	1.3	Greenfield	Little Stour and Wingham	0	0	0	Broomfield Bank	N/A	N/A	0.0000	0.00	0.00	0.00	1.30	0.18	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30	0.36	0.36	0.00	0.18	0.18	0.22
ND9	Etchinghill Nursery, Etchinghill	Former plant nursery, with disused horticultural buildings and an adjoining field	1.91	Greenfield	Little Stour and Wingham	30	65.4	7194	Hythe	N/A	N/A	0.0000	0.00	0.00	0.00	1.79	0.25	0.12	0.10	0.35	0.00	0.00	0.00	1.83	1.52	0.08	0.01	0.00	0.00	1.53	0.00	1.18	1.18	1.42
ND10	Land adjacent to the Golf Course, Etchinghill	Open, flat field inc. section of golf club access road	0.7	Greenfield	Little Stour and Wingham	8	17.44	1918.4	Hythe	N/A	N/A	0.0000	0.00	0.00	0.00	0.67	0.09	0.03	0.02	0.12	0.00	0.00	0.00	0.70	0.58	0.00	0.00	0.00	0.00	0.58	0.00	0.46	0.46	0.56
CSD9	Sellindge: Second Phase – Site A land to the west of phase 1	Non-agricultural greenfield, incl. one dwelling	9.06	Greenfield	Upper Stour Catchment	188	409.84	45082.4	Sellindge	0.45	0.0203	7.4048	0.00	0.00	0.00	8.98	1.26	0.08	0.07	1.32	0.00	0.00	0.00	8.57	7.11	0.49	0.07	0.00	0.00	7.18	7.40	5.86	13.26	15.92
CSD9	Sellindge: Second Phase – Site B land east of phase 1	Agricultural land including small woodland belt	18.91	Greenfield	Upper Stour Catchment	162	353.16	38847.6	Sellindge	0.45	0.0175	6.3807	17.16	0.36	6.18	1.05	0.15	0.70	0.58	6.91	0.00	0.00	0.00	18.49	15.35	0.42	0.06	0.00	0.00	15.40	6.38	8.50	14.88	17.86
Windfall development	n/a	Non-agricultural greenfield	42.61	Greenfield	n/a	32	69.76	7673.6	Sellindge	0.45	0.0035	1.2604	0.00	0.00	0.00	42.61	5.97	0.00	0.00	5.97	0.00	0.00	0.00	42.61	35.37	0.00	0.00	0.00	0.00	35.37	1.26	29.40	30.66	36.80
Windfall development	n/a	Previously developed	109.20	Brownfield	n/a	82	178.76	19663.6	Sellindge	0.45	0.0088	3.2297	0.00	0.00	0.00	0.00	0.00	109.20	90.64	90.64	0.00	0.00	0.00	109.20	90.64	0.00	0.00	0.00	0.00	90.64	3.23	0.00	3.23	3.88
Otterpool Park / North Downs new settlement to 2036/37																																		
Scenario 1: Up to 8,500 dwellings delivered within the Outline Planning Application Boundary																																		
Option 1	Development served by upgraded Sellindge WWTW	Predominantly mixed ag land with some other grassland and roads	585.22	Greenfield	Upper Stour Catchment	8,500	18530	2038300	Sellindge	0.45	0.9172	334.7908	484.29	Cereals, Hay Cut (General copping), Lowland grazing	150.92	83.16	11.64	17.76	14.74	177.30	0.00	0.00	0.00	290.22	240.88	295.00	41.30	0.00	0.00	282.18	334.79	104.88	439.67	527.61
Option 2	New on site facility draining to East Stour	Predominantly mixed ag land with some other grassland and roads	585.22	Greenfield	Upper Stour Catchment	8,500	18530	2038300	New on site facility	0.27	0.5503	200.8745	484.29	Cereals, Hay Cut (General copping), Lowland grazing	150.92	83.16	11.64	17.76	14.74	177.30	0.00	0.00	0.00	290.22	240.88	295.00	41.30	0.00	0.00	282.18	200.87	104.88	305.76	366.91
Option 3	Development served by West Hythe WWTW	Predominantly mixed ag land with some other grassland and roads	585.22	Greenfield	Upper Stour Catchment	8,500	18530	2038300	Hythe	N/A	N/A	0.0000	484.29	Cereals, Hay Cut (General copping), Lowland grazing	150.92	83.16	11.64	17.76	14.74	177.30	0.00	0.00	0.00	290.22	240.88	295.00	41.30	0.00	0.00	282.18	0.00	104.88	104.88	125.86
Scenario 2: Up to 10,000 dwellings delivered within the Outline Planning Application Boundary and on residual land outside the planning application boundary																																		
Option 1	Development served by upgraded Sellindge WWTW	Predominantly mixed ag land with some other grassland, small settlements and roads	765	Greenfield	Upper Stour Catchment	10,000	21800	2398000	Sellindge	0.45	1.0791	393.8715	540.65	Cereals, Hay Cut (General copping), Lowland grazing	167.58	158.40	22.18	65.94	54.73	244.49	55.00	0.28	15.40	381.00	316.23	329.00	46.06	0.00	0.00	377.69	393.87	133.20	527.07	632.49
Option 2	New on site facility draining to East Stour	Predominantly mixed ag land with some other grassland, small settlements and roads	765	Greenfield	Upper Stour Catchment	10,000	21800	2398000	New on site facility	0.27	0.6475	236.3229	540.65	Cereals, Hay Cut (General copping), Lowland grazing	167.58	158.40	22.18	65.94	54.73	244.49	55.00	0.28	15.40	381.00	316.23	329.00	46.06	0.00	0.00	377.69	236.32	133.20	369.53	443.43
Option 3	Development served by West Hythe WWTW	Predominantly mixed ag land with some other grassland, small settlements and roads	765	Greenfield	Upper Stour Catchment	10,000	21800	2398000	Hythe	N/A	N/A	0.0000	540.65	Cereals, Hay Cut (General copping), Lowland grazing	167.58	158.40	22.18	65.94	54.73	244.49	55.00	0.28	15.40	381.00	316.23	329.00	46.06	0.00	0.00	377.69	0.00	133.20	133.20	159.84

Annex 2 – Figures

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Folkestone & Hythe Local Plan Nutrient Budget

Residential Allocations

Stour Operational Catchments

- Little Stour and Wingham
- Lower Stour
- Upper Stour

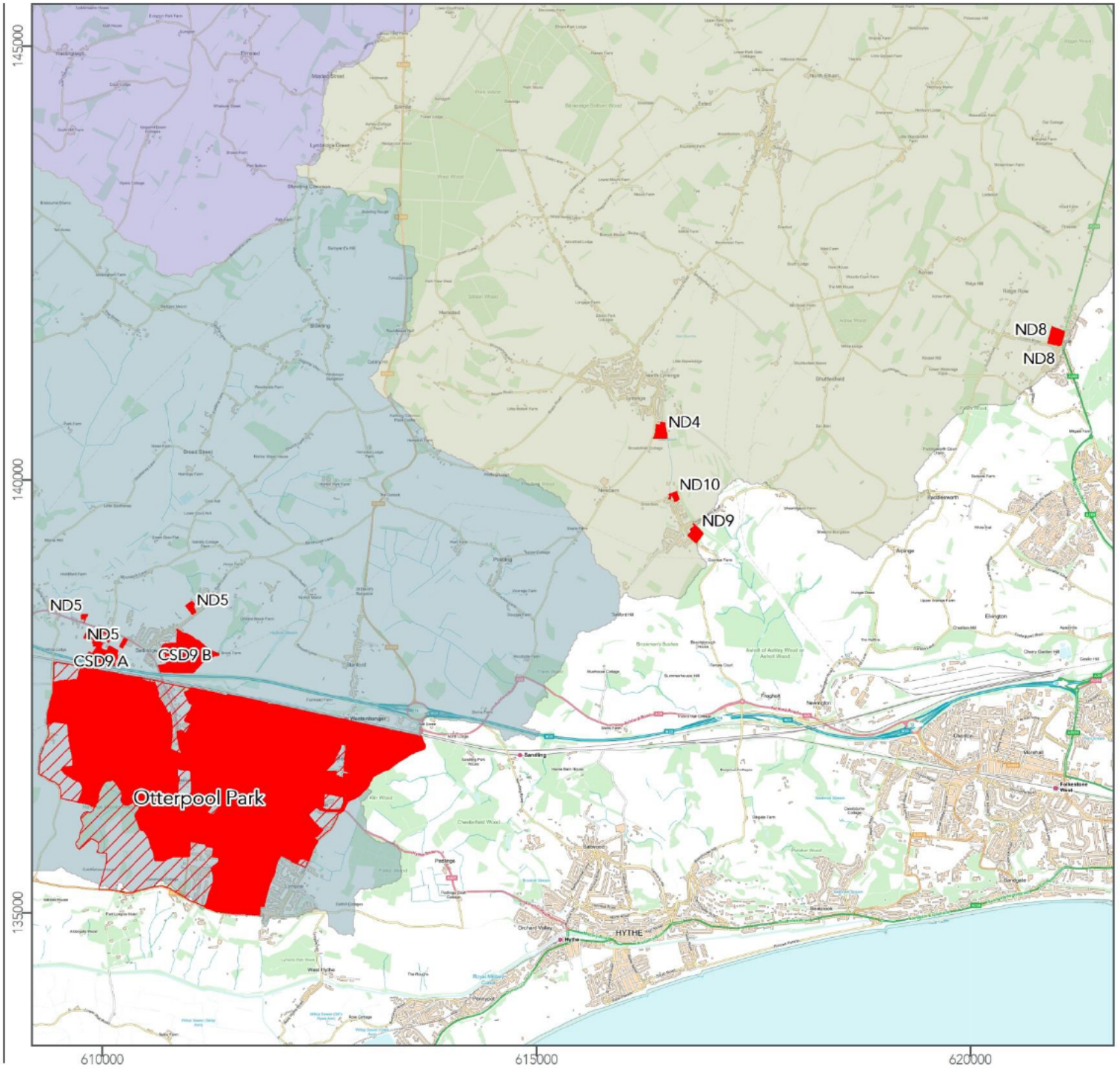

Figure A2.1: Residential allocations included in nutrient budget

0 1 2 3

Kilometers

N

Scale: 1:64,582 **Created by:** GC

Date: Aug 2020 **Reviewed by:** NP

Drawing number:

UE398HRA-FolkestoneHytheNutrients_200819

URBAN EDGE ENVIRONMENTAL CONSULTING

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Folkestone & Hythe Local Plan Nutrient Budget

- Special Areas of Conservation
- Special Protection Areas
- Ramsar Sites
- Sites of Special Scientific Interest

Stour Operational Catchments

- Little Stour and Wingham
- Lower Stour
- Upper Stour

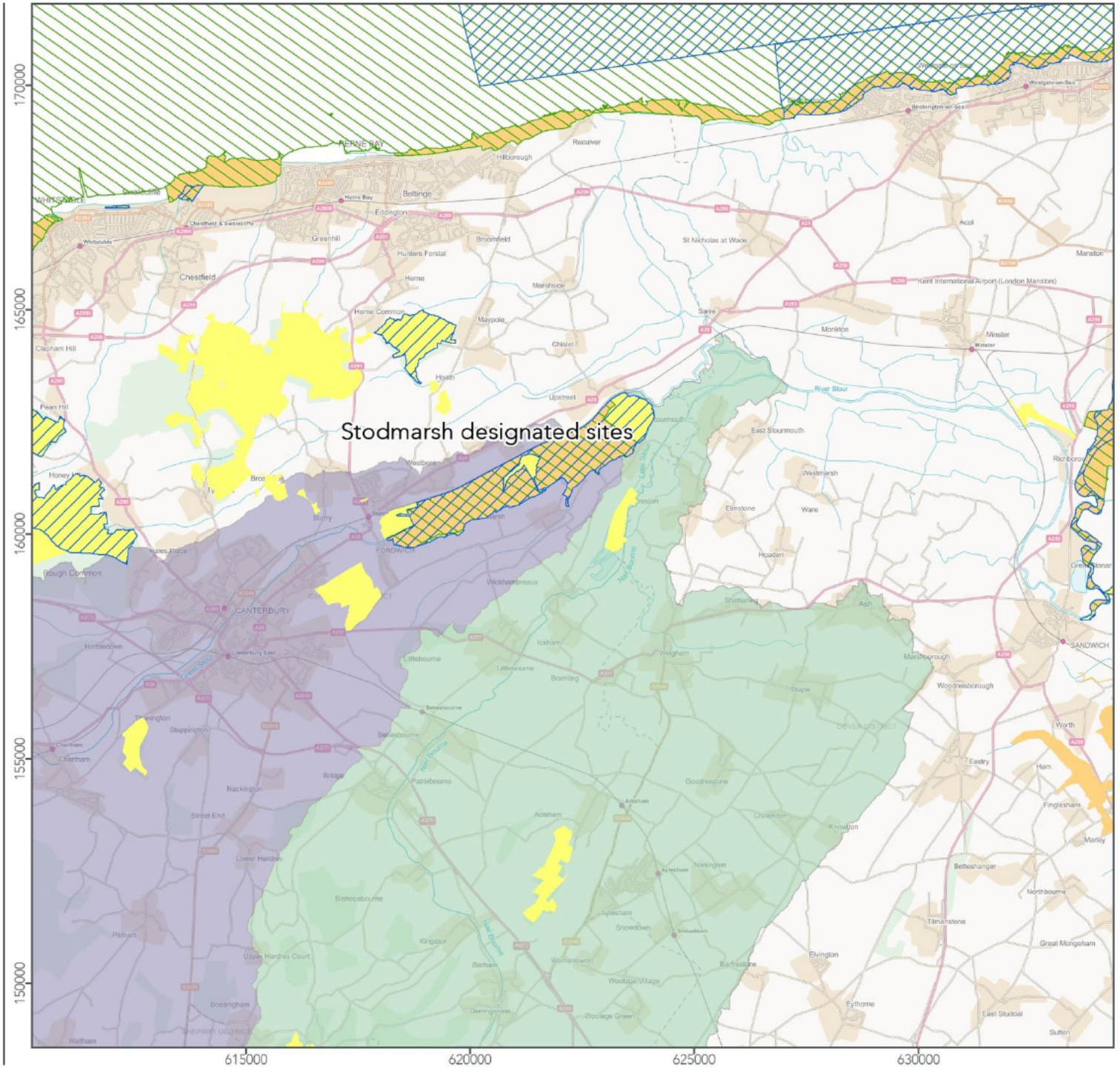

Figure A2.2: Stodmarsh designated sites

0 3 6

Kilometers

N

Scale: 1:125,000 **Created by:** GC

Date: Aug 2020 **Reviewed by:** NP

Drawing number:

UE398HRA-FolkestoneHytheNutrients__intsites_200819

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APPENDIX D:

NATURAL ENGLAND – LETTER TO LOCAL AUTHORITIES – ADVICE FOR DEVELOPMENT PROPOSALS WITH THE POTENTIAL TO INCREASE NUTRIENT IMPACTS WITHIN THE STOUR VALLEY CATCHMENT (10 JULY 2020)

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Date: 10 July 2020

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

T 0300 060 3900

BY EMAIL ONLY

To Senior Planning Officer

Advice for development proposals with the potential to increase nutrient impacts to nationally and internationally important wildlife sites within the Stour Valley catchment[1].

Introduction

As you may be aware there are impacts on nationally and internationally important wildlife sites in the Stour Valley, arising from excessive nutrients from waste water discharges. These sites comprise:

- Stodmarsh Special Area of Conservation (SAC)
- Stodmarsh Special Protection Area (SPA)
- Stodmarsh Ramsar site
- Stodmarsh Site of Special Scientific Interest (SSSI)
- Stodmarsh National Nature Reserve (NNR)

Stodmarsh is important principally for wetland habitats and the rare and special wildlife they support. As an NNR, Stodmarsh is also special for people and their access to nature. These wetlands rely on a high quality of water and stable water levels; in particular the lake habitats. Some of the lakes are currently impacted by an excess of both Nitrogen (N) and Phosphorus (P) and are not achieving the required standard to support their favourable condition. This is because both Nitrogen and Phosphorous can have a range of negative impacts, including promoting algae growth, which can lead to reduced light and oxygen available for aquatic plants and animals and affect those birds that feed on them. Increased nutrients can also promote changes in structure which make it unsuitable for wetland species, including the main SAC feature.

Natural England's role and advice

Natural England is the government's adviser for the natural environment in England. As part of our role as a statutory consultee we provide advice to planning authorities to support them in achieving their duties to protect and enhance wildlife, public access and protected landscapes.

[1] The area captured by this advice is described in figure 1 and appendix 1 of the attached advice.

In this role Natural England draws your attention to the case law[2] with regards to determination of plans or projects that add to an existing impact on European sites' conservation objectives and recommends that your authority takes its own advice on this matter. Natural England's advice is that a likely significant effect on the Stodmarsh designated sites from development that increases these nutrients cannot be ruled out, on objective evidence, at this stage. In the absence of evidence to the contrary, our advice is that all new housing development proposals, will need to consider, via an appropriate assessment, the impact of adding to the existing water quality target failures in the Stodmarsh European sites.

Updated Methodology and webinar

To help competent authorities take proper account of these issues and aid cooperation by local planning authorities and others to develop strategic solutions, Natural England issued a document of our advice on nutrient neutrality for new development in the Stour Catchment in relation to Stodmarsh designated sites in December 2019.

Attached is an updated version of our advice on nutrient neutrality for the Stour Catchment. This document explains the environmental context, the concept of nutrient neutrality, and how it can be used to assess if development requires mitigation for additional nutrients. The document also makes suggestions for mitigation options, and how to calculate if mitigation is sufficient if land use change is being proposed to offset development-derived nutrients.

To help planning authorities and key stakeholders understand the new methodology Natural England is holding a one-off webinar on 23 July 2020 from 11:30 – 13:00. If you are interested in participating please email PlanConsAreaTeamSussexandKent@defra.gov.uk with relevant contact details of the participant and the webinar details will be sent to you as appropriate.

Natural England are not able to engage with individual applications that come forward beyond our existing statutory duties, and we will therefore not be providing bespoke detailed advice on individual application's mitigation proposals. Where appropriate, for large scale developments, we may offer to engage on a cost recovery basis through our Discretionary Advice Service.

Should you have any other questions concerning this advice or our upcoming webinar please contact consultations@naturalengland.org.uk marked for the attention of Area Team 14.

Yours faithfully,

[redacted]

Manager
Sussex and Kent team

[2] E.g. ***Cooperatie Mobilisation for the Environment UA and College van gedeputeerde staten van Noord-Brabant*** (Case C-293/17 and C294/17) and People over wind (Case C323/17)

APPENDIX E:

NATURAL ENGLAND – ADVICE ON NUTRIENT NEUTRALITY FOR NEW DEVELOPMENT IN RELATION TO STODMARSH DESIGNATED SITES (NOVEMBER 2020)

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Advice on Nutrient Neutrality for New Development in the Stour Catchment in Relation to Stodmarsh Designated Sites - For Local Planning Authorities

November 2020

© Natural England/Mike Hammett

Nesting Bittern

SECTION 1 INTRODUCTION

1.1 The water environment within the Stour catchment is one of the most important for water dependant wildlife in the United Kingdom. The Stodmarsh water environment is internationally important for its wildlife and is protected under the Water Environment Regulations[1] and the Conservation of Habitats and Species Regulations[2] as well as national protection for many parts of the floodplain catchment[3].There are high levels of nitrogen and phosphorus input to this water environment with sound evidence that these nutrients are causing eutrophication at part of these designated sites. These nutrient inputs are currently thought to be caused mostly by wastewater from existing housing and agricultural sources, though recycling of nutrients within the lake habitats cannot be ruled out. The resulting nutrient enrichment is impacting on the Stodmarsh designated sites' protected habitats and species. The area covered by this advice is described in Appendix 1.

1.2 There is uncertainty as to whether new growth will further deteriorate the designated sites. This uncertainty is one reason that the wastewater treatment works discharging into the River Stour and surroundings are subject to an investigation of their impacts and connection with Stodmarsh designated sites under the Environment Agency Water Industry National Environment Programme (WINEP) that will report in 2022. This WINEP investigation has been initiated to investigate links between the Stour and the Stodmarsh lakes systems, then propose appropriate, possible and cost effective solutions to any identified impacts. Until this work is complete, the uncertainty of new growth's impacts on designated sites remains, therefore there is potential for future housing developments across the Stodmarsh catchment to exacerbate the existing impacts thereby creating a risk to their potential future conservation status.

1.3 One way to address this uncertainty and subsequent risk, until any solutions are implemented to remove the current adverse effects on Stodmarsh, is for new development to achieve nutrient neutrality. Assessing and mitigating nutrients is a means of ensuring that development does not add to existing nutrient burdens and this provides certainty that the whole of the scheme is deliverable in line with the requirements of the Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitats Regulations') and in light of relevant case law.

1.4 This report sets out a practical methodology for calculating how nutrient neutrality can be achieved. This methodology is based on best available scientific knowledge, and will be subject to revision as further evidence is obtained. It is Natural England's advice to local planning authorities (LPAs) to take a precautionary approach in line with existing legislation and case-law when addressing uncertainty and calculating nutrient budgets.

[1] The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017
[2] Conservation of Habitats and Species Regulations (England and Wales) Regulations 2017 (as amended)
[3] Including Wildlife and Countryside Act 1981 as amended, Countryside and Rights of Way Act 2000, Natural Environment and Rural Communities Act 2006

1.5 This report includes a brief summary of the planning and environmental context for this nutrient neutral approach, the detailed methodology and advice on mitigation. Further information and guidance is included in the Appendices.

SECTION 2 PLANNING CONTEXT

2.1 Since June 2019 Natural England has been advising that housing, mixed use and tourist development including all EIA development is likely to contribute to a significant effect, in combination, on the Stodmarsh designated sites in terms of water quality. We recommend a nutrient budget is calculated for such development with an attempt to achieve nutrient neutrality as part of an appropriate assessment. Early consideration of the issues ensures that any potential risks are addressed at the outset and provides the applicant with confidence that the development is deliverable subject to other material considerations being addressed.

2.2 During 2017/18 a review of the condition of the Stodmarsh lake units against the newly agreed lake water quality targets was undertaken (see Appendix 3). The best available up-to-date evidence has identified that some of the designated site units are in unfavourable condition due to existing levels of nutrients (both phosphorus and nitrogen) and are therefore at risk from additional nutrient inputs. There is no, or limited, water quality data for some of the units that are currently thought to be at favourable condition and this lack of monitoring will be addressed in the WINEP investigation.

2.3 It is Natural England's view that a likely significant effect on the internationally designated Stodmarsh sites (Special Protection Area, Special Area of Conservation and Ramsar site) cannot be ruled out due to the increases in wastewater from new developments coming forward in the Stodmarsh catchment.

2.4 The uncertainty about the impact of new development on designated sites needs to be recognised for all development proposals that are subject to new planning permissions and have inevitable wastewater implications. These implications, and all other matters capable of having a significant effect on designated sites in the Stodmarsh catchment, must be addressed in the ways required by Regulation 63 of the Habitats Regulations.

2.5 LPAs and applicants will be aware of CJEU decisions[4] regarding the assessment of elements of a proposal aimed toward mitigating adverse effects on designated sites and the need for certainty that mitigating measures will achieve their aims. The achievement of nutrient neutrality, if scientifically and practically effective and achievable, is a means of ensuring that development does not add to existing nutrient burdens.

[4] For example Cooperatie Mobilisation for the Environment UA and College van gedeputeerde staten van Noord-Brabant (Case C-293/17 and C294/17) People Over Wind and Peter Sweetman v Coillte Teoranta.(Case C-323/17).

2.6 Natural England is working with water companies, LPAs, stakeholders and the Environment Agency to try to ensure the Habitats Regulations are met. Further information on the planning context and joint working of competent authorities is provided in Appendix 2.

SECTION 3 ENVIRONMENTAL CONTEXT

Designated sites interest features

3.1 Stodmarsh is a Special Protection Area (SPA), a Ramsar site, a Special Area of Conservation (SAC), a Site of Special Scientific Interest (SSSI) and some parts are a National Nature Reserve (NNR). The site is of national and international importance for a range of water-dependant habitats including lakes and the wildlife that relies upon these habitats. The designations and features are described in Appendix 3 table A3.1 along with links to key documents of interest.

Designated sites water quality target review

3.2 The water quality targets for the Stodmarsh SPA/ SAC/ SSSI lakes were agreed with the Environment Agency in 2017 (and 2019 for Hersden Lake). These targets are based on national water quality standards for freshwater habitats and are in the published supplementary advice to the conservation objectives for the designated sites underpinning habitat. These targets include standards for nitrogen and phosphorus, as an excess of both nutrients can impact lake habitats which underpin the designated sites national and international interest features. The details of how these standards were assessed and site condition are provided in Appendix 3.

3.3 Detailed assessments of other features are available on Defra's Magic Map and condition assessments are not solely based on water quality standards. Table 1 sets out the agreed lake nitrogen and phosphorus standards and whether these standards are met, failed or if this is unknown due to lack of data (based on an amalgam of the Environment Agency and Natural England data for the WINEP investigation). Appendix 1 includes a map of SSSI unit condition. The information from the WINEP investigation will be used to inform a review of these lakes condition assessments with regards to the water quality attributes, including but not limited to nitrogen and phosphorus standards.

Other Water Quality targets

3.4 Other targets in addition to those shown in Table 1 exist. "Chlorophyll a" for all lakes should be at Water Framework Directive (WFD) High Ecological Status. All other pollutants and measurements are set at WFD Good Ecological Status. The Hersden Lake has mainly bird interest features only. The nationally agreed guidance on water quality standards for 'wintering bird lakes' (i.e. lakes which are not notified as a lake habitat in their own right or for macrophytes/ invertebrates in their own right, or to support sensitive nesting birds) says that in lakes mainly used by birds feeding on benthic invertebrates or fish severe eutrophication should be avoided.

Table 1 Summary of water quality targets and compliance with targets if known

CSMG targets were agreed with Environment Agency in 2017 and 2019 for Hersden Lake. Total Phosphorous WFD standard of 49 micrograms per litre to get Good Ecological Status (GES) and Total Phosphorous CSMG of 50 micrograms per litre for favourable condition are similar. The CSMG target for Total Nitrogen for favourable condition is provided with the newly agreed Total Nitrogen standard to get Good Ecological Status shown in brackets.

Lake name	SSSI UNIT	WFD ID	Compliance P/F/U (Pass / fail/ Unknown) No colour = no data		Natural England database (CSMI) 2018 update / threat nature
			TP Target ug/L	TN Target mg/L	
Reserve Lake/Stodmarsh Nature Reserve Pool	UNIT 10	GB30743087	F 49	F 1.5 (1.07)	Unfavourable Water Quality (WQ)
Collards Lake/Great Puckstone Lake	UNIT 7	GB30743097	F 49	F 1.5 (1.07)	Unfavourable WFD EA Assessment for 2016 MODERATE - unit fails nationally agreed WQ targets
Westbere Lake/s	UNIT 1	GB30743127	U 49	P 1.5 (1.07)	Unfavourable recovering Other reasons
The Fordwich Lakes/Fordwich Lake East	UNIT 2	GB30743156	U 49	U 1.5 (1.07)	Favourable WQ
The Fordwich Lakes/Fordwich Lakes	UNIT 2	GB30743164	U 49	P 1.5 (1.07)	Favourable WQ
Hersden (tidal) Lake	UNIT 5	n/a (tidal so part of the main transitional and coastal water body)	U 100	P 2.0	Favourable WQ

SECTION 4 NUTRIENT NEUTRALITY APPROACH FOR NEW DEVELOPMENT

Introduction

4.1 Achieving nutrient neutrality is one way to address the existing uncertainty surrounding the impact of new development on designated sites. This practical methodology provides advice on how to calculate nutrient budgets and options for mitigation, should this be necessary.

4.2 There is evidence that inputs of both phosphorus and nitrogen influence eutrophication of the water environment. There are different forms of nutrients and concentrations vary according to exactly what is measured. These differences should be recognised when calculating nutrient budgets. The nutrient standards for the designated sites are for total nitrogen and total phosphorus as that is what is available for growth. Further information on the different forms of nutrient is provided in Appendix 3.

Approach to calculating nutrient budgets

4.3 For those developments that wish to pursue neutrality, Natural England advises that a nutrient budget is calculated for new developments that have the potential to result in increases of nitrogen or phosphorus entering the international sites. A nutrient budget calculated according to this methodology and demonstrating nutrient neutrality is, in our view, able to provide sufficient and reasonable certainty that the development does not adversely affect the integrity, by means of impacts from nutrients, on the relevant internationally designated sites. This approach must be tested through the 'appropriate assessment' stage of the Habitats Regulations Assessment (HRA). Further information on the HRA process is available here.

4.4 The nutrient neutrality calculation includes key inputs and assumptions that are based on the best available scientific evidence and research. It has been developed as a pragmatic tool. However, for each input there is a degree of uncertainty. For example, there is uncertainty associated with predicting occupancy levels and water use for each household in perpetuity. Also, identifying current land/ farm types and the associated nutrient inputs is based on best available evidence, research and professional judgement and is again subject to a degree of uncertainty.

4.5 It is our advice to local planning authorities to take a precautionary approach in line with existing legislation and case law when addressing uncertainty and calculating nutrient budgets. This should be achieved by ensuring nutrient budget calculations apply precautionary rates to variables and adding a precautionary buffer to the total nitrogen (TN) and total phosphorus (TP) calculated for developments. A precautionary approach to the calculations and solutions helps the local planning authority and applicants demonstrate the certainty needed for their assessments.

4.6 By applying the nutrient neutrality methodology, with the precautionary buffer, to new development, the competent authority may be satisfied that, while margins of error will inevitably vary for each development, this approach will ensure that new development in combination will avoid significant increases of nutrient load to enter the internationally designated sites.

Location of development

4.7 The nutrient neutrality approach only applies to developments where the treated effluent discharges into or can impact (via tidal or storm overtopping) Stodmarsh designated sites or any water body (surface or groundwater) that subsequently discharges into such a site. The catchment area is shown on Figure 1 and described in more detail in Appendix 1. Table A1.2 in Appendix 1 lists the Wastewater Treatment Works (WwTW) which discharge into the areas shown in Figure 1. If development is within the areas shown in Figure 1 and discharges into a works listed in Appendix A1.2 all the stages of methodology A apply. If a development is outside the Figure 1 boundary but discharges into a WwTW that is listed in Table A1.2 then only Stage 1 and addition of the precautionary buffer from Stage 4 of the methodology A apply.

4.8 This approach may be refined if greater understanding of the eutrophication issue is gained thorough new research or updated modelling.

Type of development

4.9 This methodology is for all types of development that would result in a net increase in population served by a wastewater system, including new homes, student accommodation, tourism attractions and tourist accommodation. This development will have inevitable wastewater implications.

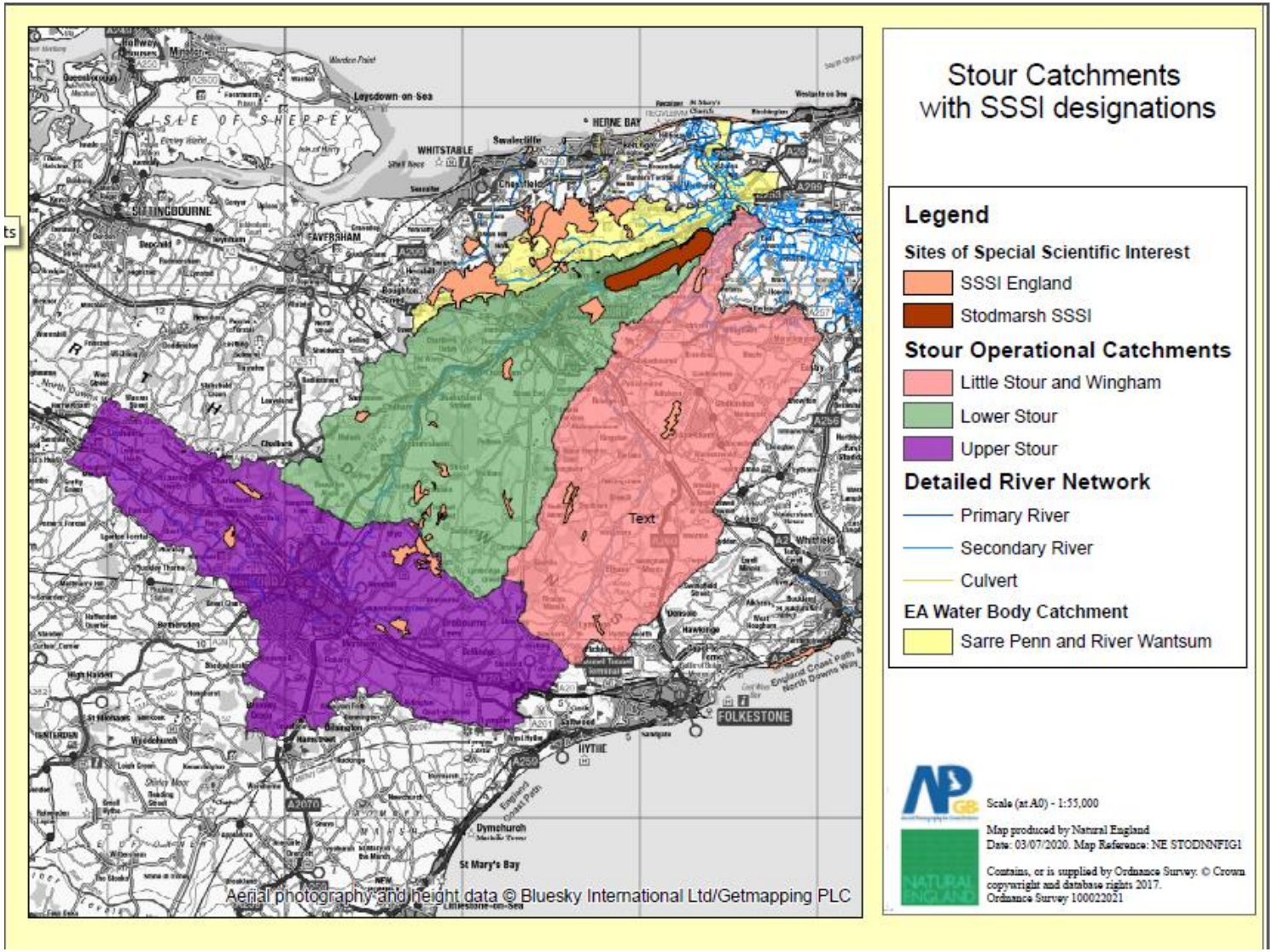
4.10 Other commercial development, not involving overnight accommodation will generally not be included unless it has other (none sewerage) water quality implications. It is assumed that anyone living in the catchment also works and uses facilities in the catchment, and therefore wastewater generated by that person can be calculated using the population increase from new homes and other accommodation. This removes the potential for double counting of human wastewater arising from different planning uses.

4.11 Tourism attractions and tourism accommodation are exceptions, as these land uses attract people into the catchment and generate additional wastewater and consequential nutrient loading on the Stodmarsh designated sites. This includes self-service and serviced tourist accommodation such as hotels, guest houses, bed and breakfasts and self-catering holiday chalets and static caravan sites. Other applications will be considered on their individual merits, for example conference facilities that generate overnight stays.

4.12 There may be cases where planning applications for new commercial or industrial development such as waste management facilities, road schemes or changes in agricultural practices could result in the release of additional nitrogen and/ or phosphorus into the system. In these situations, a case-by-case approach will be adopted. Early discussions with Natural England via our chargeable Discretionary Advice Service (DAS) are recommended.

Figure 1 Surface water of Stodmarsh Catchment to which this advice applies

Note developments outside of these boundaries may drain to WwTWs inside these boundaries. See also table A1.1 and A1.2 and notes in Appendix 1 for more detail.



SECTION 5 METHODOLOGY

5.1 A decision tree for application of the methodology is given in Figure 2. The initial stage is to determine whether the development will drain to the mains network or to a non-mains facility e.g. an on-site package treatment plant.

5.2 The methodology for development that drains to the mains network is in **Section A**. Please go to **Section B** if the new development is not on the mains network.

Section A

Stage 1 Calculate Total Nitrogen (TN) and Total Phosphorus (TP) in kilograms per annum derived from the development that would exit the Wastewater Treatment Works (WwTW) after treatment

Stage 1 Step 1 Calculate additional population

5.3 New housing and overnight accommodation can increase the population as well as the housing stock within the catchment. This can increase the nutrient in discharges. To determine the additional population that could arise from the proposed development, it is necessary that sufficiently evidenced occupancy rates are used. Natural England recommends that as a starting point local planning authorities should consider using an occupancy rate of 2.4, as calculated by the Office for National Statistics (ONS) figure, as this can be consistently applied across local authority areas in the Stour catchment.

5.4 However, competent authorities may choose to adopt bespoke calculations tailored to the area of a scheme, rather than using national population or occupancy assumptions, where they are satisfied that there is sufficient evidence to support this approach. Conclusions that inform the use of a bespoke calculation need to be capable of removing all reasonable scientific doubt as to the effect of the proposed development on the international sites concerned, based on complete, precise and definitive findings. The competent authority needs to explain clearly why the approach taken is considered to be appropriate. Calculations for occupancy rates will need to be consistent with others used in relation to the scheme (e.g. for calculating open space requirements), unless there is clear justification for them to differ.

Stage 1 Step 2 Confirm water use

5.5 Determine the water use/ efficiency standard for the proposed development to be defined in the planning application and, where relevant, the Environmental Statement. The nitrogen and phosphorus load is calculated from the scale of water use and thus the highest water efficiency standards under the building regulations will minimise the increase in nutrients from the development where this goes to a treatment works with a relevant permit limit.

5.6 It is recommended that each local planning authority impose a planning condition on all planning permissions for one or more net additional new dwellings requiring construction to the optional requirement[5] under G2 of the Building Regulations 2010.

5.7 A model condition is set out below:

"*The dwellings shall not be occupied until the Building Regulations Optional requirement of a maximum water use of 110 litres per person per day has been complied with."*

5.8 The water use figure is a proxy for the amount of wastewater that is generated by a household. New residential development may be able to achieve tighter water use figures, with or without grey water recycling systems, and this approach is supported from a water resource perspective (for example in support of Southern Water's Target 100 litres per person per day). However, the key measurement is the amount of wastewater generated by the development that flows to the wastewater treatment works.

5.9 If tighter water use restrictions are used in the nutrient calculation – with or without grey water recycling systems – these restrictions must reflect the wastewater expected to be generated for the lifetime of the development. There is a risk that when kitchen and bathroom fittings are changed by occupants over the years, less water-efficient models could be installed. It is Natural England's view that it would be difficult to evidence and secure delivery of tighter restrictions at this time, to provide certainty for the lifetime of the development. However, if sound evidence can be provided, this will be considered on a case-by-case basis.

5.10 It is Natural England's view that while new developments should ideally be required to meet the 100 litres per person per day standard, the risk of standards slipping over time and the uncertainty inherent in the relationship between water use and sewage volume should be addressed by the use in the calculation of 110 litres per person per day figure.

Stage 1 Step 3 Confirm WwTW and permit level

5.11 Identify the wastewater treatment works (WwTWs) that the development will use and identify whether the WwTW has a TN or/ and TP Permit.

5.12 For most planning applications the WwTW provider is not confirmed until after the planning permission is granted. The nutrient calculation should be based on the permit levels of the most likely WwTW. In any cases where the WwTW changes a reassessment of the nutrient calculation will be required to ensure the development is nutrient neutral.

[5] The optional requirement referred to in G2 requires installation and fittings and fixed appliances for the consumption of water at 110 litres per person per day.

WwTW with TN and TP permit

5.13 Identify the permit concentration limit for total nitrogen (TN) and total phosphorus (TP) at the WwTW. If the WwTW will have a tightened permit concentration limit for total nitrogen / total phosphorus under the company's water industry Asset Management Plan for confirmed delivery by 2024 then use this tightened value. If a new WwTW is proposed, obtain a determination from the Environment Agency on the permit limit for Total Nitrogen / Total Phosphorus that would apply to the works and when they are likely to be built. Further information on permit limits of some existing WwTW is provided in Appendix 1.

5.14 Where there is a permit limit for total nitrogen/ total phosphorus, the load calculation will use a worst case scenario that the WwTW operates at 90% of its permitted limit. A water company has the option of operating the works as close to the consent limit as practicable without breaching the consent limit. Natural England and the Environment Agency have agreed in the Solent to take 90% of the consent value as the closest the water company can reasonably operate works without breaching the consent limit and Natural England accepts this can be extended into other Southern Water WwTW outside the Solent including those in the Stour and its tributaries.

WwTWs without a TN/TP permit

5.15 For developments that discharge to WwTWs with no phosphorus and / or nitrogen permit level, best available evidence must be used for the calculation. The wastewater provider should be contacted for details of the nitrogen and phosphorus effluent levels monitored at the specific WwTW. However Southern Water have confirmed that they do not routinely monitor N or P in effluent discharge where there is no permit in the Stour catchment. Where monitored data is not available robust evidence may be available to derive a value for nitrogen and/ or phosphorus in the wastewater stream based on the type of wastewater treatment at the works.

5.16 For example, in the Southern Water WwTW in the Solent an average of 27 mg/l for Nitrogen is used and Southern Water have confirmed this may be used in the Stour catchment. This average figure may change if new evidence becomes available. Southern Water have advised they would assume an approximate upper figure of 8 mg/l TP for works without a P permit in the Stour catchment for planning purposes though further evidence to support this figure is awaited and it may be subject to change. Evidence supporting any different chosen value for TP or TN must be included with any application. It is not possible to apply the 90% correction in these cases as these WwTWs are not regulated by a total nitrogen or/ and total phosphorus consent limit.

Relationship between TN/TP and water use

Works with a TN and TP permit limit without headroom

5.17 For WwTWs with a TN or/ and TP consents that operation at the permit concentration or close to it i.e. 90% of the permit values, there is a direct relationship between TN/TP and water use. For example, for WwTWs with a permit of 9 mg/l TN and 2 mg/l TP, it can be calculated that for each litre of water that passes through the works, 8.1 mg of nitrogen and 1.8 mg phosphorus (90% of permit values) could be

released into the water environment. If a household uses 150 litres, this equates to 1215 mg of TN and 270 mg of TP; if water use is reduced to 100 litres this equates to release of 810 mg of the TN and 180 mg of TP. As there is this clear relationship it is therefore possible to calculate the effect of applying water efficiency measures to existing development and therefore this can be considered as potential mitigation in these circumstances.

5.18 Water companies often use chemical dosing to achieve permit limits on nutrients in particular phosphorus. They can dose the influent to achieve permit compliance, therefore when influent becomes less concentrated they can simply reduce the chemical dosing. For this reason mitigation that reduces the influent concentration at a works (such as sending to a package plant before sending to mains) does not have a guaranteed nutrient reduction in the corresponding effluent discharged and therefore is not certain as a mitigation measure.

Works with a TN and TP consent limit with permit headroom

5.19 Some wastewater treatment works operate considerably below 90% of their existing permit limits for TN/TP i.e. there is permit headroom. Where there is permit headroom reducing water consumption of existing developments to offset the proposed development does not necessarily reduce nutrient loading from the works to designated sites as there is the ability to increase the concentration of the discharge within permitted concentration. It is likely that where the influent concentration to a WwTWs increases, then there could be an increase in the concentration of the WwTW effluent. For this reason applying water efficiency measures to existing properties that discharge to works with permit headroom has uncertain or potentially no mitigating / offsetting benefit for new development. For new development the calculation should use the same approach as for works with a TN and TP permit and use 90% of the permit value along with the water usage, as this will represent the maximum loading, and therefore already allows for the increase in the effluent concentration up to the permit limit that might occur.

Works without a TN or/and TP limit

5.20 For WwTWs without a TN/TP consent level the relationship between water use and TN/TP in the effluent is more complex, but applying the same methodology for nutrient neutrality using the actual discharge concentration (without the 90% correction) for new development is considered appropriate provided the development is not considered likely to increase the influent concentration to the works above current average. Any error due to marginal increases in TN or TP concentration with increases in population served by a particular WwTW will be covered by the precautionary 20% buffer provided the influent concentration is not considered likely to increase.

5.21 Please note that due to the likely increase in influent concentration caused by water efficiency measures at existing properties, the use of measures designed to reduce water consumption as a means of offsetting mitigation of TN/TP are not appropriate due to uncertainty in what reductions, if any, they may provide in areas served by WwTWs without an N or/and P permit.

5.22 For developments with high water efficiency measures that are large in relation to the population serviced by existing works or for other reasons are likely to increase the influent concentration in areas served by works without a TN or TP limit a bespoke calculation is required. The advice of the likely sewerage provider should be sought as to whether the influent concentration is likely to increase from the proposed development in areas supplied by works without a TN/TP limit.

Stage 1 Step 4 Calculate Total Nitrogen (TN) and Total Phosphorus (TP) in kg per annum that would exit the WwTW after treatment derived from the proposed development

5.23 The total nitrogen/total phosphorus load is calculated by multiplying the water use of the proposed development by the appropriate concentration of total nitrogen/ total phosphorus after treatment at the WwTW.

5.24 In the nutrient neutral methodology for Solent sites a discount is made for amount of N that would be present in the groundwater and river water if they were in a more natural condition and an amount considered at this stage to be likely to meet the restoration objectives for the Solent international sites. In part this is due to the absence of a numeric targets for nutrients for the Solent and in part it is due to likelihood that a proportion of the nitrogen in a groundwater catchment would eventually reach the sea.

5.25 The acceptable load of nitrogen and phosphorus levels in the Stour catchment are taken into account in the numeric nutrient standards for the lakes. The WINEP investigation will calculate values of N and P in the Stour that are acceptable in the determination of the existing treatment works effects on Stodmarsh designated sites. For these reasons Natural England do not consider it is appropriate to discount groundwater background values from the Stodmarsh nutrient neutral calculations.

Worked example of a nutrient budget calculation for discharge to a WwTW using methodology

5.26 The following worked example calculates the total nitrogen and phosphorus loads of a development of 1000 dwellings based on a WwTW with a consent limit for Total Phosphorus of 2 mg/l but without a consent limit for total Nitrogen. In this theoretical example the company agreed the development proposal was small in proportion to the works population equivalence and was not likely to increase the influent and the base average discharge is assumed to be 27 mg/l.

5.27 Where residential developments also include other overnight accommodation such as tourist accommodation and attractions, the associated water use from these additional land uses will need to be included in the calculation. These rates should be based on empirical evidence from similar developments or published literature and will be assessed on a case by case basis.

Table 2 – Calculating wastewater Total Nitrogen/ Phosphorus load from proposed development

STAGE 1 - WORKED EXAMPLE TO CALCULATE TOTAL NITROGEN (TN) and (TP) LOAD FROM DEVELOPMENT WASTEWATER				
Step	**Measurement**	**Value**	**Unit**	**Explanation**
Development proposal	Development types that would increase the population served by a wastewater system	1000	Residential dwellings	
Step 1	Additional population	2400	Persons	Uses an average household size of 2.4 x 1000 dwgs (greenfield site)
Step 2	Wastewater volume generated by development	264,000	litres/day	2400 persons x 110 litres[6]
Step 3	Receiving WwTW Average TN discharge confirmed with company as unlikely to change as result of development Receiving WwTW permit limit for TP assume discharge to be at 90%	27 1.8	mg/l TN mg/l TP	27 mg/l TN confirmed average 90% of the consent limit is 1.8 mg/l TP
Step 4	TN discharged after WwTW treatment TP discharged after WwTW treated	7,128,000 475,200	mg TN/day mg TP/day	Step 2 x step 3 = 27 mg/l TN x 264,000 = 1.8 mg/l TP x 264,000
	Convert mg TN to kg TN per day Convert mg TP to kg TP per day	7.128 0.4752	kg TN/day kg TP/day	Divide by 1,000,000
	Convert kg/TN per day to kg/TN per year Convert to kg/TP/SRP per day to kg/TP per year	2,601.72 173.45	kg TN/yr kg TN/yr	Multiply by 365 days
Wastewater Total nutrient load		**Total Nitrogen** **Total Phosphorus**	**2,602 kg TN/yr** **173 kg TP/yr**	

[6] Where relevant, deduct wastewater volume of population displaced by the proposed development

Stage 2 Adjust Nitrogen/ Phosphorus load to offset existing nitrogen from current land use

5.28 This next stage is to calculate the existing nutrient losses from the current land use within the redline boundary of the scheme. The nitrogen/ phosphorus loss from the current land use will be removed and replaced by that from the proposed development land use. The net change in land use will need to be subtracted from or added to the wastewater total nitrogen/ total phosphorus load.

5.29 Nitrogen–nitrate/ phosphorus loss from agricultural land has been modelled using a Farmscoper model run for the Stour Management Catchment for Stodmarsh. This model has been used to estimate the loss of nutrients from different farm types in relevant catchments and these are provided in table 3. Further details on farm classification used in the Farmscoper model are included in Appendix 4.

5.30 If the proposed development area covers agricultural land that clearly falls within a particular farm type used by the Farmscoper model then the modelled average nitrate-nitrogen and phosphorus loss from this farm type should be used.

Table 3 Farm types and average nitrogen-nitrate loss

AVERAGE NUTRIENT LOSS PER FARM TYPE IN STOUR MANAGEMENT CATCHMENT AREA (kg/ha/yr)		
	Nitrate- Nitrogen (kg/ha/yr)	Phosphorus (kg/ha/yr)
Cereals	27.3	0.36
Dairy	58.3	0.49
General Cropping	27.9	0.28
Horticulture	18.5	0.18
Pig	60.3	0.34
Lowland Grazing	12.2	0.24
Mixed	31.5	0.27
Poultry	60.3	0.34
Average for catchment area	**23.5**	**0.28**

5.31 If the proposed development area covers several or indeterminate farm types then the average nitrate-nitrogen and phosphorus loss across all farmland may be more appropriate to use. The average figure is also included in table 3.

5.32 The figures in table 3 are taken from a Farmscoper V4 run for the Stour management catchment in September 2019 and are based on leachate kg/ha N and P for each of the individual farm types with prior mitigation measures taken up at national levels. These may be updated from time to time as land use and agricultural practice to control nutrient losses change.

5.33 For maize farms, it is recommended that the general cropping nitrogen leaching rate is used in the calculation. For sites that are in use as allotments, it is recommended

that the most appropriate farm type for allotments is the average rate of the catchment land use. For sites that are currently in use as horse paddocks, it is recommended that the lowland grazing figure should be used in the calculation. If evidence can be provided to support an alternative figures, then this information will be reviewed by the local planning authority and Natural England.

5.34 It is important that farm type classification is appropriately precautionary. It is recommended that evidence is provided of the farm type for the last 10 years and professional judgement is used as to what the land would revert to in the absence of a planning application. In many cases, the local planning authority, as competent authority, will have appropriate knowledge of existing land uses to help inform this process.

5.35 There may be areas of a greenfield development site that are not currently in agricultural use and have not been used as such for the last 10 years. In these cases, there is no agricultural input into the land. If these sites are in private ownership and they are not subject to unmanaged recreational use (such as dog walking), these areas should be given a baseline nutrient leaching value of 5 kg N/ha/yr and 0.14 kg P/ha/yr for nitrogen and phosphorus respectively. These figures cover nitrogen and phosphorus loading from atmospheric deposition, pet waste and nitrogen fixing legumes.

5.36 Where development sites include existing wildlife areas, woodlands, hedgerows, ponds and lakes, that are to be retained, these areas should be excluded from the calculation as there will be no change in the nitrogen and phosphorus input onto this land, or included with the same nitrogen leaching rate in stage 2 and 3. This approach assumes that if they are adopted as green infrastructure or a wildlife area in the new development appropriate management can be secured with any planning permission (see next section) to restrict nitrogen and phosphorus loading.

5.37 A similar approach can also be taken for the redevelopment of urban land as the nitrogen and phosphorus leaching rates would be 14.3 kg N/ha/yr and 0.83 kg P/ha/yr in stage 2 and 14.3 kg N/ha/yr and 0.83 kg P/ha/yr in stage 3. If there is no change in site area, these areas can be excluded from the calculation.

5.38 For sites where existing land use is not confirmed, it is Natural England's advice to local planning authorities and applicants to take a precautionary approach in line with existing legislation and case law. It is important that only land that currently drains into, or is upstream or in other way effect the designated sites is used for offsetting. If the development land is within a different catchment to the waste water treatment works (WwTW) that are receiving the waste and contributing to the existing failures then this land cannot be used to mitigate the development wastewater. Where land straddles catchments a pro-rata calculation should be made. A worked example to calculate the nitrogen and phosphorus load from existing land use is set out in table 4.

Table 4 Calculating nitrogen/ phosphorus load from current land use

STAGE 2 - WORKED EXAMPLE TO CALCULATE NITROGEN AND PHOSPHORUS LOAD FROM CURRENT LAND USE				
Step	**Measurement**	**Value**	**Unit**	**Explanation**
1	Total area of existing agricultural land	40	Hectares	This is the area of agricultural land that will be lost due to development
2	Identify farm type and confirm nutrient loss from table 2. (example based on cereals)	27.3 0.36	kg N/ha/yr kg P/ha/yr	The developable area is mainly laid to cereals. Reference Appendix 2 and Table 2
3	Multiply area by nitrate/ phosphorus loss	1,092 14.4	kg N/yr kg P/yr	40 ha x 27.3 kg N/yr 40 ha x 0.36 kg P/yr
Nitrogen load - current land use	Nitrogen 1,092 kg N/yr Phosphorus 14.4 kg P/yr			

Stage 3 Adjust nitrogen/ phosphorus load to account for land uses with the proposed development

5.39 This stage is to add in the nitrogen and phosphorus loads that will result from new development that is not received by a WwTW i.e. the nutrients that arise from the new land use. This includes the nitrogen and phosphorus load from the new urban development and from the new open space including any Suitable Alternative Natural Greenspace (SANG), Nature Reserves or Bird Refuge Areas as identified within the redline boundary of the scheme.

5.40 The calculation only includes the areas of the site where there will be a change in land use, for example from agricultural land to new urban development or agricultural land to SANG/ open space. Where there is no proposed change to land use, this land should be excluded from the nutrient budget as there will be no change to the nutrient load from this area. Where land does not drain to the designated site catchment it should be excluded from the calculation.

Urban development

5.41 The nitrogen/ phosphorus load from the new urban development results from sewer overflows and from drainage that picks up nutrient sources on the urban land. Urban development includes the built form, gardens, road verges and small areas of open space within the urban fabric. These nutrient sources include atmospheric deposition, pet waste, fertilisation of lawns and gardens and inputs to surface water sewers. The

nitrogen leaching from urban land has been estimated to equate to 14.3 kg/ha/yr[7]. The phosphorus leaching from urban land has been estimated to equate to 0.83 kg/ha/ yr[8]. These figures are proxy figures from best available data however if locally robust catchment specific data is available this can and should be used. Appendix 5 sets out some of the scientific research and literature in relation to these figures.

Open Space and Green Infrastructure

5.42 Nutrient loss draining from new designated open space or SANG should also be included. The nitrogen leaching from this land has been estimated to equate to 5 kg/ha/yr for Solent sites and this is used as a proxy for the Stour valley. The phosphorus leaching from SANG land has been estimated to equate to 0.14 kg/ha/yr. Appendix 6 sets out the scientific research and literature in relation to these figures. These figures can also be used where new nature reserves or bird refuge areas are created and for new woodland planting areas.

5.43 The competent authority will need to be assured that this open space will be managed as such and there will be no additional inputs of nutrients or fertilisers onto this land for the duration of the development. Appropriate planning conditions or other legal measures may be necessary to ensure it will not revert back to agricultural use, or change to alternative uses that affect nutrient inputs in the long term. It is therefore recommended that the 5 kg/ha/yr for Nitrogen and 0.14 kg/ha/yr for phosphorus rate applies to areas of designated open space on-site of around 0.5 hectares and above. These sites will also need long term management to ensure the provision of dog bins and that these are regularly emptied.

5.44 Small areas of open space within the urban fabric, such as road verges, gardens, children's play areas and other small amenity areas, should not be included within this category. The urban development figure is appropriate for these land uses as they are already taken account in the figures chosen.

Community food growing provision

5.45 For any areas of the site that are proposed for community food growing provision, such as allotments, it is recommended that the average farm type rate is used (see table 3).

5.46 A worked example is shown in the table below. This is based on a developable area of 30 hectares covering land in a mix of farm types with the removal of 10 hectares of agricultural land to create SANG.

[7] Supplementary Planning Document – Achieving Nitrogen Neutrality in Poole Harbour

[8] From relevant Water framework directive export coefficient for urban and suburban land 2006 Final Report: Updating the estimate of the sources of phosphorus in UK waters

Table 5 – Adjust Nitrogen and Phosphorus Load to account for future land uses

STAGE 3 - WORKED EXAMPLE TO CALCULATE NITROGEN/PHOSPHORUS LOAD FROM FUTURE LAND USES				
Step	**Measurement**	**Value**	**Unit**	**Explanation**
1	New urban area	30	Hectares	Area of development that will change from agricultural land to urban land use
2	Nitrogen/ Phosphorus Load from future urban area	429 24.9	kg N/yr kg P/yr	30 ha x 14.3 kg N/yr 30 ha x 0.83 kg P/yr
3	New SANG / open space	10	Hectares	Area of development that will change from agricultural land to SANG / open space
4	Nitrogen/ Phosphorus load from SANG/ open space	50 1.4	kg N/yr kg P/yr	10 ha x 5.0 kg N/yr 10 ha x 0.14 kg P/yr
5	Combine Nitrogen load from future land uses Combine Phosphorus load from future land uses	479 26.3	kg N/yr kg P/yr	429 kg N/yr + 50 kg N/yr 24.9 kg P/yr +1.4 kg P/yr
Nutrients from Proposed future land uses	Nitrogen 479 kg TN/yr Phosphorus 26.3 kg TP/yr			

Stage 4 Calculate the net change in the Total Nitrogen and Total Phosphorus load that would result from the development

5.47 The last stage is to calculate the net change in the total nitrogen and total phosphorus load to the Stodmarsh catchment with the proposed development. This is derived by calculating the difference between the total nitrogen/ phosphorus load calculated for the proposed development (wastewater, urban area, open space etc.) and that for the existing land uses.

5.48 It is necessary to recognise that all the figures used in the calculation are based on scientific research, evidence and modelled catchments. These figures are the best available evidence but it is important that a precautionary buffer is used that

recognises the uncertainty with these figures and in our view ensures the approach, with reasonable certainty, that there will be no adverse effect on site integrity. Natural England therefore recommends that a 20% precautionary buffer is built into the calculation.

5.49 There may be instances where it is the view of the competent authority that an alternative precautionary buffer should be used based on a site-specific basis where sufficient evidence allows the legal tests to be met. Table 6 sets out a worked example of stage 4.

Table 6 Nitrogen/ Phosphorus Load Budget

STAGE 4 - WORKED EXAMPLE TO CALCUATE THE NET CHANGE IN NITROGEN AND PHOSPHORUS LOAD FROM THE DEVELOPMENT				
Step	**Measurement**	**Value**	**Unit**	**Explanation**
1	Identify Nitrogen load from wastewater (stage 1) Phosphorus load from wastewater (stage 1)	2602 173	kg N/yr kg P/yr	See Table 1
2	Calculate the net change in Nitrogen and Phosphorus from land use change - subtract existing land uses Nitrogen/Phosphorus load (stage 2) from future land uses Nitrogen/Phosphorus load (stage 3)	-613 11.9	kg N/yr kg P/yr	479 - 1,092 kgN/yr 26.3 - 14.4 kgP/yr
3	**Determine Nitrogen/ Phosphorus Budget** – Step 1 plus step 2 of this table (the latter figure may be positive ie the change in land use will generate more nitrogen, or negative ie the change in land use will generate less Nitrogen/ Phosphorus)	1,989 184.9	kg N/yr kg P/yr	2602 kg N/yr (step 1) + (-613)(step 2) 173 kg P/yr (step 1) + 11.9 (step 2)
4	Nitrogen/ Phosphorus Budget without buffer	1,989 184.9	kg N /yr kg P/yr	
5	Divide Nitrogen/ Phosphorus Budget without buffer by 5 **(Do not apply buffer if step 4 is a negative figure)**	397.8 36.98	kg N /yr kg P/yr	1,989 kg N/yr divide by 5 184.9 divide by 5
6	Identify Nitrogen/ Phosphorus Buffer with 20% buffer	2,386.8 221.88	kg N /yr kg P/yr	Add step 4 to step 5 of this table
Nutrient Budget with 20% buffer	2,386.8 kg N /yr 221.88 kg P/yr			

Section B

Methodology for calculating TN and TP budgets for package treatment plants (PTPs)

5.50 The Environment Agency has a presumption against private sewage treatment works in sewered areas and will always seek connection to the mains sewer where possible and practicable. A principle concern relates to the failure rates of package treatment plants (PTPs) and the lack of review and periodic upgrades via regulatory systems that apply to mains. There will be site specific factors (e.g. in proximity to watercourses, soil saturation levels, etc.) that would need to be considered when evaluating this risk.

5.51 Further advice from the Environmental Agency on the use of PTP may be found at - https://www.gov.uk/guidance/discharges-to-surface-water-and-groundwater-environmental-permits. Additional guidance may also be available via local planning authorities. The following advice is only provided in relation to nutrient neutrality and is provided on the basis that the developer and/or planning authority have ensured that the Environment Agency is satisfied that a PTP is appropriate for the proposed development.

5.52 Where development proposals include use of PTPs, or similar, it is recommended that the TN and TP level is calculated on a per person basis. On average each person produces sewage containing 0.0035 tonnes of nitrogen per year (3.5 kilograms)[9] and 0.99 kg of P[10]. The TN prior to treatment = number of additional population x 3.5 kg = kg TN/yr . The TP prior to treatment = number of additional population x 0.99 kg = kg TP/yr.

5.53 The percentage reduction of TN and TP that may be applied as result of treatment will depend on the efficiency of the treatment processes employed and must be assessed on a case-by-case basis. The evidence supporting the efficiency of PTPs should include the test result documents from the lab (in English) and/ or measured effluent concentrations from real world applications, not just the covering certificate. Information will also need to be provided on the long term monitoring and management of these installations and this will need to be secured.

5.54 Bespoke calculations of the TN/TP load may be possible for larger PTPs in instances where sufficient evidence of the performance of the system in removing nitrogen and phosphorus is provided. In addition to the above, the evidence will need to include, as a minimum, a full year of operation and supporting information to ensure that the concentration of total nitrogen and phosphorus within the effluent can be reliably predicted. In these cases, early consultation with Natural England, through our charged advice service, and the competent authority is recommended.

[9] Nitrogen reduction in Poole Harbour Supplementary Planning Document. If data more suitable to the Stour is available these figures can be used

[10] Taken from upper range values quoted in for human excreta (1.7g/dy) plus detergents (1.0g/dy) x 365 days in Natural England 2015 The impact of phosphorus inputs from small discharges on designated freshwater sites (NECR170)

5.55 Table 7 sets out a worked example for Stage 1. Stages 2, 3 and 4 of the above methodology can then be applied.

Table 7 Alternative Stage 1 methodology for package treatment plants (PTPs)

STAGE 1 - WORKED EXAMPLE TO CALCULATE TOTAL NITROGEN (TN) AND TOTAL PHOSPHORUS (TP) LOAD FROM DEVELOPMENT WASTEWATER WITH AN ON-SITE PTP (prior to treatment)				
Step	**Measurement**	**Value**	**Unit**	**Explanation**
Development proposal	Development types that would increase the population served by a wastewater system	100	Residential dwellings	
Step 1	Additional population	240	Persons	Based on average household size of 2.4
Step 2	TN prior to treatment Based on 3.5 kg TN per person per year TP prior to treatment Based on 0.99 kg TP per person per year	840 237.6	kg TN /yr kg TP/ yr	240 (step 1) x 3.5 kg TN per person per yr 0.99 kg TP per person per yr
Step 3	Receiving PTP TN reduction efficiency Receiving PTP TP reduction efficient	70 80	% %	Efficiency of PTP used must be evidenced this is just illustrative example.
Step 4	TN discharged after PTP treatment TP discharge after PTP treatment	252 47.52	kg TN /yr kg TP/yr	30% of 840 20 % of 237.6
Stage 4 (included as example where no land use change has occurred)	Apply 20% precautionary buffer	302.4 57.02		120% of step 4 1.2x252 1.2 x 47.52
PTP Total Nutrient Load (including Stage 4 20% Buffer)	**Nitrogen 302.4 kg TN / Yr** **Phosphorus 57.02 kg TP/Yr**			

SECTION 6 MITIGATION

Introduction

6.1 If there is a nitrogen and/ or phosphorus surplus (a positive figure), then mitigation is required to achieve nutrient neutrality. If the calculation identifies a deficit (a negative figure), no additional mitigation is required. In the worked example described in the methodology, the nitrogen budget with 20% buffer is 2,386.8 kg TN/yr and the phosphorus budget is 221.88 kg TP/yr. Neutrality would therefore require appropriate mitigation measures that would remove a minimum of 2,387kg TN/yr and 222 kg TP/yr.

6.2 Mitigation can be through direct measures, e.g. interceptor wetlands that prevent nutrient from entering the site or 'indirect' by taking land out of nitrogen/ phosphorus intensive uses, e.g. crops or intensive livestock systems that result in an excess of nitrogen or phosphorus lost to the water environment. This indirect mitigation can be referred to as offsetting.

6.3 The purpose of the mitigation measures is to avoid impacts on the designated sites rather than compensating for the impacts once they have occurred. Avoiding impacts is achieved by neutralising the additional nutrient burden that will arise from the proposed development, achieving a net zero change at the designated sites in a timely manner.

6.4 To ensure it is effective mitigation, any scheme for neutralising nitrogen and/ or phosphorus must be certain at the time of appropriate assessment as part of the HRA, so that no reasonable scientific doubt remains as to the effects of the development on the international sites. This will need consideration of the delivery of mitigation, its enforceability and the need for securing the adopted measures for the duration of the development's effects, generally 80-125 years.

6.5 Schemes that are being delivered by other sectors (for example water industry and agricultural sector) for the purpose of meeting the necessary conservation measures designed for the international sites and to take appropriate steps to avoid the deterioration of the international sites should not also be used as mitigation for plans and projects, as this would compromise the original purpose and would be unlikely to meet the legal tests of the Habitats Regulations.

6.6 Further information has been included in this section on recommended mitigation measures. Each mitigation scheme will be assessed on its own merits and on a case by case basis, based on the submitted evidence. We recommend applicants to discuss options with local planning authorities and Natural England through our charged advice service, at the earliest opportunity. However, it is ultimately the decision of the local planning authorities, as competent authorities, to determine the suitability of the proposed mitigation scheme in line with the legal tests in the Habitats Regulations.

Types of mitigation

Conversion of agricultural land for community and wildlife benefits

6.7 Permanent land use change by converting agricultural land with higher nitrogen/ phosphorus loading to alternative uses with lower nitrogen/ phosphorus loading, such as for local communities, wildlife, and under schemes for flood management or to deliver the UK Government's Net Zero greenhouse gas emissions target by 2050[i], is one way of neutralising nutrient burdens from development. It is important to retain the best and most versatile agricultural land in food production, particularly food crop production. However, there are a number of reasons to support conversion of agricultural land where the land is less economic to farm. There may also be a wide range of incidental benefits for the local community and wildlife from this change, as well as delivery of wider planning policy objectives and climate emergency pledges.

On-site options

6.8 One option is to increase the size of the SANGs and Open Space provision for the development on agricultural land that reduces the nitrogen/ phosphorus loss from this source. This can be secured as designated open space or by other legal mechanisms.

Off-site options

6.9 Another option is to acquire, or support others in acquiring, agricultural land elsewhere within the Stour river catchment area. By changing the land use in perpetuity (e.g. to woodland, heathland, saltmarsh, wetland or conservation grassland), this reduces the nutrient loss from this source.

6.10 Mitigation land should be appropriately secured to ensure that at the time of the appropriate assessment it is certain that the benefits will be delivered in the long term. Natural England advises that this can be achieved through an appropriate change of ownership to a local planning authority or non-government organisation. However, it is recognised that there may be other legal mechanisms available to the competent authority to ensure deliverability and enforceability of a mitigation proposal. These can be considered on a case-by-case basis.

6.11 Such land use change should deliver multiple public benefits that can incidentally meet other government targets. There are wildlife and biodiversity benefits by enhancing ecological corridors and key sites identified in the Local Nature Partnership network or which form part of the nature recovery network. This land can buffer existing nature reserves and ancient woodland. It can also create priority habitats such as heathland, saltmarsh, wetland or conservation grassland.

6.12 Small scale developments are encouraged to consider opportunities for providing local small scale mitigation measures that deliver multiple benefits. Possible options include the creation of local wetlands, local nature reserves, community orchards (without nutrient inputs), or copse. Another example is to turn a strip (in excess of 10m width) of agricultural land immediately adjacent to a public footpath into a greenway. This could be demarcated by hedges or woodland planting for both public and wildlife benefits.

Woodland planting

6.13 Woodland planting on agricultural land is a means of securing permanent land use change without necessitating land purchase. It can be evidenced easily by aerial photography and site visits. The minimum level of woodland planting required to be considered land use change is 20% canopy cover at maturity. In very broad terms, this equates to 100 trees per hectare, although this is dependent on the type of trees planted and there are also options that this can be achieved by natural regeneration, especially if adjacent to existing native woodland. In the Stour Valley this should be achieved by use of native broadleaf species of local provenance, to secure wider biodiversity gains and reduce risk of non-native species and disease spread to the existing internationally protected woodland in the valley. A nitrogen leaching rate from semi-natural native woodland planting is likely to equate to 5 kg/ha/yr and phosphorus of 0.02 kg/ha/yr.

6.14 In a relatively short time, the woodland planting would require a felling licence and woodland removal would also be covered by the EIA Regulations where woodland is planted as mitigation for internationally designated sites. There are therefore a number of layers of security for the competent authorities to ensure this mitigation is being delivered effectively. Planted woodland does require management for the first decade in terms of plug fencing and maintenance until the canopy has reached above browsing height, thereafter management is relatively minimal though some thinning is preferable to enable mature trees to develop.

6.15 Woodland planting would secure carbon capture, biodiversity and recreational benefits. The established woodlands could also be used for wood fuel production or coppice timber production.

Wetlands

6.16 Wetlands receiving nutrient-rich water can remove a proportion of this nitrogen/ phosphorus through natural processes. Wetlands can be designed as part of a sustainable urban drainage (SUDs) system, taking urban runoff/ stormwater; discharges from WwTWs can be routed through wetlands; or the flow, or part of the flow, of existing streams or rivers can be diverted through wetlands though alteration of natural drainage channels should be discouraged.

6.17 Wetlands deliver incidental wildlife and biodiversity benefits, with possible drainage and flood defence benefits (by reducing risk of harm from natural hazards). Further possible benefits arise from increased infiltration into groundwater and these systems can help make communities more climate change resilient. If the wetlands can be accessible, through the provision of boardwalks, then there will also be benefits for wellbeing. It is essential that wetlands and SUDs are maintained to provide ongoing nutrient removal. Provisions for resourcing the ongoing maintenance of SUDs will need to be secured with any planning permission. Further information on the potential for nitrogen and phosphorus mitigation using wetlands is included in Appendix 7.

Wastewater Treatment Work Upgrades

6.18 Mitigation options at WwTWs theoretically include the agreement with the wastewater treatment provider that they will maintain an increase in nitrogen or phosphorus removal at the WwTW. Upgrades to WwTW that are managed by the water sector are undertaken through a specific water industry regulatory process. Securing upgrades to WwTW can only be achieved via this regulatory process.

6.19 There may also be opportunities to progress a wetland at a WwTWs, at the final stage of the process, once the permit consents have been met. It is possible to discharge the WwTWs outfall through wetlands, prior to release into the wider environment. Further details of this option are included in Appendix 7.

Size of mitigation land

6.20 The mitigation land must be sufficient to ensure the legal tests in the Habitats Regulations can be met. For some types of mitigation, for example wetlands, there can be minimum sizes for nutrient removal processes to be effective (see Appendix 7).

6.21 Larger schemes create more opportunities for other sources of funding. Land that is taken out of agriculture for nutrient mitigation could also qualify for additional funding for future management to meet other legislative and policy requirements. For example, with additional management and infrastructure, this land may qualify as SANG to relieve recreational pressure on international designated sites. Furthermore, larger schemes have the potential to deliver wider community and biodiversity benefits and these options should be encouraged where possible.

6.22 Smaller schemes will also be acceptable where the legal tests in the Habitats Regulations are met so there is certainty around these measures, for example, their deliverability, enforceability and long term use.

Location of mitigation

6.23 The location of the mitigation site will also influence the effectiveness of the measure. The appropriate location for mitigation land firstly depends on the catchment of the development and location of the WwTWs outfall. Consideration then needs to be given to site specific factors such as geology, hydrology and topography.

Identifying the catchment for mitigation land

6.24 The fluvial catchment for the Stodmarsh internationally designated sites is shown on Figure 1.

6.25 A key objective is to ensure mitigation land is situated in the most effective location. If interception of WwTW stream is required, then mitigation should be situated as close to the works as possible. The mitigation should be in the same sub-catchment as the discharge location.

Drain to ground

6.26 For developments that drain to ground via a package treatment plant (PTP), septic tank or mains WwTWs, it is appropriate for mitigation land to be within the same catchment as the outfall location of the PTP or WwTW.

Temporal principles

6.27 Within chalk geology where the nitrogen or phosphorus discharge is to ground and remote from watercourses there is likely to be a considerable delay or it may be significantly attenuated. In such circumstances mitigation measures that take effect quickly may not need to be implemented immediately. We advise that these issues are examined on a case by case basis in consultation with the relevant local planning authority or authorities and Natural England.

6.28 Sites that are downstream of the WwTWs and upstream of the designated sites are ideally located to reduce the nutrient load reaching the designated sites. It is our preference that mitigation sites are prioritised within the lower fluvial catchment and close to but upstream of the Stodmarsh site. Sites that are located on tertiary geology or clay are preferred or sites that are located on the break of slope onto chalk bedrock. These sites reduce the time lag between the nutrient benefits of changes to land use within the catchment and the benefits to the designated sites.

6.29 For mitigation sites located on the upper fluvial catchment of the Stour on the chalk bedrock, without any water course in close proximity, there may be a time lag for consideration. It is our advice that the depth of the chalk groundwater is considered. For sites where the groundwater is more than 5m below ground level, then this land is unlikely to be appropriate for mitigation for short term development. Although it may be appropriate for development that is phased over more than 5 years, provided the mitigation land is delivered straightaway.

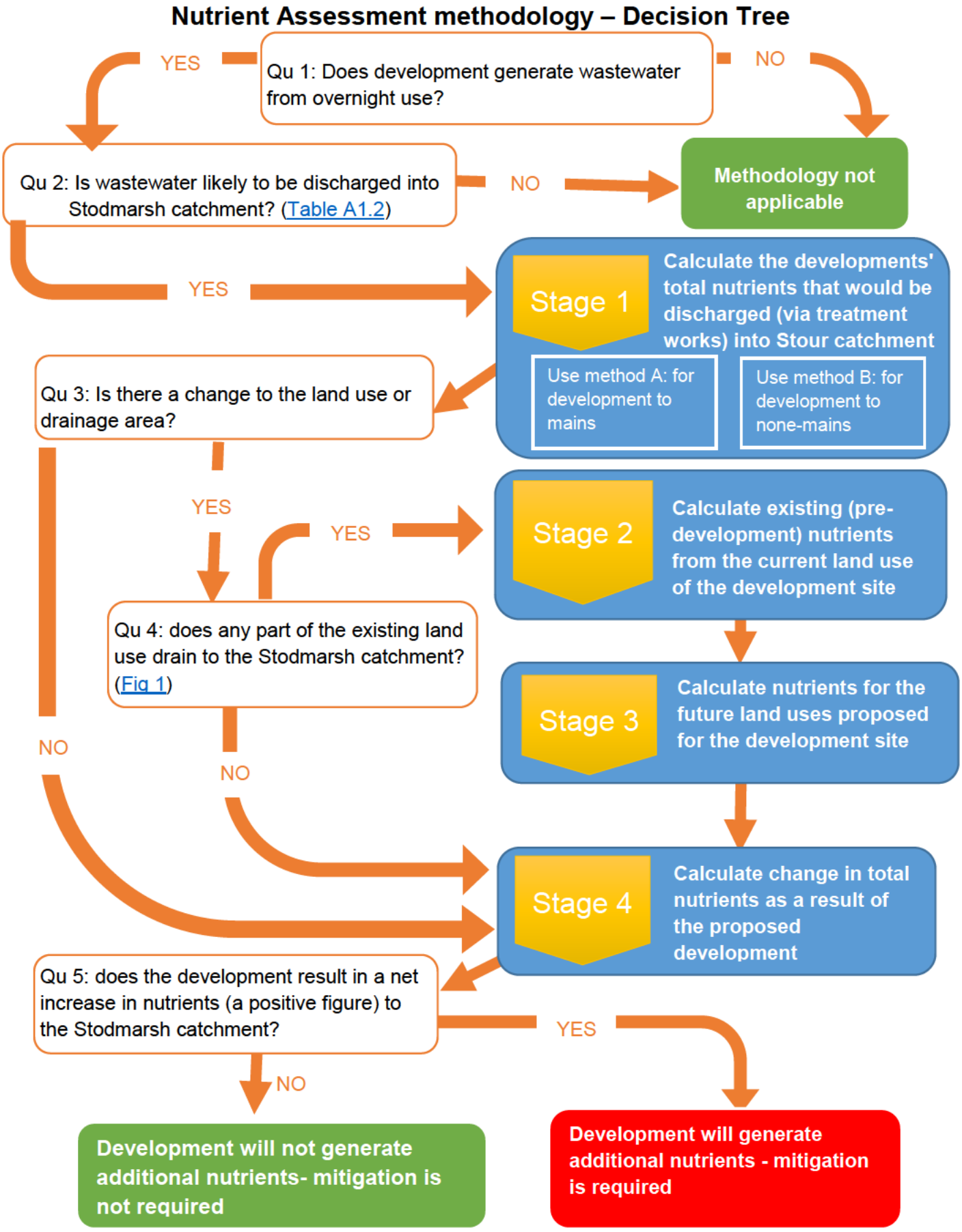
6.30 There may be sites where there is evidence of a short time lag between nutrient reduction at the mitigation site and the designated sites, or where the mitigation site is located on a geology or in an area that will result in additional benefits for nutrient removal, over and above the change in land use at the site itself. These options will be considered on a case-by-case basis.

Strategic Solutions

6.31 It is appreciated that achieving nutrient neutrality may be difficult for smaller developments, developments on brownfield land, or developments that are well-progressed in the planning system. Natural England is working closely with local planning authorities to progress Borough/ District/ City wide and more strategic options that achieve nutrient neutrality and enable this scale of development to come forward.

6.32 Further information will be available on the local authority websites in due course. Natural England can provide further advice on the methodology and mitigation options through our chargeable services (DAS).

Figure 2


Nutrient Assessment methodology – Decision Tree
Qu 1: Does development generate wastewater from overnight use?
YES
NO
Qu 2: Is wastewater likely to be discharged into Stodmarsh catchment? (Table A1.2)
NO
Methodology not applicable
YES
Stage 1
Calculate the developments' total nutrients that would be discharged (via treatment works) into Stour catchment
Use method A: for development to mains
Use method B: for development to none-mains
Qu 3: Is there a change to the land use or drainage area?
YES
YES
Stage 2
Calculate existing (pre-development) nutrients from the current land use of the development site
Qu 4: does any part of the existing land use drain to the Stodmarsh catchment? (Fig 1)
Stage 3
Calculate nutrients for the future land uses proposed for the development site
NO
NO
Stage 4
Calculate change in total nutrients as a result of the proposed development
Qu 5: does the development result in a net increase in nutrients (a positive figure) to the Stodmarsh catchment?
YES
NO
Development will not generate additional nutrients- mitigation is not required
Development will generate additional nutrients - mitigation is required

Notes for Decision Tree

Question 1 – This includes housing development and tourist development. This is covered in type of development section

Question 2 –The wastewater treatment works to which this advice applies are listed in Table A1.2 and the land drainage area to which this advice applies is shown in Figure 1. See Appendix 1 for further details on location.

Question 3 – If the development is converting an existing urban use that does not generate overnight stays (such as office accommodation or employment land) to other urban use then this is not considered a change of land use for offsetting purposes. If urban land is being converted to a park or greenspace this should be included in the land use calculation. Further information on this is contained the stage 2 and 3 calculation of the methodology

Question 4 - if the land use does not drain to the catchment its existing nutrients are not contributing to the failures or risk of failures of the designated sites water quality standards and cannot be used to offset the nutrients from wastewater. If the existing site drains into two catchments only the area that currently (before proposed development) drains into the Stodmarsh catchment (within the lower Stour) can be used for offsetting.

Question 5 - This is covered in stage 4 of the methodology.

Appendix 1

Spatial Extent Covered by this Advice

A1.1 The Environment Agency's Water Industry National Environment Programme (WINEP) investigation scope has agreed the water company assets that are to be part of the investigation into impacts on Stodmarsh designated sites (June 2020).

A1.2 At this time Natural England cannot rule out on objective evidence a likely significant effect on Stodmarsh European sites of development land drainage or effluent from works that discharge upstream in the Stour and downstream (for the tidal lake and during overtopping). Figure 1 in the main document shows the main rivers in the Stodmarsh area. Stodmarsh sits in the Environment Agency Stour management catchment, Figure A1.1 shows the environmental designations in the Stour Catchment. Links to Environment Agency maps and details of the operational management catchments within the Stour management catchment are listed in the table A1.1 below.

A1.3 Natural England recommend that an appropriate assessment of water quality impacts on the designated sites is undertaken for developments that are within, or discharge to, WwTW that are within those catchments mapped in Figure 1 and/ or listed in table A1.1 and table A1.2. Developments where the effluent and drainage goes to works in the operational catchments listed as excluded are not considered to have a hydrological connection to Stodmarsh designated sites. The WwTW listed are those existing Southern Water continuous discharge assets that are in the WINEP investigation, however if discharge from new development goes to an asset in the catchment but not owned by Southern Water, or a new asset is proposed then that should also be assessed.

Table A1.1 Stour Operational Catchment Links

Stour Operational Catchments INCLUDED in the Stodmarsh Advice	**Stour Operational Catchments EXCLUDED from the Stodmarsh Advice**
Stour Lower	Dour
Stour Upper	North and South Streams
Little Stour and Wingham	Oyster Coast Brooks (Part only see Figure 1)
Kent East Coast TRaC (Part only see Figure 1 and list of WwTW)	Kent East Coast TRaC (Part only see Figure 1 and list of WwTW)
Oyster Coast Brooks (Part only see Figure 1 and list of WwTW)	Stour Marshes (Part only see Figure 1 and list of WwTW)
Stour Marshes (Part only see Figure 1 and list of WwTW)	

Table A 1.2 Waste Water Treatment Works covered by this Guidance

Southern Water Waste Water Treatment Works Continuous Discharges considered as part of WINEP investigation * (waterbody/ catchment into which it discharges in brackets)	TP Limit current (planned permit by 2024 in brackets)	TN Limit current	Population Equivalent (2020)
Ashford (Bybrook)WwTW **(Stour -Ashford Wye)**	0.5 mg/l OSM**	None	115,149
Canterbury WwTW **(Stour A2 to West Stourmouth)**	2 mg/l	None	72,498
Charing Wwtw **(Upper Great Stour)**	1 mg/l (OSM only) (0.5 mg/l by 2024)	None	2,057
Chartham Wwtw **(Stour Wye –A2)**	None	None	6,966
Chilham **(Stour Wye- A2)**	None	None	946
Dambridge **(Wingham)**	2 mg/l (0.25 mg/l by 2024)	None	21,347
Lenham Wwtw **(Upper Great Stour)**	1 mg/l (OSM only) (0.5 mg/l by 2024)	None	3,206
May St (Herne Bay) WwTW **(Oyster coast brooks)**	2 mg/l (0.3 mg/l by 2024)	None	43,025
Newnham valley WwTW **(Little Stour)**	None (1 mg/l by 2024)	None	7,372
Sellindge WwTW **(East Stour)**	1 mg/l OSM annual mean (0.5 mg/l by 2024)	None	5,443
Westbere WwTW **(Stour A2 to West Stourmouth)**	None	None	6,503
Wye **(Stour –Ashford Wye)**	None	None	2,135
Good intent cottages WwTW **Nats Lane Brook WwTW** **Westwell WwTW**	None None None	None None None	15 308 216

*Natural England have excluded Minster WwTW from this advice as we have objective evidence that there is no pathway to Stodmarsh for inputs below Plucks Gutter on the Stour.

** This works has an UWWTD annual mean figure of 1 mg/l but the OSM figure is sufficiently certain to be used for planning purposes.

Figure A1.1 Designations in the Stodmarsh River Catchment

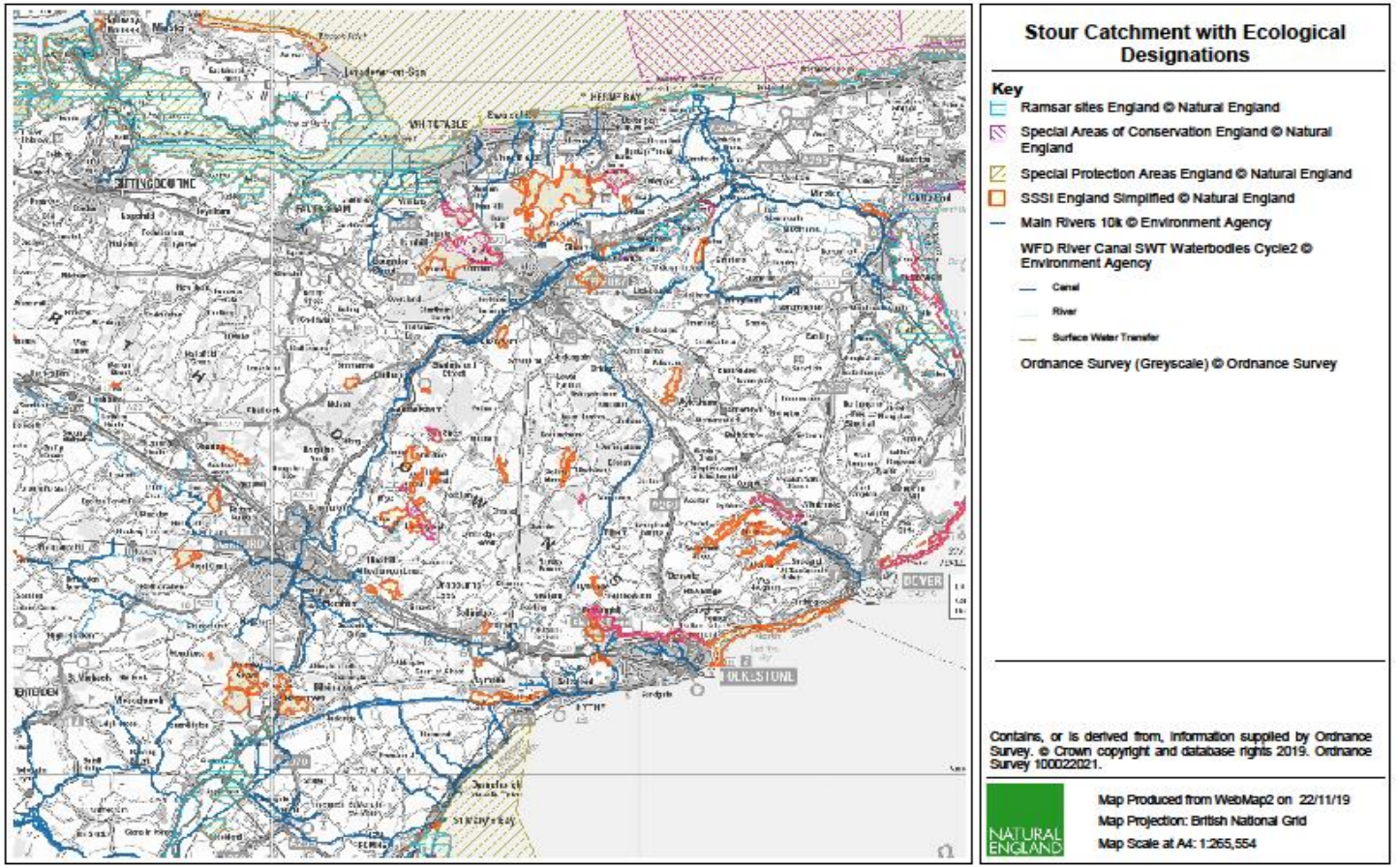
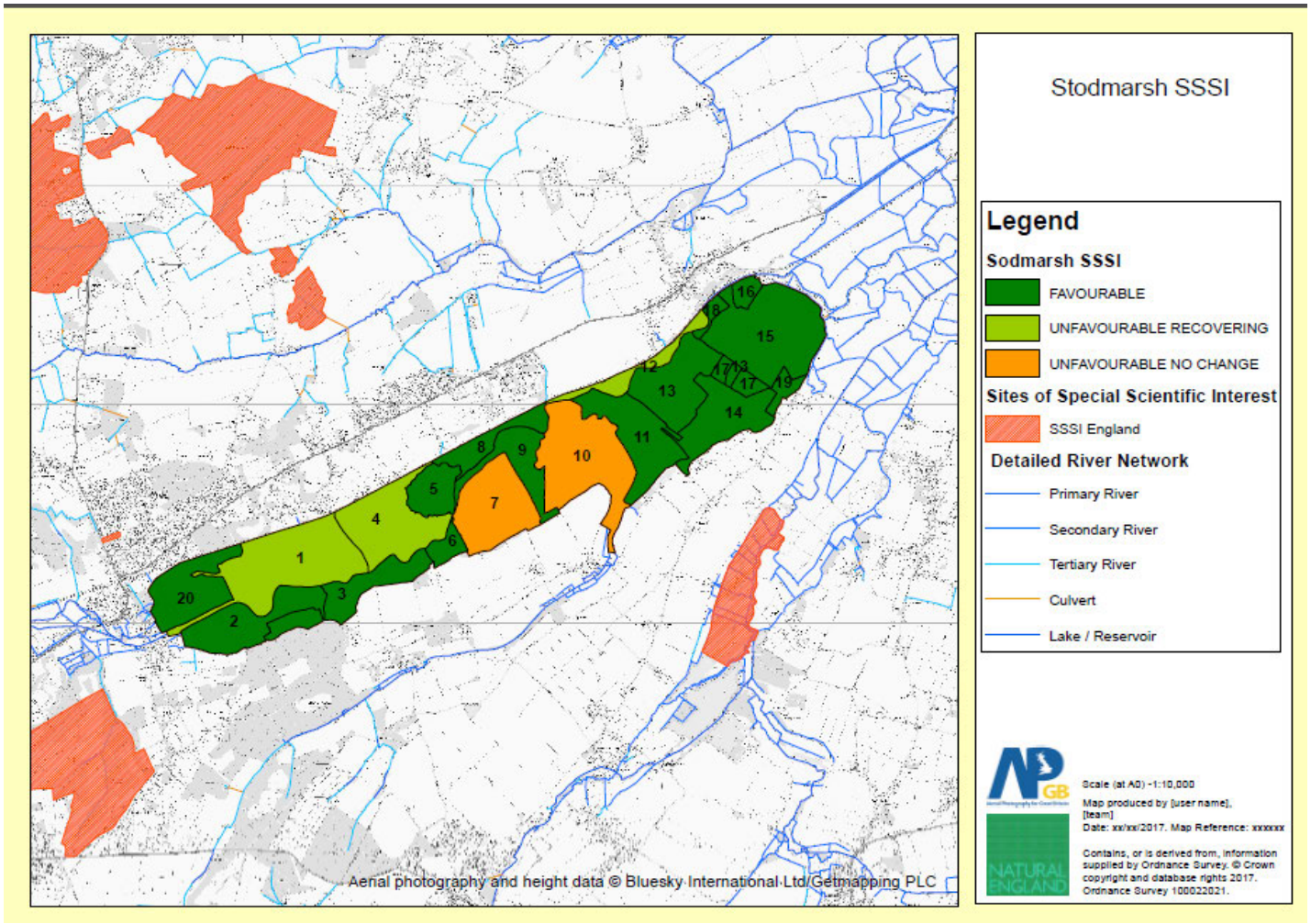


Figure A1.2 Stodmarsh SSSI unit condition



Appendix 2

PLANNING CONTEXT

Natural England's Position

A2.1 It is Natural England's view that there is a likely significant effect on several internationally designated sites in the Stour Valley (Special Protection Area, Special Area of Conservation and Ramsar site) due to the increase in wastewater from the new developments coming forward.

A2.2 The uncertainty about the impact of new development on designated sites needs to be recognised for all development proposals that are subject to new planning permissions and have inevitable wastewater implications. These implications, and all other matters capable of having a significant effect on designated sites in the Stour Valley, must be addressed in line with Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (as amended).

A2.3 Where there is a likelihood of significant effects (excluding any measures intended to avoid or reduce harmful effects on the European site), or significant effects cannot be ruled out, a competent authority should fully assess (by way of an "appropriate assessment") the implications of the proposal in view of the conservation objectives for the European site(s) in question. Appropriate assessments cannot have lacunae and must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the works proposed on the protected site concerned. The Local Planning Authority, as competent authority, may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the international sites.

A2.4 Natural England advises that the impacts of wastewater on designated sites from new development, in the interim until the WINEP investigation reports and any identified solutions are implemented, are examined within appropriate assessments and that the existing nutrient and conservation status of the receiving waters be taken into account.

A2.5 LPAs and applicants will be aware of recent CJEU decisions regarding the assessment of elements of a proposal aimed toward mitigating adverse effects on designated sites and the need for certainty that mitigating measures will achieve their aims. The achievement of nutrient neutrality, if scientifically and practically effective, is a means of ensuring that development does not add to existing nutrient burdens.

A2.6 LPAs have duties to conserve and enhance Sites of Special Scientific Interest (SSSIs) consistent with the proper exercise of their functions and to exercise those functions in a way that prevents deterioration of habitats and birds and has regard to the achievement of favourable conservation status for international sites. The LPAs should give consideration if application of neutrality would hinder the ability to restore the sites conservation objectives.

Joint working

A2.7 Natural England is working with water companies, local planning authorities, stakeholders and the Environment Agency to try to ensure the Habitats Regulations are met.

A2.8 Natural England will be working closely with local planning authorities to progress options that achieve nutrient neutrality. It is appreciated that this may be difficult for smaller developments, developments on brownfield land or developments that are well-progressed in the planning system.

A2.9 Natural England will be advising affected local planning authorities to set up authority-wide or strategic approaches that developments can contribute to thereby ensuring that this uncertainty is addressed in so far as is reasonably practicable by all applications and will be working closely with affected local planning authorities to help address this issue.

A2.10 All queries in relation to the application of this methodology to specific applications or development of strategic solutions will be treated as pre-application advice and therefore subject to chargeable services.

Appendix 3

Environmental Context

Designated sites interest features

A3.1 Stodmarsh is a Special Protection Area (SPA), a Ramsar site, a Special Area of Conservation (SAC), a Site of Special Scientific Interest (SSSI) and some parts are a National Nature Reserve (NNR). The site is of national and international importance for a range of water-dependant habitats including lakes and the wildlife that relies these habitats. The designations and features are described in table A3.1 (below) along with links to key documents of interest.

Designated sites water quality target review

A3.2 The water quality targets for the Stodmarsh SPA/ SAC/ SSSI lakes were agreed with the Environment Agency in 2017 (and 2019 for Hersden Lake). These targets are based on national water quality standards for freshwater habitats and are in the published supplementary advice to the conservation objectives for the designated sites underpinning habitat. These targets include standards for nitrogen and phosphorus as an excess of both nutrients can impact lake habitats which underpin the designated sites national and international interest features. Once the standards were agreed, Natural England assessed the available data for water quality in the Stodmarsh lakes using the Environment Agency catchment data explorer and any available data against the newly agreed standards and if no data was available to Natural England the existing condition remained based on previous site data. Where the site condition was correctly identified in terms of water quality (e.g. unit 10) the existing condition remained. Subsequently as part of the WINEP programme the Environment Agency assessed their data against the lake standards and incorporated this into the measures specification form (scope) for the WINEP investigation.

A3.3 Detailed assessments of other features are available on Defra's Magic Map and condition assessments are not solely based on water quality standards. Table 1 in the main document sets out the agreed lake nitrogen and phosphorus standards and whether these standards are met or failed or if this is unknown due to lack of data (based on an amalgam of the Environment Agency and Natural England data for the WINEP investigation). Appendix 1 includes a map of SSSI unit condition. A brief summary of the condition classes follows. The information from the WINEP investigation will be used to inform a review of these lakes condition assessments with regards to the water quality attributes, including but not limited to nitrogen and phosphorus targets.

Favourable – high risk

A3.4 Some Stodmarsh lakes are in favourable condition as they are meeting the nutrient targets or, where data is not available to complete the assessment, the officer judgement has historically viewed them as having no significant signs of water quality impacts at last visit (though this may be significantly out-of-date). These units are all considered to be at risk of elevated nutrients due to lack of information on their nutrient status. Lakes in this category include Fordwich East and main Fordwich lake

(unit 2) and Hersden lake (Unit 5). The tidal lake (Hersden lake) is only notified for bird features that are feeding on the benthic muds and therefore has less stringent water quality targets than the other lakes. Risks are described as “threats” on the Natural England designated sites database (CSMI).

Unfavourable recovering

A3.5 The Westbere lake (unit 1), passed the total phosphorus standard (based on Environment Agency Assessment of WFD status) but it is considered unfavourable for other reasons and is considered recovering on the basis of management measures to address the other impacts. It has a threat recorded due to the absence of adequate water quality data for lake assessments.

Unfavourable no change

A3.6 The main NNR lake and Collards lake are failing both the total phosphorus and total nitrogen standards based on Environment Agency assessment of WFD status. Since the sources of elevated nutrients have not been removed the lakes are not considered to be recovering. The condition assessment of the NNR lake (unit 10) already identified the water quality issues and was therefore not changed in 2018. Unit 10 condition assessment states “Study of Aufwuchs (prompted by algae bloom and fish kill events) indicates high nutrient levels in main NNR lake. (Total Phosphorus (TP) at 1 mg/l = 1000 ug/l …the target for SSSI lakes is [49]ug/l. More research is required to understand hydrological regime and water quality of input sources (Great Stour and Lampen Stream)”.

Joint working - Catchment work

A3.7 The high levels of nitrogen and phosphorus input to the water environment in the Stour catchment generally is currently caused by wastewater from existing housing and agricultural sources, though some local and within site process can occur in lake habitats and there are suspected mine waste contamination in some areas of the Stour. There are a number of mechanisms already in place to reduce the amount of nutrient inputs within our river and lake catchments and coastal waterbodies. Within the river Stour catchment; both Defra and partnership funded Catchment Sensitive Farming (CSF) programmes work with agriculture to reduce diffuse agricultural sources of pollution such as fertiliser and slurry run-off. One of the aims of this work is to deliver environmental benefits from reducing diffuse water pollution. To achieve these goals the CSF partnership delivers practical solutions and targeted support which should enable farmers and land managers to take voluntary action to reduce diffuse water pollution from agriculture to protect water bodies and the environment. The Stour has been a priority catchment under CSF since phase 1 (2006).

A3.8 Although catchment wide advice has been provided, often through newsletters and events, 1:1 advice and grant support; engagement has always been geographically focused based upon where the risks and issues are most apparent or where multiple issues overlap, and in order to make the most of available resources. Geographic targeting has been primarily focused around surface waterbodies although CSF have always tried to make provision for some sector specific targeting, for example dairies or large horticultural enterprises where direct point pollution or significant surface water flow may occur. The catchment contains numerous spring fed streams which

flow over permeable chalk, sandstones and clays. Most of the farm land along the Stour has a brick earth element that can contribute to often rapid run-off of surface waters to the water courses. Current concerns in general waterbodies in the Stour catchment are nitrates and pesticide levels, as well as heightened sediment loads in streams in winter. Agricultural phosphorus is not considered to require separate consideration in the Stour catchment, and many measures primarily aimed at addressing agricultural nitrogen will also help reduce agricultural diffuse phosphorus.

A3.9 In addition, the wastewater treatment works (WwTW) that enter into the catchment of Stodmarsh are the subject of an investigation under Water Industry National Environment Programme (WINEP) which will determine the extent of the connection of WwTW and sewerage assets to the Stodmarsh lakes and to what extent the existing WwTW discharges and other company assets are contributing to the existing water quality failures and risk of failures. The investigation will take account of the need to reconnect some of the lakes more closely to the main river Stour in future to ensure sufficient water for the designated sites in the face of climate change and in light of recent experience of NNR staff of insufficient water for the conservation management of the site in hot dry summer of 2018. The primary objective of the WINEP investigation to assess what improvements are required (if any) to the water company assets needed to enable the achievement of the agreed lake standards.

Type of nutrient inputs to designated sites

A3.10 There is evidence that inputs of both phosphorus and nitrogen influence eutrophication of the water environment. The principal nutrient that tends to drive eutrophication in the marine environment is nitrogen, the principal nutrient that drives eutrophication in flowing freshwaters is phosphorus. In still freshwaters and many estuaries both phosphorus and nitrogen can result in eutrophication (called co-limitation). In reality the picture is more complicated than this. For Stodmarsh lakes the principal nutrients are: phosphorus and nitrogen based on the water quality standards in Common Standards Monitoring Guidance for the appropriate designated sites features and the Supplementary Advice to the Conservation Objectives (SACOs) for the SPA and SAC which also cover the Ramsar site.

A3.11 The best available evidence is for focus in the Stodmarsh/ Stour catchment to be on both nitrogen and phosphorus. However, this approach may be refined if greater understanding of the eutrophication issue is gained thorough new research or updated modelling or the WINEP investigation.

A3.12 The nutrient budget in this report calculates levels of nutrient from development however both phosphorus (P) and nitrogen (N) come in different forms and it is important to understand which is relevant to the designated site features in this methodology.

Phosphorus

A3.13 The forms of phosphorus need to be recognized when calculating nutrient budgets. The key measure for still and very slow flowing waters such as lakes or ditches is total phosphorus (TP) (plus in most cases total nitrogen) because this is available for algae and plant growth. For rivers the designated sites standards are for Soluble

Reactive Phosphorus (SRP) as both an annual and a growing season mean. The relationship between SRP and TP is not straight forward and can vary between, and even within catchments (e.g. River Avon catchment). Modern WwTW permits usually have values for total phosphorus and the Environment Agency guidance on technically achievable limit (TAL) is for total phosphorus. Total phosphorus (TP), has been chosen for the current methodology as it is applicable to the lake habitats at Stodmarsh. Farmscoper reports provide amount of farm total phosphorus and this is the default setting. Though there is some uncertainty from these different forms of phosphorus, this is taken into account at the end of the methodology by the addition of a correction factor.

Nitrogen

A3.14 The different forms of nitrogen need to be recognized when calculating nutrient budgets. The key measurement is total nitrogen (TN), i.e. both organic and inorganic forms of nitrogen, because this is what is available for plant growth. TN is the sum of the inorganic forms - nitrate-nitrogen (NO3-N), nitrite-nitrogen (NO2-N), ammonia, and organically bonded nitrogen.

A3.15 Total nitrogen is measured by WwTW where there is a permit with a TN limit consent. However, for WwTWs without permits, measurements could be inorganic nitrogen (nitrate + nitrite + ammoniacal N) or TN or a mix. Most river/coastal quality monitoring by the Environment Agency only records the inorganic N forms. Farmscoper reports measure nitrate-nitrogen not TN. Nitrate is normally the largest component of TN but quantities of organic N can be significant. For example in the Test catchment dissolved organic nitrogen has been found to comprise 7% of the potential biologically available nitrogen in the river and 13% of that in the estuary (Purdie, 2005[11]). Thus, the land use change element of this methodology will underestimate TN leaching. We therefore advise that this uncertainty is recognised and the recommended precautionary buffer approach is adopted.

[11] Purdie, D., Shaw, P., Gooday, A. and Homewood, J. (2005) Dissolved Organic Nitrogen in the River Test and Estuary, University of Southampton

Table A3.1 Designate Sites Interest Features

Designation	Links to Conservation Advice or equivalent	Interest features and links to citation or equivalent
Stodmarsh Site of Special Scientific Interest (SSSI)	Favourable condition tables (FCTs)	The interest features of the SSSI are described in full in the citation and are summarised below: • Wetland habitats including Swamp, fen and reedbed communities. • Standing waters- lake and ditch habitats • Desmoulin's whorl snail • Assemblage of Breeding Birds • Aggregations of rare Breeding Birds: • Aggregations of non-breeding birds • Assemblage of vascular plants • Assemblage of invertebrates (W211 open water on disturbed sediments and W314 permanent wet mire and rich fen communities)
Stodmarsh Special Protection Area	Conservation Objectives Supplementary Advice	The interest features of the SPA are described in full in the citation but are summarised below: • Great bittern (Non- Breeding) • Gadwall (Breeding and Non-Breeding) • Northern Shoveler (Non-Breeding) • Hen Harrier (Non-Breeding) • Waterbird Assemblage • Breeding Bird Assemblage
Stodmarsh Ramsar Site	The SACOs for the SPA and SAC and the FCTs for the underpinning SSSI for the SPA and SAC are considered to cover these features	The interest features of the Ramsar site are described in full in the Ramsar Information Sheet and are summarised below: Ramsar Criterion 2: • Assemblage or British Red Data book invertebrate species, • Assemblage of rare and scarce plans species • A diverse assemblage of rare wetland birds
Stodmarsh Special Area of Conservation (SAC)	Conservation Objectives Supplementary Advice	The interest features of the SAC are described in full in the citation and are summarised below: • Desmoulin's whorl snail

Source Apportionment

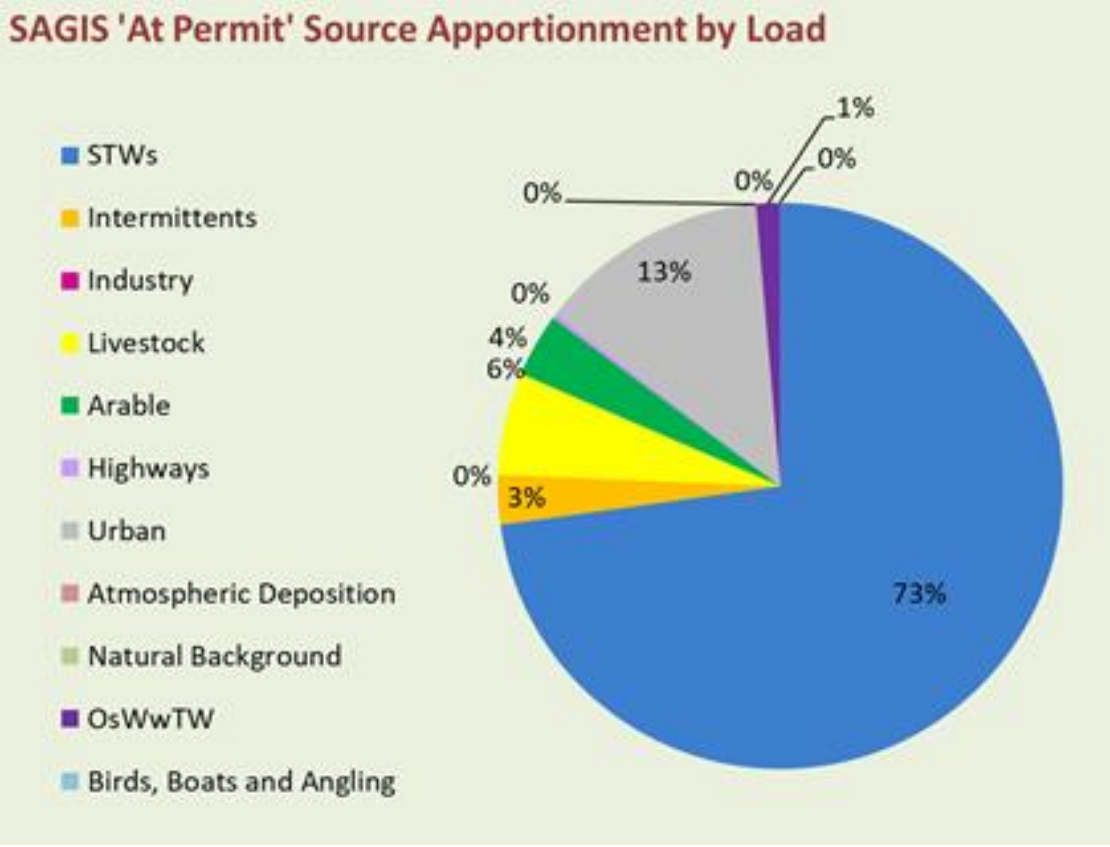
A3.16 The relative proportion of nutrients from difference sources is referred to as source apportionment. The standard industry models used by Environment Agency and water sector are SIMCAT and SAGIS. Figure A3.1 below, shows the phosphorus source apportionment provided by the Environment Agency from their PR19 planning work, estimating the permitted source apportionment by load at the bottom of the freshwater Stour downstream of the Canterbury WwTW at the closest sampling reference point to the Stodmarsh designated sites.

A3.17 The dataset was produced from a SAGIS model calibrated by the Environment Agency using SAGIS vs6a, Simcat data file Calibration SERBD v6 @permit model (Cal_Diff6_pit.dat 03417). The agricultural sources are from the ADAS PSYCHIC model based on the 2010 farm census. The WwTW flows and quality were based on observed data from 2010 to 2012.

A3.18 The majority of the phosphorus load at permit is from WwTWs and urban diffuse pollution in the catchment is larger than the total combined phosphorus loading from farming sources.

Figure A3.1 Permitted Source Apportionment in Stour nearest sluice into Stodmarsh

Though the SAGIS model has been calibrated it has not yet been validated. As such the values provided should be treated as estimates of the source apportionment at any given point. Permitted source apportionment is as if the WwTWs were operating at full permit capacity



Appendix 4 – Farm Types

A4.1 The following definition of farm types comes from the UK farm business survey guide to the farm business survey which underpins the Farmscoper model. The UK system is based on weighting the contributions of each enterprise in terms of their associated outputs. The weights used (known as 'Standard Outputs' or SOs) are calculated per hectare of crops and per head of livestock and used to calculate the total standard output associated with each part of the Farm Business.

Cereals

A4.2 Holdings on which cereals, combinable crops and set-aside account for more than two thirds of the total SO and (pre-2007) where set-aside alone did not account for more than two thirds of the total SO. (Holdings where set-aside accounted for more than two thirds of total SO were classified as specialist set aside and were included in "other" below.)

General cropping

A4.3 Holdings on which arable crops (including field scale vegetables) account for more than two thirds of the total SO, excluding holdings classified as *cereals;* holdings on which a mixture of arable and horticultural crops account for more than two thirds of their total SO excluding holdings classified as *horticulture* and holdings on which arable crops account for more than one third of their total SO and no other grouping accounts for more than one third.

Horticulture

A4.4 Holdings on which fruit (including vineyards), hardy nursery stock, glasshouse flowers and vegetables, market garden scale vegetables, outdoor bulbs and flowers, and mushrooms account for more than two thirds of their total SO.

Specialist Pigs

A4.5 Holdings on which pigs account for more than two thirds of their total SO.

Specialist Poultry

A4.6 Holdings on which Poultry account for more than two thirds of their total SO.

Dairy

A4.7 Holdings on which dairy cows account for more than two thirds of their total SO.

Lowland Grazing Livestock

A4.8 Holdings on which cattle, sheep and other grazing livestock account for more than two thirds of their total SO except holdings classified as *dairy.* A holding is classified as lowland if less than 50 per cent of its total area is in the Less Favoured Area (LFA).

Mixed

A4.9 Holdings for which none of the above categories accounts for more than 2/3 of total SO. This category includes mixed pigs and poultry farms as well as farms with a mixture of crops and livestock (where neither accounts for more than 2/3 of SOs).

Appendix 5 – Leaching of nitrogen/ phosphorus from urban areas

Urban leaching of Nitrogen

A5.1 The average total nitrogen leaching rate from an urban area used in this report is taken from the work done for the Solent Nutrient Neutral methodology which is explained below with comparison to and inclusion of local Stodmarsh/ Stour catchment data where available. Evidence that was sufficiently robust to justify significant deviation from this figure has not been identified. If locally specific values for urban land use nitrogen export have been calculated based on sound local evidence then these can replace the value given below.

A5.2 The original Solent value (14.3 kg/ha/yr) comes from values for hydrologically effective rainfall (478mm - precipitation minus losses from evapo-transpiration) and the nitrogen concentration of leachate (3 mg/l) given in Bryan *et al* (2013) the latter figure derived from an AMEC report. The value for nitrogen concentration is similar to one quoted in House *et al* (1993) who give a mean event concentration of 3.2 mg/l for total nitrogen (with this value derived from other sources) with a range of 0.4-20 mg/l. Thus although it is not specified by Bryan *et al* (2013), it is probably reasonable to take the 3 mg/l to be total nitrogen especially since the organic component of N from urban areas is likely to be relatively small.

A5.3 Mitchell (2001) gives the following event mean concentrations in mg/l total N from urban areas; Urban Open 1.68; Ind/Comm 1.52; Residential 2.85; Main roads 2.37. It is recognised that the datasets that produced these figures are not large (n = 14 in this case), a good deal of uncertainty remains and that further sampling is needed to validate models of pollutant effects from urban runoff (Leverett *et al* 2013).

A5.4 Typical nutrient concentrations in urban storm water runoff in the U.S. are 2.0 mg/l for total N (TN) (Schueler 2003). Population densities seem to be less in the most studied urban catchments (eg Groffman *et al* 2004 in Baltimore, Hobbie *et al* 2017 in Minnesota) than those in the UK but this does not necessarily lead to an increase in the rate of nitrogen leaching from the catchment as the factors affecting this value are complex. Thus although there will clearly be variation between different urban areas, there is insufficient knowledge to be able to predict N leaching from the different characteristics of these areas. And for practical purposes an overall N leaching figure is needed; nothing found in the literature indicates that another value would be more representative than 3 mg/l.

A5.5 An N leaching figure can also be derived by using the relationship between mean stream and river flow rate and catchment area. The ratio for the gauging station on the River Meon at Mislingford is 0.014m^3/sec/km^2 and, with a TN concentration of 3 mg/l, this equates to a TN leaching rate of 13.2 mg/l, similar to the value obtained when hydrologically effective rainfall is used.

A5.6 Comparison can also be made with direct measurements of TN urban outputs from studies in the USA (Hobbie *et al* 2017, Groffman 2004). The values in the Hobbie paper for urban catchments in Minnesota varied from 12.5-27.2 kg/ha/yr with a mean of 17.3 kg/ha/yr. The outputs measured by Groffman (2004) were smaller (between 5.5 and 8.6 kg/ha/yr) but these were less urbanised catchments, several including areas of old growth forest where nitrogen retention was very high. Thus these values are broadly of the same order as the 14.3 kg/ha/yr leaching figure initially calculated.

A5.7 Nitrogen inputs in these studies come predominantly from three sources - atmospheric deposition, pet waste and lawn fertilisation. N deposition was slightly lower in both Baltimore and Minnesota than values from APIS in the around the Solent (23.8 kg/ha/yr for hedgerows or woodland, 14.7 kg/ha/yr for grassland) and those in the Stodmarsh area (23.52/ha/yr hedgerows and 13.44 kg/ha/yr neutral grassland). No UK studies have been found to compare with the US ones for N inputs in urban areas from pet waste or from lawn fertilisation. Should evidence of a more appropriate value be provided or derived Natural England will update this figure.

Urban leaching of Phosphorus

A5.8 No Stodmarsh/ Stour management catchment specific information was found for urban land and Farmscoper does not cover urban land. Therefore the urban/suburban export coefficient was taken from White and Hammond 2006 (0.83 kg/ha/yr.) This is the coefficient used for calculating the relative source apportionment in the first river basin cycle to UK river Basin Districts (RBD). Stodmarsh sits in the South East RBD and this was shown to have the highest relative contribution of phosphorus from households (both effluent and urban diffuse) compared to other sectors, with agriculture only contributing 21.8% of the South East RBD phosphorus load during the first river basin cycle (White and Hammond 2006). Though this export coefficient is from an older study, more recent studies have used values of a similar range for example Bryan (2015) uses 0.7 kg of P per hectare for urban areas in the River Avon Nutrient Management Plan modelling though this figure was based on studies mainly in Scotland.

A5.9 Duan *et al* (2012) found small urban catchments exported values of between 0.245 to 0.837 kg/ha/yr compared with much lower values from forested and very low density residential catchments (0.028 to 0.031 kg/ha/yr). The large range in Duan *et al* was explained by the relative density of roads and built structures in the existing catchments. The importance of housing and roads density but also proportion of impermeable surface in urban land was also reflected in a study by HR Wallingford commissioned by Natural England that looked at impacts of urban run-off of designated wetlands using a range of models (Natural England 2018). For new developments using the approach taken in this study the urban land is separated from SANGS and parks so the use of the higher end of these urban coefficients is relevant due to the relative density, though density in the Duan *et al* study were lower than the average UK value even in their higher density urban catchments.

A5.10 Phosphorus is made available in solution through a combination of physicochemical (adsorption/desorption and precipitation/dissolution) and biological/biochemical (mineralization/immobilization) processes. Geology is important in influencing the movement of nutrients through groundwater as it influences the minerals, pH (acidity/alkalinity) and the oxygen content of the waterbody. For example in chalk aquifers, a large proportion of the soluble reactive phosphorus (SRP) is removed from groundwater (as well as most other forms of P from agricultural sources) following a chemical reaction that results in the precipitation of phosphorus in the form calcium phosphate and adsorption (adhesion) to the rock matrix requiring regular soil testing (e.g. Mclaughlin *et al* 2011). Similar processes occur with phosphorus reacting with other minerals such as magnesium and iron. These reactions can be reversed with phosphorus moving back in to solution where the mineral content of groundwater and pH change in urban development. However recent evidence from China

suggests the original soil type is still critical in urban phosphorus leaching (e.g. Wei *et al.,* 2019) provided sufficient permeable surface remains.

A5.11 Phosphorus is thought to be highly conserved in natural catchments (e.g. Verry and Timmons 1982, May *et al* 1996) but urban catchments have less phosphorus retention with the rate of retention being linked to the permeability of the urban environment and soil type (e.g. Duan *et al* 2012, Natural England 2018).

A5.12 Atmospheric deposition including from vehicles, leaching roads, fertilising gardens and parks including pet urine and waste have all been shown to be a significant source of P in urban catchments (e.g. Hobbie e*t al* 2017). Bryan, 2015 quotes several studies which examined levels of P in urban runoff in terms of Event Mean Concentrations (EMCs) as part of a wider project to develop a screening tool for Scotland and Northern Ireland to identify and characterise diffuse pollution pressures. The use of pulsed concentrations is relevant to urban land as the areas of impermeable surfaces tend to result in higher concentrations during rainfall events. Ockenden *et al* (2017) looks at the efficacy of different models including those that use export coefficients on predicting run-off of TP. This study found that temporal resolution of the underpinning rainfall data used in models was critical because "storm" events are so central to phosphorus transport. Few if any urban catchments have this level temporal resolution of data and therefore these models cannot be derived with any accuracy for the Stour catchment at this time.

Conclusion on urban P

A5.13 Based on the information above there is insufficient evidence to move away from 0.83 kg/ha for urban P leaching. Even though soils in the Stour valley are likely to show a high degree of P retention much export from urban land is from the impermeable surfaces and during high flow events therefore urban run-off has very little attenuation by soils so export coefficients towards the upper end of those observed are justified. Should evidence of a more appropriate value be provided or derived Natural England will update this figure.

Built Design to reduce phosphorus export from urban land

A5.14 Most studies have noted that the export of N and P from urban systems differ. Most P appears to export through high flows via surface drainage. Planning applications to reduce phosphorus should be designed to:

- Maximise permeable surfaces
- Implement Sustainable urban drainage schemes extensively based on larger wetlands (not ponds or detention basins) (see Appendix 5)
- Minimise composting of garden waste direct to catchment surfaces (though composting in structures should be encouraged)
- Maximise pet waste collection though this does nothing to address pet urine

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Appendix 6 - Estimating the leaching of total nitrogen (TN) and Phosphorus (TP) from natural greenspace (SANG)

A6.1 The value used in this methodology is based on work from the Solent Nutrient Neutral methodology and is set out below, APIS values for the Stodmarsh area have been used for the N deposition value which is the only change from the Solent methodology. However, if locally specific data on SANGS is available and evidenced this figure can be replaced by a locally derived figure, provided it is sufficiently well evidenced.

A6.2 A number of assumptions must be made about the management of the SANG to allow an estimate of TN/TP leaching to be made. These are as follows:

- The vegetation of the SANG would be predominantly permanent grassland but with an element of tree and scrub cover (this will of course vary for different SANGS but a 20% average figure is used here). The degree of tree and scrub cover will not greatly affect the result as both permanent grassland and woodland/scrub exhibit a high degree of N and P retention. It matters most because of the differences in the rate of atmospheric N and to a much lesser extent P deposition between the two habitats.
- The grassland would be permanent (ploughing will release large amounts of N/P) and is not fertilised either with artificial fertiliser or manures. It may be ungrazed or grazed very lightly (<0.1LU/ha/yr) with no supplementary feeding (even without supplementary feeding, grazing can increase N and to a much lesser extent P leaching because N retention is lower when N is delivered in the form of cattle urine and dung [Wachendorf *et al* 2005]).
- The grassland may be cut with the cutting regime dependent on other factors. Cuttings may be left or removed from site as the case may be but should not be gathered and composted in heaps on site. Any gorse within the scrub should be controlled so it is no more than rare across the mitigation area since a significant amount of nitrogen fixation occurs within gorse stands.

Nitrogen leaching

A6.3 A generic leaching value for N concentration from AMEC Poole Harbour study for 'rough grazing', quoted in Bryan *et al* (2013), is 2 mg/l. Using this concentration together with a value of 478mm for the hydrologically effective rainfall (HER) gives a leaching value for N of 9.6 kg/ha/yr. A similar value (8.8 kg/ha/yr) is obtained if the relationship between mean stream flow and catchment area (0.014 cumecs/km^2 which is the ratio for the gauging station on the nearby River Meon at Mislingford) is used instead, keeping the same N concentration of 2 mg/l. It is not clear whether these AMEC Poole Harbour concentrations are for total nitrogen or for inorganic nitrogen.

A6.4 The particular grassland management regime for which the 2 mg/l N concentration applied is not known. However, even though studies of N leaching from natural unfertilised grasslands are rare in the literature (most are of agricultural grasslands with fertiliser inputs of some sort) it seems likely that this value is higher than might be expected from a natural grassland with no fertiliser inputs such as a SANG. Thus for example TN leachate concentrations were between 0.44 and 0.67 mg/l in an extensively managed montane grassland (that still had one slurry application per year) and the equivalent mean TN loss was 1.0, 2.6 and 3.1 kg/ha/yr for three different areas (Fu *et al* 2017).

A6.5 Adjusting for a SANG with 20% woodland/scrub, using the AMEC woodland generic leaching value of 0.5 mg/l (Bryan *et al* 2013) for the woodland/scrub component, results in an N output of 8.1 kg/ha/yr.

A6.6 The 0.5 mg/l value is also much higher than the very low nitrate concentrations in streams from purely forested catchments (Groffman 2004) and from those reported by for a large sample of forested streams by Mulholland *et al* 2008 where the mean nitrate-N concentrations were <0.1 mg/l. All but a few of the samples from an unfertilised suburban lawn had nitrate-N concentrations below the detectable limit of 0.2 mg/l (Gold et al 1990). The same was true for a forest plot and the average nitrate-N losses from both home lawn and the forest plots averaged 1.35 kg/ha/yr over 2 years. These studies of both grassland and woodland nutrient cycling suggest that the N output of 9.6 kg/ha/yr from Amec quoted in Bryan is too high when applied to a SANG.

A6.7 Despite there being no direct N fertiliser inputs on a SANG, N inputs will still occur from three main sources. These are atmospheric deposition, pet waste and N fixation from legumes and estimating the contribution of each of these sources, together with the proportion of N retained, is an alternative method of working out the N contribution from a SANG.

N deposition

A6.8 The following are typical values taken from APIS for TN deposition in the Stodmarsh Area Grid reference TR214613 from Stodmarsh citation used (Solent area in brackets for comparison).

- Improved grassland 13.44 (14.7) kgN/ha/yr; Arable horticultural 13.44 (14.7) kgN/ha/yr; Neutral grassland 13.44 (14.7) kgN/ha/yr

- Hedgerows 23.52 (23.8) kg N/ha/year; Broadleaved, Mixed and Yew Woodland 23.52 (23.8) kg N/ha/year

- Using the value for hedgerows and woodland for the 20% scrub component of the hypothetical SANG and the neutral grassland value for the rest results in a deposition rate of 10.75 + 4.70 = 15.45 (11.76 + 4.76 = 16.52) kg/ha/yr.

N and Pet waste

A6.9 SANGs are specifically designed to attract increased levels of public access particularly dog walkers so the potential inputs of N from dog waste are likely to be significant. Hobbie *et al* (2017) give a figures for TN inputs from this source for entire urban areas and these vary between 3.56 and 21.2 kg/ha/yr for 7 urban catchments with a median of 6.9 kg/ha/yr. A figure of 17 kg/ha/yr can be gleaned from Baker 2001 which was worked out using information on pet numbers, nutritional needs, pet weights etc; 76% of this was from dogs.

A6.10 The heavy use of SANGS by dogs suggests that N inputs would most likely be higher than these figures averaged over the whole urban area. Nevertheless, inputs to the SANG from this waste means that it is not deposited elsewhere in the urban area where N may anyway end up in the same receiving water.

A6.11 TN retention in grasslands will also be higher than the average over other parts of the urban area but the characteristics of the inputs from dogs is likely to lower the amount of TN retained because the concentrated patchy nature of the input will reduce the proportion of TN retained compared with more evenly spread inputs, as mentioned above.

A6.12 Picking up dog faeces will obviously reduce the input from but not remove inputs from urine. Dog urine has a high N content.

A6.13 In these circumstances there is clearly uncertainty about the level of input from this source the highest figure from Hobbie *et al* 2017 (21.2 kg/ha/yr) has been used but adjusted downwards because not all of this will be from dogs resulting in an overall value of 16.1 kg/ha/yr.

A6.14 This has also been done on the basis that funding, together with a binding commitment, is provided for in perpetuity collection of dog waste and enforcement of pick up rather than relying on direct LA resources which could stop at any time.

TN fixation

A6.15 Hobbie *et al* (2017) give a value for this of 17.5 kg/ha/yr from direct investigation of unfertilised urban parks and this is the value used. Fixation would only be in the grassland part of the SANG which reduces the figure to 14 kg/ha/yr.

TN retention

A6.16 A number of studies have shown high TN retention in urban areas (eg 80% Hobbie et al 2017) thought to be mainly attributable to TN retention in urban grasslands and lawns which may be in turn related to high carbon within organic matter in the soils. The release of large quantities of N when permanent grassland is ploughed illustrates the capacity of these grassland for N storage (eg Howden *et al* 2011).

A6.17 Direct measurements of total N outputs from urban grasslands in the Groffman *et al* (2009) studies in Baltimore also show high N retention in urban grassland but there are difficulties in applying these results directly to SANGs partly because the plots were either quite heavily fertilised or may have had unmeasured N inputs from neighbouring land. Nitrate-N losses from an unfertilised home lawn averaged 1.35 kg/ha/yr over 2 years (Gold *et al* 1990). Generally the complex processes and uncertainties about how the management of these grasslands might affect the degree of TN retention and TN output makes estimation of the proportion retained difficult. Nevertheless a value of 90% given in Groffman *et al* (2009), and supported by a number of references given there, would seem reasonable considering also that overwatering and over fertilising, neither of which would happen on a SANG, seem to be factors that lead to more leaching.

A6.18 *Woodland and scrub*. N retention measured in forest plots in Baltimore was very high (95%) Groffman (2004). N percolation losses measured by Gold *et al* 1990 in forest plots were low and similar to those in unfertilised lawn. However, it is probably not valid to equate a scrub/woodland part of a SANG with the forest plots measured in the Groffman studies in Baltimore for these were old growth well established forests. Nevertheless there is still likely to be high N retention in these areas even if not as much as 95%.

A6.19 Given all of the above, a 90% TN retention rate over the SANG as a whole has been used in the calculation below

Inputs

A6.20 Solent specific APIS value in brackets

- N Deposition (APIS) = 15.45 (16.5) kg/ha/yr
- Pet waste 16.1 kg/ha/yr
- N fixation 14 kg/ha/yr
- Total = 45.55 (46.6) kg/yr
- Watershed retention of TN 90%

- Total TN output = 4.55 (4.66) kgN/ha/yr

Conclusion for Nitrogen

A6.21 The question of estimating TN outputs from a SANG has been approached from different angles. These investigations all indicate that the value used previously – 13 kg/ha/yr is too high. Instead a TN output of 5.0 kg/ha/yr is considered to be close to the true value but still sufficiently precautionary.

Phosphorus

A6.22 Export coefficients for phosphorus for different land cover classes were assessed and compiled by White and Hammond (2006) for the first River Basin Cycle source apportionment. They note the extremely low coefficient from natural land use such as woodland and unfertilised grassland; both habitats are given an export coefficient of 0.02 kg/ha/yr based on the rough grazing value of Jonnes 1996. Similar low phosphorus from natural habitats have been recorded from many other studies including more recent studies in the USA (e.g. Hobbie *et al* 2017, Duan *et al* 2012).

A6.23 These export coefficients take account of atmospheric deposition but are for natural habitats unlike SANGS which, although ecologically functioning as natural habitats, are designed to be used for informal recreation including dog walking. It is therefore reasonable to assume that pet waste and urine *into* SANGs will be equivalent to urban areas. Hobbie *et al* 2017 found that household nutrient inputs from pet (dog) waste contributed up to 76% of total P inputs in American catchments due to high pet ownership in urban environments - values of inputs for Phosphorus in Hobbie *et al* for dog waste were from 2.7 kg/ha/yr to 0.46 kg/ha/ yr with a mean of 1.21 kg/ha/yr. However P *output* from SANGS is likely to be significantly less as phosphorus is highly conserved in the natural land uses and the high contribution of pet waste to export coefficients of urban systems is partly due to the relative lack of permeability

of the surfaces onto which the pet urine and waste are frequently deposited. In addition (as explained in Appendix 3) phosphorus is highly conserved on the types of soils found in the Stour valley. Using the mean rate of dog waste from Hobbie *et al* 2017 to be precautionary but assuming a high retention in any SANGS in the Stour valley of 90% gives a value as follows:

A6.24 Mean TP loading from pet waste to urban sites - 1.21 kg/ha/year

- Mean Catchment retention TP = 90%
- = TP 0.12 kg/ha/Yr

- +0.02 kg/ha/year - natural land export coefficient from Johnes 1996

= 0.14 kg TP/ha/yr

Conclusion for phosphorus

A6.25 Based on best available evidence SANGS value for Stour catchment of 0.14 kg TP/ha/yr has been estimated.

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Appendix 7– Potential for Nutrient (N&P) mitigation using wetlands

A7.1 Where N and or P budget calculations indicate that N and/ or P outputs from proposed developments are greater than pre development conditions, the use of new constructed wetlands to retain some of the N and P output is one mitigation option.

A7.2 There are a number of possibilities for different types of constructed wetland. Wetlands can be designed as part of a sustainable urban drainage (SUDs) system, taking urban runoff stormwater; discharges from Wastewater Treatment Works (WwTWs) can be routed through wetlands; or the flow, or part of the flow, of existing streams or rivers can be diverted through wetlands provided this does not adversely alter the ecological status of the river and does not increase flood risk. Environment Agency advice should always be sought in design of any wetland creation scheme.

A7.3 Wetlands receiving nutrient-rich water can remove a proportion of this nutrient through processes sedimentation, sorbing nutrients to the sediment, plant growth and process such as denitrification some of which were reviewed in Fisher and Acreman (2004) and numerous studies. A recent systematic review of the effectiveness of wetlands for N and P removal (Land *et al* 2016) used data from 203 wetlands worldwide of which the majority were free water surface (FWS) wetlands (similar in appearance and function to natural marshes with areas of open water, floating vegetation and emergent plants). The median removal rate for wetlands that were included in this review was 93g/m^2/yr TN and 1.2 g/m^{-2}/yr TP (or just under a tonne/ha/year TN and 12 kg/ha/yr TP). The proportion of N removed is termed the efficiency and the median efficiency of wetlands TN removal included in the Land review was 37%. Median remail efficiency for TP in the same review was 46 % with a 95 % confidence interval of 37–55 %.

A7.4 Many factors influence the rate of nutrient removal in a wetland the most important for being hydraulic loading (HLR - a function of the inlet flow rate and the wetland size), inlet N or P concentration and temperature and for TP the Area of the wetland. Together inlet N or P concentration and flow rate partially determine the amount of N or P that flows through the wetland which ultimately limits the amount of N or P saving that can be achieved.

A7.5 The rate of removal can also be expressed in terms of the amount of N or P removed per unit wetland area. This removal rate will typically increase as the inlet N or P concentration increases, at least within the normal range of inlet N or P concentrations. Thus wetlands that treat the N or P rich discharges, for example from WwTWs, or water in rivers where the N or P concentrations are high, will remove more N or P per unit area than say, wetlands treating water in a stream where water quality is very good and the N or P concentration is low. Thus if space is at a premium, and the goal is to remove as much N or P as possible, it makes sense to site wetlands where N or P concentrations are high in other words as close to WwTW as possible.

A7.6 For wetlands to work well, specialist design input based on sound environmental information will be necessary. There will be a need for consultation with relevant statutory bodies. These processes are likely to be easier where wetlands are an integral part of a larger development. Wetlands do offer additional benefits above offsetting but will also require ongoing monitoring, maintenance and adjustments beyond any particular developments

completion. Consideration of the long term security of facilities and their adoption at an early stage is advisable.

A7.7 There are a number of publications which advise about constructed wetlands. For example, Kadlec and Wallace (2009) is a comprehensive source of information covering all stages related to the implementation of different types of constructed wetland. The many papers relating the results from detailed monitoring over many years of the performance of two constructed wetlands in Ohio, USA are also instructive (eg Mitsch *et al* 2005, 2006, 2014).

Stormwater/ flood wetlands

A7.8 These are what is termed event-driven precipitation wetlands with intermittent flows. There will normally be baseflow and stormwater / flood water components to the inputs.

A7.9 For such wetlands Kadlec and Wallace state that:-
'*A typical configuration consists of a sedimentation basin as a forebay followed by some combination of marshes and deeper pools'*

A7.10 However, ponds are usually less effective at removing N and P (Newman *et al* 2015) than shallow free water surface constructed wetlands (FWS wetlands) so the emphasis here should be on the latter although a small initial sedimentation basin is desirable since this is likely to reduce the maintenance requirement for sediment removal in the FWS wetland. One advantage of this type of wetland is that it can be designed as an integral part of SUDs for the development and therefore is subject to fewer constraints.

A7.11 Some wetlands with intermittent flows are prone to drying out and may need provisions for a supplemental water source. In some circumstances, this may be possible through positioning the wetland bottom so that there is some connection to groundwater. However many varieties of wetland vegetation can withstand drying out although there may be a small reduction in water quality improvement (Kadlec and Wallace 2009). Nevertheless base and stormwater flows to each wetland should be worked out to ensure that it is viable and will not add to the water resource issues of the relevant catchment. Initial flush of Phosphorus from soils on former intensively agricultural land was noted in the Land study and this may reduce the short and potentially even long term efficacy of such restored wetlands. Release of phosphorus associated with iron complexes under anaerobic conditions can also contribute to low or negative removal rates, as suggested by Healy and Cawley 2002 as an explanation for the observed low TP removal rates.

A7.12 Wetlands need to be appropriately sized taking into account the HLR and N or P loading rates. To give a general idea of the areas involved, a wetland 1ha in area would serve a development area of about 50 ha for Nitrogen but given the increased importance of area a larger area would be required for TP reduction from the same development. The Land *et al* review noted the inconsistency of TP reduction was particularly acute at wetlands below 2 hectares in size with wetlands below this size more likely to be net exporters of TP especially if they were created on former intensively farmed agricultural land.

A7.13 Calculating the potential N or P retention in such wetlands involves first determining the proportion of the hydraulic load that will pass through the wetland because a percentage of the water carrying N and P will go directly into groundwater, bypassing storm drains and

SUDs and the constructed wetlands. This percentage will depend on such factors as the proportion of hard surface within the development and the geology. Then, assuming the inlet TN concentration is 3 mg/l, a proportionate reduction of 37% can be used to work out the amount of N retained and using 37% is also reasonable for P due to the larger variation of P retention shown in the Land study and this is the bottom end (and therefore precautionary) of the 95% confidence interval for TP retention.

A7.14 Provision is needed to control tree and scrub invasion, for wetlands with emergent vegetation medium height such as Typha and reed had higher rates of denitrification than those dominated by trees and woody shrubs (Alldred and Baines 2016). Phosphorus uptake and amount partitioned to roots and shoots differs between different wetlands species but as a general rule tall rapidly growing emergent species are the most likely to retain P in vegetation with *Juncus effusus* having the highest percentage of retained P in the leaf litter of 5 tall emergent species in a comparative study (Kao *et al* 2003).

A7.15 Other critical aspects of design are the water control structures - inflow and outflow arrangements with water level control – and the need or otherwise for a liner. This last issue is related to soil permeability. A variety of emergent wetland plants, not only reed, can be effective within wetlands. Wetlands with a number of different plant species, rather than monocultures, are desirable both for biodiversity reasons and because they are more resilient against changes in environmental conditions; different species will have different tolerances. Guidance concerning planting can be found in Kadlec and Wallace (2009); allowance should be made in planting ratios and densities for different rates of expansion of different species. Another approach is to use material containing wetland plant seeds from a nearby wetland with a species composition similar to the one preferred. However, unless the donor site is carefully monitored, this would obviously increase the risk of importing unwanted alien plants.

A7.16 Sedimentation will eventually compromise some aspects of the wetland's function and rejuvenation measures will be necessary (Kadlec and Wallace 2009). The same authors indicate a sediment accretion rate in the order of 1 or 2cm/yr and give examples of rejuvenation after 15 and 18 years but other wetlands have not needed any significant restoration in similar timespans. Various different options for the management of sediment accumulation are given by Qualls and Heyvaert (2017). There of course needs to be provisions to ensure that appropriate maintenance and restoration measures, guided by monitoring, are periodically carried out.

A7.17 Other sources of information about stormwater wetlands include Wong *et a*l (1999, available on line). The papers about a stormwater wetland in the Lake Tahoe Basin in California are also useful (Heyvaert et al 2006, Qualls and Heyvaert 2017).

Constructed wetlands taking discharges from WwTW

A7.18 Many of the considerations discussed above for stormwater wetlands apply equally here. There will obviously be constraints on the location and size of such a wetland because of land availability in the area of the WwTW. The flow from the WwTW together with the N and P concentration in the discharge are needed to determine the approximate size of a wetland. We would recommend a wetland area that gives an N loading of about 500 g/m^2/yr or lower.

Since many of the discharges from WwTW have a high N and very high P concentration the potential for N and P retention in such wetlands is also high. The concentration of N and P in the outflow will be variable but the purpose of such wetlands is to retain N and P overall rather than to provide a specific constant standard of water quality in the outflow.

Wetlands associated with streams and rivers

A7.19 Diverting part of the flow of a stream or river through a wetland, with the outflow returning to the watercourse, provides another opportunity for N and P saving. For obvious reasons such wetlands would mostly need to be located on the river floodplain. The inlet flow rate can be controlled so it is appropriate for the size of the wetland created and so that the ecology of the watercourse is not compromised in the section affected.

A7.20 There can be other concerns in relation to the potential effects on the stream or river. An abstraction licence will almost certainly be required and this may have implications for the ecological status – any such proposals should always be discussed in detail with the Environment Agency.

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APPENDIX F:

ARCADIS – OTTERPOOL PARK NUTRIENT NEUTRALITY MITIGATION ANALYSIS UPDATE (1 OCTOBER 2020)

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MEMO

ARCADIS Design & Consultancy for natural and built assets

SUBJECT
Otterpool park - Nutrient Neutrality Mitigation Analysis Update

DATE
01 October 2020

DEPARTMENT
Water Management & Resilience

COPIES TO
Workshop attendees on 14th Oct 2020

TO
[redacted]

OUR REF
10029956-AUK-XX-XX-FN-CW-0024-P1

PROJECT NUMBER
10029956

FROM
[redacted]

1. Introduction

This technical note has been prepared on behalf of Folkestone and Hythe District Council (FHDC) to summarise Arcadis's latest findings of the nutrient budget calculations and associated mitigation opportunities to achieve Nutrient Neutrality for the revised Otterpool Park Outline Planning Application (OPA). This assessment follows:

- Natural England's (NE's) published final guidance on Nutrient Neutrality for new development in the Stour Valley Catchment in relation to the Stodmarsh Designated Sites for Local Planning Authorities (July 2020)
- Recent consultation advice provided to Arcadis as part of NE's Discretionary Advice Service

2. Background to the Issue

Excessive nutrient levels (nitrogen and phosphorous) can negatively impact on the Stodmarsh Special Area of Conservation (SAC), Special Protection Area (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. Existing Sellindge Wastewater Treatment Works (WwTW) that Otterpool Park could potentially use is also included in this WINEP investigation.

NE advised Folkestone and Hythe District Council (FHDC) in May 2020 that the water quality issues should be assessed through an updated Habitats Regulation Assessment (HRA) as part of the Core Strategy Review, which is currently submitted for Examination. This should include all proposed site allocations (including the Otterpool Park), which may be served by the existing or new WwTW within the River Stour Catchment that can impact Stodmarsh. This should include calculation of the nutrient budget for all affected site allocations with respect to nitrogen and phosphorous, with all mitigation options outlined, along with the fundamental precautionary principle that each scheme must achieve nutrient neutrality in order to provide certainty of avoiding adverse effect on integrity of the designated sites.

A roundtable meeting was subsequently organised by FHDC in June 2020 to discuss the methodology and scope for their Appropriate Assessment Update and Nutrient Neutrality Assessment for the Core Strategy Review and the Revised Otterpool Park OPA. At this meeting, Natural England also advised that if Otterpool Park OPA can demonstrate (i.e. as a standalone site) that it can achieve Nutrient Neutrality (as set out in their published guidance in relation to Stodmarsh), then it would fully satisfy their current concerns on any adverse impacts to Stodmarsh from Otterpool Park.

3. Proposed Development

The proposed development is located on 585.2ha of land within the site OPA boundary for a new garden settlement of up to 8,500 dwellings and other uses including commercial, retail, education, health, community and leisure facilities, parking, landscaping, and public open space. A summary of the approximate maximum floorspace areas for each land use type is shown in Table 1.

Table 1 Proposed Development

Land Use/Class	Development Quantum (Gross External Area m^2/ unit numbers)
Residential (C2, C3)	Up to 8,500 residential units
Hotel (C1)	Up to 8,000 m^2
Commercial (B1)	Up to 74,000 m^2
Light Industrial (B2)	Up to 13,500m^2
Retail (A1-A4)	Up to 29,000m^2
Education (D1)	Up to 46,000m^2 comprising primary schools, secondary schools and nurseries.
Health, Community Centres (D1)	Up to 21,000m^2
Leisure (D2)	Up to 8,500m^2
Outdoor sport-related recreation	c. < 30ha

4. Nutrient Budget Assessment

The existing land use within the OPA boundary is predominately agricultural use or greenfield in nature. **Appendix 1** includes a figure showing the existing land type categories. This information is also summarised in Table 2 below, along with their assumed nutrient loss rates. This information is derived based on the NE's published guidance stated above, along with the ecological habitat surveys that had been undertaken by Arcadis throughout the project duration since 2016 and recent consultations undertaken with FHDC, NE, Arcadis project team and local land agents.

Table 2 Existing Land Types and Nutrient Loss Rates

Existing Land Type[1]	Area (ha)	Average Total Nitrogen (TN) Loss Rate - Kg/ha/year	Average Total Phosporous (TP) Loss Rate - Kg/ha/year
Cereals	319.0	27.3	0.36
Lowland Grazing Livestock	119.1	12.2	0.24

Existing Land Type[1]	Area (ha)	Average Total Nitrogen (TN) Loss Rate - Kg/ha/year	Average Total Phosporous (TP) Loss Rate - Kg/ha/year
Racetrack[2]	13.5	13.3	0.5
Hay Cut	18.9	5	0.14
Other Grassland	68.3	5	0.14
Mixed - Urban	11.5	14.3	0.83
Mixed - Greenfield	4.5	5	0.14
Total Area	**554.8**		

[1] The remaining 30.4 ha in the revised Otterpool Park OPA is excluded from the nutrient neutrality assessment, which includes retained existing roads, buildings, waterbodies, woodland, hedgerows and other ecological features.

[2] Average TN and TP loss values of Urban Land and Lowland Grazing Livestock Farmland categories (i.e. assuming a 50:50 split) have been taken for the Racetrack as discussed with NE to reflect its former use.

The proposed land use information included in the nutrient budget assessment is summarised in Table 3 below, along with their assumed nutrient loss rates. **Appendix 2** also includes the latest Open Space Parameter Plan and Draft Illustrative Masterplan.

Table 3 Proposed Land Types and Nutrient Loss Rates

Proposed Land Type[1]	Area (ha)	Average Total Nitrogen (TN) Loss Rate - Kg/ha/year	Average Total Phosporous (TP) Loss Rate - Kg/ha/year
Urban Area[2]	322.7	14.3	0.83
Suitable Alternative Natural Greenspace (SANG)	178.3	5	0.14
Community Farm/Allotment	9.8	23.5	0.28
Mitigation Wetlands[3]	19.0	N/A	N/A
Mitigation Woodlands[3]	25.0	N/A	N/A
Total Area	**554.8**		

[1] The remaining 30.4 ha in the revised Otterpool Park OPA is excluded from the nutrient neutrality assessment, which includes retained existing roads, buildings, waterbodies, woodland, hedgerows and other ecological features.

[2] This is currently a precautionary estimate because 25.2 ha of extra Sustainable Urban

Drainage Systems (SuDS) has been included within the urban area in the current illustrative masterplan, which can be treated as SANG instead for the purpose of nutrient budget assessment if required in detailed planning stage.

[3] Assumed no loss rates for TN and TP to avoid double counting as they included as mitigation measures.

Nutrient budget estimates have been undertaken by Arcadis for the emerging revised Otterpool Park OPA for each of the following WwTW discharge options (with potable water efficiency targets of 90 l/person/day and 110 l/person/day):

- Southern Water Offsite Sellindge WwTW
- Onsite WwTW
- Southern Water Offsite West Hythe WwTW

This includes both Albion Water and Severn Trent Connect proposals under the Onsite WwTW assessment, reflecting what they can currently commit to achieve for Total Nitrogen (TN) and Total Phosphorous (TP) to comply with the future Environment Agency (EA) discharge permit limits. The EA has provided the indicative Wastewater Treatment Works (WwTW) discharge permit requirements that would be required to accommodate the Otterpool Park OPA for both onsite WwTW and offsite Sellindge WwTW. This information is attached in **Appendix 3**.

Arcadis has also consulted each water company to verify what they can currently commercially achieve in terms of TN and TP that would comply with the indicative WwTW discharge permits stipulated by the Environment Agency. Table 4 below shows this information, which has been used in our preliminary nutrient budget calculations.

Table 4 TN and TP Discharge Limits Used for WwTW Options

WwTW Option	TN (mg/l)	TP (mg/l)
Southern Water – offsite Sellindge WwTW	25.0	0.3
Albion Water - onsite WwTW	10.0	0.3
Severn Trent Connect - onsite WwTW	7.2	0.1

The excel calculation file used for the nutrient budget assessment is attached in **Appendix 4**, which includes the following information:

- Worksheet 1 – Key Input Data
- Worksheet 2 – Nutrient Budget Calculations for Offsite Southern Water Sellindge Wastewater Treatment (WwTW) option, using a Per Capita Consumption Rate (PCC) of 110 l/p/d
- Worksheet 3 – Nutrient Budget Calculations for Offsite Southern Water Sellindge WwTW option, using an alternative tighter PCC of 90 l/p/d
- Worksheet 4 – Nutrient Budget Calculations for Onsite Albion Water WwTW option, using a PCC of 110 l/p/d
- Worksheet 5 – Nutrient Budget Calculations for Onsite Albion Water WwTW option, using an

alternative tighter PCC of 90 l/p/d

- Worksheet 6 – Nutrient Budget Calculations for Onsite Severn Trent Connect WwTW option, using a PCC of 110 l/p/d
- Worksheet 7 – Nutrient Budget Calculations for Onsite Severn Trent Connect WwTW option, using an alternative tighter PCC of 90 l/p/d
- Worksheet 8 - Nutrient Budget Calculations for Southern Water West Hythe WwTW option (PCC rate is not relevant with this option as WwTW does not discharge to the River Stour catchment).
- Worksheet 9 – Nutrient Budget Summary for all the WwTW options assessed, including approximate wetland area requirements for offsetting impacts
- Worksheet 10 – Existing Land Type Information Used in the Assessment
- Worksheet 11 – Existing Mixed Land Type Information Used in the Assessment
- Worksheet 12 – Proposed Land Use Type Information Used in the Assessment
- Worksheet 13 – Potential Mitigation Options Assessment

Table 5 below summarises the estimated nutrient budget requirement, which includes 20% buffer as per the Natural England's guidance.

Table 5 Nutrient Budget Assessment Summary for WwTW Options

WwTW Option	PCC Rate – 110 l/p/d		PCC Rate – 90 l/p/d	
	TN (Kg/year)	TP (Kg/year)	TN (Kg/year)	TP (Kg/year)
Southern Water – offsite Sellindge WwTW	15,843	412	11,822	364
Albion Water - onsite WwTW	1,689	412	242	364
Severn Trent Connect - onsite WwTW	97	236	-1,061	219
Southern Water – offsite West Hythe WwTW	-6,272	147	-6,272	147

5. Preliminary Nutrient Mitigation Options

Table 5 above clearly shows that mitigation will be required to offset phosphorus budget surplus with all WwTW options. Sellindge WwTW and onsite WwTW options will discharge to the currently impacted River Stour catchment, which requires offsetting phosphorus from WwTW discharge as well as development runoff from urban areas and SANG. Sellindge WwTW also require offsetting a notable amount of nitrogen surplus. Whereas West Hythe WwTW will discharge directly to the coast through a long sea outfall in Folkstone, bypassing the Stodmarsh catchment but Otterpool development runoff from urban areas and SANG will still enter the River Stour, which require phosphorus surplus offsetting.

Table 6 below summarises the indicative total area of the new wetlands required to offset the nutrient loading surplus shown in Table 6. This also accounts for at least another 25 ha of new woodland as part of the proposed structural planting within the Otterpool Park OPA boundary (i.e. assuming TN removal rate of 5 Kg/ha/year and TP removal rate of 0.02 Kg/ha/year).

Table 6 Nutrient Budget Assessment Summary for WwTW Options

WwTW Option	PCC Rate – 110 l/p/d		PCC Rate – 90 //p/d	
	TN – Wetland Area[1] (ha)	TP – Wetland Area[2](ha)	TN – Wetland Area[1] (ha)	TP – Wetland Area[2] (ha)
Southern Water – offsite Sellindge WwTW	16.9	34.3	12.6	30.3
Albion Water - onsite WwTW	1.7	34.3	0.1	30.3
Severn Trent Connect - onsite WwTW	N/A	19.6	N/A	18.2
Southern Water – offsite West Hythe WwTW	N/A	12.2	N/A	12.2

[1] Assumed TN removal rate of 93 g/m^2/yr for both wastewater and stormwater discharges
[2] Assumed TP removal rate of 1.2 g/m^2/yr for both wastewater and stormwater discharges

Arcadis team has identified potential locations to provide up to 23 ha of new wetlands with the revised Otterpool Park OPA boundary. Therefore, achieving nutrient neutrality with Severn Trent Connect onsite WwTW option is technically feasible. Table 6 also shows that this onsite WwTW option is not overly sensitive to the PCC rate (110 l/p/d and 90 l/p/d) to deliver nutrient neutrality. This is mainly because Severn Trent Connect onsite WwTW option can achieve a tighter TP limit of 0.1mg/l due to the proposed treatment technology when compared to Southern Water Sellindge and Albion Water onsite WwTW options, which can only achieve 0.3mg/l TP limit.

Worksheet 13 of the excel calculation file in Appendix 4 and Table 7 below summarise the information related to the proposed wetland locations. In line with Natural England's guidance, stormwater wetland sizes are kept to 2 ha minimum recommended size to maximise their nutrient removal efficiency although this will require linking some smaller storm wetlands with new or existing water features.

Table 7 Proposed Wetland Locations

Welland Location Ref.	Indicative Wetland Area (ha)	Comments
A	11.8	Receives WwTW effluent discharge. This includes an extra allowance for future 1,500 homes in overall Otterpool Park Framework Masterplan.
B	2.2	Receives stormwater discharge
C	2	Receives stormwater/river discharge
D	2.2	Receives stormwater/river discharge

Welland Location Ref.	Indicative Wetland Area (ha)	Comments
E	0.7	Receives stormwater/river discharge. Can be linked to Wetland D to increase size/efficiency.
F	1	Receives stormwater/river discharge. Can be linked to Wetland E to increase size/efficiency.
G	0.7	Receives stormwater discharge. Can be linked to Wetland F to increase size/efficiency.
H	0.7	Receives stormwater discharge. Can be linked to Wetland G to increase size/efficiency.
Total Area	**23.1**	

There is currently insufficient space to accommodate 34 ha of wetlands within the Otterpool Park OPA boundary without making notable alterations to the current development proposals. This means if Albion Water onsite WwTW and Southern Water Sellindge WwTW options are to be taken forward then offsite wetland mitigation or significant woodland mitigation will be required, making them less viable or desirable at this stage.

Similarly, West Hythe WwTW is the currently least favoured or developed option by Southern Water to accommodate Otterpool Park due to the considerable distance involved with pumping and other significant technical risks and challenges associated with upgrading the existing WwTW, pumps, sewers and long sea outfall. This option involves pumping sewage away long distance from the water stressed Stour Catchment into another catchment using costly new rising mains, including potential to cause more environmental damage in the Stour Catchment during low flow periods. NE have also indicated that coastal designated sites in Kent will undergo a review in the near future, which may lead to tightening discharge permit at the West Hythe WwTW. For these reasons, West Hythe WwTW is currently not favoured for Otterpool Park although it has the lowest wetland area requirement to offset phosphorus surplus.

6. Summary

This technical note confirms that Nutrient Neutrality can be technically achieved within the revised Otterpool Park OPA site with the Severn Trent Connect onsite WwTW option (i.e. using both 110 l/p/d and 90 l/p/d PCC rates) by implementing a series of wastewater and stormwater/river wetlands along with new woodland planting without any offsite mitigation measures. The current wetland area estimate is a precautionary estimate. For example, if the urban area currently included in the nutrient budget assessment is reduced by 25.2 ha to account for extra SuDS in the illustrative masterplan (i.e. as SANG) then the wetland requirement will be reduced accordingly (i.e. by 1.8 ha).

Nutrient Neutrality can also be achieved with Southern Water offsite West Hythe WwTW option as it involves the least amount of onsite wetland mitigation. However, this WwTW option is not currently preferred for the revised Otterpool Park OPA due to other reasons explained above.

Albion Water onsite WwTW and Southern Water Sellindge WwTW options will require offsite wetland mitigation or significant woodland mitigation, making them less viable or desirable for the revised Otterpool Park OPA.at this stage.

Following key actions are recommended, prior to the submission of revised Otterpool Park OPA submission:

- Confirm the timescale for the Local Planning Authority's (LPA's) Habitat Regulation Assessment Update for the Core Strategy Review, including what further information is required from Arcadis team in relation to the Otterpool Park to inform this

- Confirm the status of LPA's Statement of Common Ground to address this matter

- Undertake further consultation with NE, EA, LPA and Kent County Council (KCC)

- Produce preliminary wetland design proposals to achieve nutrient neutrality (including associated cost estimates) whilst maximising their other benefits such as flood mitigation, rainwater reuse, biodiversity, amenity and education.

- Confirm how long-term management in perpetuity and funding will be ensured for proposed wetlands and other bioretention SuDS proposals

APPENDIX G:

NATURAL ENGLAND – LETTER TO FOLKESTONE & HYTHE DISTRICT COUNCIL (15 OCTOBER 2020)

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Date: 15 October 2020
Our ref: 15328/318278
Your ref: F&H NN queries

[redacted] [redacted]
Senior Planning Policy Specialist
Folkestone & Hythe District Council,
Civic Centre, Castle Hill Avenue,
Folkestone, Kent. CT20 2QY.

Customer Services
Hornbeam House
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CW1 6GJ

0300 060 3900

BY EMAIL ONLY
[redacted]

Dear [redacted]

Discretionary Advice Service (Charged Advice)

Development proposal and location: Folkestone and Hythe District Council proposed local plan Allocations including Otterpool pertaining to nutrients and their effects on Stodmarsh Special Protection Area (SPA), Special Area of Conservation (SAC) Ramsar Site, Site of Special Scientific Interest (SSSI) and National Nature Reserve NNR

Thank you for your consultation on the above dated and received on 01 September 2020 with additional clarification questions provided on the 9th October 2020.

This advice is being provided as part of Natural England's Discretionary Advice Service. Folkestone and Hythe District Council acting as a competent authority and planning authority has asked Natural England to provide advice upon:

- Folkestone and Hythe District Council housing proposals and allocations for their local plan specifically with respect to issues around nutrient neutrality.

This advice is provided in accordance with the Quotation and Agreement dated12th June 2020.

The following advice is based upon the information within:

- Otterpool Nutrient Mitigation Preliminary Analysis draft - Technical Memo and appendices (17 August 2020), on which NE previously commented.
- Arcadis Otterpool nutrient mitigation analysis update memo (1 October 2020).
- Arcadis Nutrient Neutral Memo appendices (part review only 1 October 2020) .
- Updated spreadsheet of Nutrient Neutral calculations (22 September 2020).
- Additional follow-up query and clarification by email from James Hammond (9th October 2020).

The advice contained within this letter is restricted to the proposed nutrient neutral calculations with regard to the above documents. This is not the limit of Natural England's advice on the proposals and other environmental impacts and obligations that will apply, which are not covered in this response. These include an appropriate assessment, which should be produced for the local plan, or as an additional section in the existing local plan appropriate assessment. Natural England has assessed a sample of the calculations in the spreadsheet but we have not checked the accuracy of every line.

Summary of Natural England's advice
Some of the assumptions are not precautionary, or differ materially from the values suggested in the Natural England nutrient neutral methodology. Where this is the case, we advise values should be evidenced in the update to the local plan appropriate assessment that is required. As the competent authority Folkestone and Hythe should satisfy itself that the values chosen and assumptions made are consistent with others used in the local plan, and are sufficiently precautionary to meet the tests for assessments of plans and projects set out in the Conservation of Habitats and Species Regulations (2017) as amended (HRA).

Natural England's advice is that the local plan supporting documents have the potential to meet the HRA tests for water quality at the plan level, subject to suggested changes and amendments provided in our detailed advice contained in Annex I to this letter. We draw attention to our advice that additional areas of wetland mitigation may be required above those listed in the Otterpool updated memo. Clarification of the difference in the nutrient budgets in the updated memo appendices, compared with those in the Local Plan for Otterpool options is required. Our role with regards protected species is in Annex II.

Senior adviser to QA letter and check box below
X The advice provided in this letter has been through Natural England's Quality Assurance process

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Yours sincerely

[redacted]
Senior Water Adviser

On Behalf of Sussex and Kent Team

[redacted]

Annex 1
Natural England's detailed advice

1) Requirement for Appropriate Assessment

Natural England is the statutory Nature Conservation Body with regards consultations on appropriate assessments for impacts of plans or projects and a statutory consultee on many planning applications. As the competent authority for the local plan, the Council should satisfy itself that the plan is able to meet the tests for assessments of plans set out in the Conservation of Habitats and Species Regulations (2017) as amended (HRA).

The Stodmarsh Nutrient Neutral methodology (NNM) we have proposed is one way for competent authorities to satisfy themselves that an adverse effect upon integrity of nutrient impacts of proposals can be avoided with sufficient certainty to meet the HRA tests. An appropriate assessment should be produced for the local plan, or as an additional section in the existing local plan appropriate assessment. Natural England is a statutory consultee with regards to appropriate assessments under the Conservation of Habitats and Species Regulations (2017) as amended. We advise the appropriate assessment should include information on any likely significant effects the planned development could have and how to mitigate those to avoid an adverse effect upon the integrity of any relevant European sites. It is likely the information contained within the above documents (subject to the additional information and changes recommended in this letter) will form an important part of any appropriate assessment/ amendment to the existing local plan appropriate assessment.

As we previously advised, with respect to nutrients calculation, we recommend that the following information is included within the updated appropriate assessment:

- All the information, values and assumptions made in the nutrient calculations.
- Information and evidence to support assumptions used, especially where these deviate from Natural England's methodological advice (e.g. the Council's evidence on occupancy rates and their long term stability).
- Evidence to support any mitigation planned, including source evidence or link if a website or copies of documents are not readily or freely available.
- Evidence of types of mitigation (wetlands, proposals) including proposed locations to ensure the areas of mitigation are draining relevant areas of mitigation land/ WwTW so will function effectively.
- 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 developer's ownership will be secured. In particular, information on mitigation proposals for the allocations other than Otterpool.
- Any information on winter maintenance programmes or other information material to water quality assessment that may impact the efficacy of proposed nutrient removal systems.

2) Assumptions made in the base calculations- and Precautionary Principle

The information supplied was difficult to assess as the data in the Otterpool updated memo and accompanying spreadsheet have significantly different nutrient budget figures and therefore different mitigation requirements. This appears to be due to the more detailed land use and mitigation proposals supplied in the Otterpool updated memo appendices (1st October), compared

with the Local Plan nutrient budget spreadsheet (September). There are a number of assumptions and approaches that deviate from those recommended in the NNM or that are not precautionary for such assumptions.

Below are Natural England's comments on those assumptions.

1.1 Water Consumption 90 L, 100L & 110 Litres per person per day

The Council has presented calculations for water use of both 100 litres per person per day and 110 litres per person per day in the local plan budget. This is a useful comparator as the resultant mitigation requirements differ significantly for these two values of water use, and the proposals include the potential to mitigate for the higher water consumption. However, it is unclear where all the additional wetlands will be located. Natural England notes that the Otterpool Park technical memo also includes an option for 90 litres per person per day. Tighter water efficiency standards are proposed as greywater recycling may be included in the larger developments. Not all greywater recycling options reduce the flow to WwTW and are not therefore material in terms of nutrient neutrality. In-house water recycling, for example using bathwater or shower water to flush toilets will reduce effluent flow. Capturing rain water, and using it for toilet flushing does not reduce flow to WwTW though it does have water resource benefits.

Natura England recommends 110 litres per person per day, as this is the assumption and target used by the six water companies in the Water Resources South East plans (including all three of the water suppliers operating in the Stour Valley) for future planning of water resources and can be linked to the existing building regulations requirements.

If the Council chooses one of the proposed lower water consumption figures (of 100 or 90 litres per person per day) it must satisfy itself that it is sufficiently certain this will be achieved and sufficiently precautionary and that it is likely to be stable for the lifetime of the development. As set out in section 5.9 of the NNM "*It is Natural England's view that it would be difficult to evidence and secure delivery of tighter restrictions [than 110L] at this time, to provide certainty for the lifetime of the development*."

1.2 Household Occupancy 2.18 versus 2.4 people per household

Occupancy rates are a matter for the local authority, but we have provided some observations on their use. Although 2.18 is lower than the national occupancy figure suggested in the NNM (2.4), this may reflect genuine differences in the occupancy within the Folkestone and Hythe District Council Area. Natural England's advice is that the Council must satisfy itself this figure is well evidenced and that it is consistent with other decisions related to occupancy made in the local plan (such as provision for schools, roads or other services). It could then be considered as sufficiently precautionary for the calculation of nutrients from development.

1.3 Need to separate Upstream and 'downstream' catchments

The Core Strategy Review identifies the potential for future growth to provide a total of 8,000-10,000 homes (subject to detailed masterplanning) within the new garden settlement site allocation area beyond the plan period. The Core Strategy Review also allocates two parcels in Sellindge, labelled as 'CSD9 A' and 'CSD9 B', which will accommodate 350 dwellings across the two parcels. These proposed allocations are within the catchment upstream of Stodmarsh and are planned to discharge to works in the proposed upstream catchments in the spreadsheet, although the technical options notes some could in theory be sent to works outside the NNM boundary.

The mitigation in the Otterpool updated memo (1 October) is largely designed for the Otterpool Park development and does not set out what is planned for the CSD9 A and B in detail in terms of mitigation. In the email of the 9th October the District Council states:

One would imagine that would could tailor a solution to suit for the two parcels in Sellindge (i.e. would Natural England be accepting of an on-site solution for the two parcels that will accommodate 162 dwellings and 188 dwellings respectively?), or otherwise go down the route of proposing the

imposition of Grampian conditions as a safeguard. For the policy position the latter option is perhaps more straightforward to align at this stage.

An on-site new WwTW by an inset provider may or may not be viable for medium sized developments of this kind, and the Environment Agency has a presumption against private sewage treatment works in sewered areas. However, depending on the timing of the proposed provisions, it may be worth the District Council exploring whether the wastewater from these new proposed allocations 'CSD9 A' and 'CSD9 B', could be sent to the new works proposed at Otterpool. A new works of this kind can be designed to accommodate more development provided this is built in to the planning design This would require more wetland mitigation immediately downstream of the works than is currently proposed in the Otterpool updated memo and plan. However, there appears to be space on site to accommodate such a change, albeit necessitating changing the plan outline map. All such proposals should be discussed with the Environment Agency and the potential sewerage provider. The nutrient neutral calculations on these new allocation options and any proposed mitigation should be included within the appropriate assessment update of the local plan.

The other sites referenced are smaller sites that form part of the recently adopted Places and Policies Local Plan to 2031. The smaller site parcels ND4, ND5, ND8, ND9 and ND10 yield circa 232 dwellings.

ND4, ND5, ND8, ND9 and ND10 are in the little Wingham and Stour sub-catchment, which is a downstream catchment because water from this sub-catchment enters the lower portion of the Stodmarsh on the tide. These options are likely to go to a mixture of different WwTW– some to works outside the Stodmarsh catchment and some to works in a different sub-catchment which are upstream of the site. Natural England recommends that offsetting is only undertaken in the same sub-catchment as the impact.

It is not clear from the local plan spreadsheet what is proposed for these smaller developments, some of which may not need any, or only very limited land use mitigation (as their wastewater goes to works outside the scope of the NNM). As far as Natural England can tell these allocations do not have any mitigation proposed currently, but are included in the calculations for the local plan with notes on the areas of land needed to mitigate using offsetting, and the areas of land needed if interceptor wetlands are proposed. These options should be included in the in-combination appropriate assessment update of the local plan allocations, and any mitigation proposals clearly set out.

1.4 Use of Operator self-monitoring (OSM) and 2024 proposed permit values

The permit and OSM values, as well as agreed values for permits upgrades by 2024, are provided in the NNM alongside the current permit values. The calculations have used the 2024 or/ and the OSM values. However, there is a risk that if the Water Industry National Environment Programme (WINEP) need tighter standards to meet the lakes water quality standards, the upgrades to the works could be delayed to prevent wasted investment. At the application stage, the use of a Grampian-style condition related to occupancy may be a potential solution to this. The Environment Agency has informed Natural England that these proposed upgrades and OSM values are secure to be used for planning purposes and can therefore be used for the local plan mitigation calculations.

2 Assumptions on Mitigation and likely Efficacy

Location of mitigation in relation to the impacts is critical in determining the likely efficacy of mitigation. There are three approaches to mitigation proposed in the above listed documents for the allocations which are proposed to be combined to provide neutrality.

- **Offsetting mitigation (indirect mitigation)**

As described in section 6.7 to 6.15 of the NNM, offsetting is the change of land use from a high nutrient land use such as agriculture to a lower nutrient use. This type of mitigation uses the land use values proposed in the NNM.

The land use calculations for offsetting the existing onsite use appear to largely follow the methodology with two exceptions. Firstly, the existing allocations (ND4,5,8,9 &10), where it is unclear what is being proposed as mitigation or how the calculations have been incorporated in the final mitigation totals. There is no proposal for offsetting land outside of the allocation redline boundaries, although the calculations of how much land would be required are made.

Secondly is the woodland "mitigation" proposed as part of the Otterpool scheme (table 3 in the Arcadis updated memo 1st October). The calculation here has assumed no nutrient discharge from these to "prevent double counting" and then goes on to propose uptake by woodland as mitigation in the way that is proposed for wetlands. This results from a misunderstanding of the figures given in the nutrient neutral methodology (section 6.13).

The rate from semi-natural native woodland planting, likely to equate to 5kg/ha/yr and phosphorous 0.02 kg/ha/yr, is provided in the document, but these are figures for nutrient loss per year from these habitats, and not the removal of nutrients. The mitigating value of the planting comes from reductions compared to existing land uses. Therefore the draft calculations in the Arcadis updated memo have removed 25 hectares x 5 kg = 125Kg of Nitrogen and 25 hectares x 0.02 hectares= 0.5 Kg of phosphorus from the allocation, when these values should have been added to the figures.

This alters the values for mitigation, with 250Kg Nitrogen and 1Kg phosphorous additional mitigation required per year. Updated calculations to reflect this change should be included in the draft appropriate assessment. However, Natural England notes that, based on the updated memo, the change made by correcting this issue in the appendix spreadsheet would result in only 19.7 hectares of wetland being required. The Otterpool scheme updated memo states that there is space for 23 hectares of wetlands, although this is not necessarily all in the correct mitigation locations on the existing outline plan.

- **Interception (direct mitigation)**

Interception is the use of semi-natural habitats that remove nutrients in the long term based on wetlands, as these can provide the best offsetting potential. One of the best habitats for removal of nutrients from water are wetlands. Guidance on wetland design for nutrient removal is provided in Appendix 7 of the Stodmarsh NNM. This is when land between the development and the river or between the WwTW and the river is changed to a use that will actively remove nutrients. The location of this land is critical in relation to the efficacy of mitigation, as is the size of the wetland and the need for permanent flow. The positioning of the largest proposed wetland (11.8 hectares) downstream of the proposed new WwTW works is likely to offer the best mitigation options. The inclusion of a series of other wetlands of greater than 2 hectares will also offer significant mitigation.

The total wetland volume proposed in the updated memo for Otterpool is 23 hectares, though some of this area may offer little in the way of nutrient removal as it may have no permanent flow of water (as they are storm water wetlands) . This area is less than the total required to mitigate the whole local plan allocation in the local plan spreadsheet, and less than that required by Otterpool in the local plan spreadsheet. However, the 23 hectares is more than is required for Otterpool allocation based on the calculations in the updated memo appendices. The difference appears to be due to more precise land use allocation by the Otterpool updated memo nutrient calculations than in the local plan allocation calculations. Natural England recommends that the difference between the two calculations is examined (following the corrections described above) and that the most well-evidenced option is included within the updated local plan appropriate assessment.

- **Direct treatment Mitigation and feasibility of tight permit standards proposed**

On the call with Natural England on 9th October and in your email of the same date you raised the issue of whether it is feasible to achieve tight standards at WwTW. One of the solutions proposed in the Otterpool updated memo of 1st October is a new waste water treatment works, with a provisional suggested discharge permit standard of 7.2 mg/l total nitrogen and 0.1 mg/l total phosphorous, proposed by Severn Trent Connect.

Permitting and regulating mains WwTW is a matter for the Environment Agency via a regulatory process with the water sector. In order to help you determine if standards as tight as those

proposed are a feasible option, Natural England is able to share some information with you as it applies to the information you have provided in your technical note and on the proposed mitigation.

As a result of national trials using innovative techniques by the Environment Agency with the water sector, Technically Achievable Limit (TAL) for Phosphorous reduction at WwTW was tightened from 0.5 mg P/l to 0.25 mg P/l for PR19 (the 2019 water industry price review). In PR19 the Environment Agency would not impose permit standards tighter than TAL on a water company, however companies were able to agree to tighter standards. There are some exceptions to this, for example, legally enforceable operational agreement standards at Pevensey Levels SAC, Ramsar SSSI in Sussex of 0.1 and 0.08 mg/l Total Phosphorus on the Hailsham North and South WwTW are agreed as a stretch target. The upgrades to these two works, which use membrane technology more frequently used in drinking water treatment, will be completed by 2021. These tight standards will deliver favourable condition for the SSSI and contribute to favourable conservation status in terms of water quality for the SAC at Pevensey Levels. Housing which will discharge to these works has been given permissions with a Grampian-style condition linked to a first occupancy date of December 2021 since the agreement was first secured in the company's PR14 business plan and Environment Agency's WINEP in 2014.

The proposals by Severn Trent Connect are similar to the operationally agreed standards for sites that discharge into Pevensey Levels and therefore Natural England sees no obvious reason why these proposals will not be implementable, but you may wish to confirm this with the Environment Agency.

Annex 2
European Protected Species

A licence is required in order to carry out any works that involve certain activities such as capturing the animals, disturbance, or damaging or destroying their resting or breeding places. Note that damage or destruction of a breeding site or resting place is an absolute offence and unless the offences can be avoided (e.g. by timing the works appropriately), it should be licensed. In the first instance it is for the developer to decide whether a species licence will be needed. The developer may need to engage specialist advice in making this decision. A licence may be needed to carry out mitigation work as well as for impacts directly connected with a development. Further information can be found in Natural England's 'How to get a licence' publication.

If the application requires planning permission, it is for the local planning authority to consider whether the permission would offend against Article 12(1) of the Habitats Directive, and if so, whether the application would be likely to receive a licence. This should be based on the advice Natural England provides at formal consultation on the likely impacts on favourable conservation status and Natural England's guidance on how the three tests (no alternative solutions, imperative reasons of overriding public interest and maintenance of favourable conservation status) are applied when considering licence applications.

Natural England's pre-submission Screening Service can screen application drafts prior to formal submission, whether or not the relevant planning permission is already in place. Screening will help applicants by making an assessment of whether the draft application is likely to meet licensing requirements, and, if necessary, provide specific guidance on how to address any shortfalls. The advice should help developers and ecological consultants to better manage the risks or costs they may face in having to wait until the formal submission stage after planning permission is secured, or in responding to requests for further information following an initial formal application.

The service will be available for new applications, resubmissions or modifications – depending on customer requirements. More information can be found on Natural England's website.

APPENDIX H:

NATURAL ENGLAND – LETTER TO FOLKESTONE & HYTHE DISTRICT COUNCIL (29 OCTOBER 2020)

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29th October 2020

BY EMAIL ONLY
[redacted]

Dear [redacted]

I am writing this letter following our conversation on Tuesday 26th and Wednesday 27th October. We discussed the overarching approach that Folkestone and Hythe District Council were taking in relation to housing proposals and allocations within their local plan, specifically with respect to issues around nutrient neutrality. We understand Folkestone and Hythe District Council are looking to build in safeguards for the attainment of nutrient neutrality at a plan level.

Natural England recognises that Folkestone and Hythe District Council are actively seeking to make the necessary changes in line with our advice letters (the latest dated 15th October).

Natural England has already advised that the draft local plan supporting documents, which we reviewed in preparation of our advice dated 15th October, had the **potential to meet the Habitat Regulation Assessment tests for water quality at the plan level with some amendments**. This advice was provided subject to suggested changes being embedded in the local plan and a deliverable implementation plan set out which would need to align with wider agencies advice, in particular Environment Agency.

Folkestone and Hythe District Council have reported significant progress to Natural England following our advice, reporting the aim to ensure safeguards are set out through policy Amendments which will be tabled at the examination. Folkestone and Hythe District Council have confirmed that the Appropriate Assessment will be concluded with necessary changes in advance of the virtual hearing into Matter 7 scheduled for the 18th November 2020. Natural England are in the process of evaluating the new documentation and Folkstone and Hythe appear confident that the issues are capable of resolution. Natural England will work with the council through to 18th November in line with the examination timetable.

Please confirm if Folkestone and Hythe District Council and the inspector wishes Natural England attendance for Matter 7 of the examination in Public on the 18th.

Yours

[redacted]

[redacted]
Area Manager Sussex & Kent
Natural England
[redacted]
www.gov.uk/natural-england

APPENDIX I:

ARCADIS – OTTERPOOL PARK FRAMEWORK MASTERPLAN – NUTRIENT NEUTRALITY MITIGATION PROPOSALS (4 NOVEMBER 2020)

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MEMO

ARCADIS Design & Consultancy for natural and built assets

SUBJECT
Otterpool Park Framework Masterplan - Nutrient Neutrality Mitigation Proposals

DATE
04 November 2020

DEPARTMENT
Water Management & Resilience

COPIES TO
[redacted]

TO
[redacted]

OUR REF
10029956-AUK-XX-XX-FN-CW-0025-P2

PROJECT NUMBER
10029956

FROM
[redacted]

1. Introduction

This technical note has been prepared on behalf of Folkestone and Hythe District Council (FHDC) to summarise Arcadis's latest findings of the nutrient budget calculations and associated mitigation proposals to achieve Nutrient Neutrality for the entire Otterpool Park Framework Masterplan Site Allocation, which includes the revised Otterpool Park Outline Planning Application (OPA) for the initial 8,500 homes.

In addition, two proposed broad site allocations in Sellindge (CSD9A and CSD9B) within FHDC's submission version of the Core Strategy Review (CSR) have been included within this updated Arcadis assessment, following the recent consultations with FHDC and Natural England (NE).

This assessment follows:

- NE's published final guidance on Nutrient Neutrality for new development in the Stour Valley Catchment in relation to the Stodmarsh Designated Sites for Local Planning Authorities (July 2020)
- Consultation advice provided to Arcadis for the Otterpool Park OPA within NE's letter dated 06th October 2020, as part of NE's Discretionary Advice Service
- Consultation advice provided to FHDC for their CSR Site Allocations within NE's letter dated 15th October 2020, as part of NE's Discretionary Advice Service

Environment Agency (EA)'s Guidance Manual for Constructed Wetlands, R&D Technical Report P2-159/TR2 (2003) has also been used for undertaking the initial hydraulic loading calculations and design preparation for the proposed wetlands.

2. Background to the Issue

Excessive nutrient levels (nitrogen and phosphorous) can negatively impact on the Stodmarsh Special Area of Conservation (SAC), Special Protection Area (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. Existing Sellindge Wastewater Treatment Works (WwTW) that Otterpool Park could potentially use is also included in this WINEP investigation.

NE advised FHDC in May 2020 that the water quality issues should be assessed through an updated Habitats Regulation Assessment (HRA) as part of the CSR, which is currently been submitted for Examination. This should include all proposed site allocations (including the Otterpool Park), which may be served by the existing or new WwTW within the River Stour Catchment that can impact Stodmarsh.

This should include calculation of the nutrient budget for all affected CSR site allocations with respect to nitrogen and phosphorous, with all mitigation options outlined, along with the fundamental precautionary principle that each scheme must achieve nutrient neutrality in order to provide certainty of avoiding adverse effect on integrity of the designated sites.

A roundtable meeting was subsequently organised by FHDC in June 2020 to discuss the methodology and scope for their Appropriate Assessment Update and Nutrient Neutrality Assessment for the CSR and the Revised Otterpool Park OPA. At this meeting, Natural England also advised that if Otterpool Park OPA can demonstrate (i.e. as a standalone site) that it can achieve Nutrient Neutrality (as set out in their published guidance in relation to Stodmarsh), then it would fully satisfy their current concerns on any adverse impacts to Stodmarsh from Otterpool Park.

Following recent technical work and consultations undertaken with NE, by Arcadis and FHDC to address this issue, this latest assessment considers the entire Otterpool Park Framework Masterplan and nearby CSD9A and CSD9B CSR site allocations in Sellindge. This ensures a consistent and strategic approach to the Nutrient Neutrality Assessment and mitigation plan, which will then form a key part of FHDC's CSR Appropriate Assessment Update.

3. Proposed Development

The Otterpool Park Framework Masterplan for the proposed garden town includes up to 10,000 new residential homes and associated non-residential uses/infrastructure, 71 ha of existing community and 54.9 ha of retained farmland, covering a total area of 756.1 ha. Otterpool Park Garden Town is jointly promoted by FHDC and Otterpool Park LLP.

The proposed revised Otterpool Park OPA is located on 585.2 ha la nd to deliver up to initial 8,500 dwellings and other uses including commercial, retail, education, health, community and leisure facilities, parking, landscaping, and public open space within the Otterpool Park Framework Masterplan. A summary of the approximate maximum floorspace areas for each land use type included in the revised OPA is shown in Table 1.

Table 1 Proposed Development

Land Use/Class	Development Quantum (Gross External Area m^2/ unit numbers)
Residential (C2, C3)	Up to 8,500 residential units
Hotel (C1)	Up to 8,000 m^2
Commercial (B1)	Up to 74,000 m^2
Light Industrial (B2)	Up to 13,500m^2
Retail (A1-A4)	Up to 29,000m^2
Education (D1)	Up to 46,000m^2 comprising primary schools, secondary schools and nurseries.
Health, Community Centres (D1)	Up to 21,000m^2
Leisure (D2)	Up to 8,500m^2
Outdoor sport-related recreation	c. < 30ha

Sellindge CSD9A and CSD9B CSR site allocations include 188 new houses (total site area 9.06ha) and 162 new houses (total site area 18.91ha) respectively. These two sites are currently being promoted by Quinn Estates and other developers.

4. Nutrient Budget Assessment

The existing land use within the area impacted by Otterpool Park Framework Masterplan boundary is predominately agricultural use or greenfield in nature although it includes 71 ha of existing community and 54.9 ha of retained farmland. **Appendix 1** includes a figure showing the existing land type categories in the main development area. This information is also summarised in Table 2 below, along with their assumed nutrient loss rates. This information is derived based on the NE's published guidance (dated July 2020) stated above, along with the ecological habitat surveys that had been undertaken by Arcadis throughout the project duration since 2016 and recent consultations undertaken with FHDC, NE, Arcadis project team and local land agents.

Table 2 Existing Land Types and Nutrient Loss Rates Within Otterpool Park Framework Masterplan

Existing Land Type[1]	Area (ha)	Average Total Nitrogen (TN) Loss Rate - Kg/ha/year	Average Total Phosporous (TP) Loss Rate - Kg/ha/year
Cereals	324.9	27.3	0.36
Lowland Grazing Livestock	119.1	12.2	0.24
Racetrack[2]	13.5	13.3	0.5
Hay Cut	18.9	5	0.14
Other Grassland or greenfield	101.1	5	0.14
Mixed - Urban	11.5	14.3	0.83
Mixed - Greenfield	4.5	5	0.14
Remaining Urban Area in Framework Masterplan	19.9	14.3	0.83
Total Area	**613.4**		

[1] The remaining 142.7 ha in the Otterpool Park Framework Masterplan boundary is excluded from the nutrient neutrality assessment as the existing land use in this area is unchanged by the proposed development. This excluded area includes 71 ha of existing community, 54.9 ha of retained farmland and 16.8 ha of retained buildings, waterbodies, woodland, hedgerows and other ecological features.

[2] Average TN and TP loss values of Urban Land and Lowland Grazing Livestock Farmland categories (i.e. assuming a 50:50 split) have been taken for the Racetrack as discussed with NE to reflect its former use.

Similarly, existing land use information for CSD9A and CSD9B is summarised in Table 3 below, along with their assumed nutrient loss rates as per NE's published guidance (July 2020).

Table 3 Existing Land Types and Nutrient Loss Rates Within CSD9A and CSD9B

Existing Land Type[1]	Area (ha)	Average Total Nitrogen (TN) Loss Rate - Kg/ha/year	Average Total Phosporous (TP) Loss Rate - Kg/ha/year
CSD9B/Cereals	17.16	27.3	0.36
CSD9B/ Urban	0.7	14.3	0.83
CSD9B/Other grassland or greenfield	1.05	5	0.14
CSD9A/ Urban	0.08	14.3	0.83
CSD9A/Other grassland or greenfield	8.98	5	0.14
Total Area	**27.97**		

The proposed land use information included in the nutrient budget assessment is summarised in Table 4 and 5 below, along with their assumed nutrient loss rates as per NE's published guidance (July 2020). **Appendix 2** includes the latest Open Space Parameter Plan and Draft Illustrative Masterplan for Otterpool Park revised OPA whereas **Appendix 3** includes Approved Landscaping and Land Use Parameter Plan for CSD9B Site under Planning Application Reference Y16/1122/SH.

Table 4 Proposed Land Types and Nutrient Loss Rates Within Otterpool Park Framework Masterplan

Proposed Land Type[1]	Area (ha)	Average Total Nitrogen (TN) Loss Rate - Kg/ha/year	Average Total Phosporous (TP) Loss Rate - Kg/ha/year
Urban Area[2]	352.4	14.3	0.83
Suitable Alternative Natural Greenspace (SANG)	191.4	5	0.14
Community Farm/Allotment	9.8	23.5	0.28
Mitigation Woodlands	35.0	5	0.02
Mitigation Wetlands[3]	24.8	N/A	N/A
Total Area	**613.4**		

[1] The remaining 142.7 ha in the Otterpool Park Framework Masterplan boundary is excluded from the nutrient neutrality assessment as the existing land use in this area is unchanged by the proposed development. This excluded area includes 71 ha of existing community, 54.9 ha of retained farmland and 16.8 ha of retained buildings, waterbodies, woodland, hedgerows and other ecological features.

[2] This is currently a precautionary estimate because 25.2 ha of extra Sustainable Urban Drainage Systems (SuDS) has been included within the urban area of the current illustrative masterplan for revised Otterpool Park OPA, which can be treated as SANG instead of urban area for the purpose of nutrient budget assessment in detailed planning stage, if required.

[3] Assumed no loss rates for TN and TP for wetlands to avoid double counting as they included as mitigation measures.

Table 5 Proposed Land Types and Nutrient Loss Rates Within CSD9A & CSD9B

Proposed Land Type	Area (ha)	Average Total Nitrogen (TN) Loss Rate - Kg/ha/year	Average Total Phosporous (TP) Loss Rate - Kg/ha/year
CSD9B/Urban Area	10.91	14.3	0.83
CSD9B/SANG	8.00	5	0.14
CSD9A/Urban Area	7.56	14.3	0.83
CSD9A/SANG	1.50	5	0.14
Total Area	**27.97**		

Nutrient budget estimates have been undertaken by Arcadis for the Otterpool Park Framework Masterplan (including additional CSD9A and CSD9B sites) for the currently preferred Onsite WwTW solution in accordance with Severn Trent Connect Proposal. The assessment is completed using NE's recommended potable water efficiency target of 110 l/person/day and 2.4 average household occupancy rate as well as the alternative 90 l/person/day target for comparison purpose.

Depending on the chosen final discharge outfall location and corresponding Dry Weather Flow (DWF) volume, the EA has confirmed the following indicative discharge permit values shown in Table 6 for the proposed Otterpool Park Onsite WwTW. Severn Trent Connect has confirmed that they are able to meet any of these EA discharge permit values whilst limiting Total Nitrogen discharge to 7.2 mg/l for the purpose of achieving NE's nutrient neutrality requirement. Therefore, as agreed with NE, a Total Nitrogen limit of 7.2 mg/l and Total Phosphorus limit of 0.1 mg/l have been used for the purpose of latest Arcadis nutrient budget calculations presented in this Technical Note.

Table 6 Proposed Environment Agency Indicative Discharge Permit Values for Onsite WwTW

WwTW Option	Maximuum DWF Limit – 2,841 m3/d			Maximum DWF – 3,472 m^3/d		
	BOD (mg/l)	Ammonia (mg/l)	Phosphorus (mg/l)	BOD (mg/l)	Ammonia (mg/l)	Phosphorus (mg/l)
Upstream Outfall Location @ NGR 609426 137712 (at Harrindge Lane Bridge)	5	0.5	0.1	N/A	N/A	N/A
Downstream Outfall Location @ NGR 608558 138047 (at confluence with East Stour and	8	2	0.3	7	2	0.3

WwTW Option	Maximuum DWF Limit – 2,841 m3/d			Maximum DWF – 3,472 m^3/d		
	BOD (mg/l)	Ammonia (mg/l)	Phosphorus (mg/l)	BOD (mg/l)	Ammonia (mg/l)	Phosphorus (mg/l)
Horton Priory Dyke)						

The excel calculation files used for the nutrient budget assessment is attached in **Appendix 4**, 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 Onsite Severn Trent Connect WwTW option, using a PCC of 110 l/p/d
- Worksheet 3 – Nutrient Budget Calculations for Onsite Severn Trent Connect WwTW option, using an alternative tighter PCC of 90 l/p/d
- Worksheet 4 – Wetland Mitigation Requirement Summary
- Worksheet 5 – Existing Land Type Information Used in the Assessment
- Worksheet 6 – Existing Mixed Land Type Information Used in the Assessment
- Worksheet 7 – Proposed Land Use Type Information Used in the Assessment
- Worksheet 8 – Proposed Wetland Details and Preliminary Hydraulic Loading Assessment

Table 7 below summarises the estimated nutrient budget requirement, which includes a 20% buffer as per the Natural England's guidance.

Table 7 Nutrient Budget Assessment Summary for Severn Trent Connect Onsite WwTW Option

WwTW Option	PCC Rate – 110 l/p/d		PCC Rate – 90 l/p/d	
	TN (Kg/year)	TP (Kg/year)	TN (Kg/year)	TP (Kg/year)
Otterpool Park Framework Masterplan Only	1,287	256	-75	237
Otterpool Park Framework Masterplan plus Sellindge Sites CSD9A and CSD9B	1,288	270	-122	250

5. Preliminary Nutrient Mitigation Options

Table 8 below summarises the indicative total area of the new wetlands required to offset the nutrient loading surplus shown in Table 7. Arcadis team has identified potential locations to provide up to 24.8 ha of new wetlands within the revised Otterpool Park OPA boundary. Therefore, achieving nutrient neutrality with Severn Trent Connect onsite WwTW option is technically feasible with 110 l/p/d PCC rate

to accommodate the proposed development in entire Otterpool Park Framework Masterplan and the two extra CSR site allocations CSD9A and CSD9B, involving a total of 10,350 new homes and associated non-residential development.

Table 8 Nutrient Budget Assessment Summary for WwTW Options

WwTW Option	PCC Rate – 110 l/p/d		PCC Rate – 90 //p/d	
	TN – Wetland Area[1] (ha)	TP – Wetland Area[2](ha)	TN – Wetland Area[1] (ha)	TP – Wetland Area[2] (ha)
Otterpool Park Framework Masterplan Only	1.4	21.3	N/A	19.7
Otterpool Park Framework Masterplan plus Sellindge Sites CSD9A and CSD9B	1.4	22.5	N/A	20.8

[1] Assumed TN removal rate of 93 g/m^2/yr for both wastewater and stormwater discharges
[2] Assumed TP removal rate of 1.2 g/m^2/yr for both wastewater and stormwater discharges

Worksheet 8 of the excel calculation files in Appendix 4 and Table 7 below summarise the key information related to the proposed wetlands. In line with Natural England's guidance, stormwater wetland sizes will be optimised where possible to maximise their nutrient removal efficiency by interlinking smaller storm wetlands with SuDS features and existing smaller local watercourses, to collectively provide a larger wetland area whilst maintaining sufficient base flow.

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. The estimated preliminary Hydraulic Retention Time (HRT) for the Wastewater Treatment Wetland (W13) indicates that this may vary between 1 day to 6 days, depending on the wetland treatment depth provided between 50mm and 250mm. Again, this shows sufficient HRT is available at Wetland W13 to provide effective treatment for sediment and nutrient removal.

Table 9 Proposed Wetland Details Summary

Welland Location Ref.	Indicative Wetland Area (ha)	Treatment Depth (m)	Average Wetland Depth (m)	Comments
W1	1.21	0.42	0.72	Receives storm discharge. W1, W2, W3 & W8 are interlinked (Total area 3.7ha).
W2	0.81	0.43	0.73	Receives storm discharge. W1, W2, W3 & W8 are interlinked (Total area 3.7ha).
W3	0.25	0.15	0.45	Receives storm discharge. W1, W2, W3 & W8 are interlinked (Total area 3.7ha).
W4	1.70	0.07	0.37	Receives storm discharge.

Welland Location Ref.	Indicative Wetland Area (ha)	Treatment Depth (m)	Average Wetland Depth (m)	Comments
W5	2.17	0.16	0.46	Receives storm discharge.
W6	2.63	0.27	0.87	Receives storm discharge.
W7	1.87	0.05	0.35	Receives storm discharge.
W8	1.46	0.49	0.79	Receives storm discharge. W1, W2, W3 & W8 are interlinked (Total area 3.7ha).
W9	0.27	0.13	0.73	Receives storm discharge. W9 & W10 are interlinked (Total area 1.1ha)
W10	0.78	0.21	0.81	Receives storm discharge. W9 & W10 are interlinked (Total area 1.1ha)
W11	0.43	0.05	0.65	Receives storm discharge. W11 & W12 are interlinked (Total area 1.7ha).
W12	1.26	0.04	0.34	Receives storm discharge. W11 & W12 are interlinked (Total area 1.7ha).
W14	1.11	0.08	0.38	Receives storm discharge.
W13	8.86	0.25	0.35	Receives wastewater discharge. The total footprint of the wetland area is 11.8ha but only 75% is taken as effective area due to earth works required for constructing cascade wetland features.
Total Area	**24.8**			

The proposed offline storm wetlands are distributed across the Otterpool Park Site and strategically located in the downstream section of the contributing catchment, prior to discharging 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 wetlands.

The current illustrative masterplan for the revised Otterpool Park OPA alone, includes over 60 ha 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. The water permanently stored in proposed wetlands and SuDS will form a part of a rainwater recycling strategy for non-potable usage within Otterpool Park 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.

The treated effluent from the onsite WwTW will then be routed through the proposed Wetland W13, prior to discharging to the East Stour. The total footprint of this large wetland area is approximately 11.8 ha but only 75% of this is taken as effective treatment area in Table 9 above to account for the earth works required for constructing small cascade wetland features on 1 in 20 sloping existing ground.

The long-term adoption and management of the onsite WwTW, including the associated sewer infrastructure and Wastewater Wetland (W13) will be provided by Severn Trent Connect. Similarly, Severn Trent Connect has confirmed that they can adopt the proposed stormwater wetlands and strategic SuDS system at Otterpool Park. Therefore, this is the currently preferred approach for the long-term maintenance of storm water wetlands and SUDS but alternatively, Otterpool Park Community Trust can take this responsibility if required. 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.

6. Summary

This technical note confirms that Otterpool Park Framework Masterplan and the two CSR site allocations,CSD9A and CSD9B,can achieve Nutrient Neutrality based on the proposals presented in this Technical Note. This will be achieved by:

- Direct treatment mitigation with the proposed Severn Trent Connect Onsite WwTW option (based on average household occupancy rate of 2.4, 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 24.8 ha of offline wastewater and stormwater wetlands, and 35 ha of new 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 current wetland area estimate is a precautionary estimate as advised by NE. For example, the urban area currently included in the nutrient budget assessment can be reduced by 25.2 ha if necessary, to account for extra SuDS within the urban parcels as per the revised Otterpool Park OPA/illustrative masterplan. In accordance with NE's published guidance, SuDS will have lower nutrient leaching rates (i.e. similar to SANG) than the urban areas currently used, which means that the wetland requirement can be reduced by another 1.8 ha, if this additional SuDS are considered in the detailed assessment.

This Technical Note demonstrates that Otterpool Park, CSD9A and CSD9B site allocations in FHDC Core Strategy Review can achieve nutrient neutrality, protecting the integrity of the downstream Stodmarsh designated sites and thereby can meet the required tests under the HRA. Therefore, it is recommended that FHDC Core Strategy Review Appropriate Assessment is updated based on findings of this Technical Note and a Statement of Common Ground with NE is also urgently prepared ahead of the upcoming Examination in Public to reflect this.

FHDC to also update their previous Nutrient Neutrality calculations for the other smaller site parcels ND4, ND5, ND8, ND9 AND ND10 (a total of circa 232 dwellings) that are within the little Wingham and Stour sub-catchment. These sites discharge downstream of Stodmarsh, which may need extra mitigation within the in-combination appropriate assessment of the CSR site allocations if required.

Arcadis and FHDC (in consultation with NE, EA and Severn Trent Connect) to continue developing the proposed onsite WwTW and wetland designs, maintenance and delivery programmes, and the associated cost estimates, prior to the submission of the revised Otterpool Park OPA.

APPENDIX J:

FOLKESTONE & HYTHE DISTRICT COUNCIL – PROPOSED MODIFICATIONS TO CORE STRATEGY REVIEW POLICY CSD5: WATER AND COASTAL ENVIRONMENTAL MANAGEMENT

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Policy CSD5

Water and Coastal Environmental Management

Development should contribute to sustainable water resource management which maintains or improves the quality and quantity of surface and ground water bodies, and where applicable, the quality of the coastal environment and bathing waters.

This will be achieved by protecting or enhancing natural water reserves through sustainable design and construction, managing development in relation to wastewater infrastructure, and promoting long-term resilience to climatic pressures on the coast and water systems. Proposals must be designed to contribute to the maintenance of a sustainable supply of water resources in the district; the achievement of water management plans for the district; and the maintenance of coastal ecological habitats (through seeking to avoid the inhibition of natural coastal processes).

Development will be permitted where the following criteria are met:

a. All developments should incorporate water efficiency measures appropriate to the scale and nature of the use proposed. Planning applications for the construction of new dwellings should include specific design features and demonstrate a maximum level of usage to meet the higher water efficiency standard under Regulation 36(3) of the Building Regulations to achieve a maximum use of 110 litres per person per day (including external water use). Proposals should demonstrate that water efficiency and water re-use measures have been maximised and should seek to significantly exceed this standard.

b. For non-residential development, the development achieves BREEAM 'outstanding' standard addressing maximum water efficiencies under the mandatory water credits, where technically feasible and viable; ~~and~~

c. New buildings and dwellings must be delivered in line with wastewater capacity, and designed so as to ensure that peak rate of surface water runoff from the site is not increased above the existing surface water runoff rate, incorporating appropriate sustainable drainage systems (SuDS) and water management features, with full consideration given to integration of water management. The quality of water passed on to watercourses and the sea must be maintained or improved, and flood risk must not be increased by developments within the district; and

d. Development which could have an impact on water quality in the Stodmarsh European-designated sites through increased nutrient levels from wastewater discharges into the River Stour catchment will be required to provide evidence on nutrient impacts through a nutrient budget approach. Planning permission will only be granted if:

   (i) The applicant can demonstrate, subject to meeting the tests of the Habitat Regulations, that the development would not have a significant effect on the Stodmarsh European sites either alone or in combination with other plans and projects and
   (ii) The applicant can demonstrate that the development will provide all requisite mitigation measures to avoid any likely significant effect on the Stodmarsh European sites as may be necessary for the life of the development through a design and implementation plan to be submitted to and approved by the Council.

Water reserves and the coastal environment will be maintained and enhanced through the council working with partners to manage development and upgrade water infrastructure and quality, and through green infrastructure provisions (policy CSD4).

5.68 Policy CSD5 highlights that the objectives of efficient water management and measures such as sustainable drainage systems (SuDS) need to be balanced with long-term coastal management and planning decisions.

5.69 It will also be necessary to ensure that development on brownfield land includes an appropriate strategy for addressing past contamination, where present, on a risk assessed basis. In practical terms this could lead to conflict with the objective to the implementation of SuDS, as infiltration drainage is not always appropriate on brownfield sites.

5.70 When planning new development and growth it is important to consider both local and strategic wastewater infrastructure. Local infrastructure generally comprises local sewers funded by the development, whereas strategic infrastructure encompasses trunk sewers, pumping stations and wastewater treatment works and is normally funded by the water company. Specific construction features (such as separate and adoptable quality foul and surface water sewers) are important to new developments.

5.71 New development in the North Downs area of the district has the potential to increase nutrient flows into the River Stour, flowing into the Stodmarsh system of European designated sites (Special Area of Conservation, Special Protection Area and Ramsar site), north east of Canterbury. Damage to the water quality of these sites (eutrophication) has been caused by high nutrient levels, particularly phosphorus but also nitrogen. Figure 5.4 below shows the likely extent of the affected catchments.

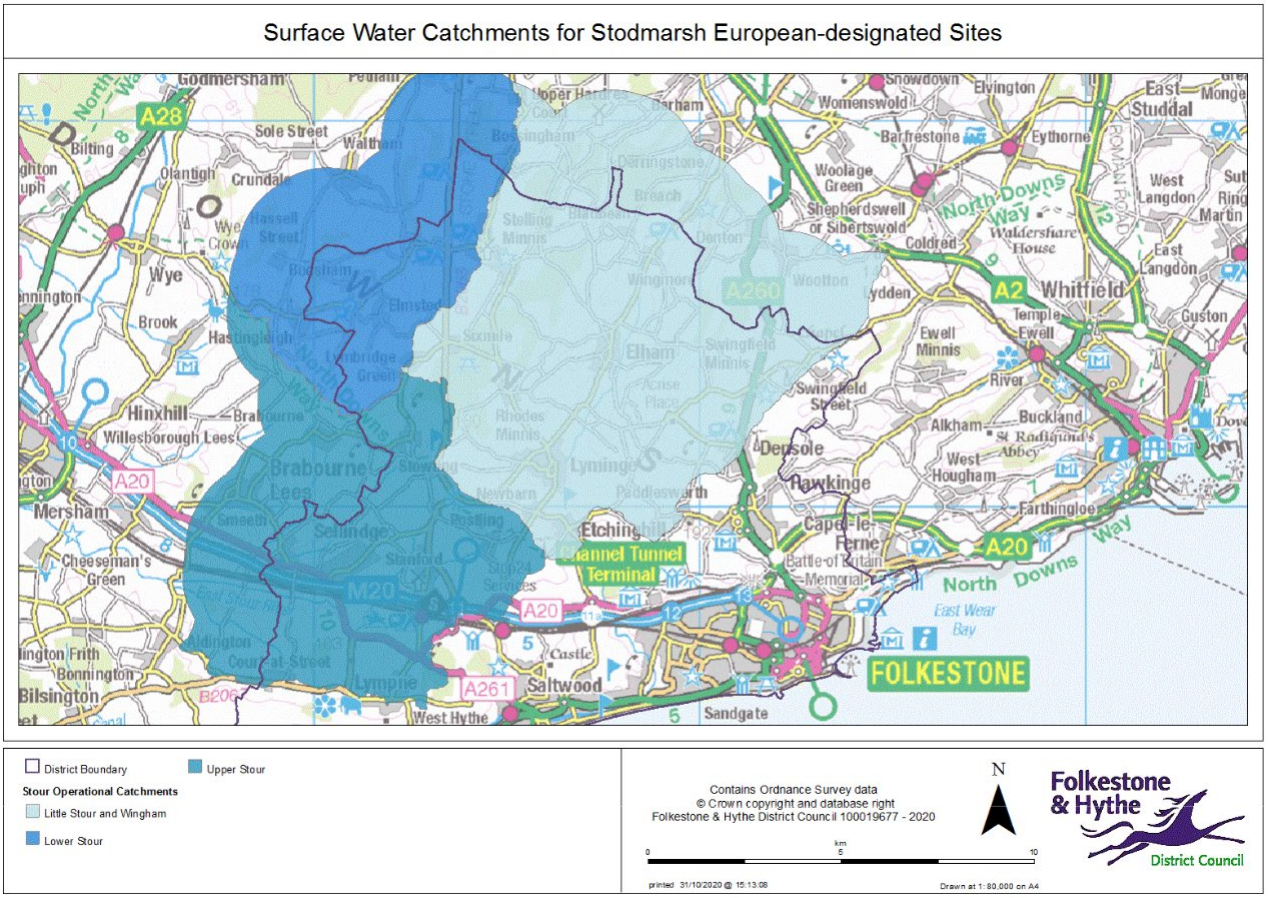

Figure 5.4: Likely extent of affected catchments within Folkestone & Hythe District

5.72 The council will work with Natural England to assess the likely impacts of development proposals, in line with the Conservation of Habitats and Species Regulations 2017. In assessing proposals, the council will have regard to Natural England's 'Advice on Nutrient Neutrality for New Development in the Stour Catchment in Relation to Stodmarsh Designated Sites' (July 2020, or subsequent updates) and applicants should follow this advice in developing their proposals. Developers will need to demonstrate, either that their proposals will not have a significant effect on the Stodmarsh sites, or that measures can be delivered whether on or off-site to avoid any impact, in line with Policy CSD5.

APPENDIX K:

NATURAL ENGLAND – EMAILTO FOLKESTONE & HYTHE DISTRICT COUNCIL REGARDING PROPOSED MODIFICATIONS TO CORE STRATEGY REVIEW POLICY CSD5: WATER AND COASTAL ENVIRONMENTAL MANAGEMENT (19 NOVEMBER 2020)

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From: [redacted]
To: [redacted]
Subject: RE: Folkstone: Proposed amended wording for Policy CSD5
Date: 19 November 2020 17:11:37
Attachments: image001.png

Dear [redacted],
Thank you for sending the redrafted Policy CSD5 of the Core Strategy Review for Natural England to make comments. We have had a look and are happy with the policy, however would suggest a slight change in wording.

> (ii) The applicant can demonstrate that the development will provide all requisite mitigation measures to **avoid adverse effects on integrity** on the stodmarsh European sites as may be necessary for the life of the development through a design and implementation plan to be submitted to and approved by the council.

Kind regards,
[redacted]

Lead Adviser | Sustainable Development |Sussex and Kent
[redacted]
Working Pattern: Monday-Friday : 09:00-17:00

www.gov.uk/natural-england

We are here to secure a healthy natural environment for people to enjoy, where wildlife is protected and England's traditional landscapes are safeguarded for future generations.

In an effort to reduce Natural England's carbon footprint, I will, wherever possible, avoid travelling to meetings and attend via audio, video or web conferencing.

During the current coronavirus situation, Natural England staff are working remotely and from some offices to provide our services and support our customers and stakeholders. Although some offices and our Mail Hub are now open, please continue to send any documents by email or contact us by phone to let us know how we can help you. See the latest news on the coronavirus at http://www.gov.uk/coronavirus and Natural England's regularly updated operational update at https://www.gov.uk/government/news/operational-update-covid-19.

Wash hands. Cover face. Make space.

[redacted]

Date: 1 November 2020 at 10:09:50 GMT
To: [redacted]
Cc: [redacted]
Subject: Proposed amended wording for Policy CSD5

Dear [redacted]

Following our discussions about the Stodmarsh issue, we have redrafted Policy CSD5 of the Core Strategy Review to take this into account (attached). We have used the approach that Havant District Council are taking in their plan.

Could you let me have the views of you and your colleagues on this policy? I'd be grateful if you could get back to me as soon as you can – we would hope to agree a revised policy with you that we could put to the Inspectors at the examination. We would include references in the garden settlement and Sellindge policies to highlight the requirements of Policy CSD5.

Many thanks for your help

[redacted]

[redacted]
Strategy, Policy & Performance Lead Specialist
Folkestone & Hythe District Council,
Civic Centre, Castle Hill Avenue,
Folkestone, Kent. CT20 2QY.
Office: 01303 853438
Mobile: [redacted]
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Website: www.folkestone-hythe.gov.uk

APPENDIX L:

NATURAL ENGLAND – LETTER TO FOLKESTONE & HYTHE DISTRICT COUNCIL (2 DECEMBER 2020)

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Date: 02 December 2020
Our ref: 11529/325393
Your ref: F&H NN updated memo Nov20

[redacted]
Senior Planning Policy Specialist
Arcadis on behalf of
Folkestone & Hythe District Council,
Civic Centre, Castle Hill Avenue,
Folkestone, Kent. CT20 2QY.

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

0300 060 3900

BY EMAIL ONLY
[redacted]

Dear [redacted]

Discretionary Advice Service (Charged Advice)

Development proposal and location: Folkestone and Hythe District Council proposed local plan Allocations including Otterpool and Sellindge pertaining to nutrients and their effects on Stodmarsh Special Protection Area (SPA), Special Area of Conservation (SAC) Ramsar Site, Site of Special Scientific Interest (SSSI) and National Nature Reserve NNR

Thank you for your consultation on the above dated and received on 04 November 2020.

This advice is being provided as part of Natural England's Discretionary Advice Service. Folkestone and Hythe District Council acting as a competent authority and planning authority has asked Natural England to provide advice upon:

- Folkestone and Hythe District Council housing proposals and allocations for their local plan specifically with respect to issues around nutrient neutrality.

This advice is provided in accordance with the Quotation and Agreement dated 12th June 2020.

The following advice is based upon the information within:

- Arcadis Otterpool Park Framework Masterplan – Nutrient Neutrality Mitigation Proposals - Technical Memo and appendices (Dated 4 November 2020 ref 10029956-AUK-XX-XX-FN-CW-0025-P2)
- Appendix 1 Otterpool Park existing land info
- Appendix 2 Otterpool Park Development Proposals
- Appendix 3 Sellindge Development Proposals
- Appendix 4 Nutrient Budget and Mitigation Proposals

The advice contained within this letter is restricted to the proposed nutrient neutral calculations with regard to the above documents. This is not the limit of Natural England's advice on the proposals and other environmental impacts and obligations that will apply, which are not covered in this response. The above documents recommend the calculations and mitigation proposals are added to an updated appropriate assessment for the local plan review. Natural England agree this step is required. Natural England has assessed a sample of the calculations in the spreadsheet but we have not checked the accuracy of every line or the hydraulic loading calculations.

Summary of Natural England's advice
As the competent authority, Folkestone and Hythe should satisfy itself that the values chosen and assumptions made are consistent with others used in the local plan. In addition, they are sufficiently precautionary to meet the tests for assessments of plans and projects set out in the Conservation of Habitats and Species Regulations (2017) as amended (HRA). The assumptions have been updated from previous versions of the calculation to be more precautionary, and now meet those suggested in the Natural England Nutrient Neutral methodology. Natural England updated our Nutrient Neutral methodology in November 2020 and the Otterpool and Sellindge calculations use the July version of the guidance. However, the changes made between July and November advice do not materially affect the calculations made for the Otterpool and Sellindge sites in the above documents.

Natural England's advice is that the calculations and mitigation proposals supporting documents provided above are likely to meet the HRA tests for water quality at the plan level. Our detailed advice contained in Annex I to this letter. Our role with regards protected species is in Annex II.

☒ The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Yours sincerely

[redacted]

On Behalf of Sussex and Kent Team

[redacted]

Annex 1
Natural England's detailed advice

1) Requirement for Appropriate Assessment

Natural England is the Statutory Nature Conservation Body with regards consultations on appropriate assessments for impacts of plans or projects and a statutory consultee on many planning applications. As the competent authority for the local plan, the Council should satisfy itself that the plan is able to meet the tests for assessments of plans set out in the Conservation of Habitats and Species Regulations (2017) as amended (HRA).

The Stodmarsh Nutrient Neutral methodology (NNM) we have proposed is one way for competent authorities to satisfy themselves that an adverse effect upon integrity of nutrient impacts of proposals can be avoided with sufficient certainty to meet the HRA tests. Natural England welcome the proposal (in the updated Arcadis memo) to update the appropriate assessment for the local plan review. We previously advised the types of information that should be included in the appropriate assessment (15 September 2020) and have not repeated that information here.

Natural England look forward to receiving the appropriate assessments consultation under the Conservation of Habitats and Species Regulations (2017) as amended that is proposed in the Arcadis updated report.

2) Changes to the calculations from previous versions

Natural England welcomes the changes to the nutrient budget calculations and additional information. We welcome:

- The confirmation of the potential sewerage service provider (Severn Trent Connect)
- The confirmation of the indicative licence for the new on-site WwTW and demonstration of discussion with the Environment Agency
- The confirmation that potential adoption of SuDs and wetland mitigation by the service provider to ensure ongoing maintenance
- The change in design and relative location of wetlands to better intercept nutrients and provide a permanent flow of water.
- Linking the wetlands to the rainwater harvesting system to help with water efficiency measures.
- The correction of the previous error with regards to woodland planting nutrient discharge figures
- The use of the 2.4 occupancy figure
- The inclusion of both 90 litres but also 110 litres per person per day water efficiency figures in calculation options and for reasons we previously noted the provision of mitigation for the 110 litres consumption figure.
- The inclusion of the two Sellindge parcels CSD9 A and CSD9 B to go to the new proposed WwTW and the inclusion of their mitigation in the calculations.
- Use of EA's *guidance manual for constructed wetlands, R&D Technical report P2-159/TR2* to provide the high level hydraulic loading assessments to check for efficacy of storm water drainage (though Natural England has not checked these calculations as it is a matter for the Environment Agency).

Natural England note the median value of nutrient removal described in Appendix 7 to NN Methodology appendix has been assumed. Arcadis note that further work will be done to refine this design and calculation going forward. Natural England consider this assumption to be reasonable for the large wetland W13 that will receive the hydraulic and nutrient loading from the WwTW and therefore be most likely to have the highest percentage removal rate of all the wetlands proposed.

Most of the remaining wetlands are small (less than the 2 hectares minimum recommended size for nutrient removal) and receive storm water flow. Assuming the same nutrient removal rate from these wetlands as the larger wetlands is not precautionary. Natural England note you have linked

the small storm water wetlands in series to increase their size and probable efficacy. Further evidence at the planning application stage will be required to ensure these small wetlands do not become net exporters of nutrients. In addition Natural England note that wetlands are on steep land, and an allowance has been made for the earthworks required to manage this in the wetlands surface area calculations. Natural England cannot advise on the efficacy of wetlands on such topography but recommend the applicant provides evidence for their chosen figures and likely efficacy.

Next steps
In addition to the updated appropriate assessment we note the mitigation for the small existing allocations in the "downstream" Wingham and Stour sub-catchment have not been included in these calculations. The Arcadis note advises the planning authority includes these smaller existing allocations within the in combination assessment. Natural England concur with this view.

Annex 2
European Protected Species

A licence is required in order to carry out any works that involve certain activities such as capturing the animals, disturbance, or damaging or destroying their resting or breeding places. Note that damage or destruction of a breeding site or resting place is an absolute offence and unless the offences can be avoided (e.g. by timing the works appropriately), it should be licensed. In the first instance it is for the developer to decide whether a species licence will be needed. The developer may need to engage specialist advice in making this decision. A licence may be needed to carry out mitigation work as well as for impacts directly connected with a development. Further information can be found in Natural England's 'How to get a licence' publication.

If the application requires planning permission, it is for the local planning authority to consider whether the permission would offend against Article 12(1) of the Habitats Directive, and if so, whether the application would be likely to receive a licence. This should be based on the advice Natural England provides at formal consultation on the likely impacts on favourable conservation status and Natural England's guidance on how the three tests (no alternative solutions, imperative reasons of overriding public interest and maintenance of favourable conservation status) are applied when considering licence applications.

Natural England's pre-submission Screening Service can screen application drafts prior to formal submission, whether or not the relevant planning permission is already in place. Screening will help applicants by making an assessment of whether the draft application is likely to meet licensing requirements, and, if necessary, provide specific guidance on how to address any shortfalls. The advice should help developers and ecological consultants to better manage the risks or costs they may face in having to wait until the formal submission stage after planning permission is secured, or in responding to requests for further information following an initial formal application.

The service will be available for new applications, resubmissions or modifications – depending on customer requirements. More information can be found on Natural England's website.