

Drainage and Wastewater Management Plan (DWMP)

Overview of the Rother River Basin Catchment

October 2022
Version 2

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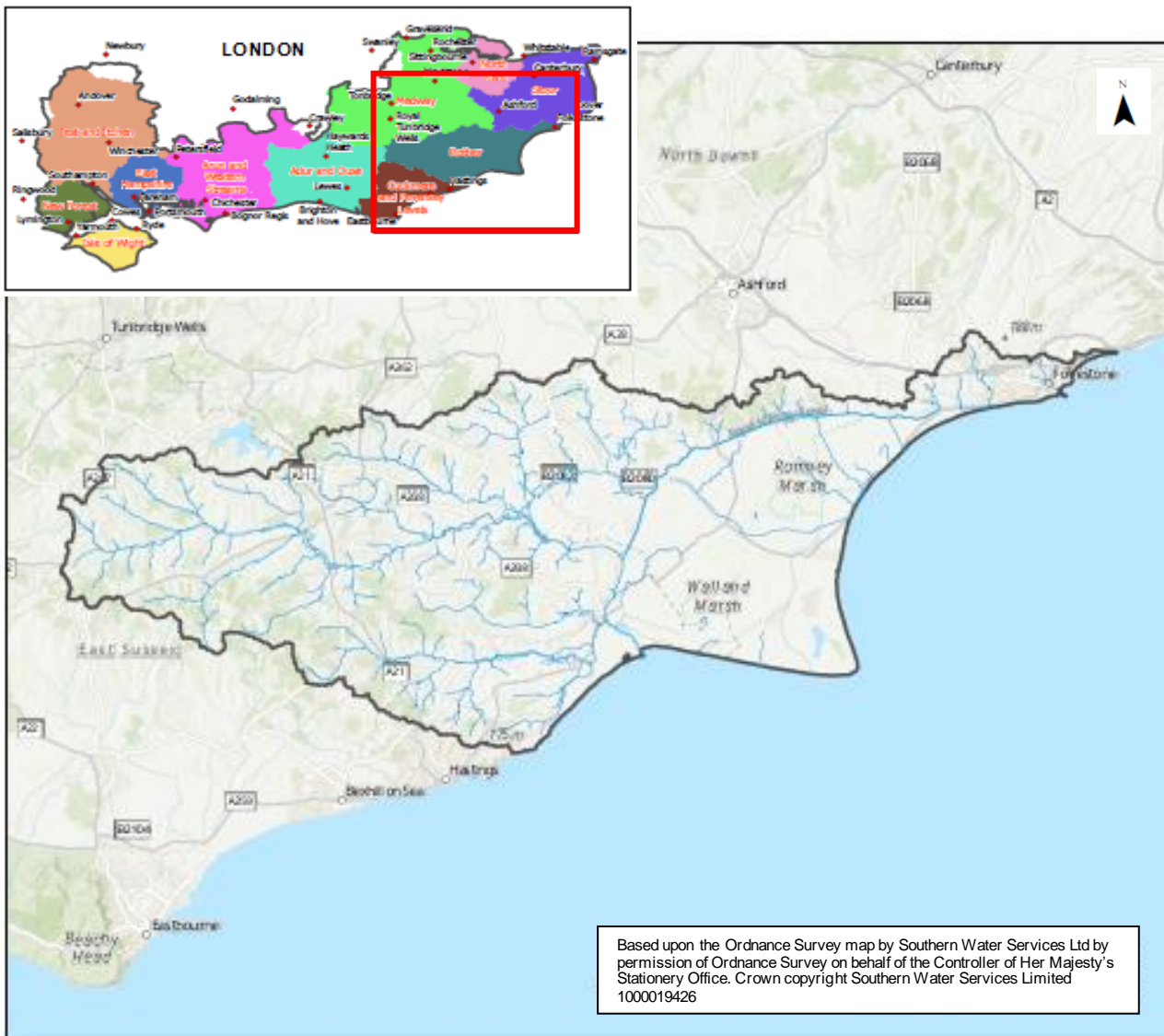


from
**Southern
Water** 

Overview of the Rother River Basin Catchment

The Environment Agency has previously defined the River Basin District catchments in their River Basin Management Plans prepared in response to the European Union's Water Framework Directive. These river basin catchments are based on the natural configuration of bodies of water (rivers, estuaries, lakes etc.) within a geographical area, and relate to the natural watershed of the main rivers. We are using the same catchment boundaries for our Level 2 DWMPs. A map of the Rother river basin catchment is shown in figure 1.

Figure 1: The Rother River Basin Catchment in East Sussex and Kent



The Rother catchment drains just over 982km² of land in East Sussex and Kent. The largest and longest river in the catchment is the River Rother. The catchment has a unique collection of river systems and man-made canals and includes the network of ditches, streams and sewers of the Romney Marsh and the 28 mile Royal Military Canal.

The Rother rises near Rotherfield in Wealden district of East Sussex and flows for 35 miles through East Sussex and Kent to its mouth on Rye Bay on the English Channel. Along its course, it is joined by the Rivers Limden and Dudwell at Etchingham, the River Darwell to the north of Robertsbridge, and the Brede and Tillingham Rivers which join it at Rye before it discharges to the sea. For the final 14 miles the river bed is below the high tide level, and the Scots Float sluice is used to control water levels. The sluice prevents salt water entering the river system at high tides, and retains water in the river during the summer months to ensure the health of the surrounding marsh habitat. Below the sluice, the river is tidal for 3.7 miles. It is navigable from Bodiam to Rye Harbour.

The upper part of the catchment is mainly woodland and grassland, with some farming and urban development. Much of the lower and eastern end of the catchment is low-lying reclaimed coastal marshland and, below Udiam, extensive areas lie below the spring high tide levels.

Most of the underlying geology is impermeable clay and this means rainfall rapidly runs off the land into the river system. Because the lower reaches are so low-lying the flow is slow and the marshlands are prone to extensive flooding. Conversely, there are few groundwater aquifers feeding the river which means the river flow can be quite low in dry periods. When it is dry, water is pumped into the surrounding network of canals and ditches to manage the marshland habitats but when it is wet the system is reversed with waterlogged areas pumped into the river to drain the land.

There are a number of towns within the catchment including Rye, Tenterden, Hythe, Dymchurch, Lydd, Robertsbridge and New Romney and many villages scattered across the area with the major towns of Hastings and Folkestone just outside. There are around 103,590 people who live in the River Rother river basin catchment. Historic Rye became part of the Cinque Ports in the thirteenth century, and although it is now situated some distance from the sea, its harbour is still visited by commercial shipping and it has a fleet of fishing boats.

Romney Marsh, including Dungeness, is the largest coastal wetland habitat and is one of the most important wildlife sites in the world – protected at a Global, European and UK levels. The area is home to species found hardly anywhere else in the UK and it is also a crossroads for migrating birds. The Marsh has no boundaries but it incorporates one of the largest wild and stable vegetated shingle landscapes in the world supporting a rich and diverse wildlife and a wide and unique variety of uncommon plants, insects and spiders. It is designated a National Nature Reserve (NNR), Special Protection Area (SPA) and a Special Area of Conservation (SAC). Dungeness, Romney Marsh and Rye are also designated as Sites of Special Scientific Interest (SSSI).

South East Water provides drinking water to homes and businesses in the Rother catchment whereas Southern Water provides wastewater services although we have three regionally important reservoirs (Powdermill, Darwell and Bewl Water) which are used to store water for public supply.

Drainage and Wastewater Systems

Drainage and wastewater systems are designed to convey water. There are several different drainage systems, including:

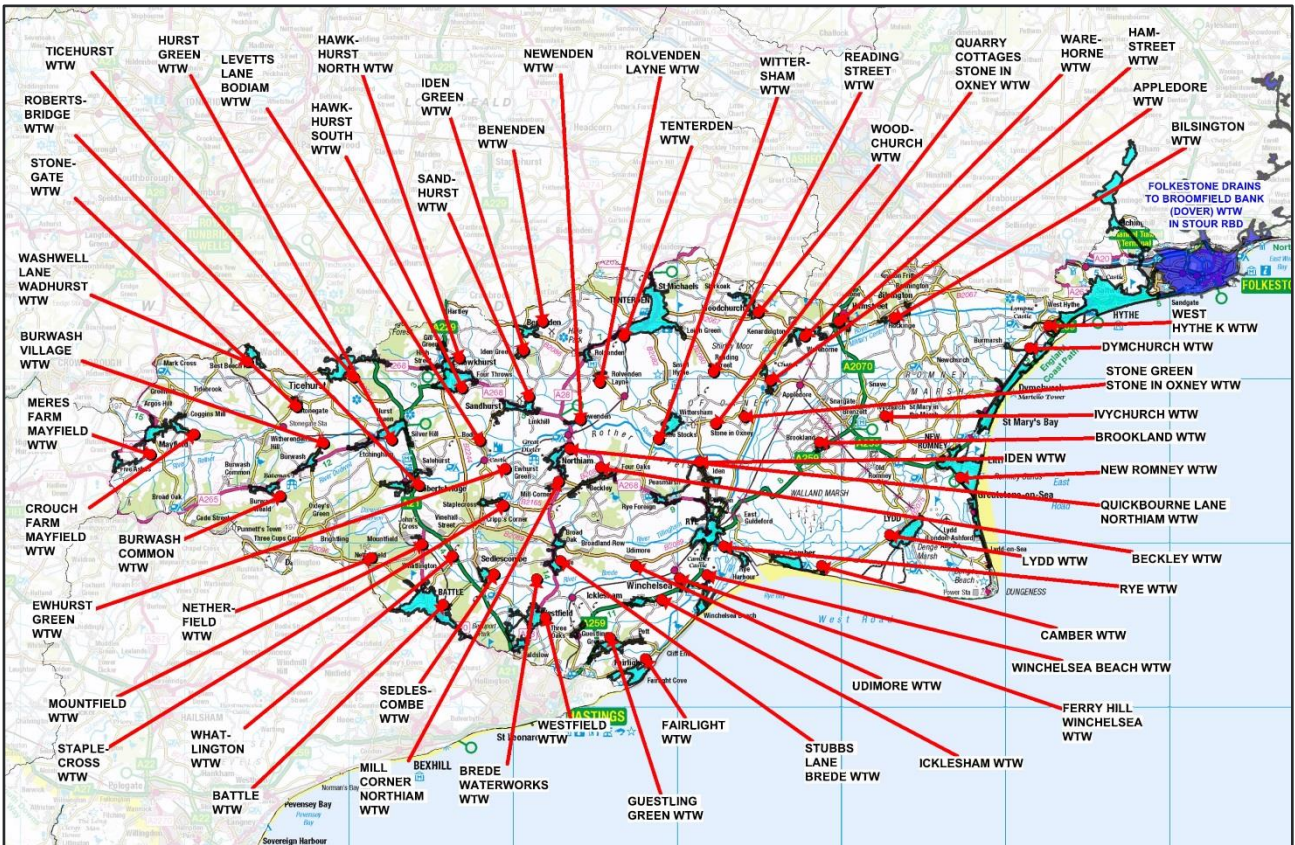
- land drains in fields to drain the land to enable it to be used for agricultural purposes
- highway drainage systems to ensure that roads and car parks remain safe and useable during rainfall
- rivers and streams to transport water running off the land to the sea
- surface water drainage systems that take water from rooves and paved areas to local rivers, and
- sewerage systems that take wastewater away from people's homes and businesses so it can be recycled and released safely back into the environment.

All these systems provide essential services to protect the economy and environment, and ensure public health, safety and hygiene. The links between water use and the management of wastewater is important to protect the wider environment. This excellent independent short film, called "[The Drip](#)", shows how the water cycle links everything together.

In the Rother river basin catchment, we own and operate 55 separate sewerage systems that collect wastewater over a geographical area known as a sewer catchment. These are the areas shaded blue on the map, see figure 2 below. Each sewer catchment is drained by a complex sewerage system comprising a network of pipes, pumps and wastewater treatments works (WTWs) that combine to remove wastewater from homes and businesses and re-cycle the water so it can be safely discharged back into the environment.

Our sewer catchments generally cover the urban centres and communities. Of the 982km² of land in the river basin catchment, only 67km², or 6.8%, is covered by our sewer catchments. However, of the 77,187 residential properties and 11,328 businesses within the Rother catchment, 89% of the homes and 82% of the businesses are connected to our sewerage system. Remote rural properties are often not connected to sewerage systems and therefore rely upon a septic tank within their property to collect wastewater before it is periodically emptied by tankers and the wastewater is taken to a WTWs to be recycled.

Figure 2: Map of the Rother Catchment showing the sewer catchment areas (in blue) and locations of the WTWs



More than 1,259 km of wastewater pipes serve the Rother catchment with 274 pumping stations within the network to pump sewage to the 55 WTWs for recycling the water back into the rivers or the sea. Table 1 provides a summary of the 55 sewer catchments within the Rother river basin catchment, including the equivalent population that each sewerage system serves and the approximate length of sewers within the sewer catchment. The Population Equivalent (PE) is a measure of the quantity of sewage that the water recycling centre needs to process, and consists of the calculated equivalent number of people who would contribute the amount of sewage from within the sewer catchment from residential and commercial properties.

Table 1: Sewer Catchments in the Rother River Basin Catchment

Sewer Catch Ref	Sewer Catchment Name	Communities Served	Population Equivalent	Length of sewers (km)
HYTH	HYTHE	Hythe, Frogholt, Newington, Peene, Lypne, Newingreen, Saltwood, Westenhanger, Etchinghill, Lyminge, Sandgate, West Hythe, Ottinge	19354	214,367
TENT	TENTERDEN	Tenterden, Cranbrook, Rolvenden, St. Michaels, Wittersham	7960	134,479
DYMC	DYMCHURCH	Romney Marsh, St. Marys Bay, Dymchurch, Burwash	7329	94,814

RYEW	RYE	Rye, Beckley, Brede, Broad Oak, Camber, East Guldeford, Iden, Landgate, Northiam, Peamarsh, Rye Harbour, Udimore, Winchelsea, Icklesham, Winchelsea Beach	5630	61,844
WEST	WESTFIELD	St. Leonards on Sea, Westfield, Hastings, Sedlescombe	2140	52,115
IDEN	IDEN	Rye, Iden, Peamarsh, Playden, Camber, Peamarsh, Rye Foreign	1840	47,913
HUGR	HURST GREEN	Etchingham, Burwash Common, Burwash, Hurst Green	1817	30,905
ROBE	ROBERTSBRIDGE	Robertsbridge, Bodiam, Salehurst	2444	28,779
FAIR	FAIRLIGHT	Hastings, Pett, Fairlight,	1563	25,809
LYDD	LYDD	Romney Marsh, Brenzett, Brookland, Lydd	3783	24,525
MAYM	MERES FARM MAYFIELD	Mayfield, Five Ashes, Wellbrook	1742	23,890
GUES	GUESTLING GREEN	Hastings, Pett, Guestling, Fairlight	1082	23,209
NOQL	QUICKBOURNE LANE NORTH	Northiam, Rye	1721	22,348
HAWS	HAWKHURST SOUTH	Cranbrook, Hawkhurst	1968	21,327
CAMB	CAMBER	Rye, Camber	3128	17,350
HAST	HAMSTREET	Ashford, Hamstreet	1592	16,915
HAWN	HAWKHURST NORTH	Cranbrook, Gills Green, Hawkhurst	2134	16,377
SHST	SANDHURST	Sandhurst, Cranbrook	1147	15,479
BURV	BURWASH VILLAGE	Etchingham, Burwash	1370	14,199
WOOD	WOODCHURCH	Woodchurch, Ashford	1178	13,333
WADL	WASHWELL LANE WADHURST	Wadhurst, Cousley Wood, Moseham, Sparrows Green	751	13,254
MAYC	CROUCH FARM MAYFIELD	Mayfield, Coggins Mill	760	12,668
ICKL	ICKLESHAM	Winchelsea, Icklesham	896	12,221
WITT	WITTERSHAM	Wittersham, Tenterden	787	11,510
SEDL	SEDELSCOMBE	Sedelscombe, Battle	1024	11,465
WIBE	WINCHELSEA BEACH	Winchelsea Beach	706	11,309
WARE	WAREHORNE	Kenardington, Ashford, Warehorne	348	10,960
WIFH	FERRY HILL WINCHELSEA	Winchelsea, Winchelsea Beach	512	8,061
BURC	BURWASH COMMON	Etchingham, Burwash Common, Burwash Weald, Burwash	577	7,920
STCR	STAPLECROSS	Staplecross, Robertsbridge	496	7,676
NOMC	MILL CORNER NORTHIAM	Northiam, Rye	144	6,399
THOA	THREE OAKS	Three Oaks	0	5,497
NETH	NETHERFIELD	Netherfield, Battle	358	4,743
IDEG	IDEN GREEN	Cranbrook, Iden Green	300	4,379

MNTF	MOUNTFIELD	Mountfield, Robertsbridge	0	4,188
STON	STONEGATE	Stonegate, Wadhurst	275	3,128
NEEN	NEWENDEN	Newenden, Cranbrook	132	1,756
STOG	STONE GREEN OXNEY	Stone, Tenterden	149	1,579
IVYC	IVY CHURCH	Romney Marsh, Ivychurch	111	1,155
READ	READING STREET	Tenterden	29	691
UDIM	UDIMORE	Udimore, Rye	48	536
ROMN	NEW ROMNEY	New Romey, Greatstone, Littlestone, Romney Marsh, Burwash, Dungeness, Dymchurch, Ivychurch, Lydd, Newchurch, Lydd on Sea	13692	107.676
BATT	BATTLE	Battle	606.8	89.895
BECK	BECKLEY	Rye, Beckley	885	61.844
BRSL	STUBBS LANE BREDE	Rye, Brede, Broad Oak	1303	20.181
BILS	BILSINGTON	Ashford, Bilsinton, Ruckinge	226	7.565
BENE	BENEDENE	Cranbrook, Benedene	638	6.724
APPL	APPLEDORE	Ashford	531	6.121
BROO	BROOKLAND	Romney Marsh, Brookland	344	5.164
ROLN	ROLVENDEN LAYNE	Cranbrook, Rolvenden Layne	345	4.429
BOLL	LEVETTS LANE BODIAM	Robertsbridge, Bodiam	112	2.678
EWHU	EWHURST GREEN	Robertsbridge, Ewhurst Green	28	0.783
BRWW	BREDE WATERWORKS	Rye, Brede	13	0.479
WHAT	WHATLINGTON	Whatlington, Battle	52	0.359
SQCT	QUARRY COTTAGES OXNEY	Stone, Tenterden	28	0.333

Of the 55 WTWs in the catchment, two systems serve more than 10,000 population equivalent per day.

Hythe WTW serves homes and businesses in the Hythe area. The sewerage system includes 19 wastewater pumping stations in the network to transport the water through the sewers from these homes and businesses to the treatment works. The works is permitted to discharge just over 12587 m³ per day of recycled water.

Tenterden WTW serves communities within the Tenterden, Cranbrook, Rolvenden, St. Michaels and Wittersham areas. The site receives water via the Rolvenden pumping station as well as gravity flows from the local catchment. Flows up to 87 litres per second are treated through the works. The last significant capital investment on the site was the installation of a ferric dosing scheme in 2008. We installed a ferric dosing unit which injects ferric sulphate into water before the treatment process. This reduces phosphorus in the final recycled water so it can be safely

discharged back into the environment. A further investment was completed for primary tanks, filters and washwater systems in 2013.

Dymchurch WTW is a long and narrow catchment along the coast which serves communities such as those on Romney Marsh, St. Marys Bay, Dymchurch and Burwash. The catchment is served by a network of rising mains and 25 wastewater pumping stations and terminal pumping stations. Dymchurch WTW DWF permit conditions is 1,659m³ per day. The sludge is exported from the site by tanker to Ashford Sludge Treatment Centre (STC) which is a site that is permitted to accept imported sludge from our other WTWs.

The Environment Agency (EA) sets limits on the quality and quantity of recycled water (known as effluent) that can be discharged from WTWs. The EA issues discharge permits to ensure the recycled water released from WTWs complies with three main legal provisions

- (i) The Water Resources Act (WRA) 1991;
- (ii) The Environmental Permitting (England and Wales) Regulations 2010 and
- (iii) The Urban Wastewater Treatment Regulations (UWWTR) 1994.

The permits ensure that the quality of the receiving water (i.e. the river or the sea) is protected and that the discharges do not cause an unacceptable impact on the environment. The flow that may be discharged (released) in dry weather is one of the limits set by permits. Our 55 WTWs operate in accordance with their permits and recycle the wastewater to the specifications set out by the EA to ensure it is safe and clean to be released back into the rivers and streams or directly to the sea.

Under heavy storm conditions, rainfall can enter the sewerage systems and significantly increase the flow in the system. The flow of water arriving at the WTWs can exceed the recycling capacity of the works, so any excess water is temporarily stored in large storm tanks. If these tanks ever fill to capacity, then they would discharge water into the rivers or sea through storm overflows. Our aim is to prevent any discharge of water that has not been fully recycled to the required standards. Any water released from storm tanks is screened to remove items such as wet wipes and solids. These discharges are permitted by our regulator and monitored carefully. This control mechanism is required to prevent the backing up of water within the sewers and putting homes at risk of flooding.

Wastewater System Performance

We routinely monitor, analyse and report the performance of our wastewater sewerage systems to enable us and our regulators to assess the service provided to our customers and the impact of our activities on the environment.

The current performance on the sewerage systems is a good starting point for the DWMP, and enables current issues to be highlighted so the planning objectives can be identified and defined for use throughout the DWMP. These planning objectives will determine the metrics that we used in the next stage of the DWMP, which is to determine the current and future risks to people, property and the environment of changes in the river basin catchment and in the performance of our sewerage systems.

The current performance, based on the last three years of date, is summarised below.

Sewer blockages

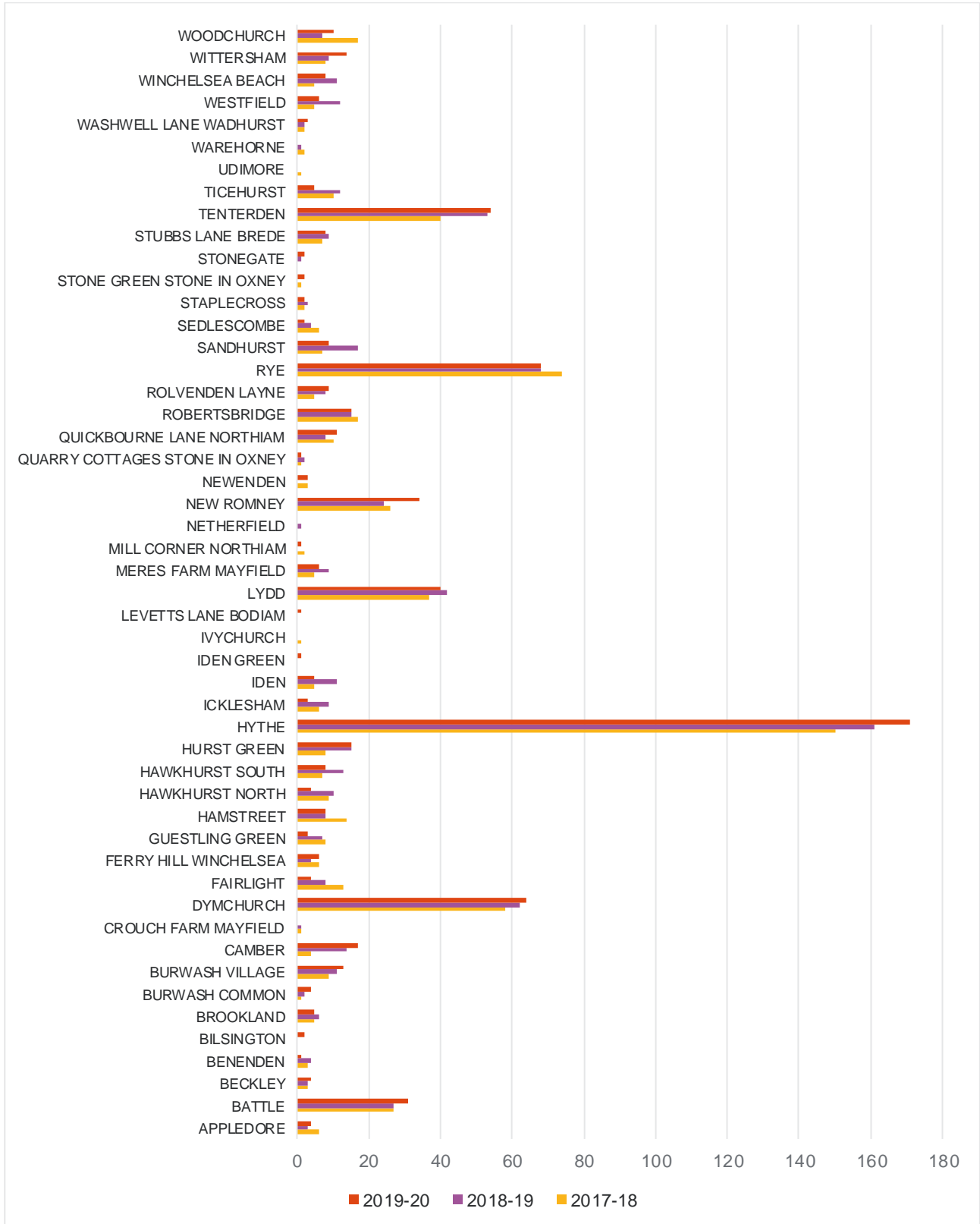
Every year there are thousands of avoidable blockages in our sewers caused by the flushing of wet wipes, cotton buds and other inappropriate items down the toilet, or by pouring fat, oil and grease down the sink. These items cause blockages within the sewer systems, and these blockages can result in flooding to customers' properties or impact upon watercourses or coastal waters.

Figure 3 shows the number of blockages recorded in the Rother river basin catchment. We have noticed an increasing trend in the number of blockages over the last three years, which we are tackling through our pollution and flooding reduction programmes.

Hythe, followed by Rye, Tenterden and Dymchurch had the highest number of blockages.

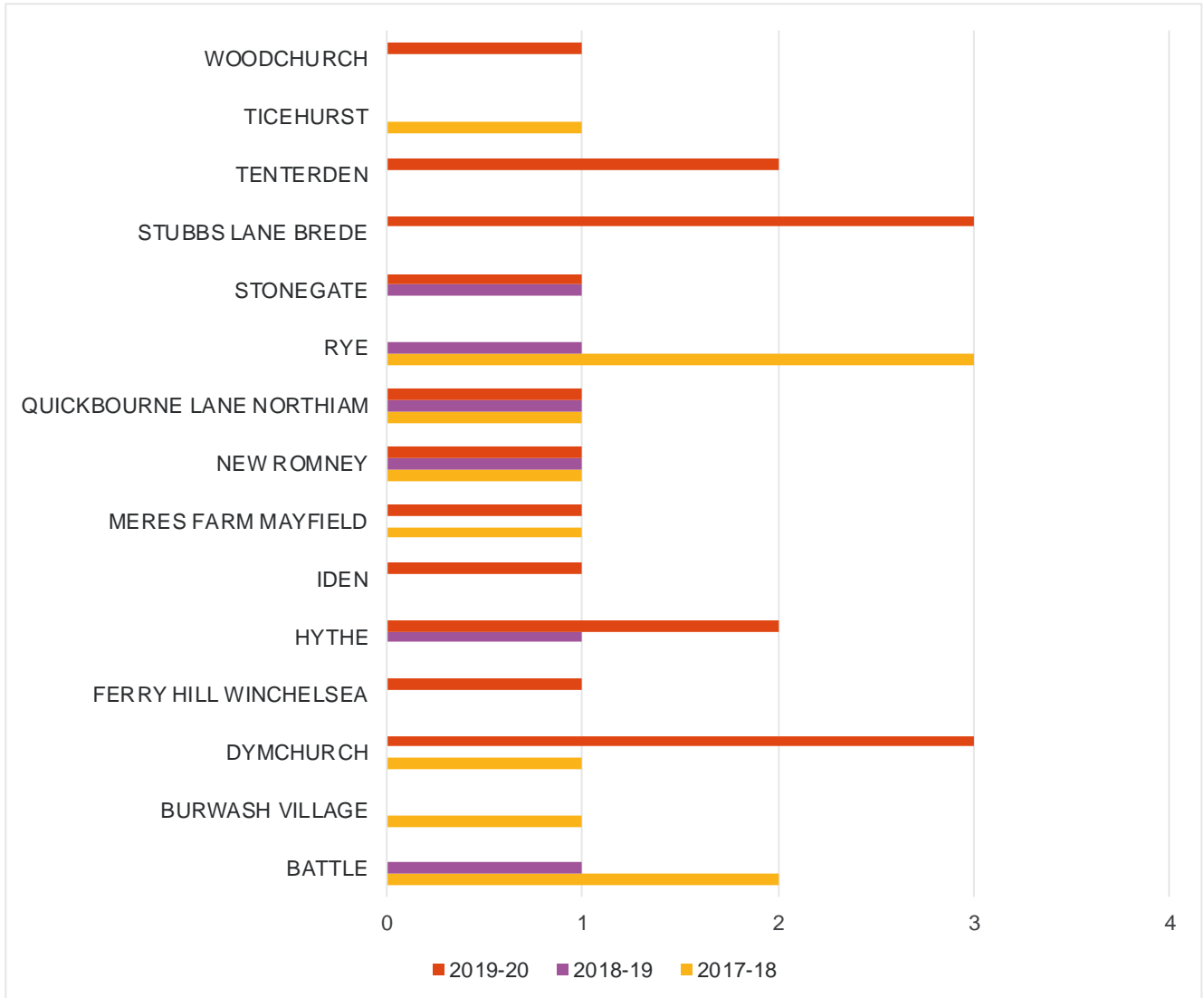
We use high-powered water jets to clear blockages and ensure our sewers are running freely. In 2015, we launched our '[Keep it Clear](#)' campaign which involves teams visiting 'blockage hotspot' areas to educate customers on how to safely dispose of items rather than putting them down their sinks or toilets. We visit almost 20,000 customers a year across the region to promote correct disposal of 'unflushable' items.

Figure 3: Blockages in the Rother catchment



Sewer collapses and rising main bursts

Figure 4: Number of incidents of sewer collapses and rising main bursts in the Rother River Basin by sewer catchment



1. Flooding Incidents

The most common cause of flooding is from blockages of debris such as wet wipes. However, flooding can also occur in wet weather when the sewerage system becomes overloaded due to rainwater entering the sewer system.

Within the Rother river basin catchment, several of our sewer catchment have both separate and combined sewer systems to carry wastewater. Combined systems convey both sewage from homes and businesses as well as rain and storm water collected from roofs and hard paved areas. During heavy rainfall, the capacity of combined sewers can be exceeded and lead to localised flooding as a result of the water backing up the system to the closest available escape route: manhole, toilet, sink, basement etc. In some combined sewer systems where flooding of properties

could occur in heavy rainfall, there are built in overspill weirs, called storm overflows, which release excess water into rivers to prevent flooding of homes or businesses. Storm overflows (also known as Combined Sewer Overflows) are permitted by the Environment Agency to operate in certain conditions. The majority of storm overflows have equipment installed to record the number of times that water passes through the storm overflow. We monitor these carefully and report this information to the Environment Agency. There are 87 combined sewer overflows in the Rother catchment.

Sewer flooding can also occur as a result of rising groundwater seeping into the underground sewer systems and creating additional flow within the sewer network of pipes. This is called infiltration.

Figures 5 and 6 show the number of external and internal flooding incidents respectively over the last 3 years in the Rother catchment. (Note: sewer catchments where there were no flooding incidents in last three years are not shown in the graph). For the purpose of the DWMP, sewer flooding is defined as incidents caused by an escape of water and sewage from a public sewer due to a blockage, sewer collapse, rising main burst, equipment failure or from too much water entering the system (known as hydraulic overload). Importantly, the definition of sewer flooding excludes extreme storms with a probability of occurring of less than once in 20 years (i.e. less likely than a 5% chance in any given year). Internal flooding occurs inside a building or cellar, whilst external flooding occurs within a curtilage (garden) or on a highway or public space.

Of the 298,623 homes connected to the 55 sewer systems within the Rother river basin, 36 properties experienced some form of internal flooding (including sewage backing up into a bath or shower tray) during the financial year 2019-20. This figure has increased from 14 properties that experienced flooding in 2017-18. The data shows there have been an increase in the number of floods from the sewer network in the Mill Corner Nothiam, Mountfield, Quay Cottages Stone, Sandgate and Washwell Lane Wadhurst catchments which we are targeting in our flooding reduction programme.

Figure 5: External Flooding within the curtilage of a property (not inside) by sewer catchment in the Rother river basin (number of incidents)

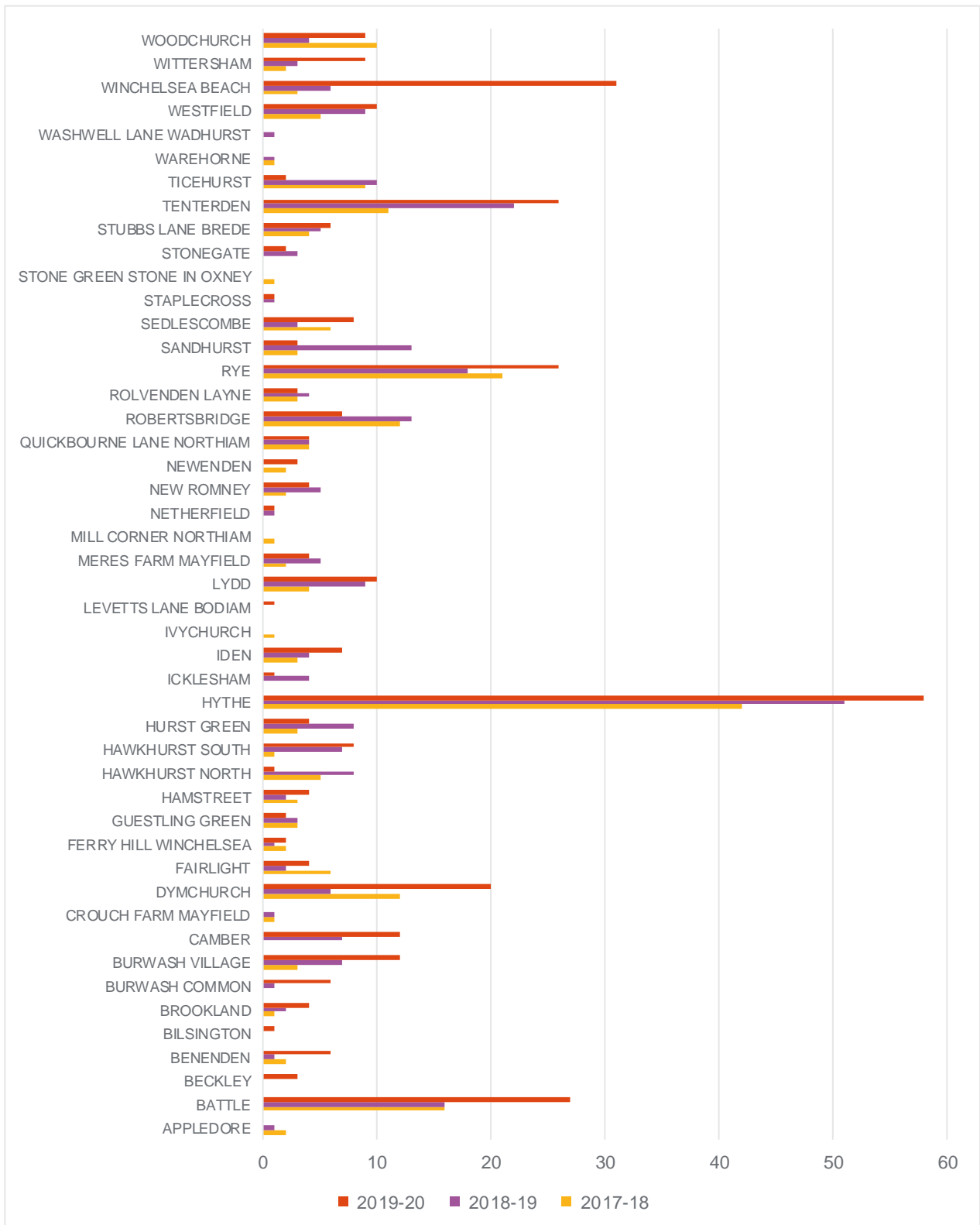
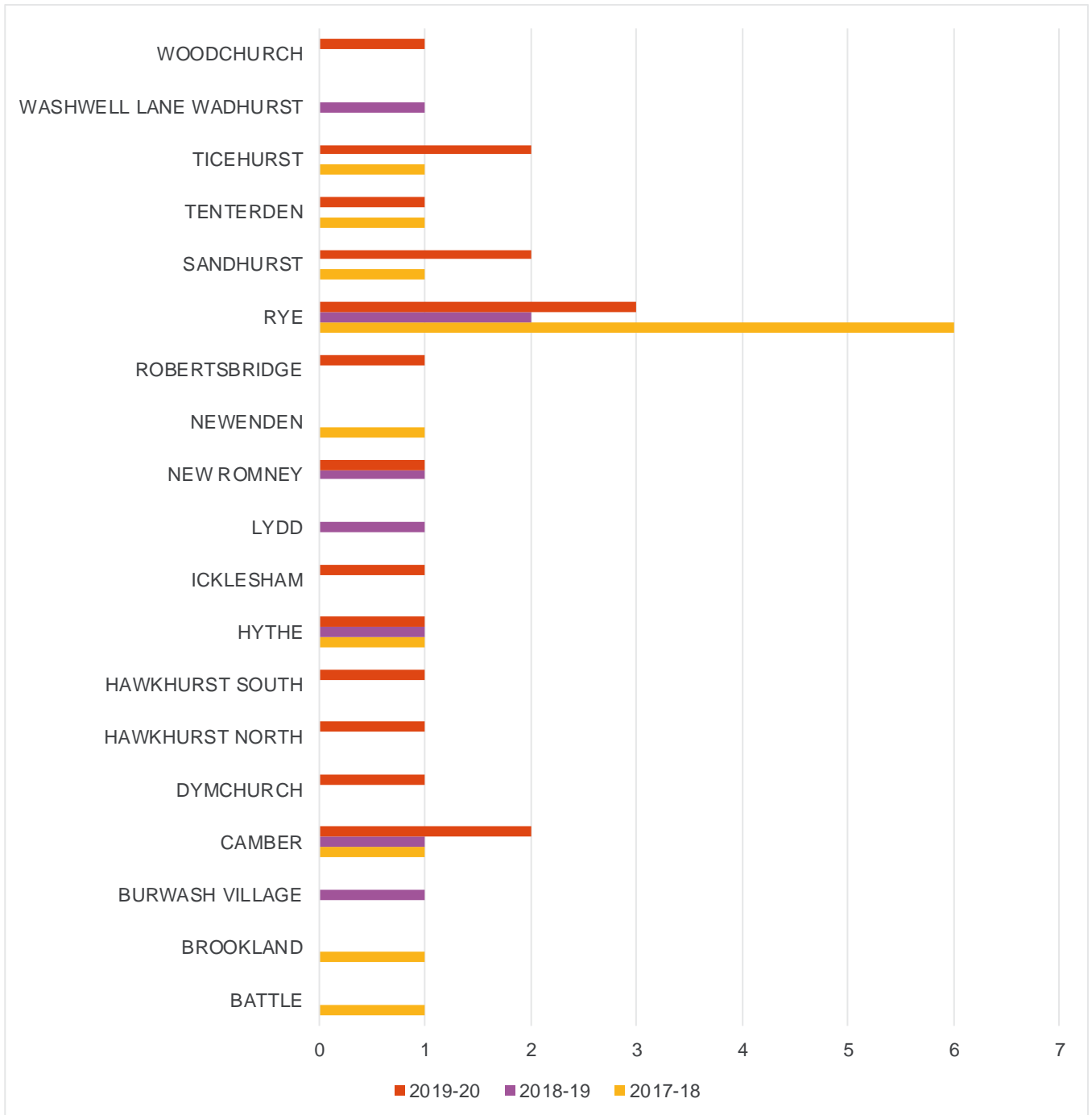


Figure 6: Internal Sewer Flooding within Properties by sewer catchment (number of incidents)



Pollution Incidents

Reducing the number of pollution incidents is a priority for us, our customers and our stakeholders. We have set the target to reduce the number of pollution incidents across the whole of our operating region to 79 incidents by 2024-25, and our aim by 2040 is to have zero pollution incidents. To achieve this we have created an extensive pollution incident reduction plan with the

Environment Agency to significantly reduce pollution over the next five years in line with industry targets.

Pollution incidents connected with our wastewater assets (e.g. blocked sewers, pump failures) are reported to the Environment Agency.

The impact an incident has on the environment is categorised into one of four categories using the Common Incident Classification System (CICS). More information on the classification system can be found on the Ofwat website [here](#). There are four categories for pollution incidents: 1 (major), 2 (significant), 3 (minor) or 4 (no pollution). Only category 1, 2 and 3 pollutions are reportable.

We continue to investigate the root causes of pollution incidents. Our improvements in monitoring of assets and data collection are informing our Pollution Reduction Programme and resulting in more pollutions being prevented. We have also strengthened our incident response team and arrangements to improve our response and reporting of a potential pollution incident.

In addition, our new Environment+ programme looks at all aspects of environmental compliance and performance. Our focus on wastewater treatment works compliance will bring about improved river quality, reduced pollution incidents and flooding, and enhance bathing water quality.

We publish pollution data in our Annual Report and on our website. However, we are not yet at the stage where we can publish that data in greater detail or make further detail publically available. To do so would also require the agreement of the Environment Agency as they provide some of the information. We are currently being investigated by the Environment Agency in relation to pollution events, and the management of some of our wastewater treatment works, so what we can say about these at this time is limited.

Wastewater Treatment Works Compliance with Permits

The Environment Agency sets limits on the quality and quantity of recycled water from WTWs entering rivers or the sea so the water does not cause an unacceptable impact on the environment. The flow that may be discharged in dry weather (known as Dry Weather Flow) is one of these limits. Dry weather flow (DWF) is the average daily flow to a wastewater treatment works during a period without rain. Exceedances of the DWF can be caused by a number of factors, but it can be due to the additional flow from new development in the sewer catchment. To enable further development, we work with planning authorities to understand where future development is planned and include growth schemes in our investment programme so we can increase the capacity of WTWs and continue to comply with our permits in the future.

We must comply with permits issued by the EA. Where we do not meet the permit requirement, we call this a compliance failure.

We are investing in improved operational resilience to maintain wastewater treatment compliance at a high standard by achieving 99.0% as a minimum, but continuing to aim for 100% compliance.

In the Rother catchment, there have been one water quality compliance failure over the last three years.

Southern Water
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