

# Drainage and Wastewater Management Plan (DWMP)

## Overview of the Isle of Wight Catchment

October 2022  
Version 2

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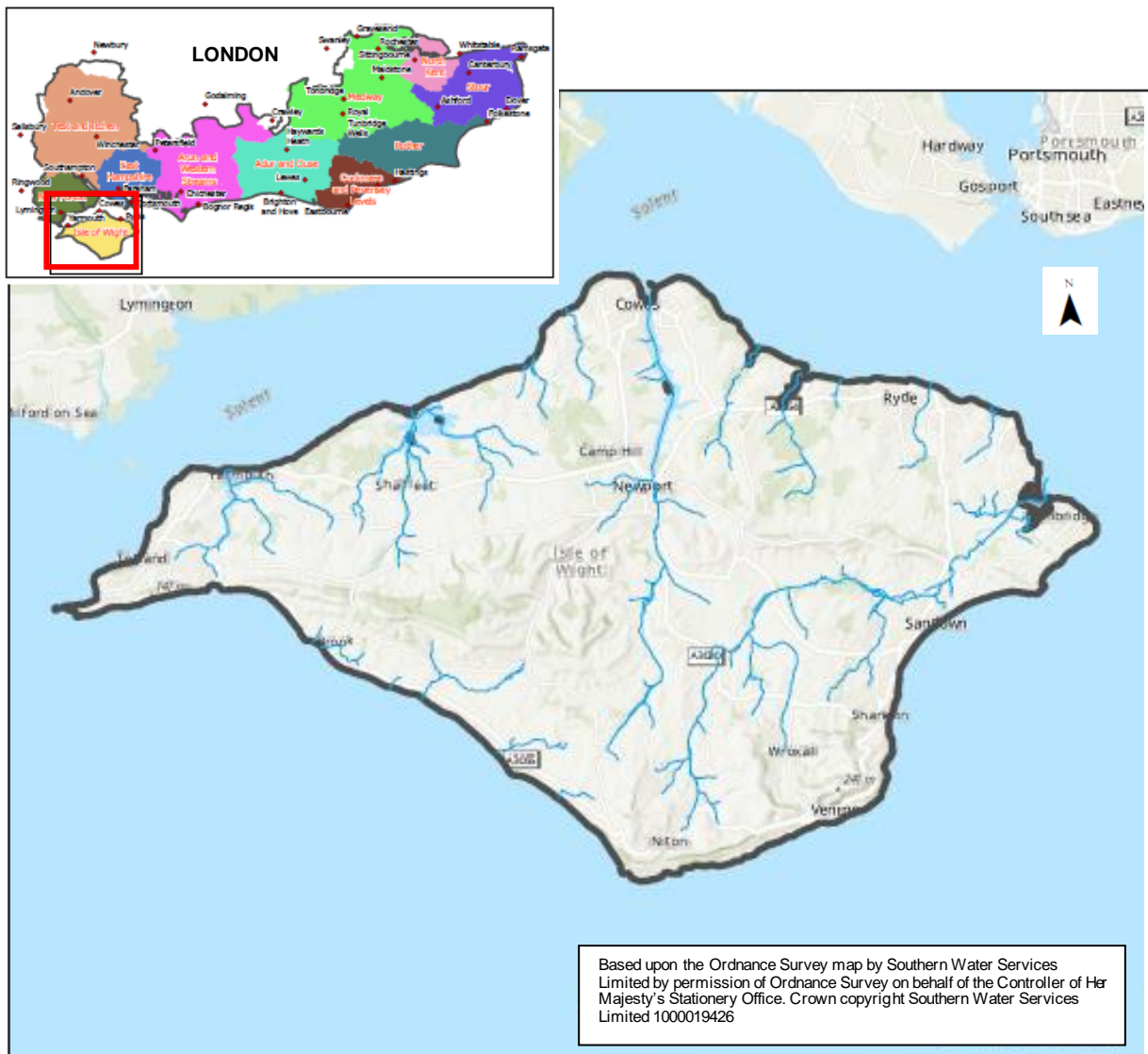


from  
**Southern  
Water** 

## Overview of the Isle of Wight 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 Isle of Wight river basin catchment is shown in figure 1.

Figure 1: The Isle of Wight river basin catchment



The Isle of Wight lies in the English Channel off the coast of Hampshire. It is the largest island in England, covers a geographical area of approximately 390 km<sup>2</sup> and is home to around 142,000 people. With the exception of Newport, the island's county town located in the centre of the island, urban development lies mainly along the coast. The major coastal towns are Ryde, Cowes, Sandown, Shanklin, Yarmouth and Ventnor, and there are a number of smaller villages on the coast and in the rural countryside.

The Isle of Wight is known for its mild climate, coastal scenery and rolling landscapes. It has numerous visitor attractions and recreational offerings, this makes it a popular UK holiday destination. Tourism and its supporting services, such as hospitality and retail, provide the bulk of the island's economy. It also has a significant agricultural heritage, including sheep, dairy, arable farming and, increasingly, salad crops. Its maritime heritage has also supported various economic activities including boat-building, sailcloth manufacturing and other maritime industries. Other major industrial sectors include the manufacturing of composite materials.

The primary source of the island's rivers is permeable chalk. Apart from the small chine streams, which drain to the south and into the English Channel, the majority of the island's rivers flow northwards before discharging into the Solent. There are three distinct river systems on the island, the Newport Rivers and two large river sub-catchments: the Eastern Wight and the West Wight Rivers.

The Medina is the main river in the Newport system. It rises from chalk at St Catherine's Down near Chale and flows northwards through Newport where it becomes a navigable tidal estuary before discharging into the Solent at Cowes. It is joined throughout its course by numerous streams, the largest being Lukely Brook. Both the Medina and Lukely Brook have been heavily modified as they flow through Newport for flood defence purposes.

The Eastern Yar, the island's longest river, drains much of the east side of the island. It rises as a series of springs at the southern end of the island and flows for some 20 km before draining into the eastern Solent at Bembridge. Its two main tributaries, the Wroxall Stream and Scotchells Brook, converge in the village of Whitwell. There are also a series of streams draining the northeast of the island including the Binstead Stream, the Munsley, Palmers, Blackbridge and Monktonmead Brook. These all flow into the Solent.

The main watercourses in the West Wight sub-catchment are the Western Yar, Caul Bourne, Rodge Brook, Chine Streams, Gurnard Luck, and Thorness Streams. The Western Yar, once a major river, is now an estuary for most of its length. It rises near Freshwater Bay in the southwest and discharges to the Solent at Yarmouth. The coast south of its upper reaches has been badly eroded by the English Channel and flood protection at Freshwater Bay prevents the sea from flowing into the Western Yar river. The Western Yar estuary lies within the Isle of Wight's Area of Outstanding Natural Beauty (AONB).

Included in the West Wight catchment is Newtown Creek, an estuary on the north coast of the Isle of Wight which is a designated National Nature Reserve managed by the National Trust. The creek has a number of tributaries including the Newtown River, the Caul Bourne and the Rodge Brook.

The island also has several small rivers draining southwards through deep coastal ravines called The Chines. Some of the best known are those that drain to the south of the island, such as Shanklin, Luccombe and Blackgang.

The Isle of Wight provides a wide variety of landscapes and habitats from wide shallow valleys, mudflats, saltmarsh, steep cliffs, acid peat bog, meadows and open grassland. Consequently, it has a significant number of nature conservation, landscape, and coastal heritage designations. Some of these sites are recognised as being of international importance and include Ramsar, Special Protection Areas (SPA) and Special Areas of Conservation (SAC). The island itself is designated a UNESCO Biosphere Reserve.

There are also features of national importance including Sites of Special Scientific Interest (SSSIs) and Scheduled Monuments (SM). A large part of the Isle of Wight is a nationally designated Area of Outstanding Natural Beauty (AONB) and the Newtown Creek, as above, is a National Nature Reserve. In addition, there are also locally important sites designated as Sites of Importance for Nature Conservation (SINC), Landscape Character Areas (LCA), Local Nature Reserves (LNR) and Geological Sites (which are also designated as SSSI sites).

Water for public supply, agriculture and industry is abstracted from the island's rivers and groundwater but demand outstrips supply so at least half the island's water is now imported by pipe from Hampshire.

## 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 roofs and paved areas to local rivers, and
- sewerage systems that take wastewater away from people's homes and businesses so it can be recycled at wastewater treatment works (WWTs) and released safely back into the environment.

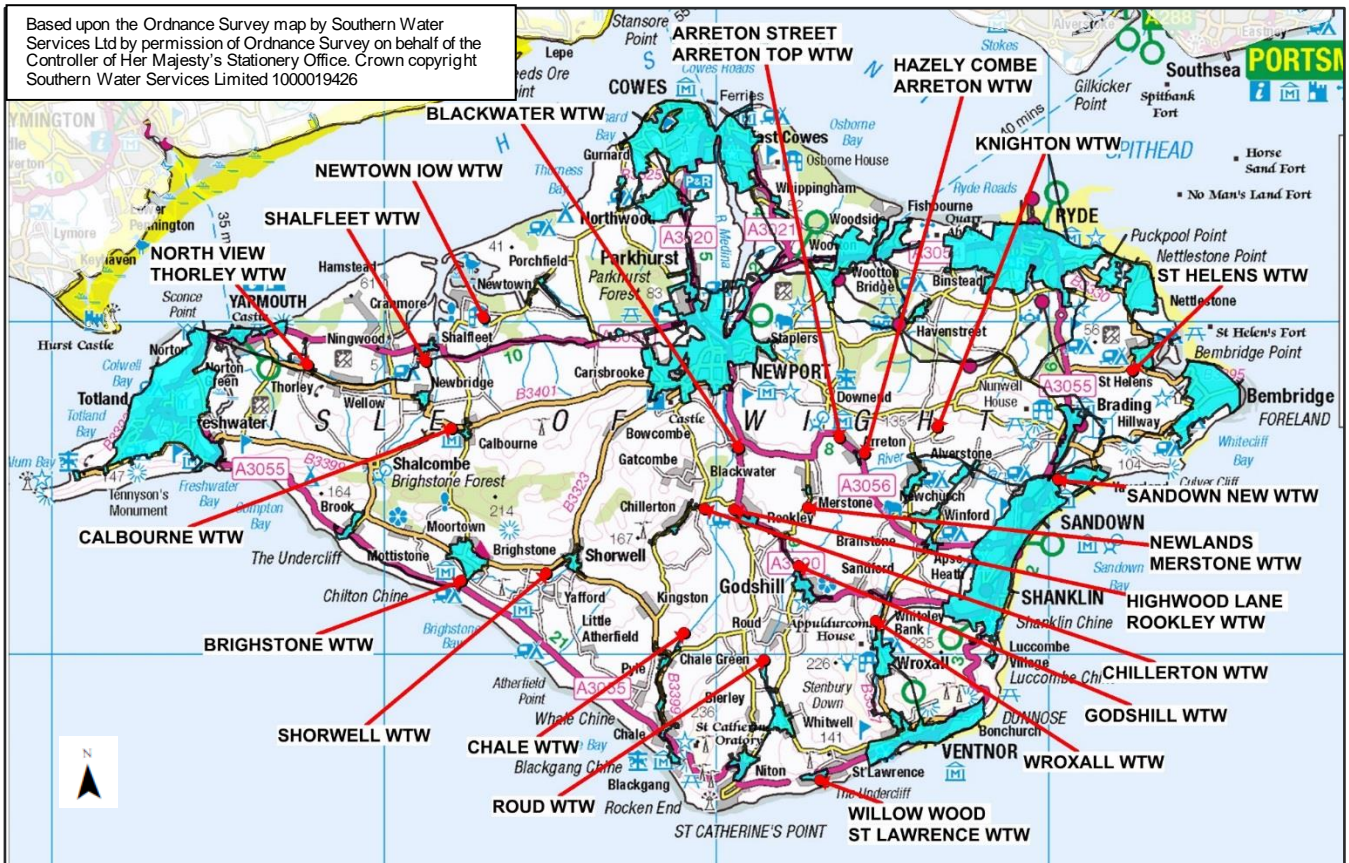
All these systems provide essential services to protect the economy and environment, and ensure public health, safety and hygiene. The links between water use and the management of wastewater is important to protect the wider environment. This excellent independent short film, called "[The Drip](#)",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

In the Isle of Wight catchment, we own and operate 20 separate sewerage systems. Each of these collects wastewater over a geographical area known as a sewer catchment. These areas are shaded blue in Figure 2. Each sewer catchment is drained by a complex sewerage system comprising a network of pipes, wastewater pumping stations (WPSs), and wastewater treatment works (WWTs). These combine to remove wastewater from homes and businesses and transport it to treatment facilities so that it can be recycled and safely discharged back into the environment.

Our sewer catchments generally cover urban centres and communities. Of the 384 km<sup>2</sup> of land serviced by our sewer catchments in this river basin, only 51 km<sup>2</sup>, or 13 %, of the land is covered by our drainage systems. However, of the 70,225 residential properties and 4,060 businesses within the Isle of Wight catchment, 95% of the homes and 89% 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 Isle of Wight Catchment showing locations of the WTWs



More than 1,455 km of wastewater pipes serve the Isle of Wight catchment. The catchment's network includes 167 wastewater pumping stations (WPSs) pumping sewage to the 20 wastewater treatment works (WTWs) for treatment. Table 1 provides a summary of the 20 sewer catchments within the Isle of Wight river basin catchment. It includes the population equivalent that each serves and the approximate length of sewers within the sewer catchment.

**Table 1: Sewerage Catchments in the Isle of Wight River Basin**

Sewer Catchment Name	Communities Served	*Population Equivalent	Length of sewers (km)
SANDOWN NEW	Sandown, Shanklin, Ventnor, Newchurch, Alverstone, Brading, Bembridge, Nettlestone, Seaview, Ryde, Wootton, Havenstreet, Newport, Cowes, East Cowes, Gurnard, Northwood, Yarmouth, Freshwater, Totland	124,937	1,299.20
WROXALL	Wroxall, Lowtherville	2,549	23.1
ROUD	Niton, Whitwell, Roud, Southford	1,631	26.2
GODSHILL	Godshill, Rookley	1,604	20.4
BRIGHSTONE	Brighstone	1,256	26.2
ST HELENS	St Helens	1,114	11.3
CHALE	Chale, Chale Green	527	12.9
SHALFLEET	Shalfleet, Newbridge	523	10.9
SHORWELL	Shorwell	420	6.3
CHILLERTON	Chillerton	311	5
CALBOURNE	Calbourne	131	3
WILLOW WOOD ST LAWRENCE	St Lawrence	116	2.4
HAZELEY COOMBE ARRETON	Arreton	100	1.4
NORTH VIEW THORLEY	Thorley	95	3.8
HIGHWOOD LANE ROOKLEY	Rookley	59	0.6
NEWLANDS MERSTONE	Merstone	40	1.5
BLACKWATER	Blackwater	23	0.2
ARRETON STREET ARRETON TOP	Arreton	16	0.2
NEWTOWN IOW	Newtown	16	0.2
KNIGHTON	Knighton Farm	9	0.1

\*The population equivalent is a quantity measure used to represent how much sewage the treatment facility needs to treat. It consists of the calculated equivalent number of people who are likely contribute to the amount of sewage in the catchment.

Sandown New WTW serves a population equivalent of 124,937 and is permitted to discharge 29,703 m<sup>3</sup> of recycled wastewater per day during periods of dry weather. The WTW serves Sandown, Cowes, Newport, Ryde, and Ventnor, Shanklin, Newchurch, Alverstone, Brading, Bembridge, Nettlestone, Seaview, Ryde, Wootton, Havenstreet, Newport, East Cowes, Gurnard, Northwood, Yarmouth, Freshwater, Totland. The connecting sewage network is a combination of gravity sewers and sewers where the wastewater is pumped (called rising mains). A total of 102 wastewater pumping stations (WPS) are included in the network. Sandown New also serves as a sludge treatment centre (STC) to process and recycle the 'solids' from within the sewage. It receives around 340 m<sup>3</sup> of liquid sludge per week, delivered to site by tankers, from several other

sites in catchment. Sandown New WTW discharges the recycled water via a long outfall to the English Channel.

In the Isle of Wight catchment there are five WTWs which serve a population equivalent greater than 1,000:

- Wroxall WTW serves a population equivalent of 2,549 and serves Wroxall and Lowtherville. It has a consented discharge of 875 m<sup>3</sup> per day in dry weather. Liquid sludge removed from the wastewater at Wroxall WTW is taken to Sandown New WTW for processing.
- Roud WTW serves a population equivalent of 1,631. It serves the Niton, Whitwell, Roud and Southford areas. It has a consented discharge of 756 m<sup>3</sup> per day in dry weather. Liquid sludge removed from the wastewater at Roud WTW is taken to Sandown New WTW for processing.
- Godshill WTW serves a population equivalent of 1,604. It serves the villages: Godshill and Rookley. It has a consented discharge of 552 m<sup>3</sup> per day during dry weather. It uses an activated sludge plant to treat wastewater and discharges to a tributary of the Godshill Stream. Liquid sludge removed from the wastewater at Godshill WTW is taken to Sandown New WTW for processing.
- Brighstone WTW is a biological filter site which serves a population equivalent of 1,256. It serves the Brighstone area and has a consented discharge of 428 m<sup>3</sup> per day during dry weather. It discharges to the Brighstone stream. Liquid sludge removed from the wastewater at Brighstone WTW is taken to Sandown New WTW for processing.
- St Helens WTW is also a biological filter site which serves a population equivalent of 1,114. It serves the St Helens area and has a consented discharge of 300 m<sup>3</sup> per day during dry weather. Liquid sludge removed from the wastewater at St Helens WTW is taken to Sandown New WTW for processing.

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, streams, or 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 20 WTWs operate in accordance with their permits and recycle wastewater to the specifications set out by the EA to ensure it is safe and clean when discharged to rivers, streams or directly into 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 networks and treatment processes 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 data, 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 often result in flooding to customers' properties or impact upon pollution to watercourses or coastal waters.

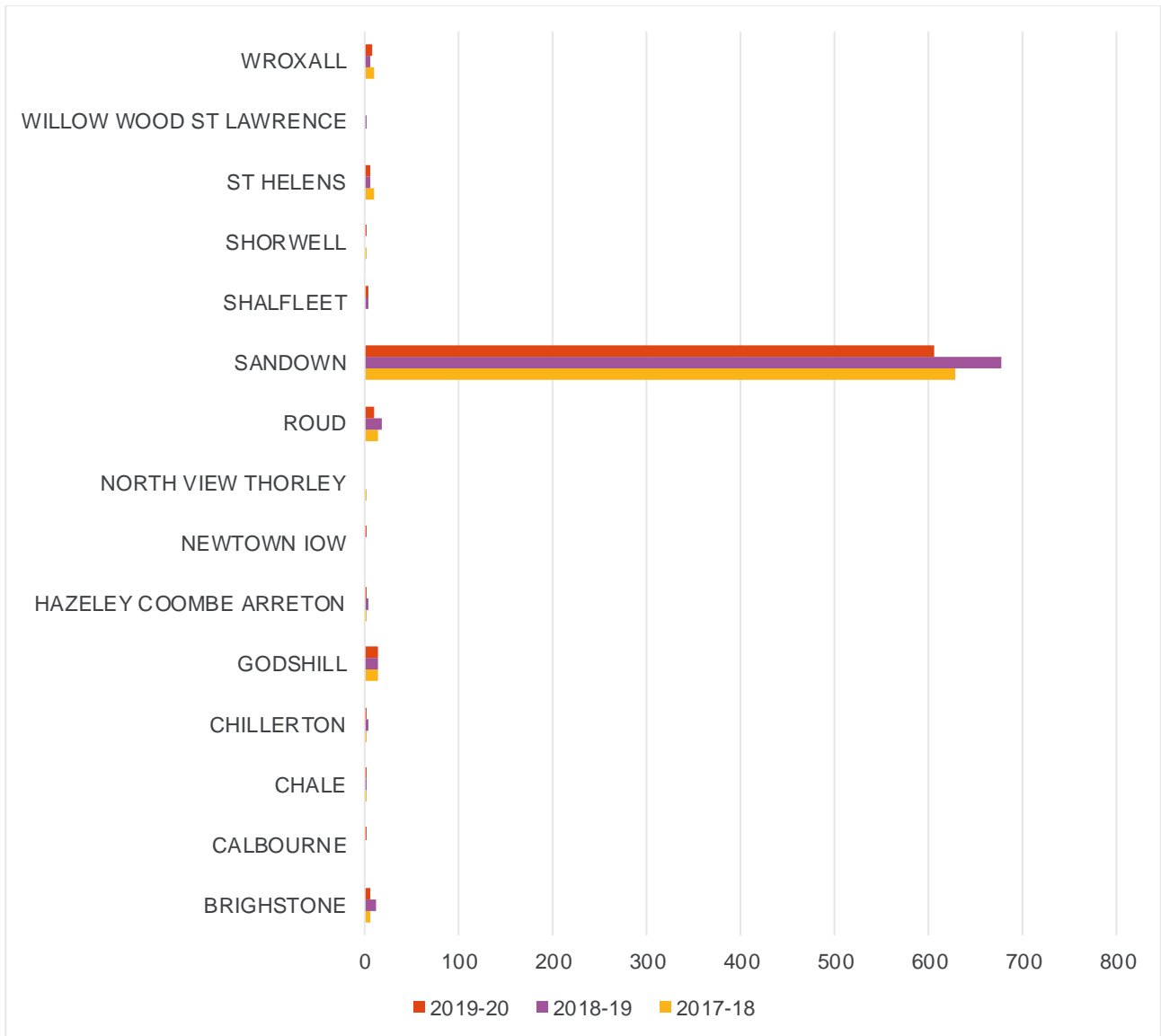
Figure 3 shows the number of blockages recorded in the Isle of Wight catchment by sewer catchment over the last three years. We have noticed an increasing trend in the number of blockages, which we are tackling through our pollution and flooding reduction programmes.

Sandown New Sewer Catchment had the highest number of blockages on the island. Of the five WTWs serving a population equivalent greater than 1,000, Godshill Sewer Catchment had the next 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: Number of blockages in each of the sewer catchments in the Isle of Wight river basin catchment**

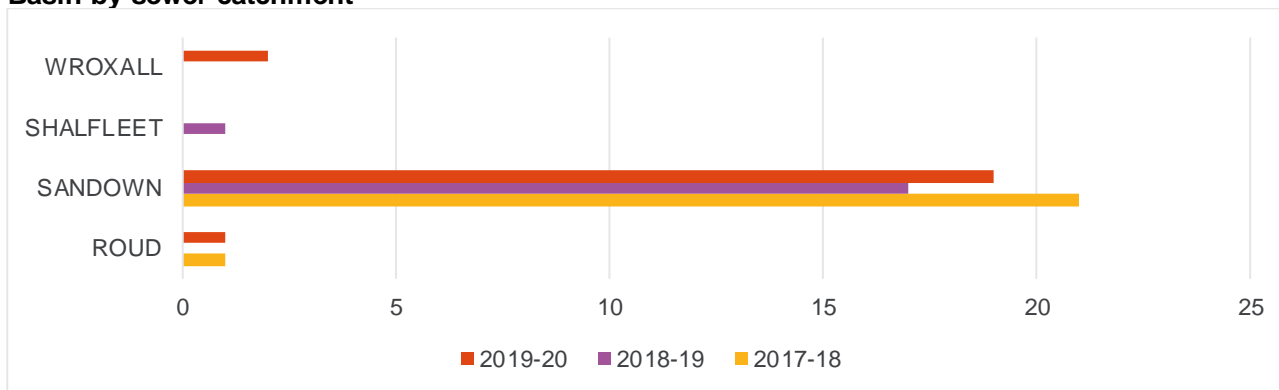


## Sewer collapses and rising main bursts

Figure 4 shows the number of sewer collapses and rising main bursts recorded by our Sewer Incident Reporting for public sewers in the Isle of Wight catchment over the last three years. Rising mains contain wastewater that is pumped under pressure from our wastewater pumping stations towards the treatment works.

The majority of these collapses and bursts were in Sandown New catchment, but there were also one or two in Wroxall, Shalfleet and Roud. A collapse or burst can result in a discharge to the environment or flooding. We have an ongoing programme to inspect (by CCTV), replace or refurbish ageing sewers at high risk of collapse or where bursts are likely.

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



## 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.

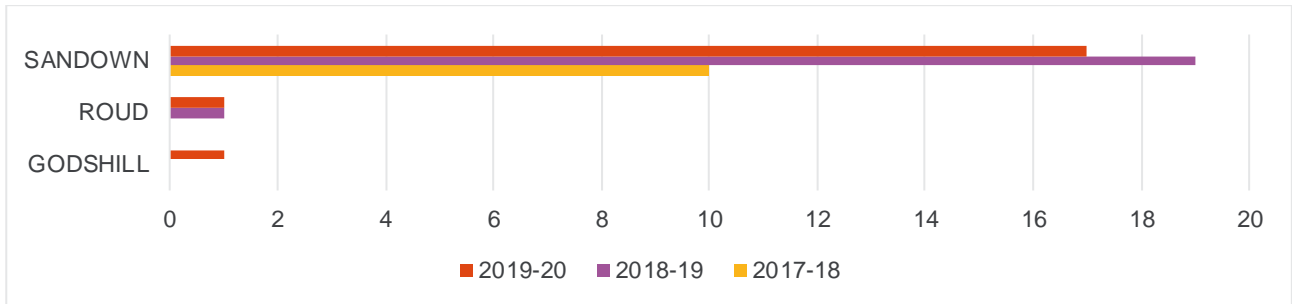
Within the Isle of Wight river basin catchment, several of our sewer catchments have both separate and combined sewer systems to carry wastewater. Combined systems convey both sewage from homes and businesses as well as rain and storm water collected from roofs and hard paved areas. During heavy rainfall, 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 (EA) to operate in certain conditions. The majority of storm overflows have equipment installed to record the number of times water passes the weir into the environment. We monitor these carefully and report this information to the EA. There are 114 combined sewer overflows and emergency overflows in the Isle of Wight catchment.

Figures 5 and 6 show the number of internal and external flooding incidents respectively over the last 3 years in the Isle of Wight catchment. 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.

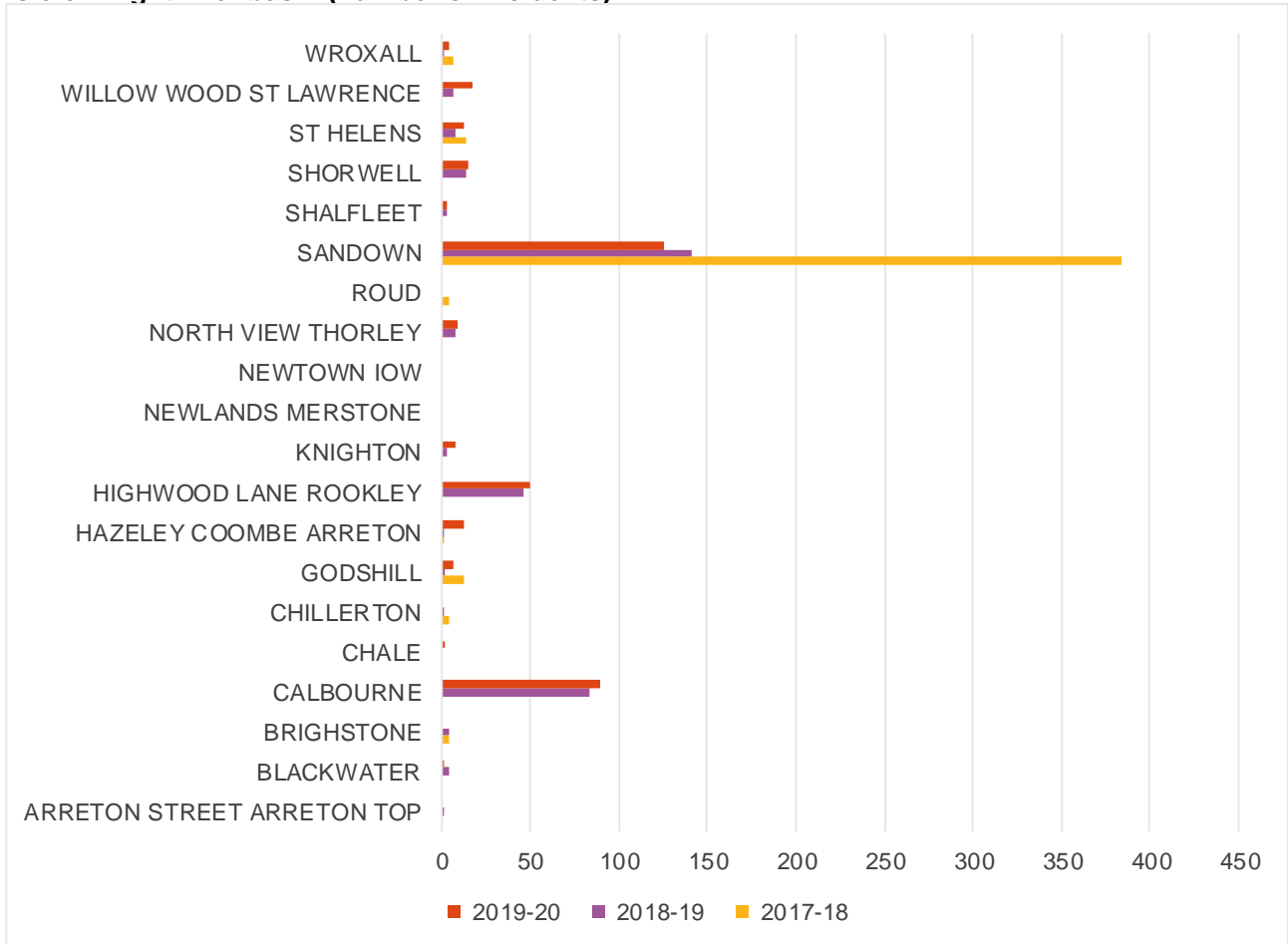
Of the 70,225 homes connected to the 20 sewer systems within the Isle of Wight river basin, 7 properties experienced some form of internal flooding (including sewage backing up into a bath or shower tray) during the financial year 2019-20. This figure is down from 22 properties that experienced flooding in 2018-19 and 10 properties that flooded in 2017-18. The data shows a significant decrease in the number of floods from the sewer network in the Sandown New catchment which we have been targeting in our flooding reduction programme.

However, the small catchment of Highwood Lane Rookley has had a relatively high number of five properties flooded internally in both 2018-19 and 2019-20.

**Figure 5: Internal Sewer Flooding within Properties by sewer catchment in the Isle of Wight catchment (number of incidents)**



**Figure 6: External Flooding within the curtilage of a property (not inside) by sewer catchment in the Isle of Wight river basin (number of incidents)**



Within the Isle of Wight catchment, we estimate that there are approximately 23 properties currently at risk of internal sewer flooding in any given year due to overloading of the sewers by rainwater in a storm.

**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.

For each site, we are allowed a certain number of breaches, based on how many samples are taken a year. If the number of breaches exceeds the allowed number, then the site is deemed failed. In the Isle of Wight catchment, there have been no failed sites over the last three years.

**Southern Water**  
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