



Havant Borough Council

November 13, 2018

Paul Kent – Environment and Wastewater Strategy Manager

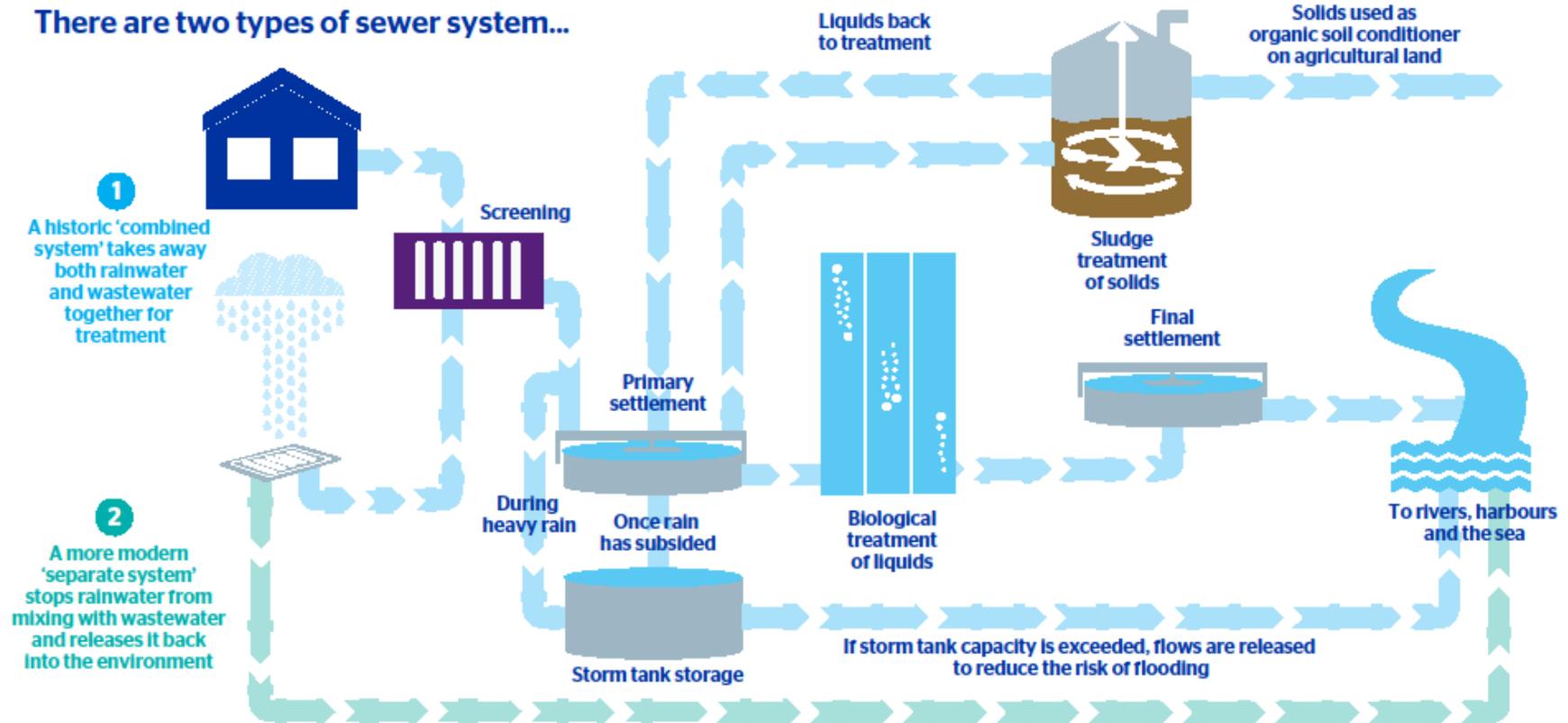
Sam Underwood – Stakeholder Manager (Hants and IoW)



Our area of operation



The wastewater treatment process



Budds Farm Wastewater Treatment Works

- Portsmouth's wastewater flows to Eastney and is then pumped 8km to Budds Farm for treatment.
- Treated water returns to Eastney, via the same pipe, and is pumped almost 6km out to sea.
- During heavy rain, storm flows from the city are diverted through the Long Sea Outfall, along with treated flows from Budds Farm.
- To increase the outfall's capacity during heavy rain, we release treated wastewater into the north of the harbour from Budds Farm.
- When the outfall reaches capacity, excess flows go to storm tanks at Fort Cumberland and Budds Farm which can store 47m litres of stormwater – enough to fill 18 Olympic-sized swimming pools.
- If the storm tanks fill up, we release excess flows into the harbour through outfalls to protect homes and businesses from flooding.
- When levels in the network return to normal, the stormwater in the tanks is fully treated.



Releases into Langstone Harbour

- Southern Water has nine outfalls connected to the wastewater network which release directly or indirectly into Langstone Harbour to prevent flooding in the catchment.
- These are permitted by the Environment Agency.
- During dry weather there are no releases into the harbour.
- During wet weather, we release excess stormwater into the harbour to protect homes and businesses from flooding.
- Such releases will always be required to prevent flooding. We've improved their quality and reduced their frequency.
- Since January this year there have been releases on 61 days – a total of 218 releases across nine locations.
- 213 of these were in line with our environmental permits.
- The unpermitted releases relate to problems at pumping stations and Budds Farm, including the major power outage, which have since been rectified.



Model Scenarios – tides and wind

Neap tide – releases at:

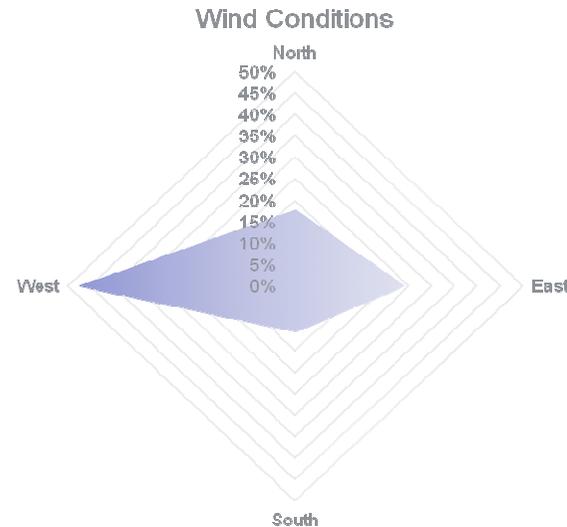
- High water
- Mid ebb
- Low water
- Mid Flood

Spring tide – releases at:

- High water
- Mid ebb
- Low water
- Mid Flood

Four wind conditions

- North frequency 18%
- East frequency 24%
- South frequency 11%
- West frequency 48%



Model locations

- Three model locations

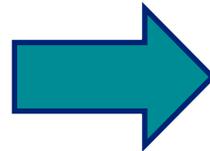
Location	Spill Frequency (%)	Modelled spill (m3/s)
Fort Cumberland	0.02%	1.0
Court Lane Group CSOs	6.00%	0.5
Budds Farm	7.80%	1.0

- Modelled at high flow, pessimistic approach (modelling more impact than really happens).
- Spill frequency taken from our telemetry.



Model inputs

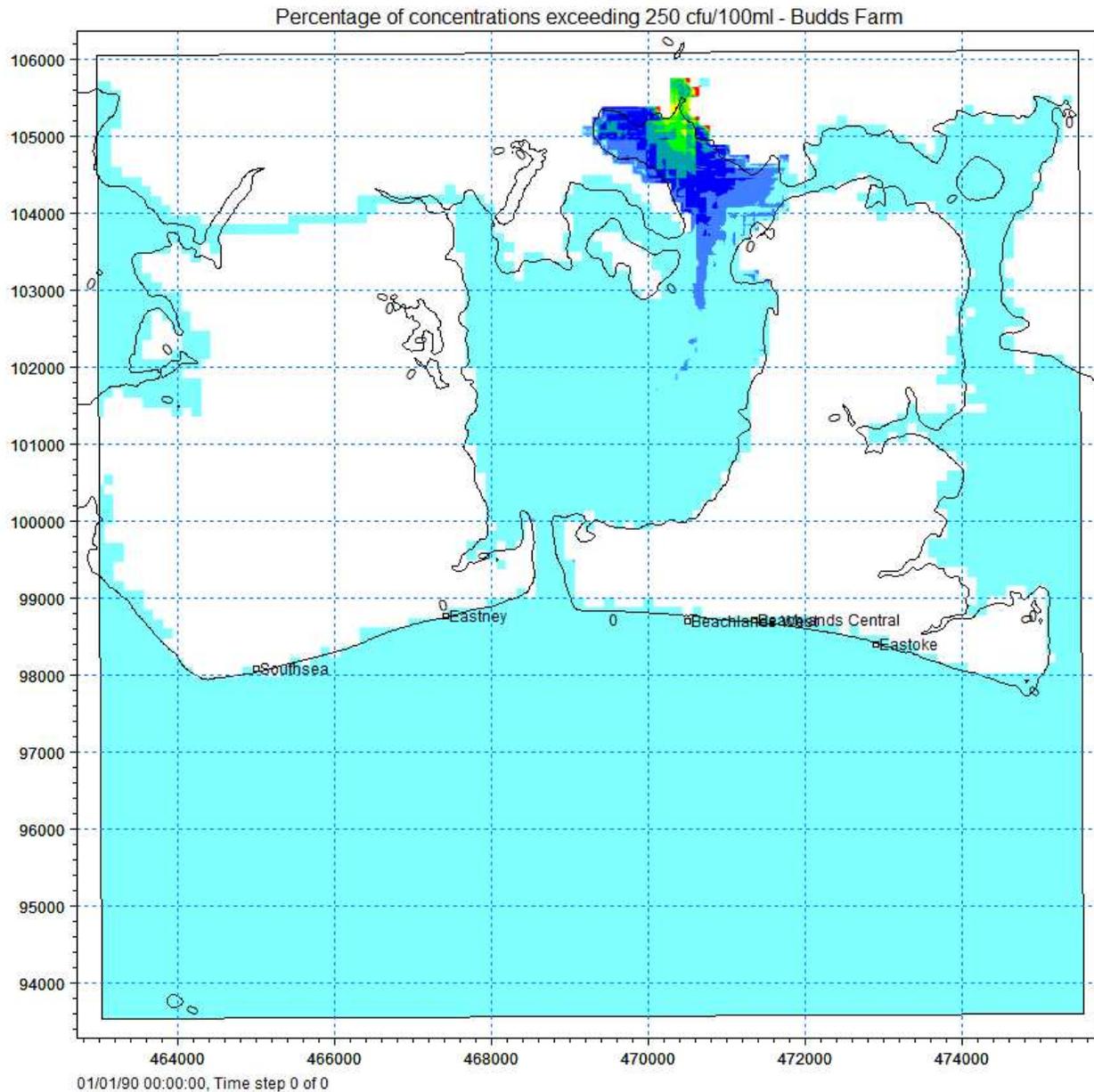
- Three model locations
- Eight tidal conditions
- Four wind conditions
- Total of 96 model simulations
- Model parameter – E.coli
- Decay rate (90% after 50 hours). This is more typical of winter conditions, in the summer the bacteria will die much more quickly.
- Model concentration 4,000,000 cfu/100ml (an extremely high concentration for a storm release).
- Each model simulation carried out for the subsequent 200 hours.



Model output

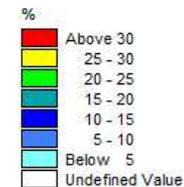
- Modelled concentrations over the whole area for the whole 200-hour simulation period.
- For each simulation calculate the period of time that the bathing water “excellent” threshold for E.coli (250 cfu/100ml) is exceeded.
- Apply the wind, spill and tidal frequencies to the results to produce a final frequency plot for each release location.

Model Results – Budds Farm

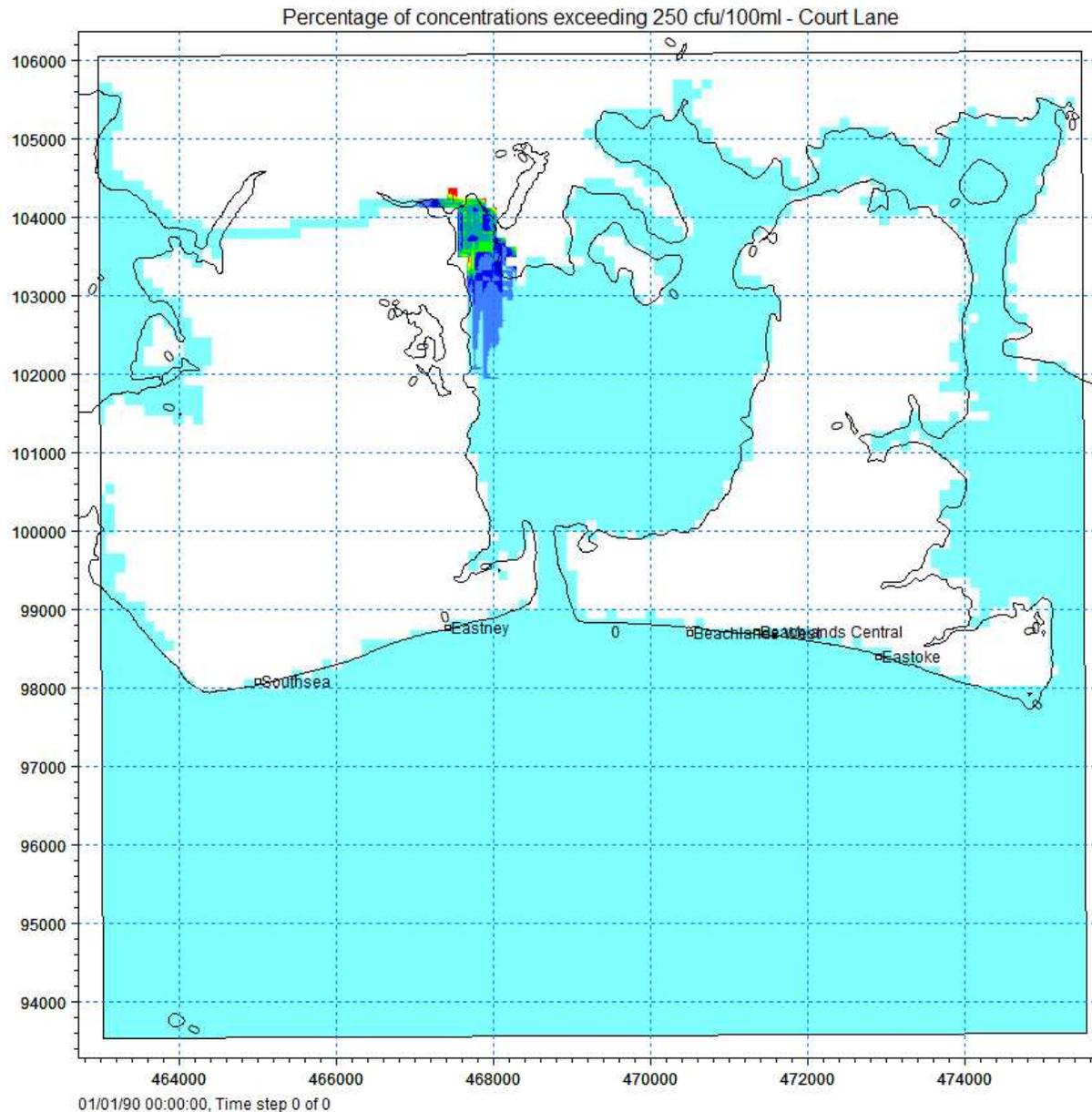


The harbour is not a designated bathing water but the modelling assumes water quality is “excellent” under the bathing water standard 95% of the time.

Data shows the period of time that the “excellent” bathing water standard was exceeded under the model.

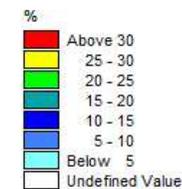


Model Results – Court Lane Group

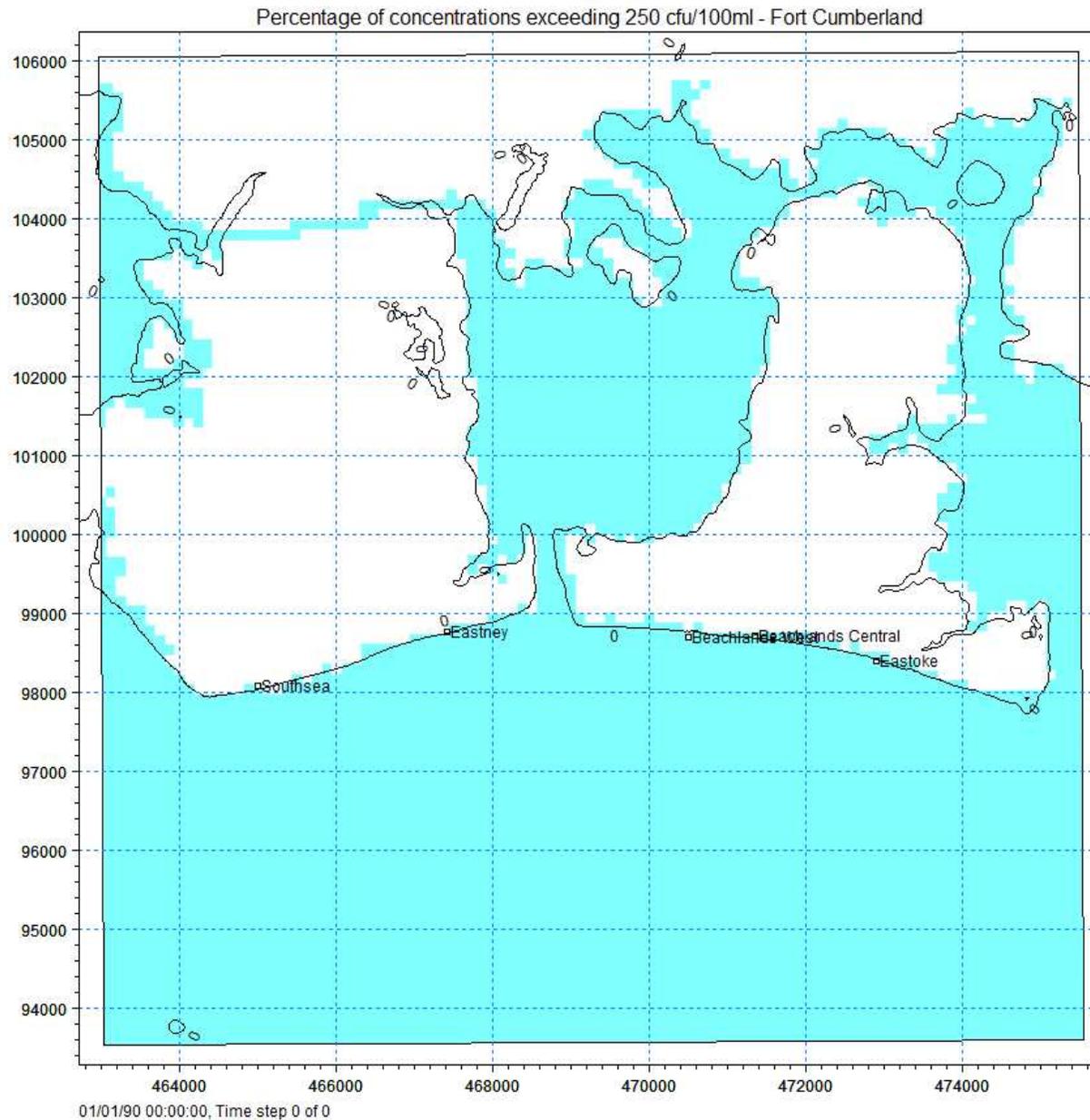


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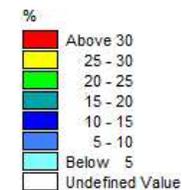
Model Results – Fort Cumberland CSO



Model of two releases per year for Fort Cumberland CSO

The harbour is not a designated bathing water but the modelling assumes water quality is “excellent” under the bathing water standard 95% of the time.

Data shows the period of time that the “excellent” bathing water standard was exceeded under the model.



What is stormwater? What is wastewater?

- Stormwater is a mixture of wastewater and rainwater from a combined sewer network, which is released to the environment to prevent flooding.
- The term “raw sewage” is often, wrongly, used to describe stormwater.
- Wastewater from homes is about 3% human waste from toilets – the vast majority is water from toilet flushing, kitchens and bathrooms.
- In a combined system such as Portsmouth’s, where rainwater and wastewater mix, this percentage is even smaller.
- During dry weather, wastewater from the city arrives at our Eastney pumping station at about 700 litres a second.
- During heavy rain this can rise to 20,000 litres a second (more than 28 times that in dry weather).
- Dilution of the typical 3% content at this rate means stormwater would be about 0.1% human waste.
- Stormwater is screened to remove solids and items such as wet wipes.

Beachbuoy

We voluntarily notify the Harbour Board of releases and upload information onto:

Beachbuoy

Our service provides the most up to date information on water quality at the beach.

We're currently piloting this service at the two main harbours in our region which are used as recreational waters, as well as a small selection of bathing waters.

We plan to provide similar information for other bathing waters in the near future.

During this pilot, we'll add updates between 9am-5pm (we're working on 24/7 automatic updates in the future).



Emergency releases in September 2018

Two of the unpermitted releases happened on one weekend in September.

- The first, on Sept 14, was caused by a major electrical fault at Budds Farm following a power surge on the network.
- We brought in replacement generators and used the site's storm tanks to minimise the release to 22 minutes.
- We let the Environment Agency and Harbour Board know and sent notifications to harbour users via Beachbuoy.
- The site's emergency generators operated as designed but the original fault in the high voltage gear is believed to have damaged the power line so only parts of the site received back up power.
- Our teams worked through the night with UK Power Networks to set up temporary generators and fix the problem.

Emergency releases in September 2018

- The second, on Sept 15, happened after a build up of wet wipes and sanitary products blocked our Stoke pumping station in Hayling Island.
- It was not linked to the incident at Budds Farm.
- This caused wastewater to back up in the sewer and seep out through two manholes into a ditch that leads to the harbour.
- We let the Environment Agency and Harbour Board know and sent notifications to harbour users via Beachbuoy.
- We deployed a fleet of more than 20 tankers to minimise the flows and allow the team on site to clear the blockage and get the site running.
- A clean-up operation was recently concluded, once access to the ditch was granted by residents.
- The site's pumps are being reviewed as part of an ongoing region-wide replacement programme.
- One new pump is due to be installed in the next few weeks.

Recent investment

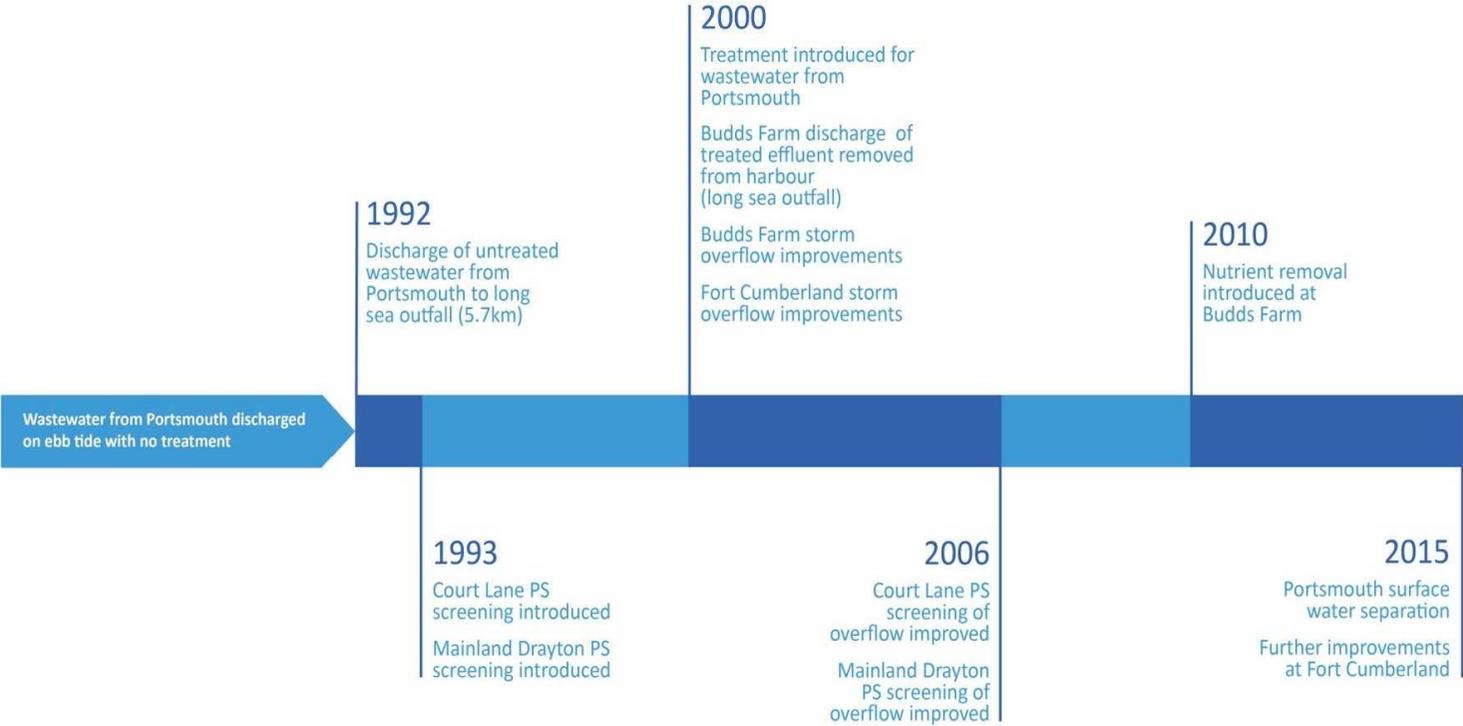
We've invested millions of pounds in the area's wastewater treatment over the last ten years

- Portsmouth has 1-in-76-year protection from flooding – usually, water companies build to 1-in-30-year protection.
- In 2014 we completed a £20 million flood alleviation scheme including new surface water drains and pumping stations.
- The scheme diverts up to 6,400 litres a second of rainwater to sea – reducing the burden on the network by a third.
- Also in 2014, we completed a £13 million upgrade of Fort Cumberland to renovate pumps and install new screens to handle incoming wastewater more effectively.
- We also spent £5 million on an odour management system and upgrades to our control systems at Eastney.



Timeline of improvements

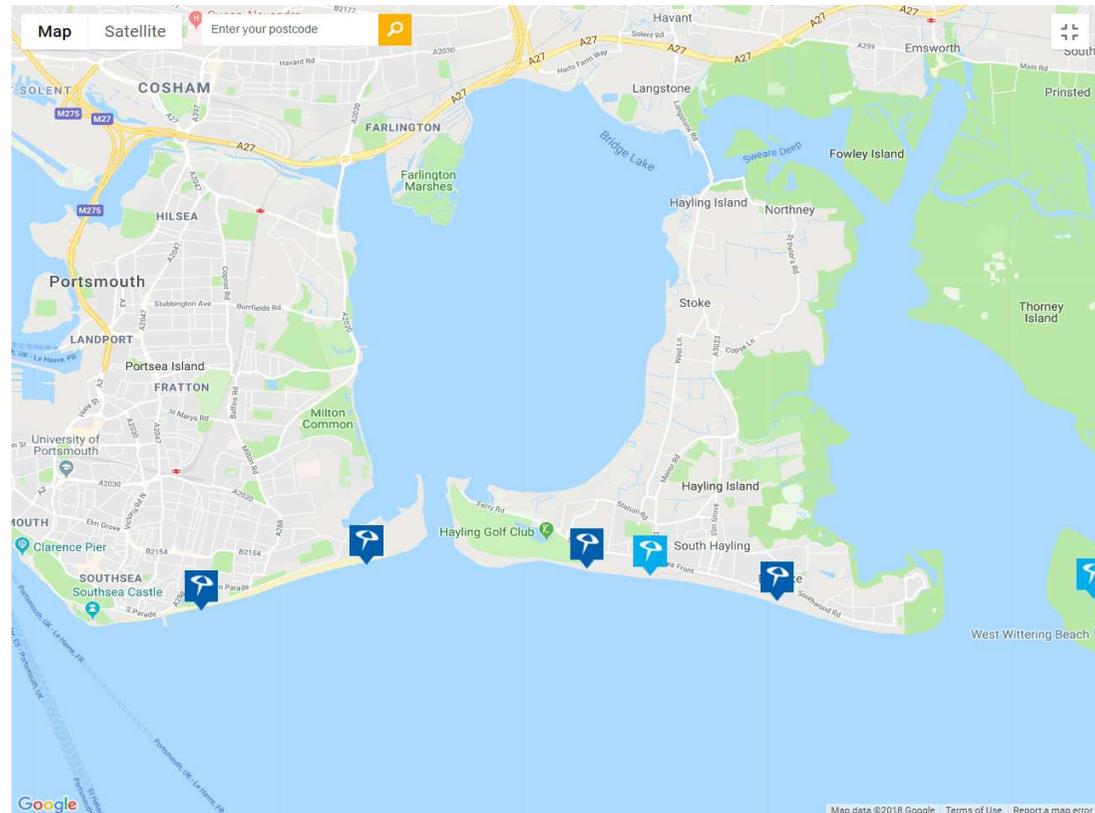
Langstone Harbour - Southern Water Improvements



Bathing water quality

All local bathing waters are consistently rated “excellent” by the Environment Agency

- Southsea East
- Eastney
- Beachlands West
- Beachlands Central
- Eastoke

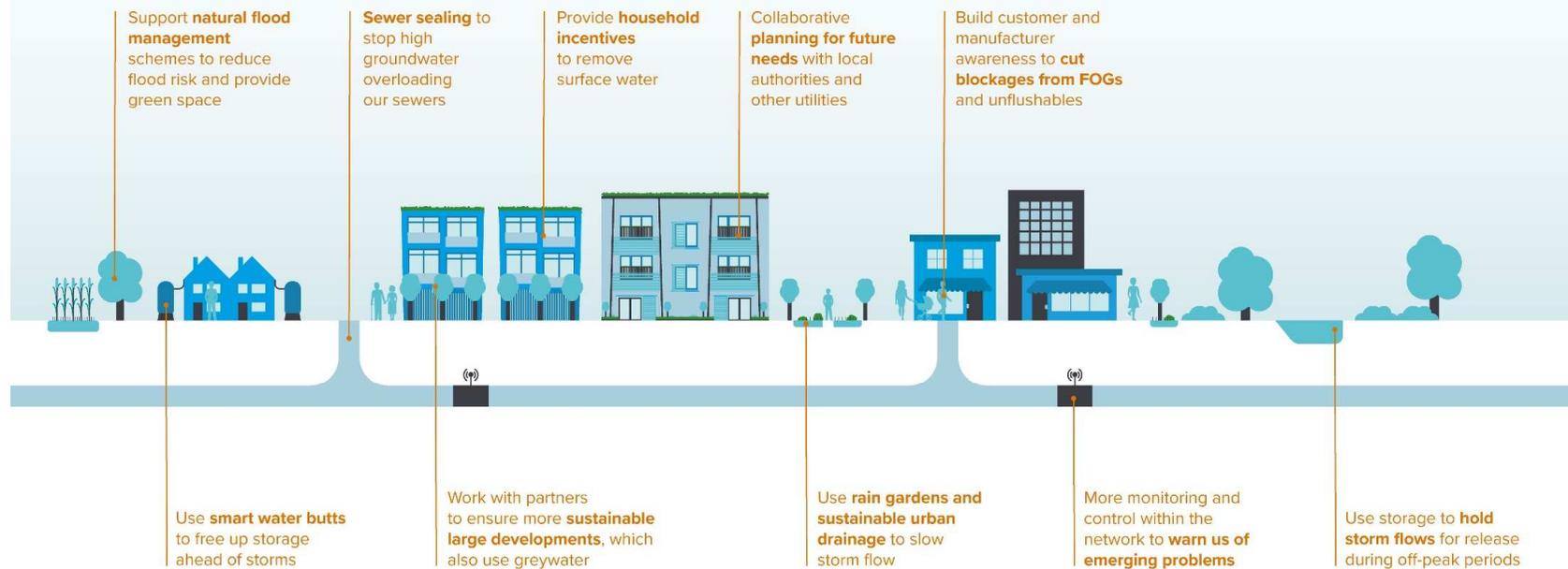


Beachlands Central has been a Blue Flag bathing water for 27 years

Planning for growth

Sustainable Drainage 2030

Creating capacity across the sewer network by implementing surface water solutions, building smart networks and increasing customer awareness.



Reducing plastic waste

- Waste plastics pose a global threat to the marine environment and to our region.
- We are a link in the chain and can help to tackle this problem.
- We have an opportunity to remove microplastics at our treatment works.

As part of our wider Environmental policy we are:

- Minimising our use of plastics
- Reducing the environmental impact of waste plastics
- Aiming to beat the national target of eliminating avoidable plastic waste before the end of 2042

We are focusing on a three-stage approach:

- We've developed a plastics policy
- We're sponsoring academic studies into wastewater plastics
- We're influencing behaviours to reduce plastic use and plastic waste



Any questions?