



**South West
Water**

Pollution Incident Reduction Plan

September 2021 Update



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Executive summary

This is an update to the Pollution Incident Reduction Plan we published in July 2021.

It has continued to be a challenging year, not least with the Coronavirus pandemic and consequential impact on our business. However, as the government advice on Coronavirus has changed the economy has opened up and the South West has seen record levels of tourists arriving and holidaying in the South West over the summer period.

Our people and teams have continued to work tirelessly to provide the services our customers depend on in a time when there is an unprecedented pressure on our assets, the services we provide and the environment we continue to protect.



Despite the increasing demand on our assets and services the number of pollution incidents continue to reduce and compared to the same period last year from January to August, we have 64% less pollution incidents continuing the trend we reported in our July Pollution Incident Reduction Plan Update.

1. Improving our pollution reporting and assessment

ON TRACK

In July we confirmed our commitment to focus our resource on pollution reduction. Since July we have completed the following activities:

- ✓ Installed a further 33 sewer depth monitors taking the number of installations from 171 to 204 out of 210 to gain a better understanding of our network and to provide more timely information on issues that may affect our network, pumping stations and treatment works.
- ✓ Procured and distributed signs to be put on and near our assets to enable members of the public to report issues direct to us should they arise to help us respond quicker to potential incidents. We are using 'what-3-words' to help more accurately describe the location of any potential impact.
- ✓ Updated and revised our website to make it easier for members of the public to report a potential pollution incident to us by providing a link on our home page.
- ✓ Implemented a data analytics software package called Meniscus in the Dart and Tavy catchments that predicts how CSOs (Combined sewer outfalls) will perform so we can respond more proactively to any issues that occur with these.

All of these activities have helped contribute to a significant reduction in the number of pollutions compared to the same period in 2020.

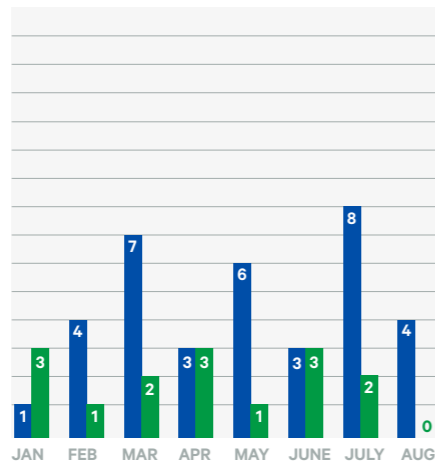
The charts to the right show a comparison across assets type for the period January to August for years 2020 and 2021.

Total number of pollutions - January to August

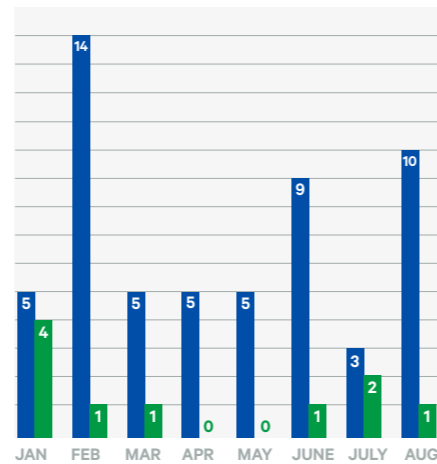


64%
year on year
improvement

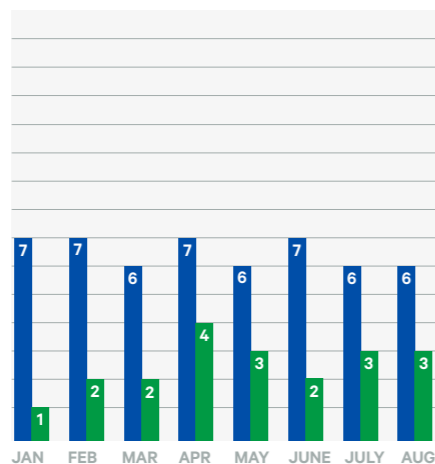
Wastewater Treatment Works



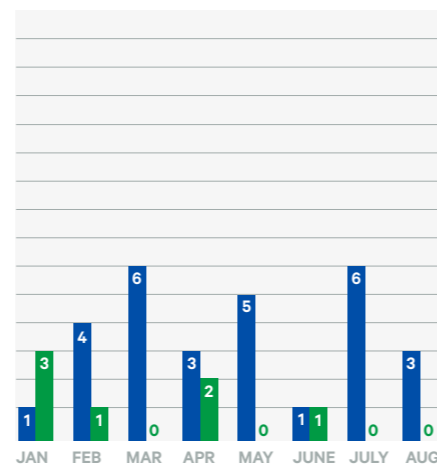
Sewage Pumping Stations



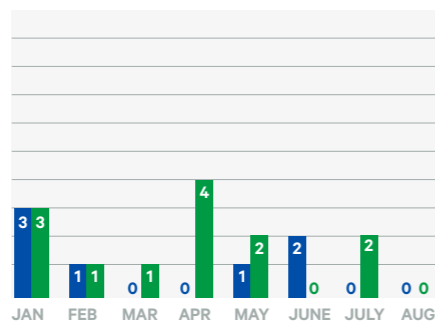
Foul Sewer



Combined Sewer Overflow



Rising Main



* = data to be agreed and verified with the Environment Agency

Review of the Pollution Incident Reduction Plan continued

2. Root cause analysis

ON TRACK

Our root cause analysis has been effective in understanding what interventions we require to undertake in order to prevent a specific incident happening again. It also provides learning for similar asset types which can

be employed to further reduce pollutions occurring. We have progressively shared our root cause analysis with the Environment Agency and continue to refine and adapt as part of our continuous improvement programme.

3. Control systems and early warning

ON TRACK

We continue to deliver and employ our network of Event Duration Monitors to better understand the performance of our assets. This includes further deployment of EDM monitors to record storm spills to the environment in addition to the 1095 monitors already deployed. In 2021 we are delivering a further 280 EDMs on storm overflows as part of our environment programme for this 5 year period. Before December 2023 we will be deploying spill monitoring to provide 100% coverage of storm overflows, extending our number of EDMs to circa 1600.

Our 24/7 data monitoring and service centre provides an immediate opportunity to respond to alarms and escalate

our response to prevent a pollution from occurring. We continue to review the data and alarms to ensure we provide a continuously improving alarm response capability. We are currently engaged in a trial using radar rainfall and weather forecasts coupled with historic and current storm overflow operational data to model predicted flows in sewers, pumping stations and storm overflows. The benefits include sewer blockage detection and a reduction in alarms facilitating more targeted operational intervention to prevent pollution events. This is all part of developing a better understanding of our network operations in real time and predicting where we need to take proactive action to prevent pollution.



4. Asset specific plans (Pollution Hot Spot Interventions)

ON TRACK

In July we reported we were working in 210 locations across our region to reduce the number of potential repeat events. We completed 44 of the planned 49 schemes between April 2021 and June 2021. The 5 outstanding schemes are planned to be completed by mid-August. A further 47 schemes were planned to be completed between July and September 2021. By the end of September we had completed 30 of these. Delivery of projects between July and September has been particularly impacted by highways constraints due to summer holidays, gaining approval and access to private land, impacts of Coronavirus due to the increase in staff being “pinged” via the

NHS App and supply chain issues particularly related to micro-chips and processors.

Despite these impacts, we continue to progress with our programme of work to reduce the number of pollution incidents. In addition, we are sharing these plans with the Environment Agency to provide assurance of our continued drive to reduce pollution incidents.

Some cases studies of our Hot Spot Programme are provided at the end of this report.

5. Influencing customer behaviour

ON TRACK

Customer behaviour will influence the performance of our assets and working with our customers on the impact of their behaviour is essential in addressing pollution risks over the longer term. Where we are able to determine the source or cause of specific blockages we are engaging with those customers to explain how their behaviour can impact the environment.

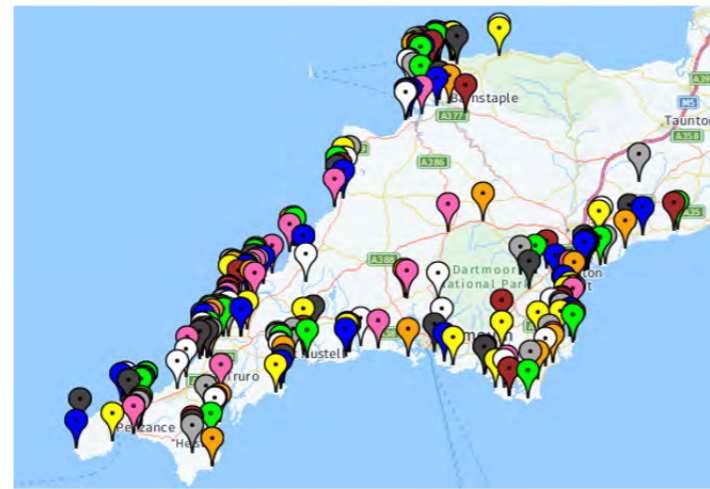
By analysing our data we have also employed revised maintenance schedules and operational interventions to reduce the number of blockages.

In our July update we described the work we are undertaking with holiday parks over this summer period. A summary is as follows:

Holiday Park Campaign 2021

In addition to the sample promotional materials that we included in the letters which were sent to all targeted businesses in the campaign, the team have handed out the below:

- Leaflets 1024
- Tent Cards 2097
- Posters 498
- Gunk Pots 55



Feedback from customers

“ I totally agree and have put this label in my holiday let
Dear guest
Our plumbing is new unfortunately it joins old pipes
Please bin nappies, hygiene products and wet wipes
Nappy sacks are provided and bins too
Please don't put the above down the loo. ”

“ Thank you for reminding all households! ”



“ Dear South West Water,
Thank you for your email. I am the owner of a Bed and Breakfast that complies fully with all rules and regulations including recycling.
My guests are instructed on arrival to Only flush the 3Ps – pee, paper and poo – down the loo (I have a macerator toilet in one of the rooms, so I know that the guests comply, otherwise the toilet would block) We always ensure that:-
Bagging and binning used wipes, moist toilet tissue and sanitary products – including those labelled as flushable or biodegradable is done.
Food scraps and fat are scraped off our plates into our bin or food waste recycling
We use a GunkPot or similar container to collect cooled fats, oils and grease from roasting trays and frying pans then empty into the kitchen bin when full.
My 27 year daughter would not let me do anything else but comply, either. ”

“ We have received your email info regarding preventing sewer blockages. We have just opened a new commercial kitchen on site for the first time. In the email you mentioned a free service is available to advise on preventing blockages from commercial kitchens. We would be interested in this if still available? Beachside Holiday Park ”

“ Dear Sirs me and my wife do everything we can to help you we throw oil & Fat on the garden when we can, also we put it in a bag & throw it in the waste bin we do everything we can to help you with this problem your sincerity. ”

“ Thank you. Have been doing everything recommended by SWW for the past 20 years and so the sewage blockages do not arise from 11 Lankelly Lane. ”

We are also in early discussions with the Environment Agency on how we can use digital technology to engage with members of the public in two locations in Exmouth and Bude.

Both case studies and customer engagement opportunities enable us to continue to develop our messaging on the 3 Ps. Further details are provided in Section 7 on Innovation and collaboration.

6. Leadership focus – improving our environmental culture

ON TRACK

We continue to hold our Daily Pollution Board, chaired by our CEO to maintain focus on our pollution incident reduction targets. This has led to a more robust reporting process being established.

We have established a Storm Overflow Steering Group to focus on our commitments to better understand the performance and impact of our storm overflows on the environment. In addition, our funding through the Green Recovery Fund will enable us to better understand the impact on a wider catchment basis through our work in the River Dart and River

Tavy catchments.

We have shared our Pollution Hot Spot Intervention Programme with the Environment Agency to provide assurance of our commitment to reducing pollutions at specific sites where we have undertaken are root cause analysis.

We continue to work with the Environment Agency to ensure we are delivering against our commitments in our Pollution Incident Reduction Plan and meet with them on a quarterly basis.

7. Innovation and collaboration – closing the performance gap

BEING ACCELERATED

OFWAT Water breakthrough challenge – our current bids

South West Water are core partners in four of the nine Ofwat Innovation Fund – Water Breakthrough Proposals that were successfully awarded funding in September. Details of these can be found below.

Over the next few months, we will be developing these project plans further which will enable South West Water to collaborate with other water companies across England creating a shared learning environment.

Project Title	Project Duration (yrs)	Lead Partner	Budget requested from Ofwat (£M)	Project Overview
Artificial Intelligence of Things and Autonomous Waste Catchments	2.5	Severn Trent Water	2	Use of dense sensor networks/IoT/AI in predictive asset management and maintenance in wastewater catchments to predict and prevent sewer spills, supporting our journey towards zero CSO spills and increase insight and intelligence on wastewater network performance.
Catchment Systems Thinking Cooperative	3	UU	5.1	Innovative big data modelling and monitoring of catchments to enable optimal use of natural solutions in integrated catchment management, water and wastewater treatment.
Transforming the Energy Balance - Low-Temperature Anaerobic Treatment for Municipal Wastewater	4	Thames Water	6.5	Low-Temperature Anaerobic Treatment for Municipal Wastewater. Development and trial of cold anaerobic wastewater treatment system that will drive significant increase in energy and carbon savings, as well as recovery and capture of biogas.
Safe, Smart Systems	3	Anglian Water	8	Embedding resilience in our water supply networks through the use and optimisation of automation, application of cutting-edge data science, Machine Learning and Artificial Intelligence. This project will propel our ability to pre-empt and predict asset maintenance and management to reduce supply interruptions and leakage.

Totals 21.6

Using Artificial Intelligence and CCTV images to monitor sewerage network integrity

There are approximately 525,000 km of underground sewer pipes in the UK, the majority of which are underground and not always easy to access. Hence, CCTV cameras are currently utilised to survey this underground network. The recorded footage is annotated to identify pipe faults and features for effective maintenance and where necessary rehabilitation or replacement. However, this is an extremely time-consuming process, often taking as long to annotate footage as it does to record.

We are therefore using this CCTV footage to automatically annotate sewer surveys using cutting edge computer vision technology. This will both increase the speed of annotation and introduce uniformity across surveys going beyond what is reasonably expected by a human assessment.

Currently in development as part of both PhD research and the KTP programme, the AI tool is capable of identifying high level faults and features of a sewer pipe fault with 90% accuracy and the overall fault type (Crack, Root Intrusion, Deposits etc.) to a 70% accuracy.

The success of this AI is only possible with the curation of 90,000 example images of faults and features from historic surveys. Whilst this data set is large, it currently does not

comprehensively represent all potential faults. Hence, further data sets are required.

This project is about to undertake its biggest steps yet with the award of a prestigious Future Leaders Fellowship. This UKRI funding provides almost £300k worth of match funding for the continued development of the technology over the next 4 years.

The aim is to push from its current Technology Ready Level (TLR) of 5, where the tool has been validated on real world data, through to alpha and beta trials (TRL 7) and fully fledged commercial deployment at TRL 9.

The successful implementation of this tool will provide SWW with wide-ranging benefits:

- Reduce on site health and safety hazards and risks.
- Reduced surveys times.
- Increased visibility of network performance and greater proactive interventions.
- Improvement in the consistency of fault recognition leading to a better understanding of networks degradation over a longer time period enabling more accurate long term investment strategies.
- Commercial opportunities beyond sewer network assets.

Motivation

CCTV used to survey most wastewater pipes:

- Coding is time consuming
 - Subjective, inconsistent use of coding system
 - Requires trained engineers
- Quality of surveys: Human error



Intruding Roots

Settled Deposits

Collapsed Pipe

AIM: Use AI to improve survey quality and speed

- Address current issues and improve accuracy
- Go beyond obvious, historic surveys, rate of deterioration

Using interactive robot language technology (Hello Lamp Post)

The Environment Agency are using interactive robot language technology to engage members of the public in topical conversations at a number of locations within the South West to improve their understanding of environmental issues.

South West Water has been offered the opportunity to work with the Environment Agency at two locations, Bude and Exmouth, to provide an interactive educational tool to help tourists and local residents better understand how their action can prevent and hence improve the environment they are visiting.

We are taking the opportunity at these two locations to reinforce our 3Ps campaign i.e. only pee, poo and paper should be put in the toilet.

Whilst we are at the early stages of this new opportunity we believe this could be expanded to other locations in the south west where we have the potential to help reduce the number of pollutions caused by sewer mis-use and also improve leakage and water efficiency messages.



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Hello Lamp Post
Links to South West Water September 2021

Background
The Environment Agency (EA) in Devon, Cornwall and Isles of Scilly have started a 12 month pilot with Hello Lamp Post: to trial engagement with communities at risk of flooding via signs that have QR codes. These allow people to scan the codes and have a two way automated 'conversation' to find out more about flood risk, climate change and wider environmental challenges in their area. It also allows the EA to collect information or opinions from the public (in a GDPR compliant way).

Signs will be installed at Exmouth, Bude, Truro, Dartmoor National Park and the Lower Otter: in locations with high footfall and/or that are relevant to the messages being promoted e.g. on flood defence assets. Signage can be attached to street furniture - such as fences, car parking meters and benches - with the asset owner's permission. People will be encouraged to scan the QR code (with a text number for those who don't have a smart phone) to learn more about a particular object, or a general issue.

Links to South West Water
There is a clear link to South West Water as there are opportunities to integrate behaviour change messages. For example, discourage sewer misuse to prevent pollution and blockages that may increase the risk of flooding. This could help to reduce the number of avoidable emergencies our organisations resource. As well as the shared benefits of joining up our organisations' engagement, other benefits include customer engagement being accessible 24/7/365. The engagement tool is Covid-safe and accessible to most of the population. This technology enables us to engage with a wide range of people, who we may not usually be able to reach via our traditional engagement activities.

Recommendation
We'd love to invite you to join us. Let us know what pollution prevention and campaign messages you'd like us to promote on your behalf. We'll incorporate them into the knowledge base that enable automated chat bot conversations with our shared customers (Appendix 1). Consider if the signs can be placed on any of your assets in/linear areas with high footfall in the pilot locations. Could you seek landowner permission to position signs on any of their assets e.g. Sandy Bay Holiday Park?

This tool could supplement our existing communication channels and maximise our reach. Together, we'll be more visible to our customers, partners and the media.

There are plenty of options. Please contact Kate Pearson (contact details below) if you would like to learn more.

For more information please contact Kate Pearson: kate.pearson@environment-agency.gov.uk

Pollution Incident Hot Spots Case Studies

Case study 1 Ponsanooth Phase 1 (*part of the pollution hotspot scheme at Carnmenellis)

There are 5 known flooding/pollution hotspots within the Ponsanooth Catchment which primarily occur during the winter months; this is due to significant groundwater infiltration. This project targeted infiltration within the Hendra catchment as well as incorporating the movement and upgrade of the CSO screen.

The existing CSO screen is currently located within the boundary of a local farmer who has often become frustrated with the asset as it frequently blinds in storm conditions which leads to SWW/Alliance operatives having to access his property

to cleanse it. The movement of the screen to the STW has been agreed as a betterment with the EA and will facilitate ease of maintenance and contribute towards a positive CMEX outcome. This part of the project will be completed in March once the sewer upsizing has been completed.

The infiltration reduction works were completed this year (16/08/2021) and consisted of lining over 1200m of sewer and repairs to 21 manholes.

Total Scheme Value: £421k

Case study 2 Porthtowan Pollution Prevention (* part of the Porthtowan pollution hotspot site)

17 pollution incidents (14 Cat. 3's & 3 Cat. 4's), have occurred within the Porthtowan sewerage catchment in the last five years, making it the 2nd worst repeat pollution location across the entire SWW region based on the current PIRP project.

A surface water separation scheme was undertaken to remove the large impermeable areas within the Towan Valley Holiday Park and the additional agreed development that was over-

whelming the lower catchment and SPS. Construction was finished on this project on 07/05/2021.

(Below) Car Park Gulley Connection; allows for the removal of a substantial amount of impermeable area to be removed allowing headroom to be created in the existing sewer.

Total Scheme Value: £348k



Case study 3
Beach Road, Porth Pollution Prevention

The aim of this scheme is to provide increased hydraulic capacity to the sewerage system to ensure that selected man holes (one of which is pictured below – bottom left of the photo) do not become overloaded and surcharge and potentially impact the bathing water quality. This is high priority due to the locality of the chambers adjacent to a designated bathing water beach.

To provide the necessary protection to the bathing waters we will construct:

1. 135m of rider sewer from MH9409 to MH9603 on Beach Road.

2. Install a new bifurcation chamber (shaft) = 3.6m dia. x 5.6m depth
3. A new pumping station
4. 440m of rising main along the foreshore of Porth Tourist Beach.

Glanville Environmental mobilised to site on 27/09/2021 with construction due to finish 28/02/2022.

Total Scheme Value: £885k



Case study 4
Treeve Lane, Connor Downs Pollution Prevention

Owing to insufficient sewer capacity, a project was required to reduce the risk of frequent internal and external flooding in the Treeve Lane area of Connor Downs near Hayle. Due to the proximity of the nearby watercourse there was an increased risk of pollution events occurring although are no PIRS reports for any events.

The scope of this scheme was to provide 1:30 year flood protection for the boundaries of the properties as well as ensuring protection to the highways and fields during a 1:20 year storm event this was achieved by upsizing 346m of sewer and providing 165m³ of online storage.

Total Scheme Value: £562k



Weholite Tank being installed



The finished site

Case study 5
Crantock Rising Main Replacement

Following a number of bursts on the existing rising main at Crantock, Newquay it has been established that the main is at the end of its operational life.

The existing main was installed in 1970 and is 14" (355mm) diameter UPVC which is flexible and subject to movement, particularly during the surge cycle when the pumps stop. Historic surge analysis and recent pressure monitoring has found that Crantock does experience high surge pressures after pump stop. It therefore appears that the UPVC rising main is failing due to fatigue.

A solution has been developed and will entail constructing a new rising main from Crantock SPS to Newquay STW. These works are due to begin on 18/10/2021 and the asset be live on 22/03/2022.

Forecast Project Cost £2.3m



Existing Rising Main Route



Gannel Estuary Crossing of the Existing Rising Main



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