

Problems with sewerage in Sussex (April 2024)

Introduction

Problems with storm sewage overflows have caused much public concern, received considerable media attention and prompted a flurry of political debate. The Sunday Times “Clean it up” campaign and several high profile TV documentaries have given many graphic examples of storm sewage impacting on the water environment but these examples have tended to be the most conspicuous, with sewage flowing from pipes, the build-up of sewage litter in streams and so on. Many more problems are diffuse, relating to the networks of sewers, manholes and pumping stations, and are often linked to high rainfall and poor surface water drainage. Such sewage flooding will pass to the nearest drainage ditch or culvert and ultimately to main rivers or rifies, many of which are protected by the Water Framework Directive Regulations (2017) but are not of “good” status.

Southern Water’s Baseline Risk and Vulnerability Assessments

Southern Water is the sewerage undertaker for Sussex and in 2020 published their baseline risk and vulnerability assessments for all their wastewater treatment plants. For Sussex, these relate to three river basin catchments, as shown in Table 1 and of the 14 parameters assessed, the 3 most relevant to sewerage networks are summarised. The risks of sewer flooding in a 1 in 50 year storm and the risks relating to storm overflow performance are the same in 2020 and 2050 because both assessments use the same assumed weather condition. The risks of sewer flooding due to hydraulic overload show a substantial deterioration between 2020 and 2050, due to rainfall assumptions and the impact of climate change, assumed population growth and increased “urban creep” (a measure of the increasing extent of impervious surfaces).

Overall, the percentage populations at “very significant” risk are high and demonstrate widespread problems across Sussex; the deterioration over 2020 to 2050 is of added concern.

You can get more detail at: www.southernwater.co.uk/dwmp/baseline-risk-and-vulnerability-assessment

Storm sewage overflows register

Southern Water maintains a register of the spills occurring at all of their designated overflows; these extend to storm overflows at pumping stations and the inlets to some wastewater treatment plants, and to settled storm sewage overflows at wastewater treatment plants. The register shows the total duration of spills (in hours) during a year, the counted number of spills in that year and the long-term average spill count. The extent of storm overflow problems at a selection of wastewater treatment plants is shown in Table 2 for 2022 and 2023; a marked deterioration is evident in 2023 as a consequence of the heavy rain suffered in this year.

The register does not identify many of the numerous diffuse locations within sewerage networks where sewage flooding occurs, often at the manholes along a

sewer, nor the location of impacted sites (roads, green spaces and homes). To check on the extent of these more diffuse problems will require sewage flood monitoring by the local council.

You can get more detail at: www.southernwater.co.uk/our-performance/environmental-performance/flow-and-spill-reporting

This data is also available from the Environment Agency in the form of an interactive map:

[Storm Overflow Spill Frequency \(arcgis.com\)](https://arcgis.com)

[It can be noted a small number of works are operated in NW Sussex by Thames Water.]

Regulation of storm sewage overflows

In June 2022, the Office for Environmental Protection (OEP) launched an investigation into the roles of Ofwat, the Environment Agency and DEFRA in the regulation of combined sewer overflows in England.

On 12th September 2023, the OEP published its findings:

- “We think there may have been misinterpretations of some key points of law. The core of the issue is that we interpret the law to mean that untreated sewage discharges should generally be allowed only in exceptional circumstances, such as during unusually heavy rainfall, it appears that the public authorities may have interpreted the law differently, permitting such discharges to occur more often.”
- “This then has consequences for the regulatory activity that follows. The guidance provided by Government to regulators, and the permitting regime they put in place for the water companies, possibly allow untreated sewage discharges to occur more regularly than intended by the law without risk of sanction.”

It can be expected that the discharge of untreated sewage from sewerage networks will be considerably curtailed in the future, but mainly at the more conspicuous point sources. There appears to be limited appreciation of the extent to which diffuse sources impact on the environment or on homes.

DEFRA first published its Storm Overflows Discharge Reduction Plan on 26th August 2022, in response to the growing public concern over the discharge of untreated sewage to the environment. This was updated on 25th September 2023, two weeks after OEP had published its findings. The “headline” targets from DEFRA are:

- Water companies will only be permitted to discharge from a storm overflow where they can demonstrate that there is no local adverse ecological impact;
- Water companies must significantly reduce harmful pathogens from storm overflows discharging near designated bathing waters by 2035;

- Storm overflows will not be permitted to discharge above an average of 10 rainfall events per year by 2050.

This latter target is being used by Southern Water as the current basis for taking action.

These targets do not yet appear to relate to the numerous diffuse locations within sewerage networks where sewage flooding occurs.

Southern Water's Clean Rivers and Seas Plan

Southern Water published their Clean Rivers and Seas Plan in November 2023, in the form of an interactive map. Approximately 100 locations with a purple symbol will be addressed in the period 2025 to 2030 as part of Asset Management Plan 8; many of these locations are storm overflows at wastewater treatment plants. Approximately 200 locations with a blue symbol will be addressed after 2030; about half of these locations are storm overflows at wastewater treatment plants with the remainder at pumping stations within sewerage networks. No action is proposed at approximately 100 locations with a green symbol as they are considered to be "out of scope" with spills occurring in less than an average of 10 rainfall events per year. The actions at a range of locations are summarised in Table 3.

You can get more detail at: www.southernwater.co.uk/water-for-life/clean-rivers-and-seas-plan/map

Discussion

The enormity of the problems with the hydraulic overloading of sewers in Sussex is clearly evident in Table 1 and is predicted to get worse over the period 2020 to 2050. The sewerage system is old and has not kept pace with the extent of new home developments, with decades of under-investment due to a lack of priority by Ofwat, the water companies' economic regulator. The situation has not been helped by the increase in impervious surfaces as a consequence of development nor by the greater intensity and frequency of rainfall events due to climate change. A marked deterioration was evident (Table 2) with storm overflows in 2023 due to the heavy rainfall in this year and is perhaps an indication of the growing impact of climate change.

Whereas much attention has been given to the poor performance of designated overflows at point sources, the diffuse sewage flooding occurring within sewerage systems has largely been over-looked; this is because little objective data is available and most evidence has been anecdotal.

In the preparation of Middleton-on-Sea's Neighbourhood Plan, a Flood Watch team was assembled in November 2022 to monitor all types of flooding. In its first annual report, sewage flooding from manholes along the main sewer in the Parish was recorded up to 17 times in the vicinity of Ancton Lane. This is not at all reflected in Southern Water's records (see Tables 2 and 3) implying considerable under-

reporting of diffuse sewage flooding; in other words, discharges of untreated sewage are far more widespread than can be gauged from the designated overflows alone.

The obvious conclusion is that new home developments should not proceed until such time as the sewerage infrastructure has been improved. The adoption of “Grampian conditions” in the planning system (the aim of this CPRE Sussex campaign) should require infrastructure improvements before new home developments are permitted to start or be occupied. This approach is consistent with the views of Arun District councillors who suggested a moratorium on house building until the sewers have been improved (letter to Michael Gove MP, 18th August 2023) and the similar view expressed by Andrew Griffith MP in his letter to Arun District Council, dated 11th December 2023.

Whereas Southern Water’s Clean Rivers and Seas Plan is welcomed, the proposed mitigation of storm sewage overflows in the short term (2025 to 2030) is limited. Much of what is required will not commence until after 2030. This means that most new house building in Sussex should not take place for the foreseeable future, until sewerage deficiencies have been resolved. More homes equate to more sewage which can only worsen an already unacceptable situation. To properly reconcile sewerage infrastructure to housing development, the preparation of 25 year plans would be very beneficial, involving the local planning authority, the sewerage undertaker and the environment agency. Because of the diffuse nature of much of the discharge of untreated sewage and its localised mitigation, meaningful participation of town and parish councils is required.

Appropriately, the short term priority of Southern Water’s plan is linked to environmental sensitivity, including the protection of designated “bathing waters” and “shell fishery waters”. But there is so much more to do, particularly when considering the mitigation of the more numerous diffuse sources of untreated sewage that are impacting on homes, greenfield spaces and roads, and are a threat to public health from pathogenic bacteria (such as salmonella), viruses (such as noroviruses) and parasites (such as taenia tapeworms and cryptosporidium).

An example of sewage flooding at someone’s home is shown below:



Photograph courtesy of Jacky Pendleton, Middleton-on-Sea

DEFRA and the Department of Health need to review diffuse sewage flooding of this type and advise on what public health protection measures are required and who should enforce them. In the meantime, there are strong arguments for the sewerage undertaker to install UV disinfection at their wastewater treatment plants.

The construction of wetlands to reduce the extent and frequency of storm sewage overflows is certainly preferable to the construction of concrete tanks. However, a lot of land is required (assuming it is available) and the wetlands must be designed carefully to avoid anaerobic conditions and associated smells. It is assumed that planning permission will be required for a change of use of the land involved, in which case the planning authorities and their statutory consultees will have the opportunity to scrutinise the details of the schemes proposed.

The extensive relining of sewers proposed by Southern Water will undoubtedly reduce ingress from groundwater and rainwater, but will it cause more local flooding? Further, the extent of the relining work proposed will potentially be very disruptive to local communities. CPRE Sussex would like to see a multi-agency approach to sewer relining schemes to ensure that local flooding can be avoided, perhaps involving concurrent improvements to surface water drainage.

In principle, the use of sustainable drainage techniques is welcome, extending to the construction of swales, tree planting and the installation of water butts. CPRE Sussex considers that it will be essential for the relevant town and parish councils to be actively involved.

CPRE Sussex wants:

1. "Grampian conditions" to be applied within the planning process to ensure that sewerage deficiencies are resolved before development is allowed to proceed.
2. DEFRA and the Department of Health to review the extent of diffuse sewage flooding and its threats to public health, and provide advice to local authorities.
3. The Government to establish a cross-party committee to consider the conflict between sewerage infrastructure and new home building policies.
4. The National Planning Policy Framework to support the principle that sewerage deficiencies must be resolved before new home developments are allowed to be built or occupied.
5. Local councils to objectively monitor sewage flooding in their area, via a flood watch system, if it is known to occur.

Table 1. Summary of relevant risk and vulnerability assessments

Risk of sewer flooding in a 1 in 50 year storm

River Basin Catchment	Population served:	% population with very significant risk 2020	% population with very significant risk 2050	% population with moderate risk 2020	% population with moderate risk 2050
Arun & Western Streams	411,465	57.5	57.5	28.6	28.6
Adur & Ouse Levels	723,683	69.7	69.7	25.3	25.3
Cuckmere & Pevensy Levels	322,385	36.9	36.9	61.0	61.0

Risk of sewer flooding due to hydraulic overload

River Basin Catchment	Population served:	% population with very significant risk 2020	% population with very significant risk 2050	% population with moderate risk 2020	% population with moderate risk 2050
Arun & Western Streams	411,465	6.9	41.4	45.8	14.0
Adur & Ouse Levels	723,683	36.2	87.0	57.4	7.1
Cuckmere & Pevensy Levels	322,385	49.2	53.4	5.0	0.8

Storm overflow performance

River Basin Catchment	Population served:	% population with very significant risk 2020	% population with very significant risk 2050	% population with moderate risk 2020	% population with moderate risk 2050
Arun & Western Streams	411,465	65.5	65.5	23.1	24.0
Adur & Ouse Levels	723,683	66.1	66.1	26.3	26.3
Cuckmere & Pevensy Levels	322,385	93.3	93.3	4.7	4.7

Table 2. Examples of the extent of storm overflows in Sussex *

Location	Type of overflow	Receiving watercourse	Duration of spills in 2022/2023 (hours)	Number of spills in 2022/2023 **	Long-term average number of spills (2023)
Billinghurst WTW	Settled storm sewage	Par Brook	582/936	45/73	54
Chichester WTW No.1	Settled storm sewage	Chichester Harbour	1202/3119	68/151	62
Eastbourne WTW	Inlet to WTW	English Channel	434/741	62/101	59
Horsham WTW	Settled storm sewage	River Arun	330/776	28/58	33
Lidsey WTW	Settled storm sewage	Lidsey Rife	1579/3485	78/164	105
Petersfield WTW	Settled storm sewage	Stanbridge Stream	329/543	41/54	42
Sidlesham WTW	Settled storm sewage	Broad Rife	768/1397	47/84	56
Ancton Lane PS, Middleton	Sewer network	Ditch to Ryebank Rife	0/0	0/0	0/0
Chichester Road, Bognor	Sewer network	Aldingbourne Rife	17/83	2/15	5
Shripney Road PS, Bognor	Sewer network	Aldingbourne Rife	30/181	4/10	2

* numbers are rounded to nearest integer

** The total numbers of spills in 2022 were around 4700 in E Sussex and around 3400 in W Sussex. The total numbers of spills in 2023 were around 8000 in E Sussex and around 6100 in W Sussex.

Table 3. Examples from Southern Water’s Clean Rivers and Seas Plan to reduce storm overflows

Location	Reason for action	Average annual releases	Proposed investment £ million *	When	Proposed actions
Ancton Lane PS, Middleton	Not in scope	<10	None	N/A	None
Billinghurst WTW	Rainwater	63	3	2025-2030	Sustainable drainage to tackle 0.7 hectares impervious ground plus >50 water butts
Bognor Regis PS	Groundwater	60	88	2025-2030	Install 36.15 hectares of wetlands. Reline 136.31 km sewers
Chichester WTW No.2	Groundwater	104	24	2025-2030	Install 10.11 hectares of wetlands. Reline 36.14 km sewers
Eastbourne WTW	?	65	21	>2030	Investigations required
Horsham WTW	?	34	7	>2030	Investigations required
Lidsey WTW	Groundwater	106	9	2025-2030	Install 3.27 hectares of wetlands. Reline 15.71 km sewers
Petersfield WTW	Groundwater	37	12	2025-2030	Increase storage capacity. Sustainable drainage to tackle 4 hectares impervious ground plus >251 water butts
Shripney Road PS	Groundwater	Not known	1	>2030	Install 0.33 hectares of wetlands. Reline 1.24 km sewers

* numbers are rounded to nearest integer