Appendix D

D.1 Nutrient Neutrality Assessment – For Sellindge WwTW alternative permit

Based on the previous communication with the EA (Appendix D.2) and Southern Water (Appendix D.3) and NE during the WCS production, it was confirmed that the nutrient budget calculations for Sellindge WwTW should use a TP permit of 0.3 mg/l and a TN permit of 25 mg/l if the Proposed Development is to be accommodated at an upgraded Sellindge WwTW. NE has previously reviewed Arcadis nutrient budget assessments based these permit levels and had raised no objections to use them. Therefore, this Appendix summarises the Nutrient Neutrality calculations associated with this potential alternative permit levels for comparison.

Table 25 WwTW TP and TN permit option

Description	Offsite (Sellindge) WwTW
TN permit	25 mg/l
TP permit	0.3 mg/l
90% of the proposed consent TN limit[1]	22.5
90% of the proposed consent TP limit[1]	0.27

Stage 1

Table 26 shows the Annual Wastewater TP and TN load by the OPA based on the TP and TN Permit levels for Sellindge WwTW against the two PCC water usage rates scenarios.

Table 26 Total Annual Wastewater TP and TN Load from the Sellindge WwTW alternative Option within OPA

Description	Sellindge WwTW Scenario 1		Sellindge WwTW Scenario 2	
	Annual wastewater TP load (kg/ TP/year)	Annual wastewater TN load (kg/ TN/year)	Annual wastewater TP load (kg/ TP/year)	Annual wastewater TN load (kg/ TN/year)
Class C3	223.1	18591.4	223.1	18591.4
Class C2	53.4	4452.6	40.2	3345.8
Class C1	6.9	576.9	5.2	432.7
OPA Final Stage 1 Output	**283.5**	**23620.9**	**268.4**	**22369.9**

Table 27 shows Annual Wastewater TP and TN load for the additional 44.29ha area covered by the FMP, as described in Section 3.1.

Table 27 Additional Total Annual Wastewater TP and TN Load from the Sellindge WwTW Option within FMP

Description	Sellindge WwTW Scenario 1		Sellindge WwTW Scenario 2	
	Annual wastewater TP load (kg/ TP/year)	Annual wastewater TN load (kg/ TN/year)	Annual wastewater TP load (kg/ TP/year)	Annual wastewater TN load (kg/ TN/year)
Class C3	24.1	2009.4	24.1	2009.4
Class C2	53.9	4494.0	40.5	3376.9
Class C1	0.0	0.0	0.0	0.0
Additional FMP Final Stage 1 Output	**78.0**	**6503.4**	**64.6**	**5386.4**

Stage 4

Table 28 gives a summary of the total estimated nutrient budgets for both the OPA and FMP, as described in Section 3.1.

Table 28 Nutrient Budget Assessment Summary for Sellindge WwTW Option

WwTW Option	Loading Area Coverage	Combined Load From WwTW and Land Use		Sensitivity Test - WwTW Load Only		Sensitivity Test - Land Use Load Only	
		TP (Kg/year)	TN (Kg/year)	TP (Kg/year)	TN (Kg/year)	TP (Kg/year)	TN (Kg/year)
Sellindge WwTW - PCC Scenario 1	Otterpool OPA Area Loading	594.3	20887.0	340.14	28345.03	254.21	-7458.02*
	Extra Otterpool FMP Area Loading	122.52	7892.42	93.65	7804.12	28.87	88.31
	TOTAL	**716.82**	**28779.42**	**433.79**	**36149.15**	**283.08**	**-7369.71**
Sellindge WwTW - PCC Scenario 2	Otterpool OPA Area Loading	576.3	19385.8	322.13	26843.82	254.21	-7458.02
	Extra Otterpool FMP Area Loading	106.43	6551.93	77.56	6463.62	28.87	88.31
	TOTAL	**682.73**	**25937.73**	**399.69**	**33307.44**	**283.08**	**-7369.71**

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

Nutrient Mitigation requirements

Table 29 below summarises the indicative total area of the new wetlands required to offset the nutrient budget shown in Table 28 gives a summary of the total estimated nutrient budgets for both the OPA and FMP, as described in Section 3.1.

Table 28 and Table 29 show that the WwTW load and wetland requirement, based on the Sellindge permit levels are nearly two times higher than the Onsite WwTW option and significantly increases the total load to be mitigated for the OPA and FMP areas.

Table 29 Mitigation Wetland Requirement Summary for Sellindge WwTW Option

WwTW Option	Loading Area Coverage	Combined Load From WwTW and Land Use		Sensitivity Test - WwTW Load Only		Sensitivity Test - Land Use Load Only	
		TP [1] Wetland Area (ha)	TN [2] Wetland Area (ha)	TP Wetland Area (ha)	TN Wetland Area (ha)	TP Wetland Area (ha)	TN Wetland Area (ha)
Sellindge WwTW – PCC Scenario 1	Otterpool OPA Area Loading	49.53	22.47	28.35	30.48	21.19	-8.01[3]
	Extra Otterpool FMP Area Loading	10.21	8.49	7.80	8.39	2.41	0.09
	TOTAL	**59.74**	**30.96**	**36.15**	**38.87**	**23.6**	**-7.92**
Sellindge WwTW - PCC Scenario 2	Otterpool OPA Area Loading	48.03	20.85	26.84	28.86	21.19	-8.01
	Extra Otterpool FMP Area Loading	8.87	7.05	6.45	6.95	2.41	0.09
	TOTAL	**56.9**	**27.9**	**33.29**	**35.81**	**23.6**	**-7.92**

[1] Assumed TN removal rate of 93 g/m^2/yr for both wastewater and stormwater discharges, which is a well-accepted figure as a Median Removal rate.

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

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

Implications

As discussed under Section 6.1, the latest Sellindge WwTW mitigation requirements can only be compared to the previous combined load (WwTWs and Land Use) in the previous WCS report. As seen in Table 30, the latest NE guidance has had a significant increase on the wetland areas required for this option (> 13 ha) to achieve nutrient neutrality. This also means that the total wetland area requirement is now 59.74 ha for the FMP out of which 36.15 ha will be required to treat wastewater discharge and the remaining 23.6 ha will be required to treat the land use runoff discharges, for the worst-cast PCC Scenario 1. Therefore, it is still not considered a suitable viable option for this development as it requires significant offsite wetland mitigation.

Table 30 Differences in total wetland area requirements for FMP

Nutrient Mitigation - Wetland Area Requirement Summary	PCC Rate – Scenario 1		PCC Rate – Scenario 2	
	Wetland for Area TP (ha)	Wetland for Area TN (ha)	Wetland for Area TP (ha)	Wetland for Area TN (ha)
Difference in previous WCS report Wetland areas against latest wetland areas – FMP Area	-13.34*	-1.05	-13.30	-1.09

*Negative values here mean that there has been an increase in wetland area when comparing the wetland areas from the previous WCS against the latest wetland areas calculated in this assessment.

D.2 EA Planning Advice

Blount-Powell, Elliot

From:	Kenway, Robert <robert.kenway@environment-agency.gov.uk>
Sent:	20 April 2018 17:03
To:	KSL Enquiries
Cc:	Wilson, Jennifer; Gunasekara, Renuka
Subject:	RE: KSL 81610 LB FW: KSL 72905 LB FW: Otterpool Park Garden Town - EA Planning Advice & Data Request
Attachments:	Otterpool indicative standards.docx
Importance:	High
Categories:	Red Category

Laura, I attach a document showing the results of modelling I carried out for Renuka at Arcadis. I have copied Renuka in on this response as I am aware of urgency for a meeting next week. I hope the information is useful.

Renuka raised some questions beyond modelling. My responses to these are below.

Point 3c. of 12 Jan email.

> c) If Southern Water is prepared to treat the final effluent to a much higher quality standard than at present at Sellindge WwTW and send back a portion of the extra treated effluent to Otterpool Park development for non-potable water recycling purpose (say 30% or 50% of the treated flow volume) then what are the relaxed permit conditions compared to (b) above in order to reflect the reduced extra DWF discharge to the receiving water environment on the East Stour. I appreciate that this would be subject to further discussion and agreement with Southern Water but I was wondering if you could provide some initial advice to facilitate such discussions and inform our WCS report?

The effect on permit conditions would depend on the permitted discharge retained. They would be somewhere in-between the values quoted for Sellindge above and the current permit (12 mg/L annual for BOD). An approximation based on proportions would be give an indication.

Note that there may be restrictions on what use such reused effluent may be put as it would still carry bacteriological and other contamination.

As you have noted, detailed discussions would be necessary with SWS to further this proposal.

Point 2. of 12 Jan email.

> What is the current DWF headroom available with the existing permit at West Hythe WwTW? Also, the quality parameters of the existing coastal discharge permit are currently less stringent than Sellindge WwTW. The additional environmental capacity available combined with minimal extra flood risk impact etc., it seems currently more favourable to accommodate Otterpool development at West Hythe WwTW but your views on this would be useful.

We do not hold accurate figures for available headroom at West Hythe WWTW. I am of the opinion however that the headroom would be insufficient for the large volumes of effluent you estimate for the Otterpool development. As a consequence, as described in our previous response a review of the permit would be likely to be required to determine whether further treatment, including microbiological is required. Headroom should be discussed in detail with SWS.

In general terms, whilst lower levels of treatment may be possible at West Hythe (than inland), and this might make it appear a preferable discharge option, there are considerable benefits to the inland discharge options from a hydrological point of view. This does of course depend on high levels of treatment being provided. We commented to this effect in our previous response.

Regards,

Robert

Robert Kenway
Environment Planning Specialist
Kent, South London & East Sussex Area - Integrated Environment Planning
✉ Orchard House, Endeavour Park, London Road, West Malling, Kent, ME19 5SH
☎ +442084746789 (internal 46789)
robert.kenway@environment-agency.gov.uk

From: KSL Enquiries
Sent: 10 April 2018 12:12
To: Kenway, Robert <robert.kenway@environment-agency.gov.uk>
Subject: KSL 72905 LB FW: Otterpool Park Garden Town - EA Planning Advice & Data Request

Hello Rob

Are you able to help with the customer's questions below?

Please respond by 17/04/2018.

Many thanks
Laura

Laura Buschini
Customers & Engagement Officer
Kent South London & East Sussex

Environment Agency | 0208 4746848 | Orchard House | Endeavour Park | London Road | West Malling | Kent | ME19 5SH

From: Gunasekara, Thushyantha [mailto:renuka.gunasekara@arcadis.com]
Sent: 29 March 2018 22:26
To: KSL Enquiries <KSLE@environment-agency.gov.uk>; Wilson, Jennifer <jennifer.wilson@environment-agency.gov.uk>
Subject: RE: KSL 72905 LB FW: Otterpool Park Garden Town - EA Planning Advice & Data Request

Hi Laura/ Jennifer,

Thank you for the responses.

I have a few further queries/requests on the information provided.

- 1st point on my second email dated 16th Jan (i.e. Details of any existing licenced surface water and ground water abstractions within or near Otterpool Park Site, including those within the rest of Shepway District)

  For some reason, you have forgotten to attach the stated spreadsheet and please forward this missing spreadsheet.

- 3rd point on my first email dated 12th Jan (i.e. Discharge permits to the East Stour)

  a) The estimated Dry Weather Flow (DWF) for up to 10,000 new homes associated with Otterpool wider masterplan is approximately 2,841 m3/day (i.e. assuming a PCC of 90 l/p/day with extra 30% allowance for any infiltration) but this will increase to 3,472 m3/day if we were to assume a higher PCC of 110 l/p/day. So, please indicate the likely new permit parameters for discharging both DWF figure scenarios (2,841 m3/day and 3,472 m3/day) from an onsite WwTW.

  b) Similarly, would it be possible to indicate the likely new discharge permit conditions associated with accommodating the above same DWFs (plus any other known committed sites in the existing catchment) to an upgraded Southern Water's Sellindge WwTW? Also what is the current DWF headroom available with the existing permit at Sellindge WwTW?

  c) If Southern Water is prepared to treat the final effluent to a much higher quality standard than at present at Sellindge WwTW and send back a portion of the extra treated effluent to Otterpool Park development for non-potable water recycling purpose (say 30% or 50% of the treated flow volume) then what are the relaxed permit conditions compared to (b) above in order to reflect the reduced extra DWF discharge to the receiving water environment on the East Stour. I appreciate that this would be subject to further discussion and agreement with Southern Water but I was wondering if you could provide some initial advice to facilitate such discussions and inform our WCS report?

- 2nd point on my first email dated 12th Jan (i.e. Discharge via West Hythe WwTW)

  What is the current DWF headroom available with the existing permit at West Hythe WwTW? Also, the quality parameters of the existing coastal discharge permit are currently less stringent than Sellindge WwTW. The additional environmental capacity available combined with minimal extra flood risk impact etc., it seems currently more favourable to accommodate Otterpool development at West Hythe WwTW but your views on this would be useful.

Please note that Otterpool Park Framework Masterplan was published last week with press releases issued to local, national and trade media. You can find both the Framework Masterplan
and the report on the website http://www.otterpoolpark.org/project-information/, which will provide some additional information on our emerging project proposals.

Finally, it would be very useful if we can have your additional responses by mid-April or late-April (at the latest) to inform the next steps. Please confirm the timescale and any charges associated with providing the requested new discharge permit requirements. As you are aware, we already have an agreed cost recovery mechanism with the Environment Agency for Otterpool project (see attached FYI) and I assume we can use this framework to cover your costs if necessary?

Kind regards
Renuka

Renuka Gunasekara | Technical Director | Renuka.Gunasekara@arcadis.com
Arcadis Consulting (UK) Ltd | Crystal Court, Aston Cross Business Village | 50 Rocky Lane, Aston | Birmingham, B6 5RQ, UK
M. + 44 (0) 7793 187 700 |
www.arcadis.com

From: KSL Enquiries <KSLE@environment-agency.gov.uk>
Sent: 27 February 2018 13:12
To: Renuka Gunasekara <renuka.gunasekara@arcadis.com>
Subject: KSL 72905 LB FW: Otterpool Park Garden Town - EA Planning Advice & Data Request
Importance: High

Dear Renuka

RE: KSL 72905 LB FW: Otterpool Park Garden Town - EA Planning Advice & Data Request

Thank you for your enquiry which was received on 12 January 2018.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

Please see last word document attached KSL 72905 LB Arcadis questions. Please also find attached relevant emails and deocuments.

Our planning department will contact you directly regarding the last 3 questions from your second email.

Please refer to the Open Government Licence which explains the permitted use of this information.

Please be aware that many of our datasets are now available online. Simply visit **environment.data.gov.uk**

If you have any further queries or if you'd like us to review the information we have provided under the Freedom of Information Act 2000 and Environmental Information Regulations 2004 please contact us within two months and we will happily do this for you.

We would be really grateful if you could spare five minutes to help us improve our service. Please click on the link below and fill in our survey – we use every piece of feedback we receive:http://www.smartsurvey.co.uk/s/EnvironmentAgencyCustomerSurvey/?a=KSL

Kind regards
Laura

Laura Buschini
Customers & Engagement Officer
Kent South London & East Sussex

Environment Agency | 0208 4749353 | Jabber 49353 | Orchard House | Endeavour Park | London Road | West Malling | Kent | ME19 5SH

From: KSL Enquiries
Sent: 22 February 2018 09:55
To: 'renuka.gunasekara@arcadis.com' <renuka.gunasekara@arcadis.com>
Subject: KSL 72905 LB FW: Otterpool Park Garden Town - EA Planning Advice & Data Request
Importance: High

Dear Renuka

Thank you for your enquiry which was received on 12 January 2018.

I have been in contact with our planning department and we are currently collating the information from our teams. Apologies there will be a delay in providing the information requested.

We have provided the information for the question below.

1. Existing discharge permit details for Southern Water's West Hythe Wastewater Treatment Works (WwTW) located @ NGR E 612665, N 133120 and Sellindge WwTW located @ NGR E 608600 N 138200, including the location of existing discharge points.

We are aiming to provide the rest of the information early next week.

Kind regards
Laura

Laura Buschini
Customers & Engagement Officer
Kent South London & East Sussex

Environment Agency | 0208 4749353 | Jabber 49353 | Orchard House | Endeavour Park | London Road | West Malling | Kent | ME19 5SH

From: KSL Enquiries
Sent: 09 February 2018 17:09
To: 'renuka.gunasekara@arcadis.com' <renuka.gunasekara@arcadis.com>
Subject: KSL 72905 LB FW: Otterpool Park Garden Town - EA Planning Advice & Data Request
Importance: High

Dear Renuka

Thank you for your enquiry which was received on 12 January 2018.

We are currently collating information from our teams and apologies, there will be a delay in providing the information requested.

We have provided the information for the question below which we received via three Environmental permit requests. I have attached the email responses which contain the permits.

1. Existing discharge permit details for Southern Water's West Hythe Wastewater Treatment Works (WwTW) located @ NGR E 612665, N 133120 and Sellindge WwTW located @ NGR E 608600 N 138200, including the location of existing discharge points.

We will aim to provide the rest of the information as soon as we can.

Kind regards
Laura

Laura Buschini
Customers & Engagement Officer
Kent South London & East Sussex

Environment Agency | 0208 4749353 | Jabber 49353 | Orchard House | Endeavour Park | London Road | West Malling | Kent | ME19 5SH

From: Renuka Gunasekara [mailto:renuka.gunasekara@arcadis.com]
Sent: 12 January 2018 20:46
To: Wilson, Jennifer <jennifer.wilson@environment-agency.gov.uk>
Cc: Aimee Hart <Aimee.Hart@arcadis.com>
Subject: Otterpool Park Garden Town - EA Planning Advice & Data Request

Hi Jennifer,

Hope that you're well.

Please see below a specific request for your urgent attention to inform our Otterpool WCS preparation.

2. Existing discharge permit details for Southern Water's West Hythe Wastewater Treatment Works (WwTW) located @ NGR E 612665, N 133120 and Sellindge WwTW located @ NGR E 608600 N 138200, including the location of existing discharge points.

3. What future permit levels are likely to be imposed by the Environment Agency if the proposed Otterpool Garden Park Site, which may accommodate up to 10,000 homes is also to be treated at West Hythe WwTW? If this information is not readily available would the Environment Agency currently have any significant water quality or flood risk concerns due to the additional wastewater flows from West Hythe WwTW due to the proposed Otterpool Garden Park Site and any other new growth in this specific wastewater catchment?

4. What future permit levels are likely to be imposed by the Environment Agency if the proposed Otterpool Garden Park Site would have an onsite WwTW with a potential discharge point to the River East Stour (@ NGR E 609426, N 137712) subject to satisfactorily meeting any downstream flood risk concerns? Please note that potential flood mitigation measures that we can consider may include provision of large effluent polishing wetlands for the WwTW, a range of onsite infiltration and attenuation SuDS measures, rainwater and/or treated wastewater effluent reuse, active low management measures.

5. If the Environment Agency is currently unable to provide the information for item 3 above, can the WFD/ water quality data be provided for us to assess the potential impact of the growth at Otterpool Park Garden Site due to onsite WwTW discharge. I have attached an example dataset, to outline the data required but if you have any specific queries my colleague, Aimee Hart can assist you on this specific query.

    - **Water Quality Data**- Monitored water quality data (to include BOD, phosphorous, ammonia etc.) for the watercourses in the location of both discharge points (ideally upstream and downstream of the discharge point). Both the mean values and standard deviation values are required. Please include the mean, 90%ile and SWD Good Status midpoint values for BOD, phosphorous and ammonia to use where water quality is less than good or where there is no data available.
    - **Flow data-** Q95 exceedance flow and mean flow data for the all WRC discharge point locations.

A quick response to the above would be much appreciated as we are now entering a critical phase of the WCS as the development masterplan and planning strategy is becoming more clearer now.

As WCS work progresses, we may need to request additional information and advice. We will keep our requests to a minimum, but consistent with performing a thorough analysis.

Regards
Renuka

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Environment Agency KSLES area

Integrated Environment Planning Team

Response to query KSL 81610 LB dated 10 April 2018

Request for indicative discharge permit standards relating to new Otterpool Park Garden Town development sewage effluent

Response date 20 April 2018.

All results provided are indicative only and for assistance with Otterpool Park Framework Master planning process. The results provided are subject to review upon submission and determination of a permit application.

Options Tested

1. Effluent treated at existing Sellindge wwtw (Southern Water Services; SWS), discharging to Horton Priory Dyke (HPD) tributary of East Stour,
2. Effluent treated at new wwtw discharging to East Stour 1 km upstream of HPD confluence,
3. Effluent treated at new wwtw discharging to East Stour at HPD confluence.

Results for both 'Lower' and 'Upper' effluent volumes have been requested.

1. Sellindge wwtw. @ 608600 138200
   Targets used in modelling: Equivalent impact on the HPD as allowed by the current permit to ensure no deterioration and also a proposed PR19 phosphorus improvement scheme (achieve good status in East Stour).

   Dry weather flow (DWF) of current permit increased to accommodate flows from Otterpool development. Allowance made for headroom at Sellindge – based on current DWF and an estimate of long term (2045) 'committed to' growth at the WWTW. An accurate assessment should be requested from SWS. We have estimated headroom for the purposes of these calculations as 558 m3/day. Resulting Lower (Sellindge) DWF = 3877 m3/day; Upper DWF = 4508 m3/day

   Seasonal look up table BOD limits in current permit converted to annual for the purposes of these calculations. Permit: 8 mg/L summer, 15 mg/L winter. Converted to 12 mg/L annual.

2. New WWTW to East Stour upstream of HPD confluence. @ 609426 137712
   Targets: 3% deterioration from present quality in East Stour at this point.
   Lower (Otterpool) DWF = 2841 m3/day; Upper DWF = 3472 m3/day.
   Sellindge WWTW current permit unaltered.

3. New WWTW discharge to East Stour at HPD confluence. @ 608558 138047
   This option investigated due to very stringent standards resulting from option 2 above.
   Targets. Equivalent impact on the East Stour using the permitted impact of Sellindge WWTW as a baseline from which to ensure no deterioration.
   Proposed PR19 P scheme also used as baseline.
   Lower (Otterpool) DWF = 2841 m3/day; Upper DWF = 3472 m3/day.
   Sellindge WWTW current permit unaltered.

Information sources used in modelling:
Permitted DWF at Sellindge.
Estimate of Otterpool 'Lower' and 'Upper' DWF provided by Arcadis consulting.
Qm and Q95 in HPD and East Stour
Sellindge effluent quality monitoring point Ref E0001437.
Horton Priory Dyke monitoring point u/s Sellindge wwtw Ref E0001432; 'HORTON PRIORY DYKE RAILWAY BRIDGE'
East Stour monitoring point u/s HPD confluence Ref E0001424; 'EAST STOUR HARRINGE COURT'
Sellindge WWTW Ref E0001437; 'SELLINDGE SEWAGE TREATMENT WORKS FINAL EFFLUENT'

Results:

Results provided as Look Up Table/Upper Tier limits for BOD and Ammonia and mean limits for phosphorus. Upper Tier limits are standard Environment Agency 'read across' values.

	BOD mg/L		Ammonia mg/L		Phosphorus mg/L	
DWF	Lower	Upper	Lower	Upper	Lower	Upper
Sellindge wwtw	8/45	8/45	2/12	2/12	0.3	0.3
E Stour U/S	5/20	*	0.5/12	*	0.1	*
E Stour/HPD	8/45	7/44	2/12	2/12	0.3	0.3

* Not calculated due to very stringent limits calculated for lower DWF

Lower (Otterpool) DWF = 2841 m3/day; Upper DWF = 3472 m3/day. Note equivalent DWF at Sellindge would be 3877 (Lower) and 4508 (Upper) m3/day.

R Kenway

20 April 2018

D.3 Southern Water Advice

Blount-Powell, Elliot

From: Winterburn, David <David.Winterburn@southernwater.co.uk>
Sent: 07 July 2020 16:54
To: McKnight, Sara; Edevane, Joff; Blackwell, Vanessa; Sharp, Simon; Gareth King; Earl, Ben; andy.jarrett@folkestone-hythe.gov.uk; James Brett; Gunasekara, Renuka
Subject: RE: Otterpool - SW catch up notes

All,

Following today's meeting, please see below responses that had my name against them;

1. The cost of upgrading West Hythe would be the subject of another feasibility study**. DW to confirm if any work was done on this previously as initially, discharge to West Hythe was the preferred option**.
KCC/AECOM Kent Water for Sustainable Growth Study (2017) also identified West Hythe as SW's preferred option for Otterpool.
Follow up was made with Paul Goodwin on this matter and he informs me that pumping to West Hythe WTW was looked at as part of the Price Review 19. This option was discounted on the grounds of technical difficulties and cost;
    - Significant distance for the transfer of flows
    - Significant potential for an EIA related to the pipeline
    - Limited land availability within the existing site boundary
    - Treatment works served by a single pumping station (Range Road), which accommodates the preliminary treatment for the catchment prior to flow transfer to the treatment works, limited expansion capacity available at the pumping station site
    - Significant uprating of pumping capability and rising main required if Otterpool flows are transferred to Range Road
    - Flows from treatment works are pumped back to Range Road prior to pumping down long sea outfall, the increase in flow will require new transfer pumps and rising main between West Hythe WTW and Range Road PS
    - Increased flows may require new/additional long sea outfall
    - As there is no storage at West Hythe the incoming flow and outgoing flows are finely balanced, introducing additional flows directly to West Hythe will make the management of flows more complex

    Treatment of the additional full development flow was considered by increasing the existing FFT by 120l/s, utilising the existing works with additional processes. The requirements would be for new inlet screening and grit removal; additional ASP lane with upgrades to the RAS pumps and intermediate pumps; 2 No. new FSTs; 1 No. new sludge holding tank; upgrade of effluent return pumps and upgrade of power facilities. This notional solution excluded an assessment of the outfall condition and its ability to accept the additional flows, which remained a significant risk to this option.

13. The DWFs as calculated by Arcadis reflect 90l/ person/day and 110l/person/day for new homes as per latest Local Plan policy. SW DWFs are currently calculated on 500l/dwelling as per SW's design guide which given an average occupancy of 2.4 people is significantly higher. This is how SW is currently addressing their risks related to potential breaching of the permit conditions at West Hythe WwTW. This difference may affect both the need for negotiating a new discharge permit with the EA and the extent of the upgrade, which will be considered as part of the R&V process. **DW to investigate this further within SW and advise Arcadis what pcc value should be used for the purpose of Otterpool WCS update, Local Plan HRA Update etc.**
The assumptions / design criteria for the infrastructure (pipeline) was based on:
    - Peaking factor of 4DWF used for optimal sizing for SWS method
    - Occupancy - 2.4 people/property
    - Consumption - 125l/person/d
    - Infiltration - 10%

• Assumed that the Health facilities are hospitals and will discharge over a 24hour period. This will be the worst case situation.

Main item is we have used 125l/person/d which is to SW standards.

In order to calculate the design per capita return to sewer rate (G) = 115.6 L/hd.d, we assumed a PCC = 125 L/hd.d and a return rate of 92.5%. There is concern with adopting a PCC of 110 L/hd.d for the non-infra design of the wastewater treatment facilities.

In the non-infra design for the wastewater treatment facilities the Infiltration rate for the Otterpool Park Garden Town development was calculated based on the EA storm overflow guidelines which states *"The infiltration allowance for the increase in population is normally at 50% of the per capita rate of infiltration in the existing sewerage system."* with the existing per capita rate of infiltration based on the Sellindge WTW catchment. Whereas Arcadis appear to have assumed an infiltration rate of 25%.

Please find below an extract from the position statement we issued to the EA in order to determine the discharge permit conditions for the proposed Sellindge WTW expansion to accept flows from the Otterpool Park Garden Town development. The position statement was based upon a phased approach with design / permitting horizons of 2035 and 2045. This information / approach was accepted by the EA.

Parameter	Formulae/comments	Catchment	Units	Existing Permit	2035	2045
Population, resident, P_R		Sellindge	hd		8,420	8,836
		Otterpool	hd		13,140	24,000
Population, non-resident, P_{NR}		Sellindge	hd		170	170
		Otterpool	hd		27	27
Population equivalent, P	$P_R + P_{NR}$	Sellindge	hd		8,590	9,006
		Otterpool	hd		13,167	24,027
Per capita return to Sewer, G	92.5% of 125 l/hd.d		l/hd.d		115.6	115.6
Trade, E		Sellindge	m^3/d		1.48	1.48
		Otterpool	m^3/d		0	0
Infiltration*1, I_{dwf}		Sellindge	m^3/d		403	418
		Otterpool	m^3/d		488	890
DWF	$DWF_{2015} + (P-P_{2015})G/1000 + I_{dwf}$	Sellindge	m^3/d	1,594	1,038*2	1,101*2
	$PG + I_{dwf} + E$	Otterpool	m^3/d		2,010	3,668
		Combined	m^3/d		3,048	4,770

With reference to the below TN query that was asked by Renuka on 02 June;

The response I've had is as follows:
"The new plant wasn't designed specifically for total N. However, we did include an anoxic selector, so you can expect around 50% TN removal, so I would recommend 25 mg/l TN as a value to use in nutrient loading calculations. If they agency insist on a lower TN, its relatively easy to implement in the MBR, as the recirculation is already there. The MBR at Woolston achieves TN of 15 mg./l with no carbon addition."

Hope the above is of help.

Regards,

David Winterburn
Senior Project Manager (Engineering & Contruction)

Southern Water
T. 07733315335
www.southernwater.co.uk

From: McKnight, Sara [mailto:sara.mcknight@arcadis.com]
Sent: 04 June 2020 13:01
To: Edevane, Joff <Joff.Edevane@southernwater.co.uk>; Blackwell, Vanessa <Vanessa.Blackwell@southernwater.co.uk>; Sharp, Simon <Simon.Sharp@southernwater.co.uk>; Gareth King <Gareth.King@albionwater.co.uk>; Winterburn, David <David.Winterburn@southernwater.co.uk>; Earl, Ben <Ben.Earl@southernwater.co.uk>; Andy.Jarrett@folkestone-hythe.gov.uk; James Brett <james@miltonstudio.co.uk>; Gunasekara, Renuka <renuka.gunasekara@arcadis.com>
Subject: Otterpool - SW catch up notes

Dear All,

Further to yesterday's meeting, please find below a list of actions / points raised.

1. The Risk and Value 1 did not take place on 29th May. It is expected to be rescheduled for June – **VB to confirm new date**.
2. With regard to charging, it was confirmed that if there is no point of connection, connection charges are not payable but the developer would be expected to pay for the network.
3. The S98 sewer requisition process would follow a decision on which treatment works ie West Hythe or Sellindge. This is likely to be determined following R&V3 in 2 – 3 months.
4. The cost of upgrading West Hythe would be the subject of another feasibility study**. DW to confirm if any work was done on this previously as initially, discharge to West Hythe was the preferred option**. KCC/AECOM Kent Water for Sustainable Growth Study (2017) also identified West Hythe as SW's preferred option for Otterpool.
5. The developer cannot pay for treatment works upgrades.
6. JE provided indicative costs for quality upgrade costs to the WwTWs based on population equivalent figures from the Solent study.
7. Southern Water typically use 9 – 10 mg/l for Total Nitrogen levels when planning for future upgrades.
8. Arcadis' initial calculations show that nutrient neutrality (for both Nitrogen and Phosphorus) will be an issue at Otterpool for both Sellindge and onsite WwTW options. Consideration is to be given to the feasibility of providing a notable level Nitrogen and Phosphorous offsetting across the catchment if either of these WwTW options is to be taken forward - **RG**.
9. The Winep Study which looks specifically at the impact of all impacted WwTWs in the River Stour catchment (including Sellindge) on Stodmarsh Lakes is due in 2022.
10. It is not known if / when Natural England and the EA will do a review of permits into the Stour but even if nitrogen was reduced at Sellindge to 10mg/l there would still be neutrality issues if Otterpool is also to be connected to the WwTW. This shows treatment upgrade costs alone could be between £5M to £7.5M.
11. There are similar concerns about achieving nutrient neutrality with the on-site treatment options but further treatment could be provided using reed beds.
12. Arcadis' West Hythe WwTW headroom calculations based on DWFs suggest that there is capacity for Otterpool plus the committed sites and other future developments in the Local Plans / Places and Policies Site Allocations in this treatment catchment. However, Southern Water noted that DWF headroom does not necessarily equate to the treatment capacity. This will be looked at as part of the R&V process.
13. The DWFs as calculated by Arcadis reflect 90l/ person/day and 110l/person/day for new homes as per latest Local Plan policy. SW DWFs are currently calculated on 500l/dwelling as per SW's design guide which given an average occupancy of 2.4 people is significantly higher. This is how SW is currently addressing their risks

related to potential breaching of the permit conditions at West Hythe WwTW. This difference may affect both the need for negotiating a new discharge permit with the EA and the extent of the upgrade, which will be considered as part of the R&V process. **DW to investigate this further within SW and advise Arcadis what pcc value should be used for the purpose of Otterpool WCS update, Local Plan HRA Update etc.**

14. If Otterpool discharges to West Hythe, it would not be possible to have a return supply for recycling. However a bulk supply from Sellindge for reuse would still be a potential option. Rainwater harvesting using SuDS is also another likely option that Aracdis is currently exploring further to address this issue (i.e. with all three WwTW options being considered).

Date of next meeting to be confirmed once R&V1 date is known. **SM** to invite Affinity Water to the meeting.

Please let me know if you have any comments.

Kind Regards,

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Appendix E

Hydraulic Loading Calculations

Hydraulic Loading Calculations

Wetland Details Summary

Wetland_ID (See Note 1)	Wetland Area (m2)	Wetland Area (ha)	Wetland Depth (m)	Treatment depth (m)	Comments
W1	14609	1.46	0.72	0.34	Receives storm discharge. W1, W2, W3 & W8 are interlinked (Total area 4.9ha).
W2	9161	0.92	0.73	0.31	Receives storm discharge. W1, W2, W3 & W8 are interlinked (Total area 4.9ha).
W3	9365	0.94	0.45	0.04	Receives storm discharge. W1, W2, W3 & W8 are interlinked (Total area 4.9ha).
W4	17028	1.70	0.37	0.09	Receives storm discharge
W5	21077	2.11	0.46	0.18	Receives storm discharge
W6	26315	2.63	0.87	0.34	Receives storm discharge
W7	24838	2.48	0.54	0.15	Receives storm discharge
W8	16076	1.61	0.79	0.57	Receives storm discharge. W1, W2, W3 & W8 are interlinked (Total area 4.9ha).
W9	2692	0.27	0.73	0.17	Receives storm discharge. W9 & W10 are interlinked (Total area 1.58ha)
W10	13151	1.32	0.81	0.16	Receives storm discharge. W9 & W10 are interlinked (Total area 1.58 ha)
W11	10004	1.00	0.65	0.02	Receives storm discharge. W11 & W12 are interlinked (Total area 2.3 ha).
W12	12623	1.26	0.34	0.05	Receives storm discharge. W11 & W12 are interlinked (Total area 2.3 ha).
W14	11103	1.11	0.38	0.10	Receives storm discharge
W13	97597	9.76	0.50	0.25	Receives wastewater discharge. The total footprint of the wetland is 13.0ha but only 75% is taken as effective area (9.76ha) due to earth works required for cascade wetland features.
W15	17661	1.77	0.50	0.25	Wastewater Wetland W15 for the extra FMP flows has been extended further south within the current Public Open Space and wetland area increased to 2.73 ha . However, only 65% is taken as effective area (1.77ha) to account for the terraced wetland features and bridle way.
	285640	**30.33**			

Additional Stormwater Wetlands

Wetland_ID (See Note 1)	Wetland Area (m2)	Wetland Area (ha)	Wetland Depth (m)	Treatment depth (m)	Comments
ASW1	10640	1.06	1.2	0.06	Treats OPA Site storm discharge. ASW1, W4 & W5 when interlinked can give a total area of 4.87ha.
ASW2	2114	0.21	1.2	0.22	Treats OPA Site storm discharge. ASW2, ASW3, W9, W10, W11 and W12 when interlinked can give a total area of 4.86 ha.
ASW3	8036	0.80	1.2	0.06	Treats s OPA Site storm discharge. ASW2, ASW3, W9, W10, W11 and W12 when interlinked can give a total area of 4.86ha.
ASW4	6269	0.63	1.2	0.03	Treats OPA Site storm discharge.
ASW5	6645	0.66	1.2	0.17	Treats OPA Site storm discharge.
ASW6	7630	0.76	1.2	0.13	Treats OPA Site storm discharge.
ASW7	2600	0.26	1.2	0.18	Treats OPA Site storm discharge. ASW7 and W14 when interlinked can provide a total area of 1.37 ha.
ASW8	4883	0.49	1.2	0.14	Treats OPA Site storm discharge. ASW8 and ASW9 when interlinked can provide a total area of 0.95 ha.
ASW9	4659	0.47	1.2	0.10	Treats extra FMP Site storm discharge. ASW8 and ASW9 when interlinked can provide a total area of 0.95 ha.
	53475	**5.35**			
	Total	**35.68**			

* Wetland area has been increased from the previous wetland areas in WCS (Table 20 in Nutrient Budget Analysis Update report, October 2022).

Hydraulic Loading Calculations

Preliminary Hydraulic Loading Calcs For Storm Wetlands

				First Flush Treatment Storage Check - using 15mm depth (Based on EA R&D Technical Report P2-159/TR2)			Alternative Treatment Storage Check - (Based on EA R&D Technical Report P2-159/TR2)		
Storm Wetland	Contributing Drainage Zones (See Notes 2 and 3)	Contributing Storm Drainage Zone Area (ha)	Estimated Storm Catchment Impermeability (%)	Paved First Flush Volume (m3)	Average Treatment Depth (m)	WWAR (%)	Treatment Storage Rq (m3/ha) - Ref Figure 2.2	Treatment Storage Rq (m3)	Average Wetland Depth (m)
W1	WH1 (75%), ET1, ET2	66.76	49%	4943	0.34	2%	62	4139	0.28
W2	WH2 (80%), ETS	33.69	56%	2853	0.31	3%	67	2257	0.25
W3	WH1 (25%)	8.20	33%	409	0.04	11%	48	394	0.04
W4	RS2, RS3 & RH4	23.04	43%	1502	0.09	7%	56	1290	0.08
W5	RS1, WH3, E03 & WO2	62.45	41%	3857	0.18	3%	55	3435	0.16
W6	BH1, BH3, BH6, BH7, WO4	121.94	49%	8997	0.34	2%	62	7560	0.29
W7	W01, W03, BH2, BH4, BH5 & Phase 9	101.25	24%	3678	0.15	2%	41	4151	0.17
W8	WH2 (20%), WN1, WN2, EO4, SO6(30%), EO1 (70%), EO2, SO1, SO2 (70%), SO3, SO4, S05	131.97	46%	9150	0.57	1%	59	7786	0.48
W9	RS5 (25%)	4.87	64%	467	0.17	6%	74	360	0.13
W10	WH5, RS5 (75%)	23.02	62%	2129	0.16	6%	73	1680	0.13
W11	WH4 (30%)	4.74	34%	244	0.02	21%	50	237	0.02
W12	WH4 (70%)	11.05	34%	570	0.05	11%	50	553	0.04
W14	EO5, EO1 (30%), SO2 (30%)	21.57	36%	1163	0.10	5%	51	1100	0.10
				39959				**34943**	

Preliminary Hydraulic Loading Calcs For Additional Storm Wetlands

			First Flush Treatment Storage Check - using 15mm depth (Based on EA R&D Technical Report P2-159/TR2)				Alternative Treatment Storage Check - (Based on EA R&D Technical Report P2-159/TR2)		
Storm Wetland	Contributing Drainage Zones (See Notes 2 and 3)	Contributing Storm Drainage Zone Area (ha)	Estimated Storm Catchment Impermeability (%)	Paved First Flush Volume (m3)	Average Treatment Depth (m)	WWAR (%)	Treatment Storage Rq (m3/ha) - Ref Figure 2.2	Treatment Storage Rq (m3)	Average Wetland Depth (m)
ASW1	RS3 (50%), RS4	8.34	55%	691	0.06	13%	65	542	0.05
ASW2	RS5 (25%)	4.86	64%	467	0.22	4%	74	360	0.17
ASW3	RS5 (25%)	4.86	64%	467	0.06	17%	74	360	0.04
ASW4	EO2 (25%) EO3 (5%)	5.43	20%	161	0.03	12%	38	206	0.03
ASW5	SO4 (10%) SO5 (25%) SO1	16.15	45%	1097	0.17	4%	58	937	0.14
ASW6	BH7 (40%) WO2 (50%)	15.96	40%	958	0.13	5%	54	862	0.11
ASW7	E05, SO2 (30%)	12.69	24%	457	0.10	4%	42	533	0.11
ASW8	WO1 (25%), WO3 (10%)	9.16	50%	688	0.14	5%	64	586	0.12
ASW9	FMP1	7.44	40%	447	0.10	6%	54	402	0.09
				5432				**4788**	

Preliminary Hydraulic Loading Calcs For Wastewater Wetland (W13) - Only OPA

	Effective Wetland Area (m2) - See Note 4	Effective Wetland Depth (m)	Max Dry Weather Flow, DWF (m3/day)	Hydraulic Retention Time, HRT (days) - See note 5	Hydraulic Loading Rate, HRT (m/day) - See Note 5
OPTION 1 - Assuming 50mm effective treatment depth	97597	0.05	2685.72	1.8	0.03
OPTION 2 - Assuming 150mm effective treatment depth	97597	0.15	2685.72	5.5	0.03
OPTION 3 - Assuming 250mm effective treatment depth	97597	0.25	2685.72	9.1	0.03

For Wastewater Wetland (W13 & W15) - Only OPA/FMP

	Effective Wetland Area (m2) - See Note 6	Effective Wetland Depth (m)	Max Dry Weather Flow, DWF (m3/day)	Hydraulic Retention Time, HRT (days) - See note 5	Hydraulic Loading Rate, HRT (m/day) - See Note 5
OPTION 1 - Assuming 50mm effective treatment depth	115258	0.05	3456.70	1.7	0.03
OPTION 2 - Assuming 150mm effective treatment depth	115258	0.15	3456.70	5.0	0.03
OPTION 3 - Assuming 250mm effective treatment depth	115258	0.25	3456.70	8.3	0.03

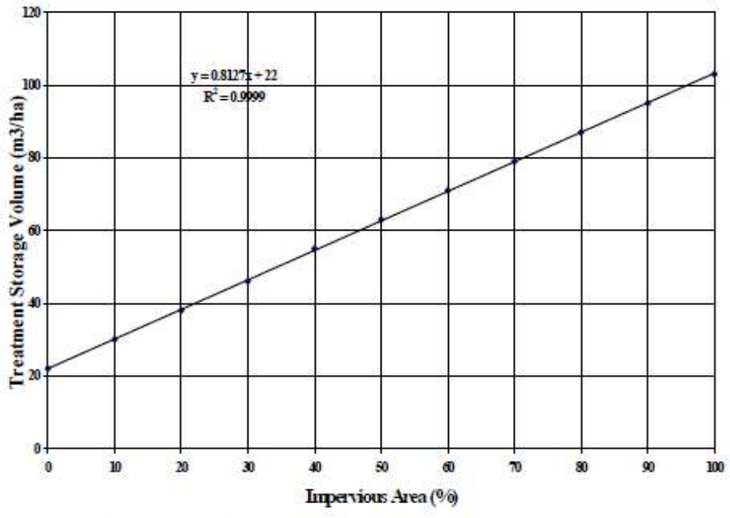

Figure 2.2 Wetland Treatment Storage Volumes

Notes

1. Proposed Wetland locations are shown on Drawing No. 10029956-AUK-XX-XX-DR--CW-0041-P3 (Proposed Nutrient Mitigation Strategy) in Appendix F.
2. Proposed Surface Water Drainage Zones are shown on Drawing No. 10029956-AUK-XX-XX-DR-CW-0014-P5 (Surface Water Drainage Strategy Overview) in Appendix A
3. Proposed Surface Water Drainage Strategy is shown on Drawing No. 10029956-AUK-XX-XX-DR-CW-0014-P5 (Surface Water Drainage Strategy Overview) in Appendix A
4. Total wetland area for W13 is 13.01ha but assumed 75% for effective wetland area and remaining 25% for creating bunds for cascade features (i.e. @ 1 in 20 existing ground slope).
5. The above shows that HRT of > 5 days and HLR of < 0.1 m/day can be achieved with the proposed WwTW wetland W13 (Option 3 - 250mm effective treatment depth) and therefore meets the recommended wetland design guidance.
6. Total wetland area for W15 is 2.73ha but assumed 65% for effective wetland area and remaining 35% for creating bunds for cascade features (i.e. @ 1 in 20 existing ground slope).

Appendix F

AECOM’s Nitrogen and Phosphorus Nutrient Neutrality Habitats Regulations Assessment

Nitrogen and Phosphorous Nutrient Neutrality Habitats Regulations Assessment

For: Otterpool Park

Prepared on behalf of:
Folkestone and Hythe District Council

January 2022

Quality information

Prepared by	Checked by	Verified by	Approved by
Isla Hoffmann Heap Senior Ecologist	James Riley Technical Director	James Riley Technical Director	Isla Hoffmann Heap Senior Ecologist & Project Manager

Revision History

Revision	Revision date	Details	Authorized	Name	Position
V0	14/07/2021	Initial issue	IHH	Isla Hoffmann Heap	Project Manager
V1	15/09/22	Updated with new data			

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Table of Contents

1. Introduction

About This Report

1.1 AECOM has been appointed by Ashford Borough Council (here after referred to as the 'Council') to produce a technical report to inform the Council's Habitat Regulations Assessment (HRA) process for **Otterpool Park, Folkestone & Hythe, Kent.** This site is located within the hydrological catchment of the River Stour in Kent and it is therefore necessary to scrutinise it for compliance with the Habitats Regulations and Natural England's Nutrient Neutrality Advice. Such compliance is required in order to meet the Council's legal obligations as Competent Authority in relation to the Conservation of Habitats and Species Regulations 2017 (as amended) in so far as they relate to the Stodmarsh internationally designated sites.

1.2 This is the third revision of this document. The first version was issued in December 2021. There has been one round of discussion with the applicant in which further information has been elicited. In 2022 a new analysis was submitted by the applicant in light of the significant changes to the nutrient neutrality methodology in early 2022. That amended information is reviewed in this updated report.

Legislation

1.3 The need for HRA of planning application is set out within Regulation 63 of the Conservation of Habitats and Species Regulations 2017.

1.4 The Precautionary Principle[1] applies to internationally designated sites. Plans and projects can only be permitted having ascertained that there will be no adverse effect on the integrity of the site(s) in question alone and in combination. Plans and projects with predicted adverse effects on the integrity of internationally designated sites may still be permitted if there are no alternatives to them and there are Imperative Reasons of Overriding Public Interest (IROPI) as to why they should proceed. In such cases, compensation would be necessary to ensure the overall integrity of the site network.

1.5 In order to determine whether or not site integrity will be affected, an HRA should be undertaken of the plan or project in question (Box 1).

[1] The Precautionary Principle, which is referenced in Article 191 of the Treaty on the Functioning of the European Union, has been defined by the United Nations Educational, Scientific and Cultural Organisation (UNESCO, 2005) as:
"*When human activities may lead to morally unacceptable harm [to the environment] that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm. The judgement of plausibility should be grounded in scientific analysis*".

Box 1: The legislative basis for Appropriate Assessment

Conservation of Habitats and Species Regulations 2017
The Regulations state that:
"*A competent authority, before deciding to … give any consent for a plan or project which is likely to have a significant effect on a European site … shall make an appropriate assessment of the implications for the site in view of that site's conservation objectives… The authority shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site*".

1.6 Over time the phrase 'Habitats Regulations Assessment' has come into wide currency to describe the overall process set out in the Regulations from screening through IROPI. This has arisen in order to distinguish the process from the individual stage described in the law as an Appropriate Assessment. For the purpose of this report the term HRA refers to the overall process, whilst use of the term Appropriate Assessment is restricted to the specific stage of that name.

2. Background to Nutrient Neutrality

2.1 This section provides a short introduction to the nutrient neutrality issue.

2.2 The Stour catchment provides both nationally and internationally important habitats to support wildlife, including sites protected under the Conservation of Habitats and Species Regulations 2017 (as amended). The catchment receives high levels of nitrogen and phosphorus input to this water environment. Evidence has identified that these nutrients are causing eutrophication at part of these designated sites, notably in the areas of standing open water and canals. The most recent Site of Special Scientific Interest (SSSI) condition assessment[2] for this habitats type identified that high nutrient levels within the main lake resulted in algal bloom and fish kills. The Natural England SSSI assessment identified that within the standing open water and canals within the internationally designated site the total phosphorous (TP) level is 1 mg/ (1000 ug/l), where the target for the SSSI lakes is 50ug/l, and thus greatly in exceedance of environmentally acceptable levels. These nutrient inputs are considered to be caused mostly by wastewater from housing and agricultural sources, though recycling of nutrients within the lake habitats cannot be ruled out as a contributing factor. Natural England advice is clear that the resulting nutrient enrichment is impacting on the Stodmarsh designated sites' protected habitats and species.

2.3 At the time of writing, uncertainty exists as to whether new growth will cause further deterioration of the designated sites. To understand if new growth (and thus increase discharges from wastewater treatment works (WwTW) that flow into the Stour catchment) is in fact contributing to the deterioration of the water quality within the Stour, the Environment Agency's Water Industry National Environment Programme (WINEP) is undertaking an investigation to determine connections and potential impacts from these WwTW on the Stodmarsh designated sites. This WINEP investigation is investigating links between the Stour and the Stodmarsh lakes systems. It will propose appropriate, possible and

[2] Available at: https://designatedsites.naturalengland.org.uk/ReportUnitCondition.aspx?SiteCode=S1003639&ReportTitle=Stodmarsh SSSI [accessed 11/03/2021]

cost-effective solutions to any identified impacts. Until this work is complete, the uncertainty of new growth's impacts on designated sites remains.

2.4 Therefore, based on the Precautionary Principle, 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, and thus potentially resulting in an adverse effect on the integrity of the conservation status and objectives of the internationally designated site. As a result, it is not possible to conclude that net new residential development within the catchment won't result in an adverse effect on the integrity of the Stodmarsh SAC, Ramsar site and SPA, without mitigation.

2.5 One way to address this uncertainty and subsequent risk, until any solutions are implemented to remove the current adverse effects on Stodmarsh, is for net new development to achieve nutrient neutrality, ensuring that development does not add to existing nutrient burdens, thus providing 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).

2.6 Natural England's latest guidance (which is periodically updated) should be consulted for the full background to the need for appropriate assessment. The most recent version at time of writing is dated March 2022 and is available at this link: Information about nutrient neutrality for the areas of the borough affected by the Natural England Nutrient Neutrality Advice. (ashford.gov.uk)

3. Habitat Regulations Assessment Methodology

Introduction

3.1 General EC guidance on HRA has been produced[3] and in summer 2019 MHCLG published guidance on appropriate assessment[4]. Figure 1 below outlines the stages of HRA.

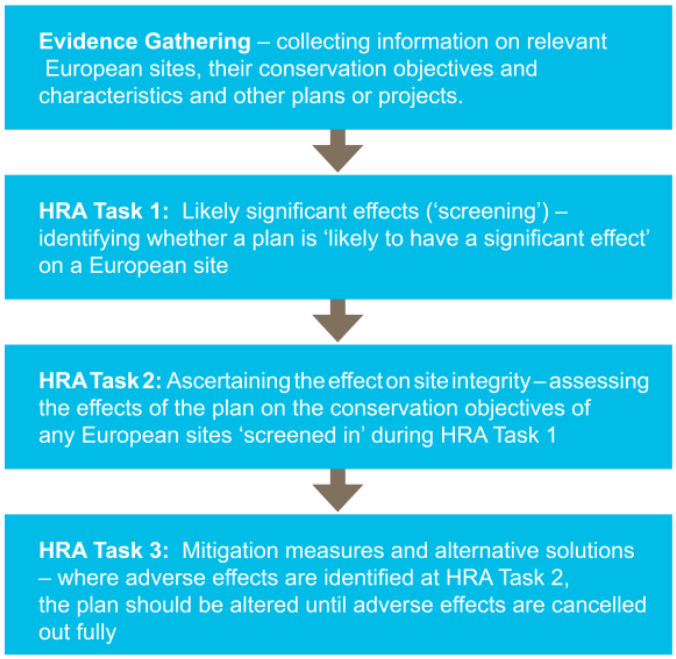

Figure 1: Four stage approach to Habitats Regulations Assessment

HRA Task 1 – Likely Significant Effects (LSE)

3.2 Following evidence gathering, the first stage of any Habitats Regulations Assessment is a Likely Significant Effect (LSE) test - essentially a high-level assessment to decide whether the full subsequent stage known as Appropriate Assessment is required. The essential question is:

"*Is the project, either alone or in combination with other relevant projects and plans, likely to result in a significant effect upon European sites?*"

3.3 The objective is to 'screen out' those plans and projects that can, without any detailed appraisal, be said to be unlikely to result in significant adverse effects upon European sites, usually because there is no mechanism for an adverse interaction with European sites. The assessment cannot concentrate on the individual development in isolation; it is a legal requirement that development is considered 'in combination' with other potential development that may affect the same site.

[3] European Commission. (2001) *Assessment of plans and projects significantly affecting Natura 2000 Sites*: Methodological Guidance on the Provisions of Article 6(3) and 6(4) of the Habitats Directive.

[4] Available at: https://www.gov.uk/guidance/appropriate-assessment#what-are-the-implications-of-the-people-over-wind-judgment-for-habitats-regulations-assessments [Accessed: 11/03/2021].

3.4 A decision by the European Court of Justice[5] concluded that measures intended to avoid or reduce the harmful effects of a proposed project on a European site may not be taken into account by competent authorities at the Likely Significant Effects or 'screening' stage of HRA. The UK will cease to be part of the European Union in 2021. However, as a precaution, it is assumed for the purposes of this HRA that EU case law regarding Habitat Regulations Assessment will still be considered informative jurisprudence by the UK courts.

3.5 With regard to nutrient neutrality issues Natural England has already confirmed that any net new residential development[6] within the catchment of the River Stour could pose a risk to the conservation objectives of the Stodmarsh internationally designated sites due to increased nitrogen and phosphorous inputs from treated sewage effluent. Since part of Folkestone & Hythe District lies within the River Stour catchment, a Likely Significant Effect 'in combination' with growth across the River Stour catchment cannot be dismissed. Therefore, any HRA of this issue undertaken by or on behalf of Folkestone & Hythe District Council constitutes an Appropriate Assessment.

HRA Task 2 – Appropriate Assessment (AA)

3.6 Where it is determined that a conclusion of 'no likely significant effect' cannot be drawn in isolating or in combination, the analysis proceeds to the next stage of HRA known as Appropriate Assessment. Case law has clarified that 'appropriate assessment' is not a technical term. In other words, there are no particular technical analyses, or level of technical analysis, that are classified by law as belonging to an appropriate assessment. The term literally means 'whatever level of further assessment is necessary to conclude whether or not adverse effects on the integrity of any European sites will arise'.

3.7 During July 2019 the Ministry of Housing, Communities and Local Government published guidance for Appropriate assessment[7]. Paragraph: 001 Reference ID: 65-001-20190722m explains: '*Where the potential for likely significant effects cannot be excluded, a competent authority must make an appropriate assessment of the implications of the plan or project for that site, in view of the site's conservation objectives. The competent authority may agree to the plan or project only after having ruled out adverse effects on the integrity of the habitats site. Where an adverse effect on the site's integrity cannot be ruled out, and where there are no alternative solutions, the plan or project can only proceed if there are imperative reasons of over-riding public interest and if the necessary compensatory measures can be secured*'.

3.8 As this analysis follows on from the screening process, there is a clear implication that the analysis will be more detailed than undertaken at the Screening stage and one of the key considerations during appropriate assessment is whether there is available mitigation that would entirely address the potential effect.

[5] People Over Wind and Sweetman v Coillte Teoranta (C-323/17)
[6] This includes hotel and visitor accommodation and student accommodation; Other commercial development not involving overnight accommodation is not included
[7] Available at: https://www.gov.uk/guidance/appropriate-assessment#what-are-the-implications-of-the-people-over-wind-judgment-for-habitats-regulations-assessments [Accessed: 11/03/2021].

HRA Task 3 – Avoidance and Mitigation

3.9 Where necessary, measures must be incorporated into the development in order to mitigate adverse effects on internationally designated sites. In the case of nutrient neutrality, the Natural England guidance makes it clear that such mitigation is to be achieved by offsetting the net additional nitrogen produced by the relevant residential development to achieve effective net neutrality.

3.10 The technical note provided in **Appendix A** undertakes a technical assessment of any avoidance and mitigation measures provided by the applicant, to determine if the proposed avoidance and mitigation strategy is suitable to result in nutrient neutrality for both nitrogen and phosphorous stemming from the proposed development. This will be discussed further in the subsequent chapters.

4. Stodmarsh Internationally Designated Sites

4.1 Stodmarsh is designated as a Special Protection Area (SPA), Special Area of Conservation (SAC), and is designed as a Ramsar wetland site. The background details of these sites, including their features of designation and Conservation Objectives are detailed in the subsequent paragraphs.

4.2 This wetland site located in the Stour valley contains a wide range of habitats including open water, gravel pits, lagoons, extensive reedbeds and grazing marsh, scrub and alder carr which together support a rich flora and fauna. Habitats are influenced by both freshwater and marine inputs. The vegetation is a good example of a southern eutrophic flood plain and a number of rare plants are found here. The invertebrate fauna is varied. The site is also of ornithological interest with its diverse breeding bird community. The site includes gravel pits, lagoons and reedbeds, and grassland habitats.

Ramsar site

Features of Designation

4.3 The site is designated as a Ramsar site under Ramsar Criteria 2[8]:

Ramsar Criteria 2:

4.4 Six British Red Data Book wetland invertebrates. Two nationally rare plants, and five nationally scarce species. A diverse assemblage of rare wetland birds.

4.5 The flora of the site includes the rare sharp leaved pondweed (*Potamogeton acutifolius*), which is considered critically endangered by the GB Red Book, as well as the vulnerable whorled water-milfoil

4.6 (*Myriophyllum verticillatum*), rootless duckweed (*Wolffia arrhiza*) and *Carex divisa*. The site finds the presence of otter (*Lutra lutra*).

Special Protection Area (SPA)

Features of Designation

4.7 The site is designated as an SPA for the following features[9]:

4.8 Wintering populations of:

- Bittern *Botaurus stellaris*
- Gadwall *Anas Strepera*
- Hen harrier *Circus cyaneus*
- Northern shoveler *Anas clypeata*

4.9 Breeding populations of:

[8] Available at: Stodmarsh | Ramsar Sites Information Service [accessed 11/03/2021]
[9] Available at: http://publications.naturalengland.org.uk/file/5080433486200832 [accessed 11/03/2021]

- Gadwall *Anas Strepera*

4.10 Regularly supports assemblages of breeding species:

- Great crested grebe *Podiceps cristatus*
- Lapwing *Vanellus vanellus*
- Mallard *Anas platyrhynchos*
- Moorhen *Gallinula chloropus*
- Reed bunting *Emberiza schoeniclus*
- Common tern *Sterna hirundo*
- Coot *Fulica atra*
- Redshank *Tringa tetanus*
- Reed Warbler *Acrocephalus scirpaceus*
- Shelduck *Tadorna tadorna*
- Mute Swan *Cygnus olor*
- Shoveler *Anas clypeata*
- Teal *Anas crecca*
- Tufted Duck *Aythya fuligula*
- Water Rail *Rallus aquaticus*
- Bearded Tit *Panurus biarmicus*
- Cetti's Warbler *Cettia cetti*
- Gadwall *Anas Strepera*
- Pochard *Aythya ferina*
- Sedge warbler *Acrocephalus schoenobaenus*

4.11 Regularly supports assemblages of wintering waterfowl species:

- Gadwall *Anas Strepera*
- Shoveler *Anas clypeata*
- Bittern *Botaurus stellaris*
- Hen harrier *Circus cyaneus*
- Tufted duck *Aythya fuligua*
- Wigeon *Anas Penelope*
- White-fronted geese *Anser albifrons*
- Mallard *Anas platyrhynchos*
- Lapwing *Vanellus vanellus*
- Snipe *Gallinago gallinago*

Conservation Objectives[10]

"With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- *The extent and distribution of the habitats of the qualifying features*
- *The structure and function of the habitats of the qualifying features*
- *The supporting processes on which the habitats of the qualifying features rely*
- *The population of each of the qualifying features, and,*
- *The distribution of the qualifying features within the site."*

Special Area of Conservation (SAC)

Features of Designation

The site is designated as an SAC for its[11]:

- 1016 Desmoulin's whorl snail *Vertigo moulinsiana*

A sizeable population of Desmoulin's whorl snail *Vertigo moulinsiana* lives beside ditches within pasture on the floodplain of the River Stour, where reed sweet-grass *Glyceria maxima*, large sedges *Carex* spp. and sometimes common reed *Phragmites australis* dominate the vegetation. Stodmarsh is a south-eastern outlier of the main swathe of sites and is important in confirming the role of underlying base-rich rock (chalk) as a factor determining this species' distribution.

Conservation Objectives[12]

"With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- *The extent and distribution of the habitats of qualifying species*
- *The structure and function of the habitats of qualifying species*
- *The supporting processes on which the habitats of qualifying species rely*
- *The populations of the qualifying species, and,*
- *The distribution of the qualifying species* within the site."

[10] Available at: http://publications.naturalengland.org.uk/file/5083313333338112 [accessed 11/03/2021]
[11] Available at: http://publications.naturalengland.org.uk/file/5733451521064960 [accessed 12/03/2021]
[12] Available at: http://publications.naturalengland.org.uk/publication/5199409650335744 [accessed 12/03/2021]

5. The Application:

Otterpool Park

6. Test of Likely Significant Effect

6.1 This planning application results in a net increase in population served by a wastewater system. This includes residential accommodation. Other commercial development not involving overnight accommodation is not included.

6.2 This Application lies within the River Stour catchment. It will discharge to an onsite Wastewater Treatment Works (WwTW) within the Stour catchment. As such a conclusion of potential likely significant effects in combination with other projects and plans is reached.

6.3 Appropriate Assessment is undertaken in the subsequent chapter.

7. Appropriate Assessment V0 (January 2022)

7.1 As detailed above, the planning application results in a net increase in population served by a wastewater system that lies within the River Stour catchment. As such a conclusion of potential likely significant effects in combination with other projects and plans is reached. Appropriate Assessment is undertaken below. This is inherently an in combination assessment.

Proforma number	
AA1	Has the applicant completed the nutrient neutrality calculator spreadsheet in relation to both nitrogen and phosphorous? Yes – [Go to AA2] ✓ No –***the nutrient neutrality calculator spreadsheet must be completed in relation to both nitrogen and phosphorous before evaluation of the application can proceed***[13]***.*** ☐
AA2	Has the spreadsheet been checked to ensure it has been completed correctly? Yes – [Go to AA3] ✓

[13] The spreadsheet requires the permit concentration for total nitrogen at the relevant WwTW to be inserted. For most planning applications, the WwTW provider is not confirmed until after 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. For developments that discharge to WwTWs with no Total Nitrogen permit level, best available evidence must be used for the calculation. In the first instance, Southern Water or other wastewater provider should be contacted for details of the nitrogen effluent levels for the specific WwTW. However, if these data are not available, **an average figure of 27 mg/l can be used**.

	No – ***check the spreadsheet to ensure that it has been populated correctly and the applicant hasn't changed any formulae. Refer to the latest Natural England Solent Nutrient Advice document to understand the calculation process[14].*** ☐
AA3	Does the output of the calculation identify that there would be a net increase in nitrogen and or phosphorous as a result of this development (a nitrogen and/ or phosphorous surplus)? Yes – [Please provide discussion below and then go to AA4]✓ **Discussion:** The nutrient budget for the proposed development has been determined to give 1,288 kg/ha/yr TN surplus and 270 kg/ha/yr TP surplus that requires mitigation. No - ***You are able to conclude that the development will not result in a net increase in treated wastewater discharge into the River Stour catchment and therefore will not contribute to the 'in combination' nutrient discharge issues for the Stodmarsh internationally designated sites. You can therefore conclude 'no adverse effect on integrity' and need proceed no further*** ☐
AA4	Has the applicant provided information regarding the mitigation that they intend to implement that will offset the increase in nitrogen and / or phosphorous? Yes – [Please provide discussion below and then go to AA5] ✓ **Discussion:** To achieve neutrality for Otterpool Park will require 22.5 ha of wetlands, using the 110 l/person/day water use efficiency. Arcadis have identified that there is space for 24.8 ha of wetland within the revised Otterpool Park OPA boundary. This would use 14 wetlands, some of which are interlinked, and with one very large wetland of 8.86 ha in size. No – **The applicant must either provide detailed proposals regarding the mitigation that they intend to deliver, before the application can be determined[15].** ☐ **Go to 'Chapter 8 Further Information Needed to provide further details.**
AA5	Is the mitigation adequate to mitigate the net additional nitrogen due to the development?

[14] 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. There is no agricultural nitrogen input onto this land and these areas should not be included in the calculation. Where development sites include wildlife areas, woodlands, hedgerows, ponds and lakes, these areas should also be excluded from the calculation as there is no existing agricultural nitrogen input onto this land. However, for clarity, areas that are legitimately excluded from the calculation should nonetheless be added as a note into the spreadsheet otherwise it may appear at first review that parts of the site have been forgotten from the calculations.

[15] Mitigation can be 'direct' through upgrading sewage treatment works and through alternative measures, e.g. interceptor wetlands or 'indirect' by offsetting the nitrogen generated from new development by taking land out of nitrogen intensive uses, e.g. where fertiliser is applied to crops. Mitigation measures will need to be secured for the duration over which the development is causing the effects, generally 80-125 years.

	The mitigation must have adequate technical certainty that it can be secured and become functional prior to occupation, and the applicant must have quantified the benefits of the mitigation to demonstrate that it will offset the net additional nitrogen and/ or phosphorous due to the development. Yes – ***You are able to conclude that the development will not result in a net increase in treated wastewater discharge into the River Stour catchment and therefore will not contribute to the 'in combination' nutrient discharge issues for the Stodmarsh internationally designated sites. You can therefore conclude 'no adverse effect on integrity' and need proceed no further.*** ✓ No – **The applicant must revisit their mitigation proposals.** ☐ **Any comments are provided in Chapter 8 Further Information Needed**

8. Appropriate Assessment V1 (September 2022)

8.1 As detailed above, the planning application results in a net increase in population served by a wastewater system that lies within the River Stour catchment. As such a conclusion of potential likely significant effects in combination with other projects and plans is reached. Appropriate Assessment is undertaken below, drawing up the updated information submitted in summer 2022 by the applicant in light of the significant changes to nutrient neutrality calculation methodology. This is inherently an in combination assessment.

Proforma number	
AA1	Has the applicant completed the nutrient neutrality calculator spreadsheet in relation to both nitrogen and phosphorous? Yes – [Go to AA2] ✓ No –***the nutrient neutrality calculator spreadsheet must be completed in relation to both nitrogen and phosphorous before evaluation of the application can proceed[16].*** ☐
AA2	Has the spreadsheet been checked to ensure it has been completed correctly?

[16] The spreadsheet requires the permit concentration for total nitrogen at the relevant WwTW to be inserted. For most planning applications, the WwTW provider is not confirmed until after 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. For developments that discharge to WwTWs with no Total Nitrogen permit level, best available evidence must be used for the calculation. In the first instance, Southern Water or other wastewater provider should be contacted for details of the nitrogen effluent levels for the specific WwTW. However, if these data are not available, **an average figure of 27 mg/l can be used**.

	Yes – [Go to AA3] ✓ Note, however, that for the Option of being served by Sellingdge WwTW (Option 2) they have used different permit concentrations than are given in the Stodmarsh calculator. This WwTW has a permit of 1 mg TP/l and 27 mg/TN/l according to the Stodmarsh Calculator, although the post 2025 permit will be tightened to 0.5 mg TP/l. However, the Applicant has used values of 0.3 mg TP/l and 25 mg TN/l in their calculations. The reason why these alternative permit values have been used needs to be clarified. No – ***check the spreadsheet to ensure that it has been populated correctly and the applicant hasn't changed any formulae. Refer to the latest Natural England Solent Nutrient Advice document to understand the calculation process[17].*** ☐
AA3	Does the output of the calculation identify that there would be a net increase in nitrogen and or phosphorous as a result of this development (a nitrogen and/ or phosphorous surplus)? Yes – [Please provide discussion below and then go to AA4]✓ **Discussion:** For Option 1, the final nutrient budget for Scenario 1 has been determined as 367.6 kg TP/yr and 705.3 kgTN/yr including a 20% buffer. The final nutrient budget for Scenario 2 has been determined as 361.6 kgTP/yr and 273 kgTN/yr. This requires mitigation. For Option 2, the final nutrient budget for Scenario 1 has been calculated as 594.3 kgTP/yr and 20887 kgTN/yr. For Scenario 2, the final nutrient budget has been calculated as 576.3 kgTP/yr and 19385.8 kgTN/yr. This requires mitigation. Note that for Option 2 the applicant uses different values to those in the Natural England calculator regarding the Sellingdge WwTW permit. No - ***You are able to conclude that the development will not result in a net increase in treated wastewater discharge into the River Stour catchment and therefore will not contribute to the 'in combination' nutrient discharge issues for the Stodmarsh internationally designated sites. You can therefore conclude 'no adverse effect on integrity' and need proceed no further*** ☐
AA4	Has the applicant provided information regarding the mitigation that they intend to implement that will offset the increase in nitrogen and / or phosphorous? Yes – [Please provide discussion below and then go to AA5] ✓ **Discussion:**

[17] 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. There is no agricultural nitrogen input onto this land and these areas should not be included in the calculation. Where development sites include wildlife areas, woodlands, hedgerows, ponds and lakes, these areas should also be excluded from the calculation as there is no existing agricultural nitrogen input onto this land. However, for clarity, areas that are legitimately excluded from the calculation should nonetheless be added as a note into the spreadsheet otherwise it may appear at first review that parts of the site have been forgotten from the calculations.

	The proposed wetland area in the previous Water Cycle Study (WCS) (March 2022) was 28.77 ha. The Applicant recommends that the current SuDS area within the OPA boundary should be designed as wetlands or bio-retention features to remove surplus P load. They note there is the potential for 8.97 ha of additional stormwater wetlands within the Otterpool Park OPA and FMP. No – **The applicant must provide detailed proposals regarding the mitigation that they intend to deliver before the application can be determined[18].** ☐ **Go to 'Chapter 8 Further Information Needed to provide further details.**
AA5	Is the mitigation adequate to mitigate the net additional nitrogen due to the development? The mitigation must have adequate technical certainty that it can be secured and become functional prior to occupation, and the applicant must have quantified the benefits of the mitigation to demonstrate that it will offset the net additional nitrogen and/ or phosphorous due to the development. Yes – **You are able to conclude that the development will not result in a net increase in treated wastewater discharge into the River Stour catchment and therefore will not contribute to the 'in combination' nutrient discharge issues for the Stodmarsh internationally designated sites. You can therefore conclude 'no adverse effect on integrity' and need proceed no further.** ☐ *No – **The applicant must revisit their mitigation proposals.*** ✓ The applicant acknowledges that whether Option 1 or Option 2 is chosen they don't (using the new calculator tool) currently have enough mitigation identified at this time to demonstrate nutrient neutrality. The proposed wetland area in the previous Water Cycle Study (WCS) (March 2022) was 28.77 ha which means that for Option 1 there is currently a shortfall of approximately 6.88 ha for PCC Scenario 1 and 5.93 ha for PCC Scenario 2. For Option 2 this increases to 30.97ha for Scenario 1 and 28.13ha for Scenario 2; the shortfall for Option 2 is even larger if the actual permit values in the calculator tool for Sellindge WwTW are used. We recognise Option 1 is the preferred option but that still has a shortfall of c. 20-25%. To address this, the Applicant proposes that the current SuDS area within the OPA boundary should be designed as wetlands or bio-retention features to remove surplus P load. They note there is the potential for 8.97 ha of additional stormwater wetlands within the Otterpool Park OPA and FMP. If this is the case, it would be sufficient to address the shortfall for Option 1, the preferred approach. However, this would require further investigation and if that potential has been identified at this point we would need to understand whether further work

[18] Mitigation can be 'direct' through upgrading sewage treatment works and through alternative measures, e.g. interceptor wetlands or 'indirect' by offsetting the nitrogen generated from new development by taking land out of nitrogen intensive uses, e.g. where fertiliser is applied to crops. Mitigation measures will need to be secured for the duration over which the development is causing the effects, generally 80-125 years.

	was to be undertaken prior to application submission to confirm that potential. Overall, if a resolution to grant outline planning permission is made it is recommended that it is subject to a planning condition that the Applicant identifies and details the additional required for wetland mitigation prior to the next planning stage. **Any comments are provided in Chapter 8 Further Information Needed**

9. Conclusion

9.1 There are three main points:

- They have consistently used the wrong units such that kgTP/yr is used for nitrogen (rather than phosphorus) and kgTN/yr is used for phosphorus (rather than nitrogen). This is only a typographical matter but should be addressed.
- For the Option of being served by Sellingdge WwTW (Option 2) they have used different permit concentrations than are given in the Stodmarsh calculator. This WwTW has a permit of 1 mg TP/l and 27 mg/TN/l according to the Stodmarsh Calculator, although the post 2025 permit will be tightened to 0.5 mg TP/l. However, the Applicant has used values of 0.3 mg TP/l and 25 mg TN/l in their calculations. The reason why these alternative permit values have been used needs to be clarified. If the permit values in the Stodmarsh calculator are used the amount of mitigation required for Option 2 increases considerably.
- The biggest issue, which the applicant acknowledges, is that whether Option 1 or Option 2 is chosen they don't (using the new calculator tool) currently have anything like enough mitigation identified at this time to demonstrate nutrient neutrality. The proposed wetland area in the previous Water Cycle Study (WCS) (March 2022) was 28.77 ha which means that for Option 1 there is currently a shortfall of approximately 6.88 ha for PCC Scenario 1 and 5.93 ha for PCC Scenario 2. For Option 2 this increases to 30.97ha for Scenario 1 and 28.13ha for Scenario 2; the shortfall for Option 2 is even larger if the actual permit values in the calculator tool for Sellindge WwTW are used. We recognise Option 1 is the preferred option but that still has a shortfall of c. 20-25%.

9.2 To address (3), the Applicant proposes that the current SuDS area within the OPA boundary should be designed as wetlands or bio-retention features to remove surplus P load. They note there is the potential for 8.97 ha of additional stormwater wetlands within the Otterpool Park OPA and FMP. If this is the case, it would be sufficient to address the shortfall for Option 1, the preferred approach. However, this would require further investigation and if that potential has been identified at this point we would need to understand whether further work was to be undertaken prior to application submission to confirm that potential. Overall, if a resolution to grant outline planning permission is made it is recommended that it is subject to a planning condition that the Applicant identifies and details the additional required for wetland mitigation prior to the next planning stage.

9.3 To achieve neutrality for Otterpool Park will require 22.5 ha of wetlands, using the 110 l/person/day water use efficiency. Arcadis have identified that there is space for 24.8 ha of wetland within the revised Otterpool Park OPA boundary. This would use 14 wetlands, some of which are interlinked, and with one very large wetland of 8.86 ha in size. It is noted that the reed bed that the PTP discharges too has not been included in the mitigation calculations.

9.4 It can therefore not be concluded at this point that no adverse effects on the integrity of the Stodmarsh designated sites will occur either alone or in combination with other plans or projects.

9.5 It is noted that each phase of development will be supported by a sequence of submissions to the local planning authority to provide a progressive layering of increasingly detailed information from the over-arching and site-wide strategy (Tier 1), through substantive key phases (Tier 2) to detailed reserved matters application for sub-phases within a specific phase and on individual development sites (Tier 3). The precise extent, components and location of each key phase must be agreed with the local planning authority as delivery of the scheme progresses. Reserved matters applications can only be submitted for approval for any part of the site where the relevant key phase has been defined and all of the key phase framework documents have been approved.

9.6 It has been indicated by Folkestone & Hythe District Council that it has previously been discussed with Natural England that due to the scale of the proposed Otterpool Park development that there is a limit to the amount of detail available at the outline stage and that the tiered planning structure will provide greater security of delivery of the appropriate mitigation. We accept that the further detail identified above could and would be provided as part of this tiered structure rather than at outline stage.

9.7 However, given that the ability of the site to achieve nutrient neutrality depends on sufficient land to provide mitigation, and given the size of the shortfall currently identified (minimum of 20% and if Option 2 were selected considerably more than this) we consider that work to achieve further confidence than currently exists that sufficient mitigation land to meet the shortfall could be brought forward is preferred prior to the grant of outline planning consent. While there are ways the outline planning consent and conditions could be phrased to ensure the European site would be protected in practice, a minimum 20% shortfall in mitigation leaves uncertainty over the deliverability of the scheme for which outline consent is being sought.

Appendix A Appropriate Assessment and Nutrient Neutrality Support

Quality information

Prepared by	Checked by	Verified by	Approved by
Amber Hancock Graduate Water Scientist Tim Jones BSc (Hon) PhD Principal Water Scientist	Tim Jones BSc (Hon) PhD Principal Water Scientist	Owen Tucker BSc (Hon) MSc CEnv MCIWEM Associate Director, Water Scientist	Dr James Riley BSc MSc PhD CEnv MCIEEM Technical Director, Ecologist/HRA

Revision History

Revision	Revision date	Details	Authorized	Name	Position
Version 0	13-12-21	Draft	JR	James Riley	Technical Director
Version 1	20-01-22	Update in response to Arcadis comments			
Version 2	15/09/22	Updated with Section 5 to take account of new data			

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Table of Contents

10. Introduction

Background

10.1 AECOM have been commissioned by Folkestone and Hythe Borough Council to undertake a review of the nutrient budget calculations and associated mitigation proposals to achieve nutrient neutrality for the Otterpool Park Framework Masterplan Site Allocation, within the Folkestone & Hythe Local Plan (2020 to 2037). The issue of nutrient neutrality in relation to the Local Plan has, on the basis of the provided background documentation, been through several rounds of revision and consultation with Natural England.

10.2 An initial nutrient budget technical note was submitted by Urban Edge Environmental Consulting Ltd (UEEC) in August 2020. Revised technical notes have been produced by Arcadis in response to Natural England feedback in October 2020 and November 2020. Various workshops and consultation has been undertaken to inform the development of the nutrient budget and mitigation. These are listed in the Statement of Common Ground between Folkestone & Hythe District Council and Natural England.

10.3 The purpose of this review is to support Folkestone and Hythe District Council by determining whether the Nutrient Neutrality assessment is sufficiently robust to assist the Council in discharging their duties under Regulation 63 and 64 of the Conservation of Habitats and Species Regulations 2017 (henceforth referred to as the 'Habitats Regulations'). Appropriate assessment must not contain gaps or lacunae and the conclusions of an appropriate assessment must be 'certain' (which earlier case law has clarified to mean that 'no reasonable scientific doubt remains'). It should be noted that 'certainty' within the context of the Habitats Regulations does not mean 'absolute certainty' as the courts recognise that this is effectively impossible to achieve. It does, however, indicate a high standard of evidence and confidence.

10.4 The review focuses on the Nutrient Neutrality letter submitted by Arcadis on 4th November 2020 as the most recent iteration of the assessment, but also draws from previous version for context where necessary. This review does not provide comment on any additional planning judgments that need to be made by Folkestone and Hythe District Council.

10.5 In response to AECOM's review, Arcadis Consulting (UK) Ltd have submitted an email response with further clarifications, dated 17th December 2021. AECOM has reviewed these responses and have provided further comments in Section 4.

10.6 In summer 2022 updated nutrient neutrality calculations were submitted to Folkestone and Hythe Council in line with the amendments made to the Natural England nutrient neutrality methodology and calculator tools in early 2022. AECOM was asked to review the newly submitted data and update their previous assessment. That updated analysis is presented in Section 5 of this document. The remainder of the document is unchanged from the January 2021 version.

Review Team

10.7 The team undertaking the review is as follows:

- Dr James Riley BSc MSc PhD CEnv MCIEEM is a Technical Director who leads on Habitats Regulations Assessment within AECOM. He has led on over 100 plan-level HRAs for a range of plans including Local Development Plans, Minerals and Waste Plans, Area Action Plans, Site Allocations Documents, Development Management Plans, Local Flood Risk Management Strategies, Local Transport Plans, Coastal Strategies, Shoreline Management Plans and Neighbourhood Plans. James has spoken on HRA issues at ten Examinations on behalf of local authorities. In particular, he had led on several nutrient neutrality assessments and related review exercises for local authorities.

- Owen Tucker BSc (Hon) MSc CEnv MCIWEM is an Associate Environmental Scientist, Chartered Environmentalist and a Member of the Chartered Institution of Water and Environmental Management (CIWEM). He has over 17 years' experience of undertaking environmental impact assessments (EIAs) and environmental management, specialising in water science. This includes river and lake water quality and sediment monitoring and analysis, water EIAs, Water Framework Directive 2006/60/EC (WFD) compliance appraisals, Highways England Water Risk Assessment Tool (HEWRAT) assessments, Sustainable Drainage System (SuDS) development and pond optimisation, and developing mitigation measures to protect the water environment from construction work.

- Dr Tim Jones PhD BSc (Hons) is a Principal Water Scientist specialising in water quality and hydrological processes. During his career in academia and consultancy Tim has worked on a number of large interdisciplinary research collaborations involving national and international stakeholders, including water companies, NGOs, and government agencies. He has published in high impact journals on water quality modelling of stream systems, and has experience in water environment EIA impact assessments, Water Framework Directive (WFD) assessment, nutrient neutrality assessment, SuDS development, applications for Water Activity Permits, time series analysis of water quality data and hydraulic modelling projects relating to river restoration.

- Amber Hancock BSc (Hons) is a Graduate Water Scientist. During her degree in Environmental Science, Amber researched the impacts of organic versus conventional farming methods on soil biological, physical, and chemical quality, and studied a wide range of subjects such as environmental protection, biodiversity conservation and management and restoration of freshwater systems. Amber has experience in river water quality monitoring, water environment EIA assessments, water quality risk assessments, and nutrient neutrality assessments.

Introduction to Nutrient Neutrality

10.8 Nutrient neutrality has become an issue in many areas of the country, such as the Solent, Somerset Levels, the Wye catchment in Herefordshire and the Stour catchment in Kent. It ultimately stems from the ruling of the European Court of Justice (ECJ) in combined cases C-293/17 and C-294/17 (the Dutch Nitrogen case). That judgment was about nitrogen from atmosphere but in the process of

making their ruling the judgment refined the definition of plans and projects to include operations such as agriculture, confirming that agricultural inputs of nutrients (either from atmosphere or runoff) need to be covered in the 'in combination' requirements of the HRA process. This is significant because the traditional assessment process as applied for example in the Environment Agency Review of Consents programme distinctly separates treated wastewater from agricultural discharge, largely because the latter is effectively unconsented [diffuse] and outside the remit of the Environment Agency.

10.9 In addition, the ruling reaffirmed that if a European protected nature conservation site is in a deteriorating condition (such as due to excess nutrient levels that may also be forecast to increase) there are very limited circumstances under which further discharges of nutrients to a site can legally be permitted. This is covered in paragraph 79 of Advocate-General Kokott's opinion, written to inform the court: '*Where total damage is reduced, but the integrity of the protected site concerned is nevertheless adversely affected* [by which she means where the total nitrogen deposition still exceeds the critical load], *Article 6(3) of the Habitats Directive does not in any case permit any additional damage of this kind'*.

10.10 As a result, in the absence of any empirically derived threshold by which additional aquatic inputs of nitrogen and phosphorus can be deemed nugatory or de minimis, it must be concluded that new development within the Stour catchment could increase nitrogen and phosphate deposition into the protected sites above consented levels and thus interfere with the ability of the site to achieve its conservation objectives and thus the integrity of the European protected nature conservation site. This is relevant because under Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (as amended) a local planning authority (competent authority) cannot legally consent a plan or project that will have an adverse effect on the integrity of any European protected nature conservation site.

10.11 The potential impact of Local Plans or individual site allocations is determined using nutrient neutrality calculations. A calculation methodology covering both nitrogen and phosphorus has been developed by Natural England, using the most up-to-date scientific evidence base at the time of publication. This has been published as an 'Advice Note on Nutrient Neutrality for New Development in the Stour Valley Catchment in Relation to Stodmarsh' (latest version November 2020).

10.12 Additional advice was provided to the affected local authorities by Natural England in a letter dated 28 June 2021. This provided further detail with regard to applicants who intend to implement water efficiency improvements as nutrient mitigation, use of package treatment plants (PTPs) as mitigation, provision of new mains wastewater treatment works (WwTW) (of relevance to large developments of over 400 homes only), and wetland creation and sustainable drainage systems (SuDS) as mitigation.

10.13 While a competent authority such as Folkestone & Hythe District Council are not obliged to follow Natural England's advice, as set out in the court ruling in R (Hart District Council) v Secretary of State for Communities and Local Government [2008], they are expected to give 'considerable weight' to Natural England's opinion on HRA matters.

11. Review of Nutrient Neutrality Letter

11.1 The following review is presented under each main section title of the Nutrient Neutrality Mitigation Proposals Technical Note prepared by Arcadis for the proposed development (submitted 4th November 2020).

Review of Section 1 Introduction

11.2 The introductory paragraphs indicate that the technical note summarises Arcadis's latest findings (on behalf of Folkestone and Hythe District Council) of the nutrient budget and mitigation proposals for the Otterpool Park Framework Masterplan Site Allocation, for an initial 8,500 homes.

11.3 Two further proposed site allocations in Sellindge (CSDA9A and CSD9B from Folkestone and Hythe District Council's Core Strategy Review) are included within the Arcadis assessment.

11.4 It is stated that the assessment follows Natural England's guidance 'Advice on Nutrient Neutrality for New Development in the Stour Catchment in Relation to Stodmarsh Designated Sites - For Local Planning Authorities' from July 2020, as well as further bespoke advice from Natural England provided on 6th October 2020 in relation to Otterpool Park, and on 15th October 2020 in relation to the Core Strategy Review's site allocations. With regard to mitigation the Environment Agency's Guidance Manual for Constructed Wetlands R&D Technical Report P2-159/TR2 (2003) has been used as the basis for hydraulic loading calculations and design preparation for the proposed wetlands.

11.5 The Natural England guidance referenced is dated to July 2020 and was superseded in November 2020, and therefore the Technical Note does not refer to the latest guidance document. However, this has been noted by Natural England in their correspondence in October 2020 who stated the following:

"*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*".

11.6 AECOM agree that the nutrient budget and calculations would not be materially affected by the November 2020 Natural England guidance, but that this should be noted and taken into account by any future iterations of the nutrient neutrality assessment.

Review of Section 2 Background to the Issue

11.7 It is explained that there are high levels of nitrogen (N) and phosphorus (P) entering the Stour catchment leading to eutrophication within the Stodmarsh site. The site is designated as a Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar Site and at the national level as a Site of Special Scientific Interest (SSSI) and as a National Nature Reserve (NNR) in parts. It is described how nutrient inputs from permitted wastewater discharges into the River Stour contribute significantly to the observed eutrophication.

11.8 Natural England advised Folkestone and Hythe District Council that the HRA for the Core Strategy Review should assess water quality issues, including all site allocations using a wastewater treatment works (WwTW) that discharges to the River Stour Catchment, and which are therefore in the catchment of the Stodmarsh designated sites.

11.9 It is noted in this section that a meeting with Natural England and Folkestone and Hythe District Council was held in June 2020, at which Natural England stated that if Otterpool Park OPA can demonstrate as a standalone site that it can achieve nutrient neutrality then it would fully satisfy their concerns on any adverse impact to the Stodmarsh sites.

Review of Section 3 Proposed Development

11.10 The proposed development is described. The revised Otterpool Park Outline Planning Application (OPA) site is 558.2 hectares in area and would deliver an initial 8,500 dwellings in addition to commercial, retail, education, health, community and leisure facilities, parking, landscaping and public open space. Further details on the development quantum are provided but are not replicated here.

11.11 The CSD9A and CSD9B sites are also described as having allocations for 188 new dwellings and 162 new dwellings, respectively.

11.12 Various plans showing the site boundary, arrangement and land use types are provided within the Statement of Common Ground between Folkestone and Hythe District Council and Natural England.

Review of Section 4 Nutrient Budget Assessment

Land Use

11.13 Existing land use is discussed, with figures demarcating the land uses provided in Appendix 1 of the nutrient neutrality assessment. Existing land use types and accompanying total nitrogen (TN) and total phosphorus (TP) loss types are summarised in Table 2 of the nutrient neutrality assessment, and the leaching rates have been checked and are consistent with those outlined in the November 2020 Natural England guidance.

11.14 Part of the existing land use is a racetrack, and consultation with Natural England has been undertaken to determine suitable leaching rates. Average TN and TP loss values from urban and lowland grazing livestock farmland categories have been used, as this best reflects the former land use within this area. This approach is agreed and we understand that Natural England have also agreed to these rates.

11.15 Existing land use details are also provided for the CSD9A and CSD9B allocations in Table 3, and again the leaching rates are consistent with the values outlined in the Natural England guidance document (November 2020).

11.16 Table 4 and 5 of the nutrient neutrality assessment presents the proposed land use areas and associated leaching values for Otterpool Park and CSD9A/ CSD9B, respectively. Appendix 2 of the nutrient neutrality assessment provides the Open Space Parameter Plan and Draft Illustrative Masterplan for Otterpool Park, and Appendix 3 includes the Approved Landscaping and Land Use Parameter Plan for CSD9B. For proposed community farm/allotment land the

average farm type rate is used in accordance with the Natural England guidance. All other values for urban areas, suitable alternative natural greenspace (SANG) and woodlands have also been correctly used.

11.17 It is noted that 142.7 hectares in the Otterpool Park Framework Masterplan boundary is excluded from the nutrient neutrality assessment as the existing land use will not be changed. This includes existing community space, retained farmland, retained buildings, retained waterbodies, hedgerows and other ecological features.

11.18 There are 25.2 hectares of proposed sustainable drainage systems (SuDS) currently included in the nutrient budget under the 'urban' land use category, and so the nutrient budget is precautionary as the urban nutrient loss (14.3 kg/ha/yr TN loss and 0.83 kg/ha/yr TP) would be much greater than SuDS which should actually remove nutrients from discharged water.

Onsite Wastewater Treatment Works

11.19 The nutrient budget is based on the use of an Onsite Wastewater Treatment Works (WwTW) solution, which has been developed in consultation with Severn Trent Connect. There are two potential outfall locations to the East Stour River, with the upstream outfall location at Harringe Lane Bridge and the downstream outfall at the confluence with the East Stour and Horton Priory Dyke. Appropriate discharge permit values have been determined in consultation with the Environment Agency for the proposed outfalls based on the maximum Dry Weather Flow (DWF) volume. A WwTW TN limit of 7.2 mg/l, and a TP limit of 0.1 mg/l has been used for the nutrient budget and has been agreed with Natural England.

11.20 Natural England's comments on these limits dated 15th October 2020 are noted as follows:

11.21 "*The proposals by Severn Trent Connect are similar to the operationally agreed standards for sites that discharge into Pevensey Levels (SAC, Ramsar and SSSI in Sussex) 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*".

11.22 Given that Severn Trent Connect have confirmed that the discharge limits can be achieved by the Onsite WwTW and that Natural England agree that these can be implemented, we would also agree that the discharge limits of 0.1 mg/l TP and 0.7 mg/l TN are appropriate for the nutrient calculations.

Nutrient Calculations

11.23 Nutrient calculations are provided in the document EB 13.95(b) Appendix I(4) of the nutrient neutrality assessment.

11.24 The budget considers 10,350 dwellings which includes Otterpool Park plus the CSD9A and CSD9B allocations. The nutrient calculations have used Natural England's recommended water efficiency value of 110 litres/person/day and an occupancy rate of 2.4 per dwelling. As such we consider this suitably precautionary. A separate budget has also been determined using 90 litres/person/day by way of a comparison.

11.25 The stage 1 calculations have been checked and verified using the onsite WwTW. 90% of the proposed TN and TP consented limits have been applied as per the Natural England guidance, giving a TN load from the proposed development WwTW of 6,462.67 kgN/yr and TP load of 89.76 kgP/yr. In the alternative budget using 90 litres/person/day water use efficiency, the TN load would be 5,287.64 kgN/yr and TP load would be 73.44 kgP/yr.

11.26 Stage 2 is to adjust TN/TP load to offset existing load from current land use. The existing land use TN and TP load has been determined correctly using the appropriate loss rates outlined in the Natural England guidance. The nutrient loss from existing land use is given as 12,102.96 kgN/yr TN and 204.49 kgP/yr TP.

11.27 Stage 3 is to adjust TN/TP load to account for future land use. There appears to be a discrepancy in the size of the proposed urban area and SANG between the technical note (Table 4 and Table 5) and the Appendix I(4) calculations. The proposed urban area and SANG area in the technical note for Otterpool Park, CSD9A and CSD9B is 370.87 ha and 200.9 ha respectively, while equivalent values in Appendix I(4) are 345.7 ha urban and 226.1 ha SANG. The correct values should be made consistent and clarified across both documents. The calculations in Appendix I(4) for the Stage 3 nutrient load are correct based on the proposed land uses that have been used within this appendix. This gives a TN/TP load from future land use of 6,497.18 kgN/yr and 322.03 kgP/yr.

11.28 Stage 4 is to determine the overall nutrient budget. The calculations shown in Appendix I(4) follow the Natural England guidance and have been checked and verified, based on the results of the preceding Stages 1-3. The 20% precautionary buffer is correctly applied. However, due to the discrepancy described above between proposed area of urban and SANG in Stage 3 (between the technical note and Appendix I(4)), the final budget in the appendix does not match the numbers presented in the Technical Note. The updated worksheets for the correct proposed land uses should be provided. Assuming the Technical Note to be the most up to date values, the overall nutrient budget is 1,288 kgTN/yr and 270 kgTP/yr for the 110 litres/person/day scenario, and so is in surplus and requires mitigation. For the 90 litres/person/day scenario the budget reduces to -122 kgTN/yr and 250 kgTP/yr.

Review of Section 5 Preliminary Nutrient Mitigation Options

11.29 This section describes the wetland size required to mitigate the identified nutrient surplus. The required sizing has been based on the 93 g/m^2/yr TN and 1.2 g/m^2/yr TP median removal rates described in the Natural England guidance document, based on the Land et al. (2016) global wetland metastudy. To achieve neutrality for Otterpool Park plus CSD9A and CSD9B will require 22.5 ha of wetlands on the basis of these median removal figures, using the 110 l/person/day water use efficiency. Arcadis have identified that there is space for 24.8 ha of wetland within the revised Otterpool Park OPA boundary. This would use 14 wetlands, some of which are interlinked, and with one very large wetland of 8.86 ha in size. Plans are provided in Appendix I(4) of the nutrient neutrality assessment letter.

11.30 The applicant's technical note was produced prior to the latest Natural England guidance being issued in June 2021. This updated guidance states with regard to wetland mitigation that, "*Use of median rates is not recommended as an alternative to robust bespoke calculations*".

11.31 While bespoke treatment rates for the proposed wetlands have not been specifically included in the nutrient budget as per Natural England's latest recommendation, the applicant has gone on to provide further details on the wetlands (indicative area, treatment depth and average wetland depth) in Table 9 of the nutrient neutrality assessment and have provided preliminary hydraulic loading calculations in line with the Environment Agency Guidance Manual for Constructed Wetlands, R&D Technical Report P2-159/TR2. It is indicted that a sufficient level of treatment volume is provided to accommodate the proposed development and thus mitigate the nutrient surplus.

11.32 The proposed offline storm wetlands would all be located at the downstream extent of contributing catchments prior to discharging to watercourses. Upstream of the wetlands would be a series of linked SuDS features (over 60 ha of SuDS) which would provide further mitigation that is not currently included in the nutrient budget. Water stored in the SuDS and wetlands is to be used as part of a rainwater recycling strategy for non-potable usage within Otterpool Park and so reduce potable water consumption. This will also allow circulation of stored stormwater within the linked SuDS and wetlands to maintain sufficient baseflow for treatment efficacy during dry weather periods as required.

11.33 Final treated effluent from the onsite WwTW will be routed through the large 8.86 ha wetland (W13) upstream of the East Stour.

11.34 It is confirmed that adoption and management of the onsite WwTW and wetlands and strategic SuDS will be provided by Severn Trent Connect. While this is the current preferred approach, it would be possible for Otterpool Park Community Trust to also take on this responsibility if required. It is stated that 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. It must be ensured that the delivery of the wetlands and mitigation is such that neutrality is assured from the initial occupation of the development, with effective nutrient mitigation being in place from the outset.

11.35 Not all of Natural England's wetland requirements outlined in the June 2021 guidance have been met. For example, seven of the proposed wetlands are smaller than the 2 ha considered the minimum acceptable size, there is not a detailed design for the wetlands at this stage, and wetland specific N and P removal rates have not been used in the mitigated nutrient budget. However, we note Natural England's comments on the wetland mitigation:

11.36 "*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*.

11.37 *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".

11.38 In order to achieve certainty for the appropriate assessment we would agree that for the future planning application a detailed design should be produced and that bespoke treatment efficiencies for each wetland should be determined and the nutrient budget updated accordingly to confirm that mitigation is still achieved. The use of smaller wetlands than 2 ha should be agreed with Natural England on the basis of the detailed design of the wetlands, given uncertainty over the performance of smaller wetlands.

Review of Section 6 Summary

11.39 The summary states that nutrient neutrality can be achieved for the Otterpool Park Framework Masterplan and the two additional land allocations (CSD9A and CSD9B). As outlined above this will be delivered through a combination of the proposed Severn Trent Connect Onsite WwTW, 24.8 ha of offline wastewater and stormwater wetlands, 35 ha of woodland planting, and conversion of areas of agricultural land to stormwater SuDS, SANG and ecology/landscape mitigation.

11.40 It is stated that Arcadis and Folkestone and Hythe District Council will continue to develop the proposed Onsite WwTW and wetland design, maintenance and delivery programmes prior to the submission of the revised Otterpool Park OPA.

12. Clarification and Recommendations

12.1 Overall, we would agree with the conclusion of Natural England (2 December 2020) in response to the nutrient neutrality Technical Note that "*the calculations and mitigation proposals supporting documents provided are likely to meet the HRA tests for water quality at the plan level*".

12.2 However, we have noted an apparent discrepancy between the size of the proposed urban area and SANG for the new development between the technical note (Table 4 and Table 5) and the Appendix I(4) calculations. This may be due to version/document control, but this should be clarified, and the documents made consistent.

12.3 Secondly, we recommend that the detailed design of each proposed wetland should be progressed and detailed within the planning application for the OPA and robust evidence provided that wetlands smaller than 2 ha will provide the required treatment efficiencies. The nutrient budget should be updated to reflect the treatment efficiency of each wetland, as per the latest Natural England guidance issued in June 2021. Agreement from Natural England will be required for the use of smaller wetlands than the 2 ha that they generally require for nutrient mitigation.

12.4 Finally, within the OPA planning application it will be necessary to provide more robust evidence that the monitoring and maintenance of proposed wetlands will be suitably secured for the lifetime of the development.

13. Review of Arcadis Response to AECOM Comments - December 2021

13.1 Clarifications provided by email by Arcadis Consultants (UK) Ltd in December 2021 are reviewed below in turn (original AECOM comments shown in bold):

We have noted an apparent discrepancy between the size of the proposed urban area and SANG for the new development between the technical note (Table 4 and Table 5) and the Appendix I(4) calculations. This may be due to version/document control, but this should be clarified, and the documents made consistent.

13.2 Arcadis have clarified the calculations used in the various documents which resolves this issue. Furthermore, details have been provided of an extra sensitivity test that has been applied, which indicates that if SuDS were incorporated into the nutrient budget (rather than included under the 'urban' land use category as is currently the case), then the wetland mitigation requirement could be reduced by a further 1.8 ha. No further clarification is required for this point.

13.3 We recommend that the detailed design of each proposed wetland should be progressed and detailed within the planning application for the OPA and robust evidence provided that wetlands smaller than 2 ha will provide the required treatment efficiencies. The nutrient budget should be updated to reflect the treatment efficiency of each wetland, as per the latest Natural England guidance issued in June 2021. Agreement from Natural England will be required for the use of smaller wetlands than the 2 ha that they generally require for nutrient mitigation.

13.4 Arcadis have indicated that they were not previously aware of Natural England's June 2021 letter to Heads of Planning/Senior Planners. This letter states the following with regard to wetlands which informed AECOM's recommendation with regard to this point.

"Guideline for Wetland Creation:

For mitigation to demonstrate the required level of certainty we advise that proposals will need to demonstrate the following criteria:

- *Be at least 2 ha in size as inconsistencies in nutrient removal are particularly acute, and therefore uncertain, in wetlands smaller than 2 ha in size;*
- *Have a permanent input of water;*
- *A detailed design of the proposed wetland;*

- *Calculate wetland specific N and P removal rates (factoring in approximate hydraulic loading, inlet N & P loading, temperature, wetland area and temporal variation in flow rates and or water levels); Use of median rates is not recommended as an alternative to robust bespoke calculations;*
- *Demonstrate that monitoring and maintenance of proposed wetlands will be suitably secured for the lifetime of the development."*

13.5 The applicant has provided updated wetland summary details indicating that the wetlands are mainly interlinked to create total areas surpassing 2 ha in size. There is only one wetland (W14) which is below this size when considered as interlinked wetlands, and this is 1.11 ha. It is further explained that there would be space to expand this wetland if bespoke wetland calculations at a later stage indicated this was necessary.

13.6 It has further been indicated by Folkestone & Hythe District Council that it has previously been discussed with Natural England that due to the scale of the proposed Otterpool Park development that there is a limit to the amount of detail available at the outline stage and that the tiered planning structure will provide greater security of delivery of the appropriate mitigation. At this stage, we do not feel that further clarifications are needed but a revised nutrient budget incorporating bespoke wetland calculations should be developed at the next stage.

Finally, within the OPA planning application it will be necessary to provide more robust evidence that the monitoring and maintenance of proposed wetlands will be suitably secured for the lifetime of the development.

13.7 In response to this recommendation, Arcadis have submitted an extract from the Water Cycle Study indicating the proposed approach for implementation and maintenance, including development of a Maintenance Plan, and a proposed Governance and Stewardship Strategy setting out the potential options for long term ownership and maintenance of the wetlands and SuDS.

13.8 The onsite WwTW (including the associated wastewater tertiary treatment wetlands system) will be operated and maintained by STC as the inset water company in perpetuity under the legal and regulatory provisions of the Water Industry Act, while ensuring water quality standards and nutrient mitigation to satisfy Water Framework Directive and Habitat Directive requirements. All proposed centralised rainwater and wastewater recycling measures will also be adopted and maintained by STC.

13.9 Further detail is to be provided during the Tier 2 and Tier 3 stages. No further clarifications are required at this stage.

14. Review of updated nutrient budget analysis in line with new guidance

14.1 The following provides a review of the latest nutrient budget analysis prepared in line with the latest guidance. Requests for clarification are presented in bold text. We have also highlighted issues of concern and make inferences regarding the

context of future planning condition(s) were outline planning permission to be granted (see text in italics). However, we do not have full visibility of the planning approach and thus our comments will need to be interpreted and acted upon accordingly.

Option 1: On-site Treatment System

Otterpool Park Tier 1 Outline Planning Application

14.2 The Otterpool Park Tier 1 Outline Planning Application (OPA) includes 8500 new residential homes, 117 hotel rooms and associated non-residential uses/infrastructure, covering a total area of 589 ha, an existing land use for 37.4 ha of the total OPA site will remain unchanged. Class C3 will be residential units, Class C2 are extra care residential units and Class C1 are hotel rooms.

Stage 1: Wastewater

14.3 There are two scenarios considered for this development at the outline stage.

14.4 Scenario 1 includes 7855 dwellings considered Residential Class C3 with a water usage of 110 l/p/d +10% buffer in line with the updated Natural England guidance. 645 dwellings with a residential class C2 with a water usage of 350 l/p/d and 117 hotel rooms considered residential C1 with a water usage of 300 l/p/d and a residential occupancy rate of 2.00. The water usage for Class C2 and Class C1 are as per the recommended higher PCC rates in British Water Flows and Loads – 4 Code of Practice.

14.5 Scenario 2 includes the same number of dwellings but Residential Class C2 has a water usage of 262.5 l/p/d and Residential Class C1 has a water usage of 225 l/p/d. The water usages for these Residential Classes have been reduced by 25% to reflect the additional water efficiency measures proposed at Otterpool Park. *Using the improved water efficiency scenario would need to be subject to a pre-commencement planning condition.*

14.6 The on-site treatment system proposes a permit of 7.2 mg/L for TN and 0.1 mg/L for TP, this has been previously agreed by Natural England and is the same as their previous submission.

14.7 For Scenario 1, wastewater loading for the 7855 Class C3 dwellings has been calculated correctly as 74.37 kg TP/yr and 5,271.69 kg TN/yr. Wastewater loading for the Class C2 and C1 dwellings has also been calculated correctly using the Natural England Stodmarsh calculator. The overall wastewater loading for scenario has therefore been correctly calculated as 94.5 kgN/yr and 6,802.8 kgP/yr.

14.8 For Scenario 2, the total wastewater loading has also been calculated correctly as 89.5 kg TP/yr and 6,442.5 kgN/yr.

14.9 It should be noted that consistently throughout the revised nutrient assessment outputs the incorrect units have been used (i.e. TP has been given units of kgTN/yr and TN has the units kgTP/yr). The report should be corrected to amend this error and avoid the potential for confusion at future planning and assessment stages. If it is decided not to update the latest Nutrient Neutrality Assessment at this stage it is important that a record of

these potential issues are made and that any future planning condition makes adequate reference to them to inform future assessments.

Stage 2: Existing Land Use

14.10 The Applicant has stated that within the site there are three types of soil within the site boundary, these are freely draining, impeded drainage and naturally wet. It is also stated that the site is within the Upper Stour, it receives between 700.1 and 750 mm of rainfall annually, and that it is within a Nitrate Vulnerable Zone. We have checked the relevant resources suggested by Natural England and can confirm that all are correct.

14.11 There is a total of 323.67 ha of cereal land, 118.8 ha of lowland grazing, 80.41 ha of greenspace, 25.72 ha of open urban land, 2.05 ha of shrub and 0.96 ha of woodland within the site. This has been confirmed by an accompanying plan showing the proposed exiting land use within the OPA boundary and Framework Masterplan Boundary. **Ideally, evidence should be provided of the existing land use within the site over the last 10 years, but this is something that could be checked at a later assessment stage with the detail added to a suitably worded planning condition.** As there are three different categories of soils within the site boundary the Applicant has correctly calculated existing nutrient exports for the freely draining, impeded drainage and naturally wet soils separately using the Natural England Calculator.

14.12 There is a total of 288.57 ha of freely draining land within the site which contains 7.62 ha of open urban land, 61.10 ha of greenspace, 60.76 ha lowland grazing, 1.69 ha of shrub, 0.04 ha of woodland and 157.36 ha of cereals. The total nutrient export from this land has been correctly calculated as 40.00 kgTP and 6,023.21 kgTN annually.

14.13 There is a total of 53.05 ha of land within the site considered to have impeded drainage, of which there is 0.8 ha of greenspace, 17.64 ha of lowland grazing and 34.61 ha of cereals. The total nutrient export has been calculated correctly as 44.18 kgTP and 931.02 kgTN annually for this area.

14.14 There is a total of 209.99 ha of land within the site which is considered naturally wet of which 18.09 ha is open urban land, 18.51 ha is greenspace, 40.40 ha is lowland grazing, 0.36 ha is shrub, 0.92 ha is woodland and 131.70 ha is cereals. The nutrient export for this area has been correctly calculated as 111.82 kgTP and 3,764.97 kgTN annually.

14.15 The overall nutrient export from the existing land has been correctly calculated as 196 kgTP and 10,719.2 kgTN annually.

Stage 3: Future Land Use

14.16 The future proposed land uses include 256.62 residential urban land, 16.22 commercial/industrial urban land, 45.29 ha of greenspace, 14.1 ha of open urban land, a further 183.84 ha of greenspace, 6.76 of community food growing and 28.78 ha of water. This is confirmed by an accompanying plan detailing the future land use.

14.17 Within the freely draining area it is proposed to be 145.21 ha of residential urban land, 14.5 commercial/industrial urban land, 5.27 ha of open urban land, 120.7 ha greenspace, 2.69 ha community food growing and 0.23 ha of water. The

nutrient export from this area of land has been calculated correctly as 233.72 kgTP/yr and 2,517.40 kgTN/yr.

14.18 Within the impeded drainage area there is to be 13.16 ha of residential urban land, 1.5 ha commercial/industrial urban land, 30.3 ha of greenspace, 2.57 ha of open urban land and 5.51 ha of water. The total nutrient export from this area of land has been calculated correctly as 23.28 kgTP/yr and 299.92 kgTN/yr.

14.19 Within the naturally wet area of the OPA site there is proposed to be 98.25 ha of residential urban land, 0.22 ha of community food growing, 78.13 ha of greenspace, 6.26 ha of open urban land, another 4.07 ha of community food growing and 23.04 ha of water. Based upon these future land use classifications the nutrient export has been calculated correctly as 150.84 kgTP/yr and 1,686.86 kgTN/yr.

14.20 The commercial/industrial urban land in the naturally wet area of the site appears to have been mischaracterised as the 0.22 ha of community food growing land, this should be clarified, however it is quite negligible and only increases the nutrient export from the naturally wet area to 150.97 kgTP/yr and 1,684.58 kgTN/yr.

14.21 The overall nutrient export from this land has been correctly calculated based upon the stated future land uses as 407.8 kgTP/yr and 4,504.2 kgP/yr.

Stage 4: Final Nutrient Budget

14.22 The final nutrient budget has been calculated correctly by subtracting stage 2 outputs from the sum of the stage 1 and stage 3 outputs.

14.23 The final nutrient budget for Scenario 1 has been determined as 367.6 kg TP/yr and 705.3 kgTN/yr including a 20% buffer.

14.24 The final nutrient budget for Scenario 2 has been determined as 361.6 kgTP/yr and 273 kgTN/yr.

14.25 It should be noted that the Applicant has incorrectly stated the units for TP as kgN/yr and for TN as kgP/yr and this should be amended in the Nutrient Neutrality Assessment to avoid confusion. If it is decided not to update the latest Nutrient Neutrality Assessment at this stage it is important that a record of this potential issue is made and that any future planning condition makes adequate reference to them to inform future assessments.

14.26 A sensitivity test has been summarised in the assessment, but this is not required under the Natural England Guidance as it is assumed that a precautionary approach is already taken.

Otterpool Park +Otterpool Framework Masterplan

14.27 The Otterpool Framework Masterplan (FMP) includes another 1,500 residential units (849 Class C3 and 651 Class C2), and associated non-residential uses/infrastructure, an additional 44.29 ha of land use will undergo change. This brings the total dwellings up to 10,000 plus 117 hotel rooms when combined with Otterpool Park.

Stage 1: Wastewater

14.28 The FMP stage has an additional 1500 dwellings, this brings the total number of development within the whole site to 10,000. For Scenario 1 this includes 8704 residential class C3 class (110 l/p/d+10% buffer), 1296 dwellings considered residential class C2 (350l/p/d) and 117 dwellings considered residential class C1 (300l/p/d and occupancy rate of 2.00).

14.29 The overall wastewater loading has been correctly determined as 120.5 kgTP/yr and 8,675.8 kgTN/yr, based upon the above water usage and an occupancy rate of 2.4 for residential class C3 and C2.

14.30 Scenario 2 has the same number of dwellings. Residential class C3 has a water usage of 110 l/p/d+10%, residential class C2 has a water usage of 262.5 l/p/d, and residential class C1 225 l/p/d. The wastewater loading outputs have been calculated correctly as 111 kgTP/yr and 7,993.8 kgTN/yr.

Stage 2: Existing Land Use

14.31 The FMP boundary is situated within the freely draining soil area of the site and consists of an additional 2.96 ha of open urban land, 16.17 ha of greenspace, 0.28 ha of shrub, 0.62 ha of woodland, 6.11 ha of cereals and 18.17 ha of commercial/industrial urban land. This is confirmed by an accompanying plan showing existing land use within the FMP boundary.

14.32 The additional nutrients have been calculated as 22.94 kg TP and 396.20 kg TN annually.

14.33 The total existing nutrient export from the OPA and FMP site has been calculated correctly as 218.9 kgTP/yr and 11,115.3 kgTN/yr using the calculator tool.

Stage 3: Final Nutrient Budget

14.34 The developed FMP area will result in an additional 30.53 ha of residential urban land, 10.55 ha of greenspace and 3.23 ha of open urban land to the total development when combined with the Otterpool Park area. This results in an additional 47.01 kgTP/yr and 469.79 kgTN/yr exported from the future land use. The total future nutrient export from the Otterpool Park OPA development and FMP development has been correctly calculated as 454.8 kgTP/yr and 4,974 kgTN/yr.

Stage 4: Final Nutrient Budget

14.35 The final nutrient budget for the total Otterpool Park OPA and FMP site for Scenario 1 has been calculated correctly as 427.7 kgTP/yr and 3,041.2 kgTN/yr including a 20% buffer.

14.36 The final nutrient budget for Scenario 2 has been calculated correctly as 416.3 kgTP/yr and 2,222.8 kgTN/yr.

Mitigation

14.37 The Applicant proposes that wetland mitigation will be implemented within the development site to mitigate the nutrient budget of the development. An assumed wetland TN removal rate of 93 g/m^2/yr and wetland TP removal rate of 1.2 g/m^2/yr has been used, which is based upon a median removal rate stated in Natural England Advice on Nutrient Neutrality from 2019. The removal data used by the

Applicant is from a study into wetland removal rates by Land et al (2013)[19]. It is stated as an acceptable value under previous guidance and since Natural England have not included any additional sources of data for wetland removal in their updated guidance these are assumed to be acceptable values. It is possible that subject to detailed design and further analysis different removal rates may be achieved, but this remains uncertain at this stage.

14.38 For the Otterpool Park OPA site, based upon these assumed wetland removal efficiencies it has been calculated for Scenario 1 that to mitigate the nutrient budget for TN would require 0.76 ha of wetland, and TP would require 30.63 ha. In Scenario 2, 0.29 ha of wetland is required to mitigate TN, and 30.13 ha is required to mitigate TP, respectively. Therefore, it has been correctly stated based on the removal rates used that in order to mitigate the nutrient budget for Scenario 1 a minimum of 30.63 ha of wetland should be provided, and for Scenario 2 a minimum of 30.13 ha of wetland should be created.

14.39 For the total Otterpool Park OPA and FMP site and based upon a total phosphorous budget of 427.7 kgTP/yr for Scenario 1 and an assumed wetland TP removal of 1.2 g/m^2/yr, the total wetland area required for mitigation has been calculated correctly as 35.64 ha. For Scenario 2 the required wetland has reduced to 34.69 ha, this has also been correctly calculated by the Applicant. In both scenarios the wetland area required to mitigate the TN is significantly lower than this value.

14.40 Overall, for the whole site a minimum of 35.65 ha of wetland are required to mitigate the nutrient budget in Scenario 1 and 34.7 ha for Scenario 2. The Applicant notes that the current wetland provision is not large enough to mitigate the nutrient budget from the whole site when adopting on-site treatment system for wastewater. The proposed wetland area in the previous Water Cycle Study (WCS) (March 2022) was 28.77 ha which means there is currently a shortfall of approximately 6.88 ha for PCC Scenario 1 and 5.93 ha for PCC Scenario 2.

14.41 Although future more detailed wetland design and further analysis of removal potential may improve the efficiency of the proposed wetlands, the Applicant has noted that they need to provide approximately up to 7 ha of additional stormwater wetlands within the current Otterpool Park OPA developments proposals and future FMP area to ensure nutrient neutrality can be achieved.

14.42 The Applicant recommends that the current SuDS area within the OPA boundary should be designed as wetlands or bio-retention features to remove surplus P load. They note there is the potential for 8.97 ha of additional stormwater wetlands within the Otterpool Park OPA and FMP. However, this would require further investigation. **Overall, if outline planning permission is proposed it is recommended that it is subject to a planning condition that the Applicant identifies and details the additional required for wetland mitigation prior to the next planning stage.**

14.43 The Applicant believes that there is sufficient flexibility to accommodate any site and land ownership constraints or detailed master planning requirements considering that there is a safety buffer of around 2 ha. For this reason, they

[19] Land M., Graneli W., Grimvall A., Hoffman C.C., Mitsch W.J., Tonderski K.S., Verhoeven J.T.A (2016) How effective are created or restored wetlands for nitrogen and phosphorous removal? A systematic review. Environmental Evidence 5:9

believe that the Proposed Development will have No Likely Significant Effects on the Stodmarsh Designated Sites.

14.44 In addition to the above, it is important that mitigation is ultimately provided in advance of new development for which it relates. Ideally, all of the proposed wetland provision will be constructed together as site wide infrastructure. However, in practice this may not be possible, and some phasing may be required. This should be avoided if possible as it could create issues with delivery or programme. **Future Nutrient Neutrality Assessment should consider whether or not phasing is proposed and set out a schedule for the delivery of mitigation if necessary. It is recommended that this is included in the proposed planning condition.**

Option 2: Served by Sellindge WwTW

Otterpool Park Tier 1 OPA

Stage 1: Wastewater:

14.45 The number and type of dwellings, and proposed water usage is the same as for Scenario 1 for the on-site wastewater treatment option.

14.46 This option considers the development being served by Sellindge WwTW. This WwTW has a permit of 1 mg TP/l and 27 mg/TN/l according to the Stodmarsh Calculator, although the post 2025 permit will be tightened to 0.5 mg TP/l. However, the Applicant has used values of 0.3 mg TP/l and 25 mg TN/l in their calculations. **The reason why these alternative permit values have been used need to be clarified.** Where it is decided that no update to the current Nutrient Neutrality Assessment is required at this stage, and if this is confirmed as an error, it should be carefully noted so that future updates of the Nutrient Neutrality Assessment are corrected and used the prevailing permit limits for the WwTW at the time.

14.47 The overall wastewater TP and TN load has been calculated based upon 90% of this permit limit and on the previously stated water usages and occupancy rates, however as discussed above the starting values may not be correct.

14.48 Based on the values used, the wastewater loading for scenario 1 was calculated as 283.5 kgP/yr and 23,620.9 kgN/yr. However, using the 2025 proposed permit values for Sellindge WwTW in the Natural England Stodmarsh Calculator gives higher values of 472.4 kgP/yr and 28,345.0 kgN/yr.

14.49 The number and type of dwellings, and proposed water usage is the same as for Scenario 2 for the on-site wastewater treatment option. The development will be served by Sellindge WwTW which the Applicant has used a permit limit of 0.3 mg TP/l and 25 mg TN/l. As stated above, these values differ from those provided in the Stodmarsh Calculator and the reason why these alternative permit values have been used need to be clarified. Where it is decided that no update to the current Nutrient Neutrality Assessment is required at this stage, if this is an error it should be carefully noted so that future updates of the Nutrient Neutrality Assessment are corrected and used the prevailing permit limits for the WwTW at the time.

14.50 Using the Applicants chosen permit values, the overall wastewater TP and TN load has been calculated based upon 90% of the permit limit and on the previously stated water usages and occupancy rates. The wastewater loading for scenario 2 is 268.4 kgP/yr and 23,620.9 kgN/yr. However, using the permit value given for the WwTW in the Stodmarsh Calculator gives a higher value of 447.4 kgP/yr and 26,843.8 kgN/yr, respectively.

Stage 4: Final Nutrient Budget

14.51 Stages 2 and 3 are the same as for option 1. The final nutrient budget for Scenario 1 of the OPA site has been calculated based upon an incorrect permit limit for Sellindge WTW as 594.3 kgTP/yr and 20887 kgTN/yr. Using the permit limit provided by natural England gives a nutrient budget of 821.04 kgP/yr and 26,556 kgN/yr, including a 20% buffer.

14.52 The final nutrient budget for Scenario 2 has been calculated as 576.3 kgP/yr and 19385.8 kgN/yr. However, using the given permit limit for Sellindge WTW gives values of 791.04 kgP/yr and 24754.56 kgN/yr, including a 20% buffer.

14.53 However, as described above the Applicant should clarify the permit values used in this assessment. If it is decided not to update the latest Nutrient Neutrality Assessment at this stage it is important that a record of these potential issues are made and that any future planning condition makes adequate reference to them to inform future assessments.

Otterpool Park + FMP

Stage 1: Wastewater

14.54 The additional dwellings included in the FMP site are the same as for the previous calculations. The total wastewater loading for Scenario 1 including the FMP site has been calculated as 361.5 kgTP/yr and 30,124.3 kgTN/yr. However, using the given value for the Sellindge WTW in the Stodmarsh Calculator gives higher values of 602.47 kgP/yr and 36,149.1 kgN/yr.

14.55 For Scenario 2 the wastewater loading has been calculated correctly as 333.1 kgP/yr and 27756.2 kgN/yr. However, using the Sellindge WTW permit gives higher values of 555.1 kgP/yr and 33,306.5 kgN/yr.

Stage 4: Final Nutrient Budget

14.56 Same land use changes as for previous option. For Scenario 1 the total nutrient budget has been calculated correctly as 716.9 kgP/yr and 28,779.4 kgN/yr. However, using the WwTW permit limits from the Stodmarsh Calculator final nutrient budgets of 1006 kgP/yr and 44,829.72 kgN/yr are reported.

14.57 For Scenario 2 the total nutrient budget requiring mitigation was calculated as 682.8 kgP/yr and 25,937.7 kgN/yr. However, using the WwTW permit limits from the Stodmarsh Calculator final nutrient budgets of 949.2 kgP/yr and 27,166.3 kgN/yr.

14.58 As described above, the Applicant should clarify the permit values used in this assessment. If it is decided not to update the latest Nutrient Neutrality Assessment at this stage it is important that a record of these potential issues are made and that any future planning condition makes adequate reference to them to inform future assessments.

Mitigation

14.59 For the Otterpool Park Tier 1 OPA site based upon a surplus phosphorous removal rate of 1.2 g/m^2/yr, the wetland area has been calculated for scenario 1 and 2 as 49.53 ha and 48.03 ha, respectively. However, this rises to 68.42 ha and 65.92 ha respectively when using the correct permit limit for Sellindge WwTW (noting that the permit values used in the assessment need to be confirmed).

14.60 For the Otterpool Park Tier 1 OPA and FMP site the required wetland area has been calculated as 59.74 ha and 56.90 ha for scenario 1 and scenario 2, respectively. However, this increases to 83.83 ha and 79.1 ha, respectively when using the correct Sellindge permit limit (again, noting that the permit values used in the assessment need to be confirmed).

14.61 The Applicant states that the proposed wetland area currently does not cover enough area to provide full mitigation for Option 2 (in the same way it does not for Option 1). Future wetland design and further analysis of nutrient removal potential may improve the efficiency of the proposed wetlands. However, the Applicant has stated that Option 1 to implement an on-site treatment system is the preferred option.

14.62 Overall, there is a significant gap between the provision of wetland on-site and the required wetland area for mitigation if wastewater from the development is treated by the Sellindge WwTW. The Applicant has stated that the preferred option is to treat wastewater on-site using the STC connect system.

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