

Fragile Waters: Chalk Stream Crisis and Development Threats in Littlebourne

Summary

Chalk streams, particularly in England, are among the rarest and most fragile ecosystems, with none of the 225 streams free from environmental damage. The Nailbourne-Little Stour river system, connected to the internationally significant Stodmarsh wetlands, faces serious threats from pollution and over-abstraction. A pressing issue is how new housing developments in several Kent villages, like Littlebourne ([click link](#) for access to portal application no. CA/23/00484), will sustainably connect to water supply and wastewater disposal systems. Excess groundwater infiltration into sewers frequent overwhelms the local sewage network and treatment plants. Emergency measures like road tankers and over-pumping are regularly used to lower the risk of sewer flooding in homes yet environmentally extremely harmful and costly.

Southern Water has struggled to resolve the ongoing issues with the inadequate local wastewater infrastructure, and the planned investments by 2030 remain uncertain. Additional housing developments risk worsening sewage overflows and pollution, threatening vulnerable ecosystems, particularly the chalk streams and connected habitats like Preston Marshes SSSI and Stodmarsh, which share key species. The narrative highlights the urgent need for remediation measures to be in place before approving further developments, as increased pollution and flooding could cause irreversible damage. The proposed Littlebourne development relies on the assumption that Southern Water's upgrades, including those to the Newnham Valley wastewater plant, will be completed by 2030. ****However, basing any planning decisions on this assumption is seen as extremely high risk.****

Chalk streams

David Attenborough recently highlighted chalk stream ecosystems, including the Little Stour, as amongst the rarest and most fragile habitats on Earth. They are an irreplaceable part of our natural heritage and currently under severe threat. Feargal Sharkey, a passionate advocate for English chalk streams, has emphasised the dire state of these ecosystems, noting that none of the 225 chalk streams in England are free from extensive environmental damage. The Nailbourne-Little Stour river system is a significant example of a chalk stream habitat. It is functionally and ecologically linked to the internationally designated Stodmarsh wetlands and supports sites like Preston Marshes SSSI. Some 73 percent of Stodmarsh's qualifying species are shared with the Little Stour floodplain across a closely linked food web ecosystem. However, this vital habitat is increasingly threatened by pollution, reduced flow rates, species decline, urban development, and excessive water abstraction. Citizen science and Environment Agency data together show significant stress from nutrient enrichment pollution. Chalk streams are a NERC Act (2006) habitat of principal importance in England.

Context of the Development Proposal

All new households need to be connected to a supply of freshwater for drinking, washing and cooking. They also require adequate and functioning wastewater removal. For small Kentish villages situated to the east of Canterbury along the Nailbourne and Little Stour (e.g. Littelbourne), increasing the provision of these services sustainably in the face of large house building programmes represents a significant challenge. Perhaps the question we need urgently to ask ourselves when addressing the burgeoning need for housing is: **“Should we accept the high cost of losing such valuable natural capital, or rather should we seek places where development impacts would be lower and more acceptable?”** *

In the following sections, we examine these supply and disposal challenges.

Groundwater. There is an underlying common denominator for our local villages which is little understood, but whose consequences can often be painfully evident. This is the inadequacy of the wastewater (foul sewage) network infrastructure along the Nailbourne-Little Stour valley. In our catchment, excessive and uncontrollable groundwater infiltration into sewers during wet weather events frequently overwhelms the sewer system, preventing sewage from reaching the treatment plant. These events can last for over 6 months (e.g. 2023-24) and affect many of the local villages from Barham to Ickham. Impacts include restrictions on customers' use of bathroom, toilet, and kitchen facilities. Southern Water addresses this by using road **tankers** and **over-pumping** as emergency measures to reduce the risk of internal sewer flooding. However, these measures are unsustainable, environmentally harmful, and in breach of environmental legislation. To minimise the need for such measures, Southern Water purports to have invested in improving the sewer system's integrity through research, maintenance and repair schemes.

Although reducing and ultimately preventing groundwater infiltration in the first place obviously remains the preferred solution, tankers and over-pumping will remain the methods used by Southern Water in the medium term to manage excessive flows in sewers. Each has distinct advantages and disadvantages.

Tankers. A large fleet of emergency tankers is deployed at phenomenal expense (below) to reduce the risk of internal household flooding. Tankering can be effective for short-term, localised drainage issues, offering quick response times, less impact on watercourses, and the ability to discharge dilute sewage at treatment works. However, it has a low impact on flow rate, can cause traffic and road damage, is noisy, and has a high cost and carbon footprint. Tanker fleets usually operate daily throughout wet periods including Oct 2023 through to May 2024. In the low lying villages, they are renowned for creating much local disruption to villagers and traffic. Using tankers to try and reduce flows creates both upstream and downstream problems. Amongst these is what to do with the raw sewage pumped out of manholes. Two years ago, we pointed out that tanker collection waste was being dumped in the Canterbury treatment works and was contributing to the nutrient enrichment problems Stodmarsh. During the last wet season, however, Southern Water appear to be using alternative dumping stations in order to avoid this pollution pathway.

In order to glean more about specific impacts of tanker use, we submitted Freedom of Information (FoI) requests to Southern Water to seek answers on tanker costs, numbers, volumes collected, collection points and dumping stations and have so far received a partial response. Nevertheless, the following points are salient (note caveats below):

- *Volumes.* 100-115,000 cubic meters (m³ or tonnes) of raw sewage were transported by tankers on hire to Southern Water during the period Oct '23 to May '24. Of this, approximately half was dumped at Weatherlees (Sandwich), and a quarter each to Hythe and Wingham (Darnbridge).
- *Costs.* Southern Water would not reveal costs of these tanker operations. However, assuming tankers average 11m³ each, this equates to around 10,000 tanker loads at average of 3 loads per tanker day, i.e. 3,330 tankers per season. Sources from Hampshire (reported in the Southern Daily Echo in 2023), indicated charges of £1,000 per tanker day resulting in a total of £200,000 over 5 days for 40 tankers to address a burst sewer. Taking this amount we can impute a value “locally” (see caveat) of £3-4 million.
- *Caveat.* Our question about collection points was not fully answered. When analysing partial post code data covering collection sites as provided by Southern Water, it became clear that tanker collection data covering Nailbourne / Little Stour catchment were absent. Nevertheless, anecdotal information from tanker drivers indicated 25 tankers were operating daily during the wet season as an area fleet. Assuming conservatively 6 months use minimum (Nov-Apr), this equates to £4.5million using the above estimates. Southern Water have been asked to further clarify this.
- *Emissions.* In regard to carbon, Southern Water has noted that approximately 1.7kg/ m³ of CO₂ emissions, equating potentially to 2-500t CO₂ over the season.

Over-pumping. This other symptom of a failing network comprises pumping raw sewage directly into the stream sometimes via a solids or biological filter. Over-pumping can be considered as more efficient than tankers for continuous operations. It provides a far higher discharge rate that is equivalent to multiple tankers; it uses less fuel and has a lower cost and carbon footprint. However, it evidently has huge environmental impact by discharging effluent directly into the watercourse, potentially resulting in biodiversity loss, and a range of disturbances to local residents. Although seen as a more “efficient” way of clearing the backlog, it is clearly a quick-and-dirty measure generally avoided by Southern Water, especially with the current national outcry over spillages and pollution in rivers and waterways. Recently released Environment Agency spillage data for 2023 for the Wingham River (an important tributary of the Little Stour and itself an iconic albeit increasingly pollution-stressed chalk stream), showed some 5 spills of longer than 12 hours each from Darnbridge sewage works. Given the likelihood of increasing storm events, Southern Water recognise that “If tankers are not adequate to remove the excess flow, discharges to the watercourse will be required.”

Treatment works. Eventually, all wastewater reaches the “end of the pipe” at Newnham Valley sewage treatment works. This plant has suffered from capacity problems for well

over a decade. ***KCC reported in 2017 that flow rates even in dry weather exceeded capacity by 47% and envisaged catchment growth to be limited to 117 households, a limit that has since been exceeded several fold.***

What is the solution?

We have explained that the problem is at least two-fold in nature relating both to the impacts of groundwater on the network, and to the inadequacy of the treatment works itself. In the absence of any measures, the risk of internal and external flooding and restricted toilet use (common even when tankers are being deployed) would increase. Furthermore, even if Southern Water were to invest in a new sewage plant (£7-8m is potentially allocated in the business plan), the network itself will continue periodically to fail due to excessive groundwater infiltration during increasingly frequent wet weather events, and tankers and over-pumping will continue in spite of the new plant.

Likelihood of Southern Water investment to 2030.

A key assumption made by the proposed Littlebourne housing development is that Southern Water remedial investment under SRN39 / WINEP, including to the Newnham Valley wastewater treatment plant, will have been completed by 2030. This, the development proposal notes, would enable an albeit phased development towards this date.

****To base any Planning Decision on this assumption being borne out is considered extremely high risk.**** This is further explained below.

Following discussions with regulators and relevant institutions, Southern Water published tentative proposals to replace these works in order to meet statutory requirements. Although there is no firm commitment to do so, their documentation (February '24) notes "*there remains a high degree of uncertainty on the final scope of activity that could be phased into AMP9*".

As of last week (28 Aug), the following statement was published: "*Southern Water has today (28 August 2024) published our response to water industry regulator Ofwat, following its draft determination of our original investment plan for 2025-2030 which was submitted in October. Stuart Ledger, Southern Water's Chief Financial Officer, said: "After carefully reviewing Ofwat's draft determination, we don't believe it would secure the investment required to deliver massive change and tackle the issues that matter most to the communities we serve."*

Faced by such uncertainty over future remediation effort and investment, even if Southern Water commits to replacing Newnham Valley treatment works, there is little evidence that the network-wide groundwater infiltration problem will be addressed in the medium or long-term. The company's own data show past investments under the Infiltration Reduction Plan have had limited effectiveness largely because of evidently increasing wet weather periods over the last decade.

Assuming limited future remediation investment, we now look at the likely impacts of the development proposal.

Net impacts of additional housing.

Published data exist demonstrating the impact of new housing and increased sewage flows in a sewer network already compromised by groundwater infiltration and internal flooding can be significant. The additional load from new developments can overwhelm an already stressed system, leading to more frequent and severe flooding incidents. Groundwater infiltration reduces the sewer system's capacity to effectively transport sewage to treatment facilities, causing backups and potential overflows. This not only increases the risk of sewage entering homes and public spaces, but also exacerbates environmental pollution as untreated or partially treated wastewater may be discharged into local watercourses, further degrading ecosystems like chalk streams. In extreme cases, this can result in public health risks, property damage, and costly emergency interventions, making it crucial to address these vulnerabilities before new housing developments are approved.

Additional pollution and flooding-related risks

Site drainage issues. As pointed out by the Internal Drainage Board (CCC portal 2 Sept 2024), a public body that manages water levels in our area, a land drainage system currently serving a large agricultural field containing a small chalk spring, would be replaced by surface water runoff from a 300-400 house development. This runoff will be directed to the Little Stour chalk stream through a damaged, low-capacity culvert, which runs partially exposed for 100 meters through Littlebourne's community orchard frequented by children. The proposed SuDS system will require pumping from a lower field and impermeable ground conditions will ensure attenuation is ineffective. Additional pollution risks relate to potentially contaminated surface water from the built environment at the application site discharging directly into the Little Stour.

Tanker dumping. A further concern is that we have already demonstrated nutrient pollution pathways from this catchment to Stodmarsh designated habitats sites as a result of tankers discharging in Canterbury. Although tankers now appear to be discharging in Wingham (Dambridge Farm works), local monitoring shows this is now exacerbating existing pollution issues in the Wingham River. This in turn further threatens the Little Stour downstream of the confluence, and increases eutrophication risks not only to Stodmarsh but also to the Little Stour and important designated sites within the floodplain, especially Preston Marshes SSSI.

Compromising functionally-linked land. Little Stour's floodplain including Preston Marshes, Seaton Pitts, Chislet Marshes, Sarre Penn and other wetlands directly adjacent to Stodmarsh, although not internationally designated, have similar if not identical ecosystem value with shared species assemblages and constitute an integral part of the wider food web. Data from Kent and Medway Biological Records Centre (KMBRC; April 2023) show that approximately 73% of the Stodmarsh sites qualifying species have been recorded in the Little Stour catchment downstream of Littlebourne, e.g. in Preston Marshes SSSI which has strikingly similar configuration to the

Stodmarsh Sites. These key wetland sites must be taken into consideration as functionally linked land for Stodmarsh under the Habitats Regulations. Whilst it is both logical and self-evident that the development site itself can be excluded as functionally linked land, the hugely important array of designated and non-designated downstream habitats cannot be ignored. Not only are these vulnerable to nutrient enrichment and eutrophication, but are also functionally-linked ecosystems that support qualifying species of the Stodmarsh designated sites.

Tim Bostock
Sept 2024