

# Local Plan to 2040, Policy R7 - Wastewater Treatment and Disposal Issues in Context of Existing application (CA/23/00484<sup>1</sup>)

## Summary

Public awareness and concern have been growing rapidly about the dire state of Britain's polluted rivers and waterways. This has happened largely due to wide ranging media attention (e.g. The Times and Guardian), helped largely by observers such as David Attenborough and Feargal Sharkey who have focused special attention on our rare chalk streams of which only 200 exist on the planet with 80% in England. There is increasing recognition of the absolute need to protect these irreplaceable "jewels in England's crown" from further threat from inappropriate development, poor farming practices and ineffective wastewater management and infrastructure.

Such a threat is embodied by this Policy 7-related existing application. The proposed development raises an **unacceptable risk of additional pollution** in the Little Stour and its important associated wetlands and ecology which are closely linked with the Stodmarsh sites (SSSI/SAC/SPA/Ramsar).

Of particular concern are the ways in which the application addresses waste water - i.e. **treatment of effluents, discharge route and discharge location**. Southern Water is unable to provide access to its main sewerage network because of existing overcapacity and infrastructural issues (response to this application 13 June 2023). The application therefore intends to use a private onsite treatment plant. Treated effluent from this will merge with (attenuated) surface water into the existing field drainage ditch. This ditch feeds into a culvert and 225mm pipeline running down the High Street and turns into open stream in Turner's Orchard. From there it enters another culvert to eventually discharge into the Little Stour by the pumping station bridge on Nargate Street. The paper raises several concerns about this:

- Environment Agency **recognises a greater risk of failure posed by private sewerage systems** leading to pollution of the water environment (response to application dated 08 Sept 2023).
- The existing pipeline has extensive damage and would "**need to be replaced**" (KCC response to this application 23 Aug 2023; Flood Risk Assessment & Outline Surface Water Drainage Strategy June 2023).
- The existing culvert and pipeline have long been associated with regular **serious flooding events** in the village.
- The use of open stream frequently by children in **Turner's Orchard** to convey effluents is wholly inappropriate.
- The discharge of effluents from 300 houses and associated built-up area, into a **designated chalk stream with low flow and at least three long-term periods of desiccation (zero flow), cannot be considered appropriate under any circumstances**.

There already exists a **substantial legal context** committing government and local authorities to reducing aquatic pollution, protecting waterways and rivers and achieving biodiversity net gains in general, and it is widely expected that chalk streams will soon receive specific protections under law.

## Wastewater treatment and impacts

The updated *Nutrient Neutrality Assessment and Mitigation Strategy* (21045-NUT-RP-01 C01) paper prepared by Water Environment Ltd. for the Applicant, recognises that deteriorating water quality (excessive nutrients, eutrophication) is already a problem within the Stodmarsh sites (Ramsar, SAC/SPA) and surrounding environment, and that this can impact on species assemblages as well as the wider food web. The cause of this deterioration has been attributed mainly to nitrification (nitrogen and phosphorus) from treated sewage discharged into adjacent rivers as well as from some farming practices. It further notes that the proposed development site will generate a substantial nutrient budget requiring mitigation if impacts on the Stodmarsh sites are to be avoided. A nutrient neutrality (NN) calculation is presented purporting to show that

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<sup>1</sup> >300 houses, Land off the Hill, Littlebourne Land Allocation SPAA098

effective mitigation can be achieved through using an **onsite wastewater treatment works** (WwTW; termed “water recycling centre”) in combination with a Sustainable Drainage System (SuDS). However, several assumptions are made in regard to the proposed mitigation approach and these are discussed below.

**Onsite WwTW.** Severn Trent Connect (STC) is a wholly owned subsidiary company of Severn Trent Ltd. STC are the designers, proponents and putative operators of this plant as an Ofwat *New appointments and Variations* (NAV) limited company. The Water Environment report presents few additional substantive design details of the onsite plant other than information taken from STC’s small-scale test / pilot facility at Petersfield. Observational data on likely noise and odour impacts are also presented. Several design options have been described to date, including a reed bed system. However, the conclusion appears to be that a **small-scale “state of the art” modular treatment unit** would be installed. This onsite WwTW would remove “rag and grit” and then deploy an activated sludge microbiological treatment process to reduce nutrients. Tankers will be regularly needed to remove accumulating solids to an off-site location.

Such small-scale onsite treatment plants are currently at an early developmental stage in UK, and lack independently verifiable information on long-term performance and economic viability. Although “state of the art” may imply technical progress in dealing with foul sewage, it also implies **high risk** as a result of there being very few similar plants currently in commercial operation<sup>2</sup>. Indeed, the **Environment Agency recognises a greater risk of failure posed by private sewerage systems** leading to pollution of the water environment (letter to Planning Portal under this application dated 08 Sept 2023). Unproven dependability and sustainability are evident risks associated with deploying new technology intended to be used in perpetuity and more especially where the receiving water environment comprises rare chalk stream habitat represented by the Nailbourne / Little Stour. Evidence from UK water industry performance further strongly suggests that plant and/or operational malfunction is very likely to occur at some time in the future particularly when the operating company (STC) lacks any track record with such onsite WwTWs.

**Effectiveness of onsite WwTWs.** Comparing the performance of small-scale with large existing (Southern Water) infrastructure is far from straightforward. While the former can effectively reduce nutrients nitrogen (N) and phosphorus (P), the latter may in fact **lack any nutrient stripping capacity at all**- for example Newnham Valley WwTW has neither phosphate stripping nor permit limit for either P or N. Perhaps a more important comparison in this case is related to **discharge location** (more on this below). Whereas Newnham Valley WwTW discharges some 4 km downstream of Littlebourne where the Little Stour is a more substantial permanently flowing river (with dilution effect), the onsite WwTW would discharge upstream at a point where the Nailbourne/Little Stour are either dry or slow flowing. They are also already ‘nutrient challenged’ with relatively high phosphate levels recorded at its source 300m from the applicant’s proposed site.

**Effectiveness in removing toxic and persistent pollutants.** Assuming a precautionary approach, the level of risk or prejudice to existing water quality and supported biodiversity will depend not only on the factors noted above including sustained plant operational performance, but also on impacts of other **emerging anthropogenic pollutants**. Dealing effectively with sewage and run-off from housing nowadays is not just about removing nutrients P and N, but also tackling a broad array of emerging pollutants ranging from pharmaceutical and personal care products (PPCPs), through to garden and domestic cleaning products, pesticides, other persistent toxic compounds and micro plastics<sup>3</sup> that are often now found in treated in wastewater and run-off. Emerging pollutants pose fundamental environmental and health hazards due to their resistance to conventional wastewater treatment methods. Despite their increasing presence in

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<sup>2</sup> Notorious hold ups in housing development due to nutrient neutrality advice in combination with shortcomings in existing sewage infrastructure operated by the national water utilities, created an opportunity for small independent treatment plants to begin playing a niche-filling role in unblocking such developments.

<sup>3</sup> Caddis larvae sampled regularly in the Little Stour and indicators of pollution, are frequently been found to include micro plastics in their ‘cases’

the environment, even conventional large-scale wastewater treatment, including activated sludge systems, struggle to effectively eliminate these pollutants. While larger treatment plants have the potential for advanced technologies, the effectiveness and cost associated with PPCP removal at small-scale depend on the suitability of specific processes and challenging economies of scale<sup>4</sup>.

**Discharge route, location and impacts.** No details have been provided about discharges other than vague indications that these would be into the “Nail Bourne” (comments in para below). However, scrutiny of the Flood Risk Assessment & Outline Surface Water Drainage Strategy (June 2023) shows that the existing field drainage ditch is to be used for both treated effluent from the WwTW and surface water run off via attenuation systems. The discharge route for the combined effluents from the site would be via an existing 225mm drainage unlined clay pipe that currently conveys a chalk spring rivulet (occasionally dry) from the north-east corner of the site to the Little Stour. A survey of this pipe commissioned by the applicant has already shown this conduit to be crack damaged and root infested. Moreover, the pipe and existing flow routes as an **open stream through Turner’s Orchard**, an important community space used by local schools and the public for recreation and net dipping. The route represents a significant flood and contamination risk for Littlebourne. The effluent volumes, estimated to be over 150cu m/day, would be substantially greater than the existing stream, raising not only the risk of heavy open flows through Turner’s Orchard, but also flooding impacts from storm events. Empirical historical evidence demonstrates a high flooding risk from the The Hill to the High Street and into adjacent low lying properties. For this reason, KCC’s Flood and Water Management group (as Lead Local Flood Authority) have indicted that **“the pipe will need to be replaced”** and that this would need to be factored into scheme feasibility (letter to the application dated 23 Aug 2023). Evidently this would represent further massive disruption to Littlebourne residents as well as to long-term traffic chaos on A257.

We had noted concern over the apparent **lack of diligence by the Applicant**. It is clear that neither the characteristics nor correct nomenclature (use of “Nail Bourne”) of this chalk-based river system have been taken into consideration. A key fact is that the Nailbourne is a rarely flowing winter-borne chalk stream which merges with the Little Stour at the wetlands adjacent to Garrington farm (Littlebourne Local Wildlife Site). The Little Stour with a rare upwelling feature some 300m from the southern margin of the development site, is a low volume/low flow chalk stream which also has a historical record of desiccation with zero flows<sup>5</sup>. Therefore, under any scenario where site outflow discharges to the *Nailbourne*, this would simply represent a conduit for treated sewage along the existing dry river channel. Similarly, were this to discharge to the *Little Stour* at some point in or upstream of Littlebourne, this would severely prejudice the integrity and ecological balance of this chalk stream. The array of key constraint factors would have become evident had an appropriate field survey or background research been commissioned by the Applicant.

Regarding the **SuDS**, it is difficult to obtain a clear picture from the proposal how this would function in practice given the highly technical nature of the application. However, KCC Flood and Water Management commented on this as part of their **objection** (2 May and 23 August 2023). KCC questions the adequacy of the proposed discharge routing and effluent volumes: recent soil impermeability tests submitted as part of the NN calculation, show permeability as zero/negligible implying attenuated storage would overflow especially during wet weather / flooding events. KCC also correctly raise concerns about the impacts of discharges into a designated chalk stream “carrying significant ecological value”, and point out the reduction in SuDS effectiveness over time resulting in build up of contaminants.

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<sup>4</sup> Government is currently committed under the Environment Act to undertake a UK-wide survey of emerging pollutants and microplastic pollution of river environments, including an assessment of their impact on aquatic ecology. House of Commons Environmental Audit Committee Water quality in rivers: Government Response to the Committee’s Fourth Report of Session 2021–22 First Special Report of Session 2022–23, May 2022

<sup>5</sup> Recorded flow rates in the Little Stour greatly year on year and through the year. Hydrological data show complete dewatering and desiccation of the Little Stour on at least three previous occasions during drought events 1949, 1991–1992 and 1996–1997. Wood PJ and G.E. Petts, Hydrological Processes, 1999

**Permitted Discharges.** Although WFD categorises the Little Stour as “Poor” for biodiversity, it remains on the whole and more especially in the upper reaches from Littlebourne through to Wenderton Woods, a clean and healthy stream with thriving riverfly population<sup>6</sup> supporting fish notably native brown trout, lamprey and European eel. The Environment Agency, who maintain an **Objection** to this application, is required to undertake a modelling exercise to assess the impact to the receiving water environment from the proposed final effluent discharge. EA has an obligation to ensure that in issuing an environmental permit, the receiving waterbody will not deteriorate, largely as defined by the WFD. The addition of large volumes of treated effluent from a technology with no record of sustained effectiveness will inevitably have a negative impact on the river water quality, the water environment and associated chalk stream habitat. This would be contrary to current legislation that aims to quantitatively enhance water quality in streams and biodiversity (Section 7 - achieving “Good Ecological Status” for 75% of water bodies by 2027 under the Water Framework Directive and Environment Act 2021). Given the chalk stream context and in consideration of the existing and emerging legislative framework, permitted effluent discharge conditions for chalk streams are likely to be extremely stringent. Furthermore, given the powerful emerging evidence, account must be taken of complex emerging pollutant issues some of which have been noted above.

**Diseconomies of scale.** On smaller sites with fewer than 350-400 dwellings, diseconomies of scale (cost effectiveness) become key factors in determining long-term effectiveness and efficacy (STC, personal communication). There are major sustainability risks associated with financial mechanisms that might be proposed that aim to “top-up” customer revenues constrained by Ofwat rules. Risks include revenues failing to cover costs of plant operation and maintenance; non-inclusion of necessary tertiary treatment options. Both of these factors in combination with long-term performance raise significant questions over sustainability and increase the likelihood of pollution incidents. As already noted, long term management by a small private sector company that lacks any track record in sewage and pollution management cannot be relied upon to provide in-perpetuity service especially where the receiving water body is an intermittent flow chalk stream which is already under pressure from nutrient pollution. Permanent operation costs are likely to be onerous with regular solids removal by tankers still required.

**Amenity impact: odour, noise and visual.** The Water Environment paper annexes information on amenity impacts related to noise and odour. The only available tests for noise and odour come from subjective evaluations undertaken by STC at their own small-scale test / pilot plant in Petersfield. In the both cases, STC conclude (as you would expect) that no “loss of amenity, annoyance, nuisance or complaints for current or future occupiers” of nearby dwellings would emerge. Yet, scrutiny of the data provided shows, for example, that ground level odour at 7.5m was *constant* and ranged in quality from *distinct* to *strong* (data from 2021 and 2022). From this it is clear that “normal” operation will involve substantial odour creation and that with prevailing westerly winds these odours will affect large parts of Littlebourne village centre. Those familiar with odours from the Canterbury WwTW on Sturry Road may be able to better understand the nature of this issue. Regarding noise (which was predicted by STC using modelling), at a distance of 30m this was considered “low” (around >30 to <50 dB). However, this level of noise is noticeable and would be permanent. Given the range of heavy pumping and generation (etc.) equipment involved, it can be assumed that continuous night time background noise would be detectable in such a quiet village location as Littlebourne, from a far greater distance. Aside from the odour and noise risk, the striking appearance of such a large, intrusive and unsightly piece of industrial equipment near the heart of Littlebourne’s Conservation Area is unacceptable.

As a general comment, only **independently verifiable data** should be used in determinations of the impacts on Littlebourne residents of such massively important nuisance factors.

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<sup>6</sup> Regular riverfly monitoring is undertaken on the Little Stour, along with physical and chemical analyses, as part of the Our Stour partnership with data contributing to national statistics.

## Wider Conservation Issues

The section takes a broader view of the environmental context in which the application is taking place. David Attenborough recently referred to chalk streams —of which the Little Stour is a prime example— as one of the rarest habitats on Earth. Feargal Sharkey, a dedicated advocate for English chalk streams, has voiced concerns about the dire state of these unique ecosystems by noting that “out of the 225 in England there remains no single chalk stream, that is not suffering from extensive environmental damage.”

The views of Attenborough and others are borne out by our 4 villages’ citizen science program<sup>7</sup> covering river water quality in the Little Stour chalk stream. Data from this demonstrates that the Little Stour is currently under pressure from nutrient enrichment pollution. Such is the existing level of enrichment that, in the absence of short term remedial investment by SW, it is inevitable that additional housing or agricultural effluent entering the stream near its source at Littlebourne will have serious local and downstream impacts. These will be felt not only on water quality, but also associated wetland / floodplain habitats (which including Preston Marshes SSSI, functionally-linked Stodmarsh sites and the high quality non-designated wetlands and grazed floodplain downstream from Wenderton Woods), and the important ecological and environmental services delivered by these.

There already exists a substantial legal context committing government and local authorities to reducing aquatic pollution, protecting waterways and rivers and achieving biodiversity net gains in general. It is likely that chalk streams specifically will soon receive specific protections under law. A range of institutions including Defra, The Rivers Trust and Catchment Based Approach have noted that “Chalk streams are both incredibly rare and a hugely important part of our environmental heritage – a true jewel in the crown of our environment”.

Chalk streams are a UK biodiversity action plan (BAP) priority habitat and are currently the focus of Chalk Stream Restoration strategy

Planned improvements to existing, inadequate wastewater treatment works’ infrastructure by Southern Water are unlikely to materialise in the medium term and would in any case only impact on housing that is currently connected to its network. The implication is that any onsite, ‘off-grid’ developments such as CA/23/00484 that lie within the catchment and aim to discharge effluents upstream of the main WwTW must be rigorously scrutinised for risk if further deterioration of the river is to be avoided.

The *Canterbury Landscape Character and Biodiversity Appraisal* (2012) highlighted the Little Stour as a good quality chalk stream, and Little Stour Valley as a coherent landscape in good condition. The report also highlights a networking opportunity for wetland habitat along the Little Stour/ Nailbourne noting “there is a strong corridor of mature riparian vegetation along the Little Stour and large areas of dense vegetation around the open water and marshland to the north. Land use is mainly pastoral with much of the area used for the promotion of wildlife.” The Appraisal points out that this is a very attractive area which forms part of the historic setting of the south eastern edge of Littlebourne. “The land along much of the ridge at Garrington has a park-like quality as does the pasture just north of the railway line. The trees along the ridge are of considerable landscape value and the setting of Well Chapel is attractive. Part of this has been declared a site of Nature Conservation Interest by the Kent Trust for Nature Conservation and it is judged to be of countywide ornithological importance.”

Legitimate concerns are raised that it is precisely this area into which the proposed onsite WwTW and surface water effluents would be discharged.

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<sup>7</sup> Funded locally through the 4 Villages Conservation Society (Littlebourne, Wickhambreaux/Stodmarsh, Seaton and Ickham) with recent input from Wingham residents