

# Downton Parish Council meeting

Matt Wheeldon – 26 September 2023

**Wessex Water**

YTL GROUP



# Agenda

- Flooding sources
  - Fluvial
  - Surface water
  - Ground water
  - Sewer
    - Infiltration sealing plans
- Storm overflows
  - Their impact
  - Solution types
  - Storm overflows affected by groundwater
  - Our current and future plans
- Questions



# Downton

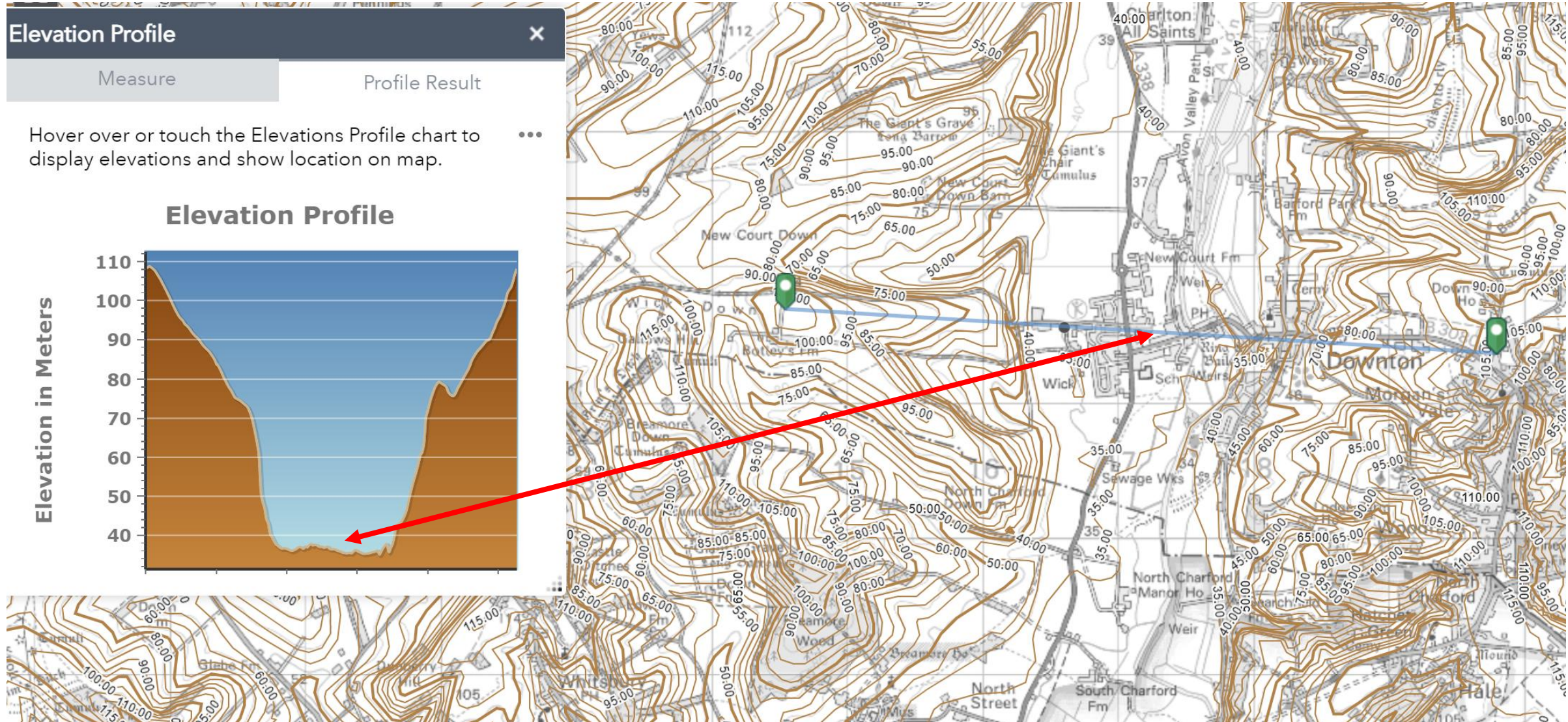
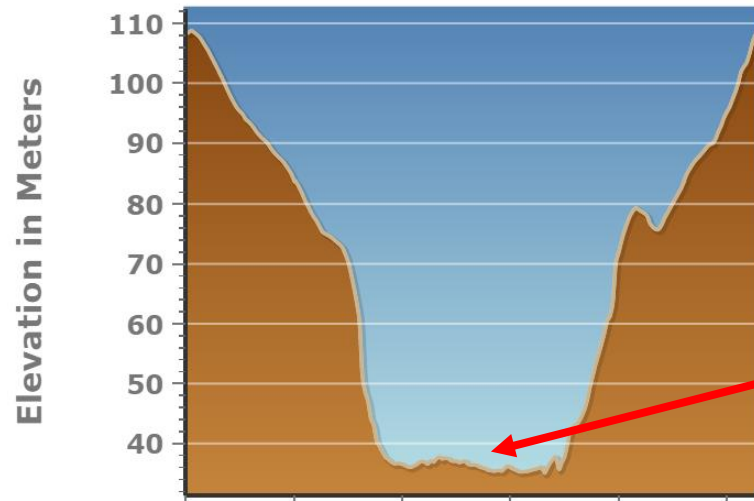
## Elevation Profile

Measure

Profile Result

Hover over or touch the Elevations Profile chart to display elevations and show location on map.

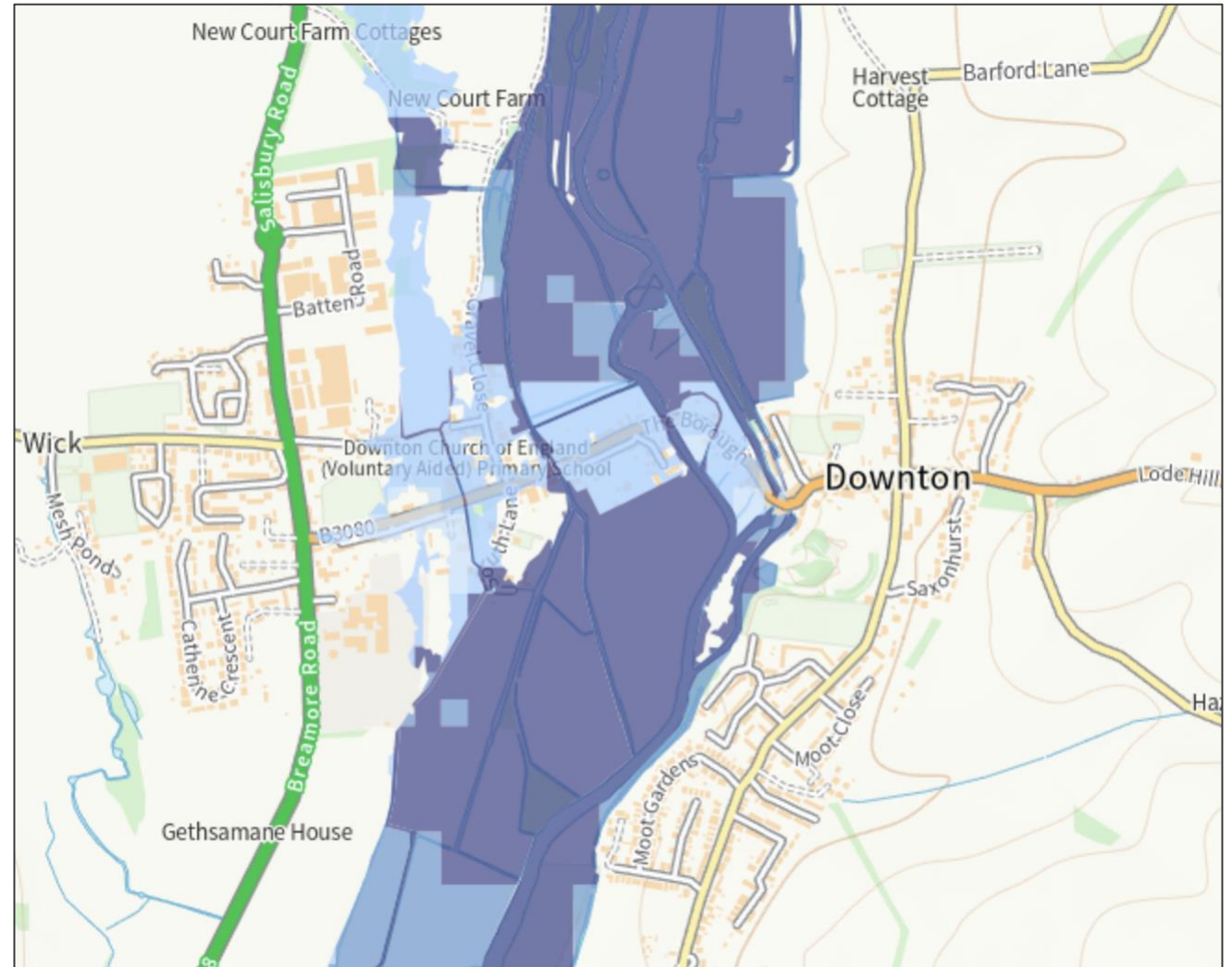
## Elevation Profile





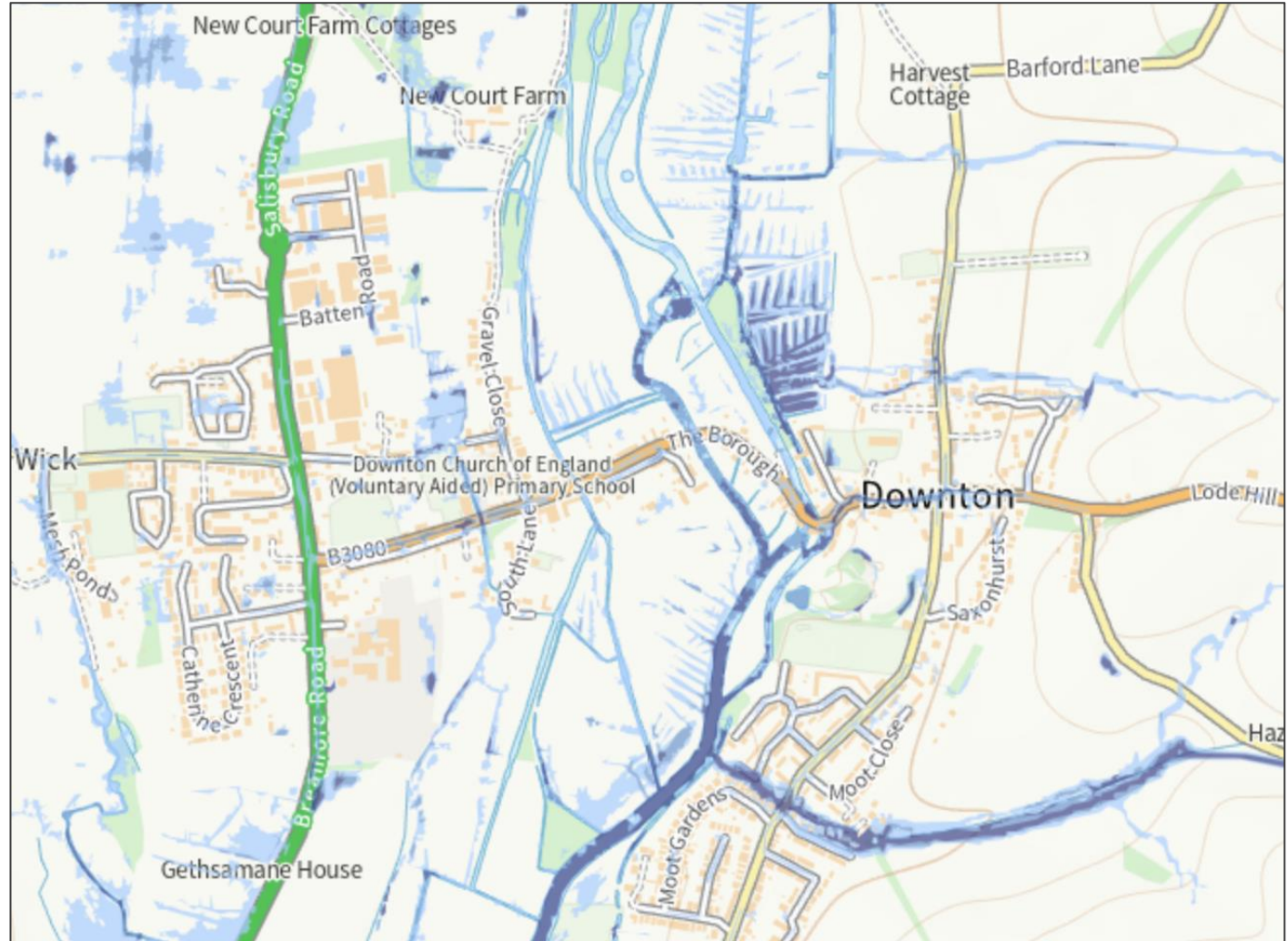
# Fluvial flooding risk

## [Fluvial flood risk maps \(GOV.UK\)](#)



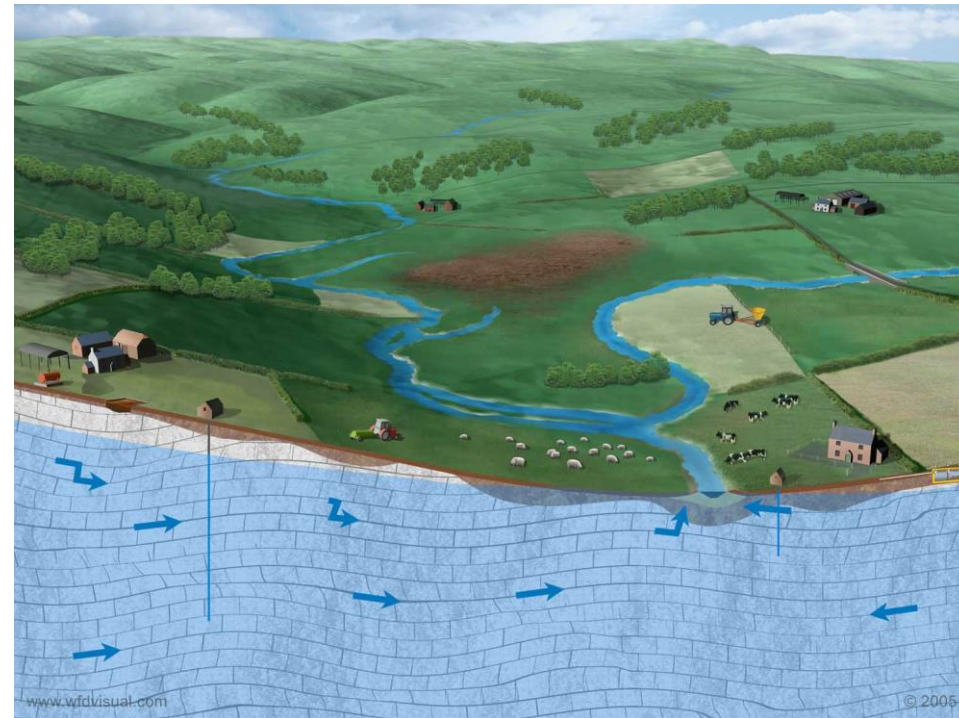
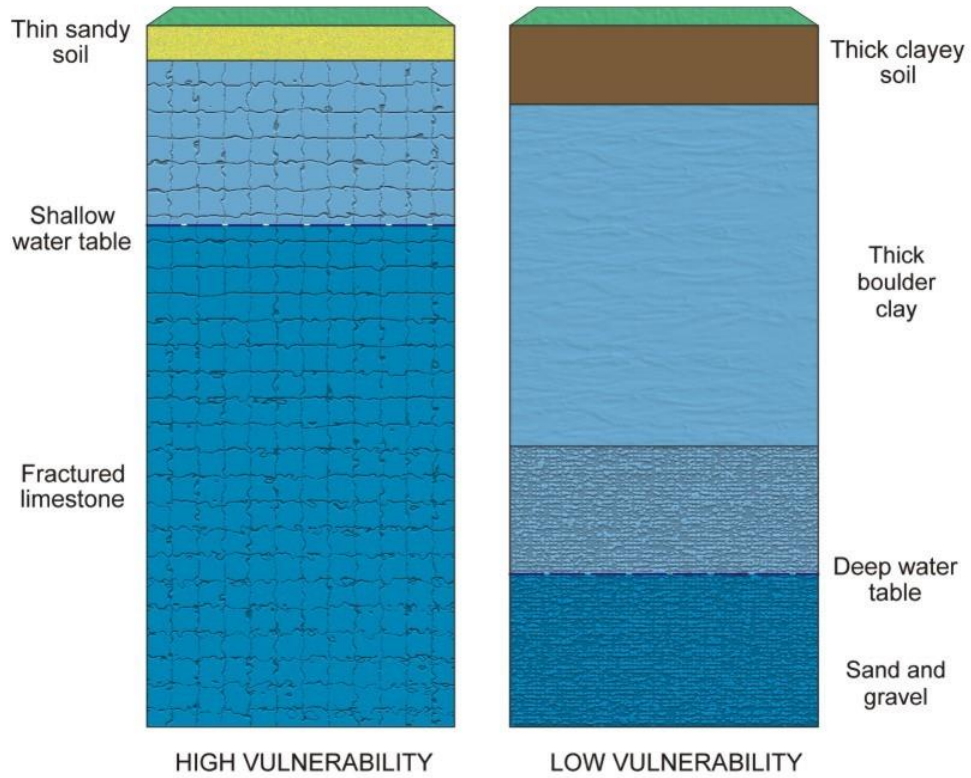
# Surface water flood risk

[Surface water flood risk maps \(GOV.UK\)](#)





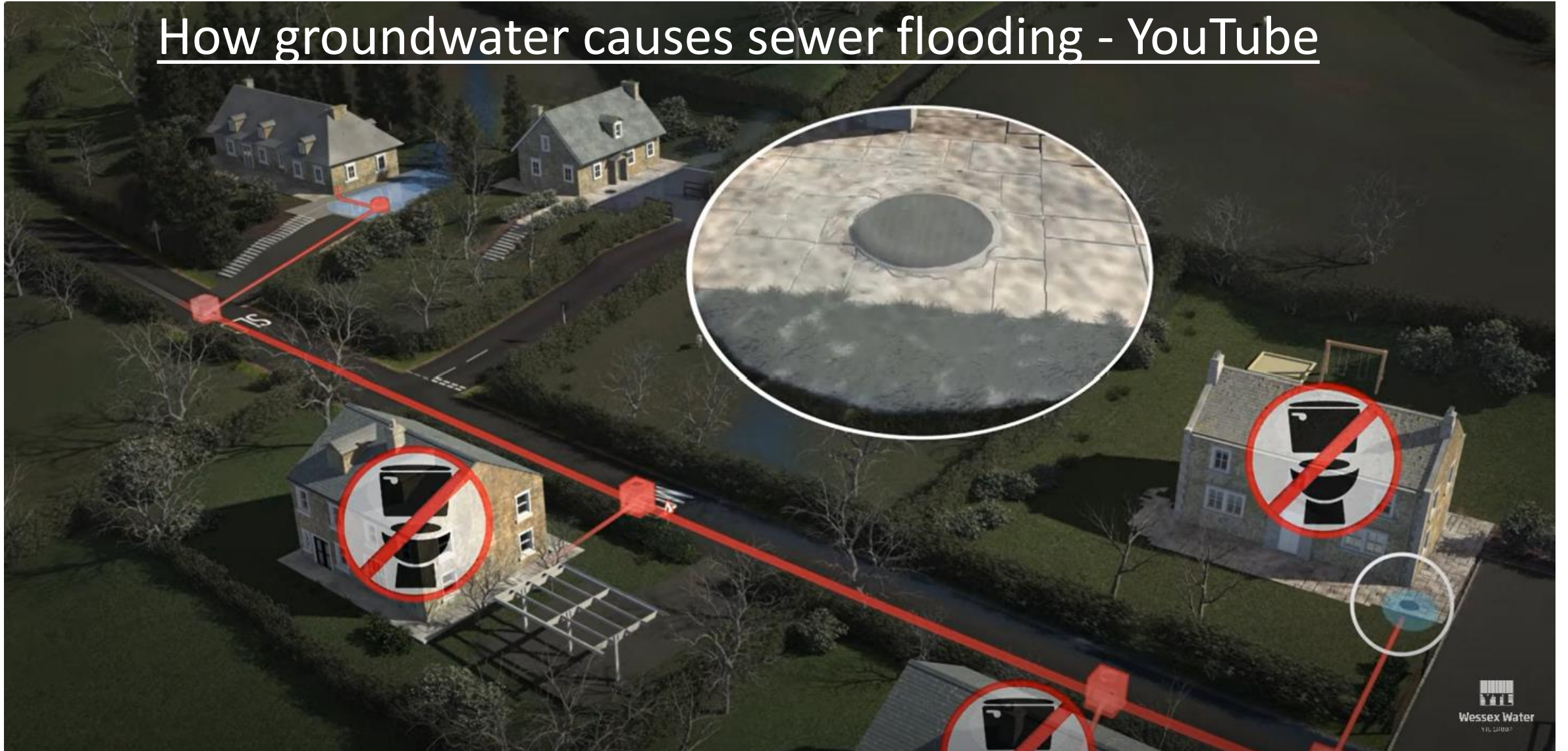
# Groundwater flooding





# Sewer flooding

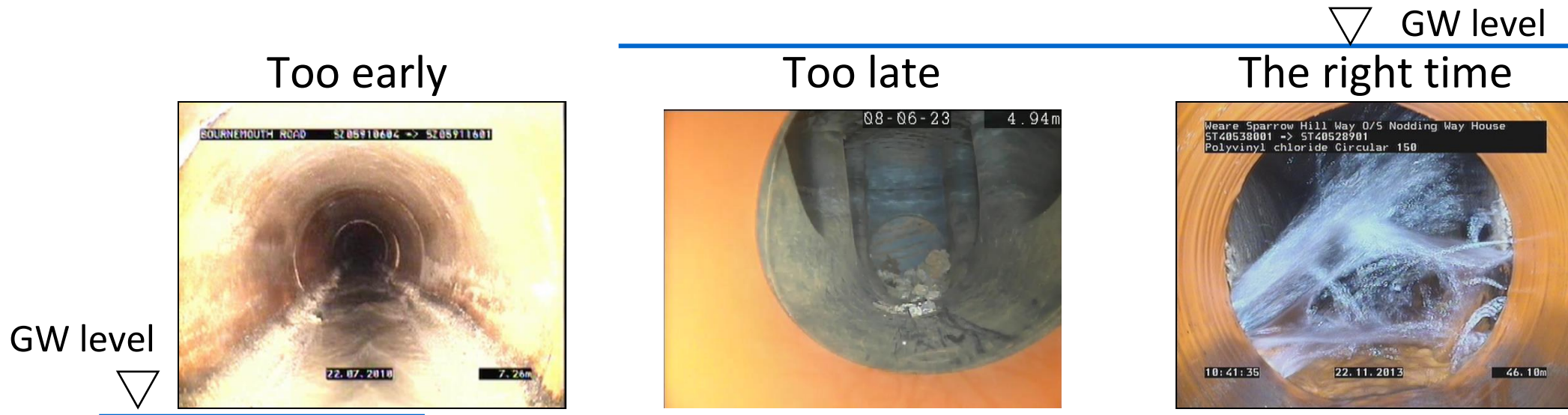
## How groundwater causes sewer flooding - YouTube





# Infiltration sealing

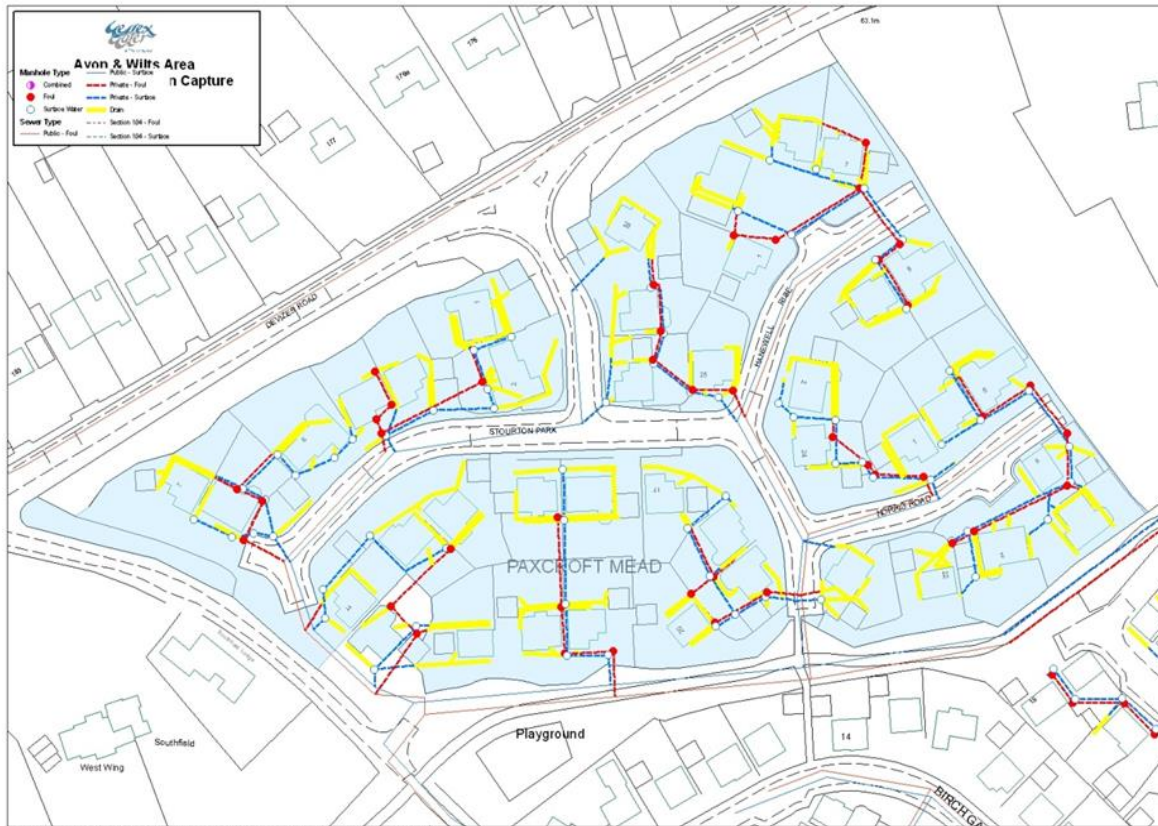
- We have a continuous programme of infiltration sealing and publish our infiltration reduction plans and update them each year
- [Infiltration Reduction Plans](#)
- [Downton Infiltration Reduction Plan](#)
- Iterative process due to the short **window of opportunity** to locate leaks each winter





# Groundwater infiltration

Private drains account for c70% of the length of the underground drainage network



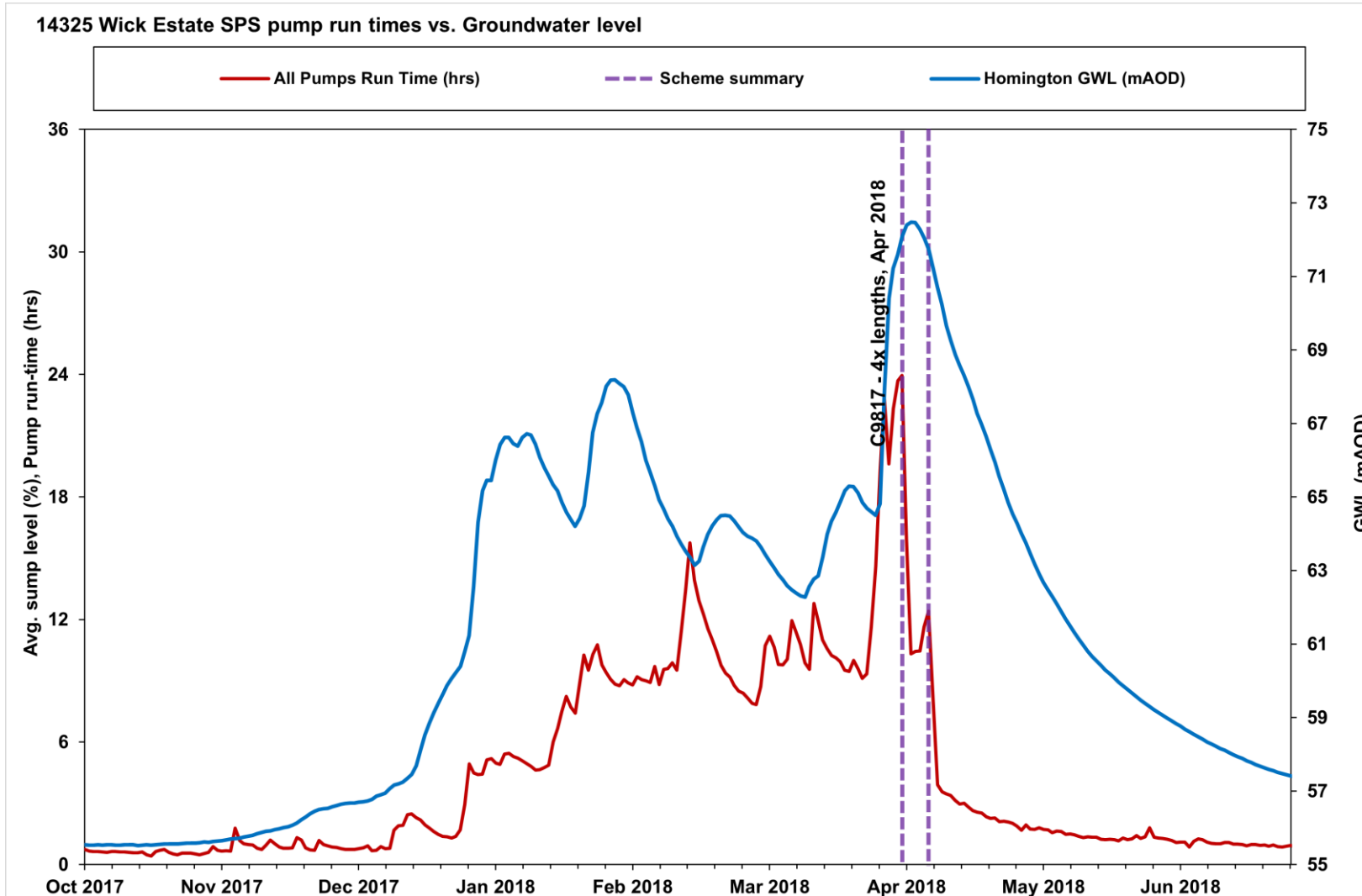
Typical development: private pipes in yellow



Illustration: the twigs on a tree (private) are a lot longer in length than the branches and trunk (public)

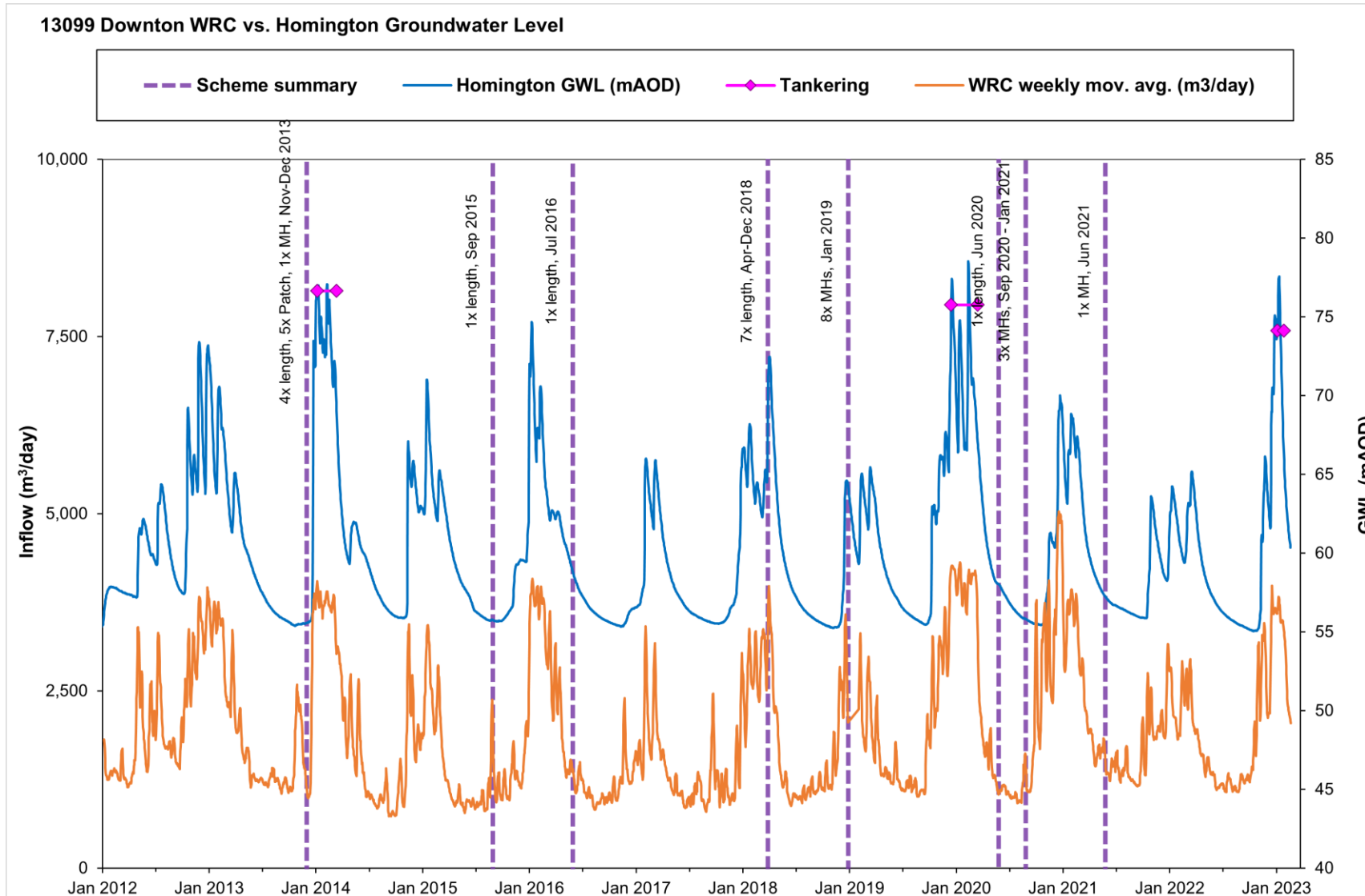


# Can sewer sealing work? YES





# Can sewer sealing work? NO





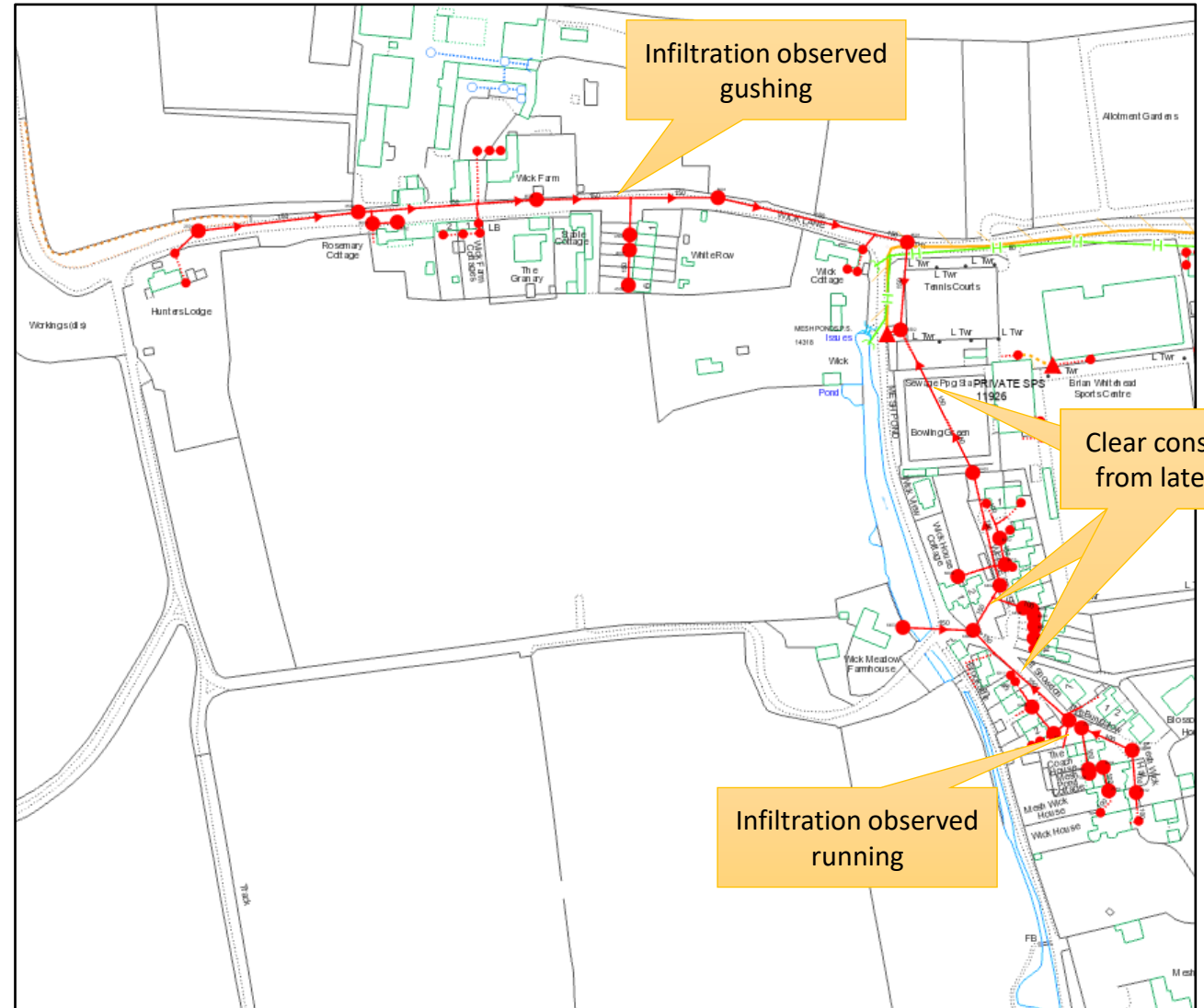
# Winter 22/23 sewer inspections

## Infiltration was found in

- 8 locations on the public sewer
- 14 instances of clear constant inflow from lateral pipes
- 4 instances of infiltration from new development

# Winter 22/23 CCTV findings

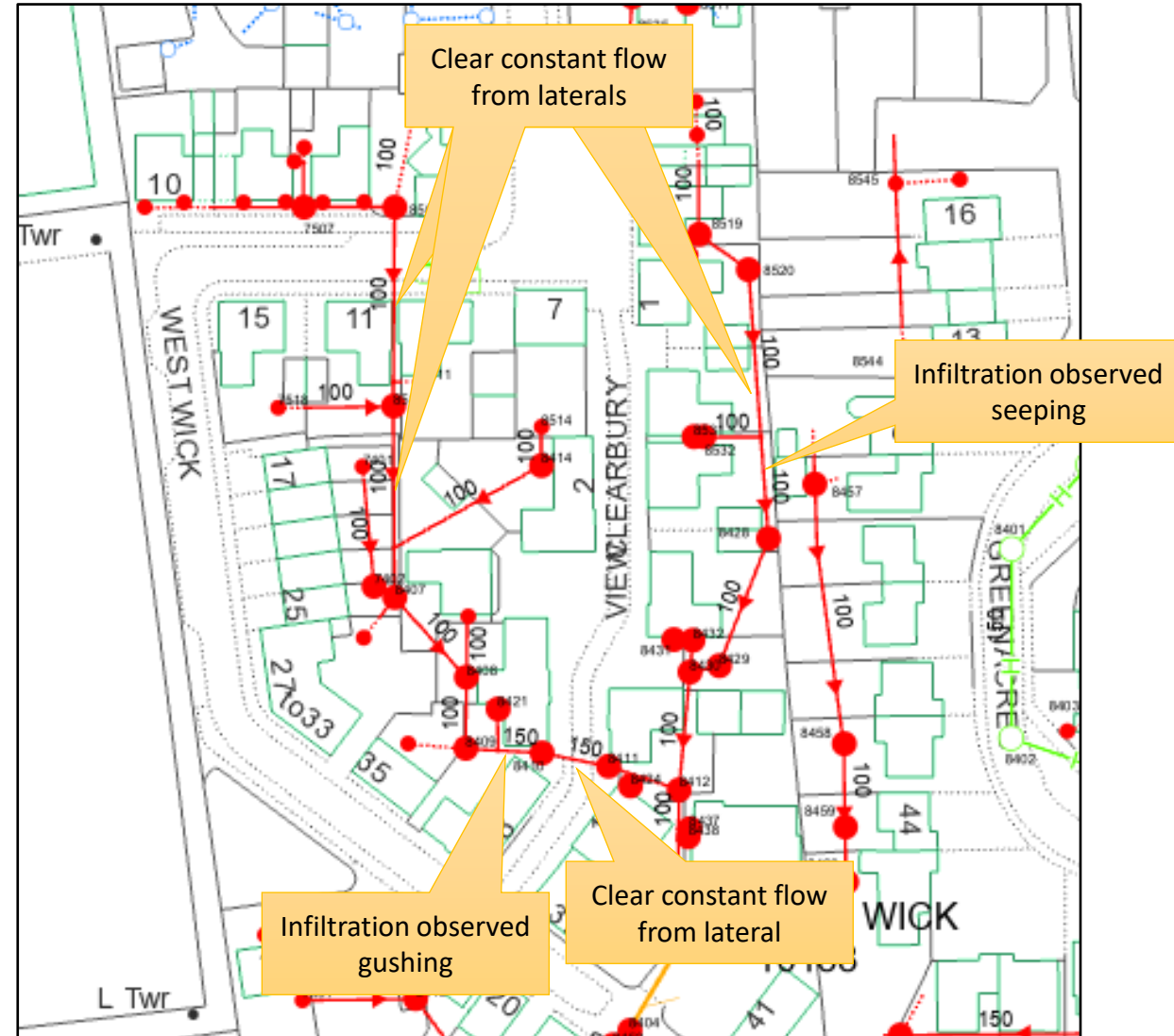
- Mesh Ponds area





# Winter 22/23 CCTV findings

- West Wick area



# Winter 22/23 CCTV findings

- Central Downton

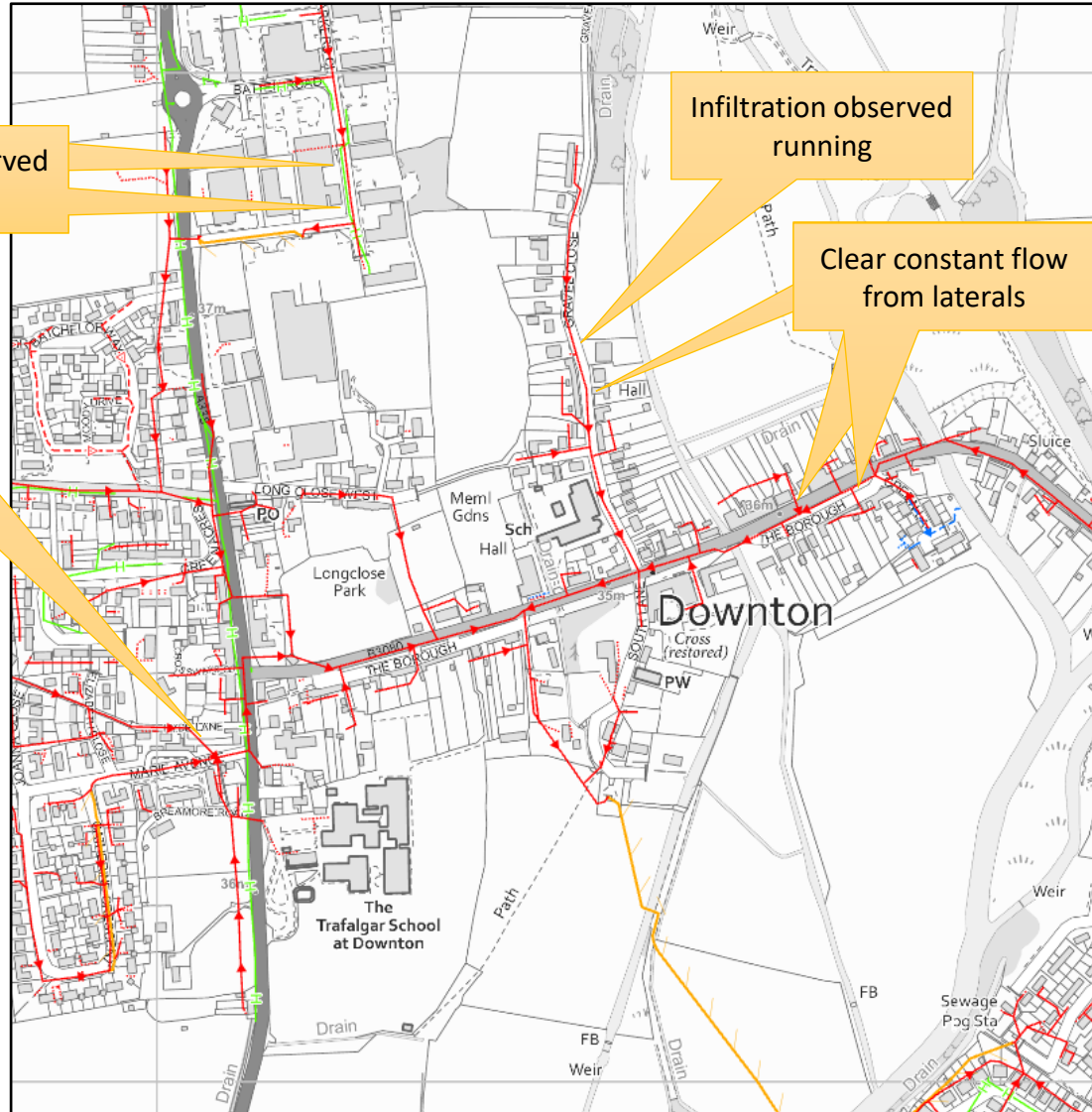


Clear constant flow from laterals

Infiltration observed running

Infiltration observed running

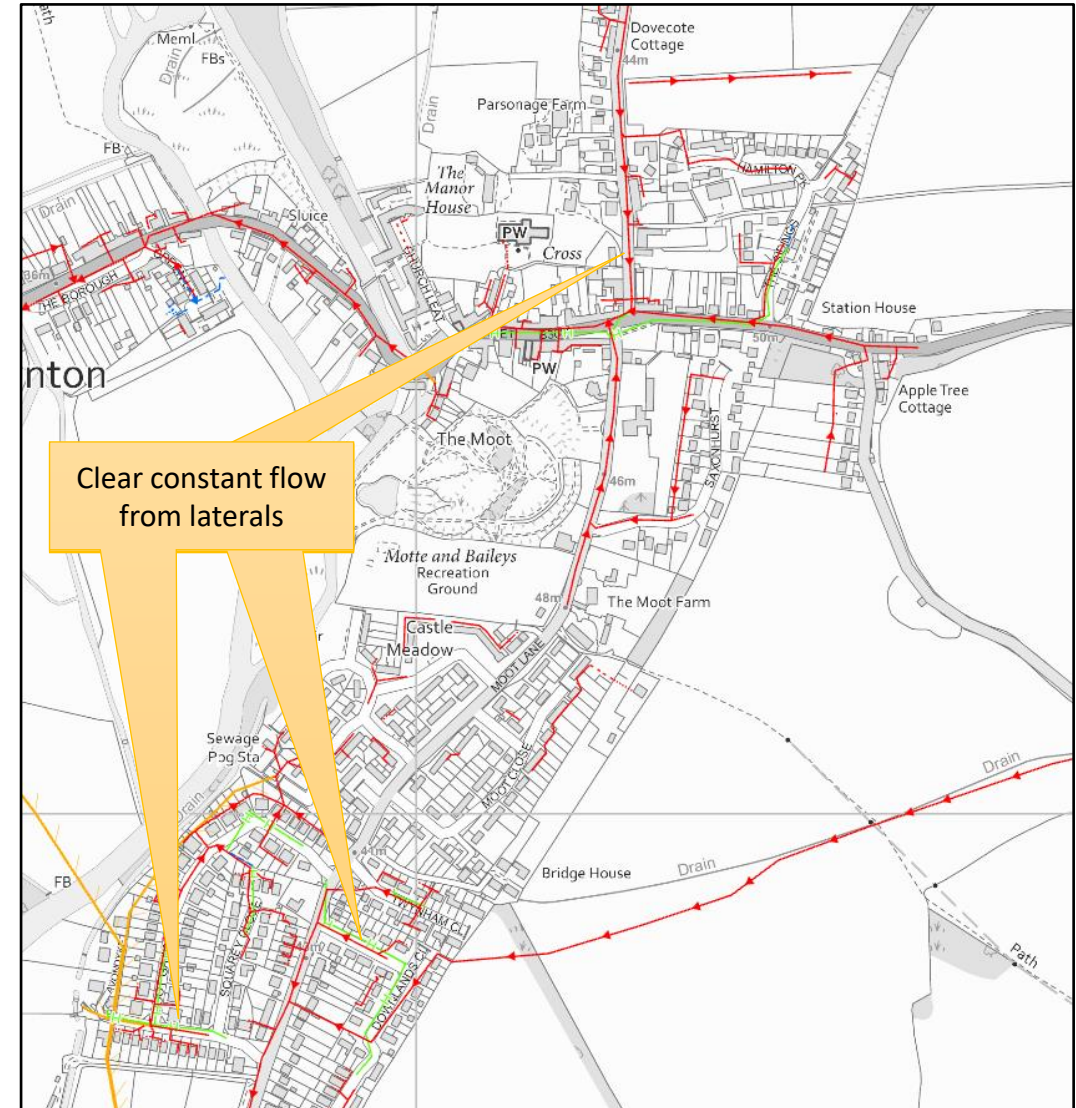
Clear constant flow from laterals





# Winter 22/23 CCTV findings

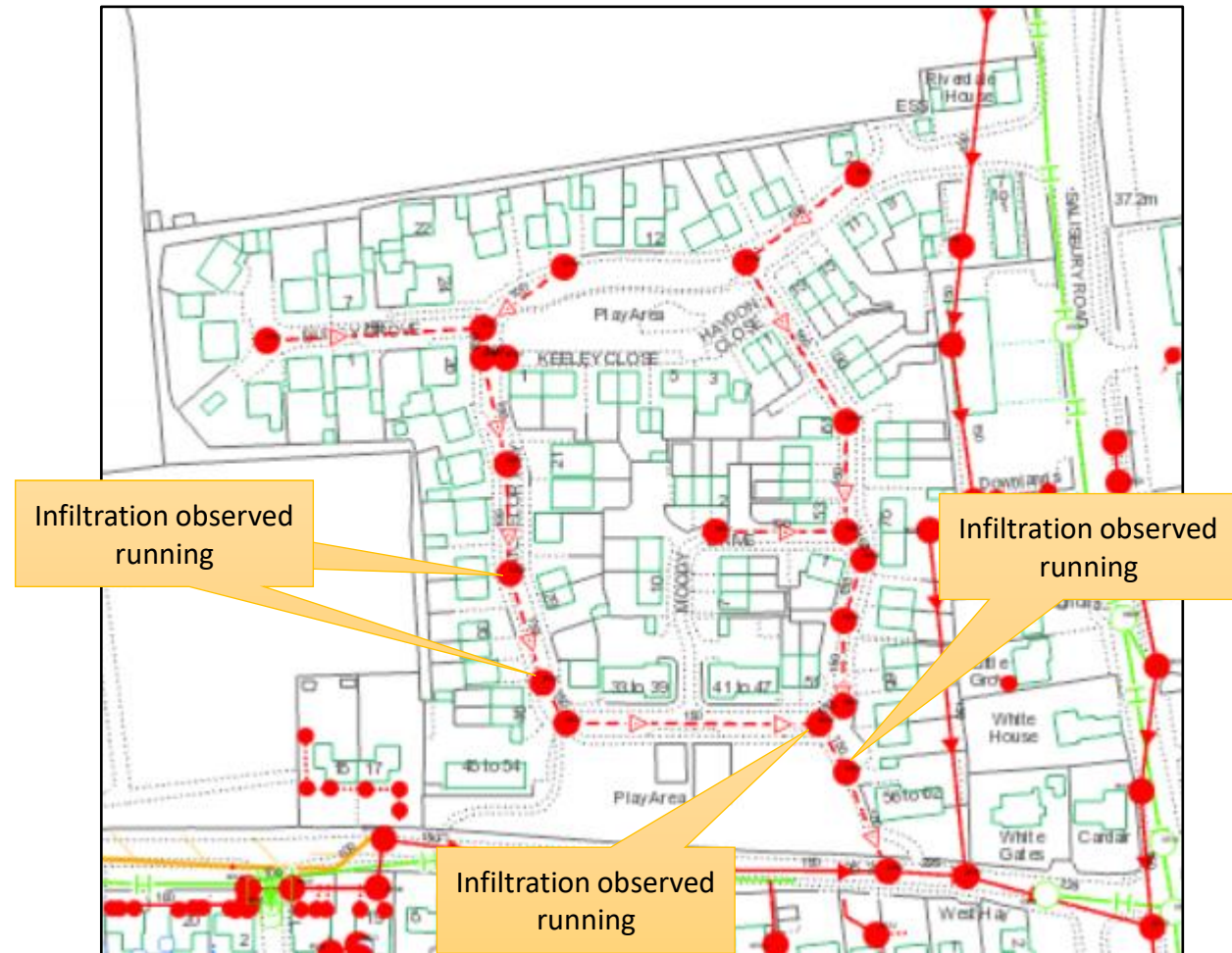
- East of the river.





# Winter 22/23 CCTV findings

- New development





- Fix gushers and runners discovered
- Follow-up action with developer to fix infiltrating assets
- More infiltration surveys will be attempted to achieve parts which could not be achieved this year
- The survey will also follow up on the infiltration from private pipes which were identified

# Storm Overflows

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# The one-pipe problem

## Foul water



## Surface water



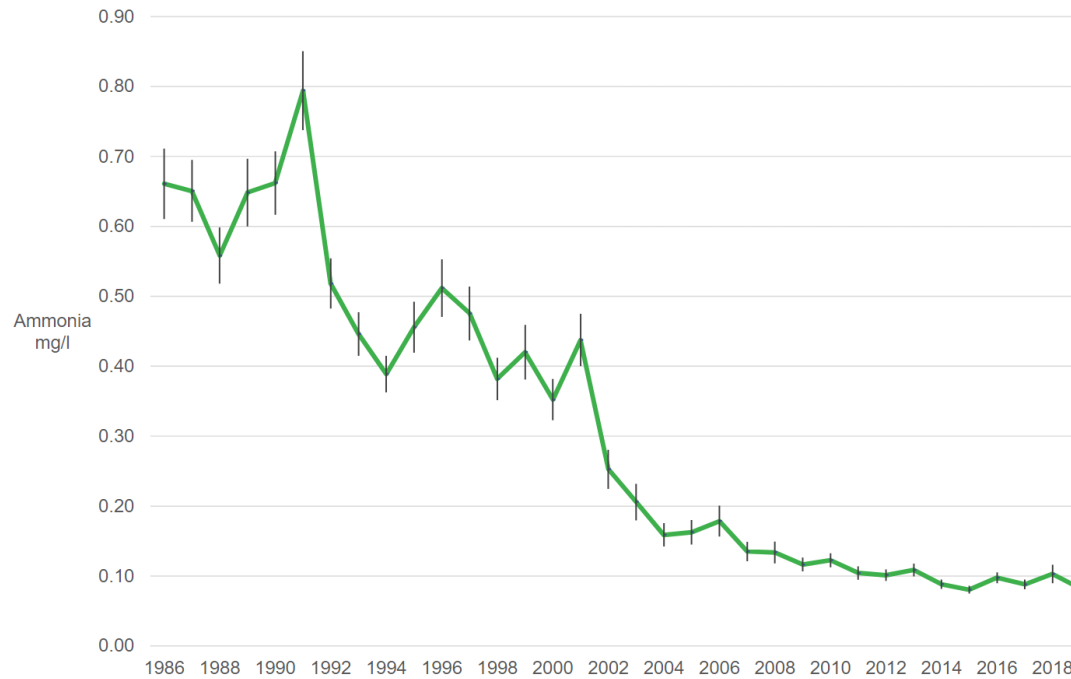
1 roof (surface water) is the equivalent flow to 100 separately drained properties (foul only flow)

## Combined drain

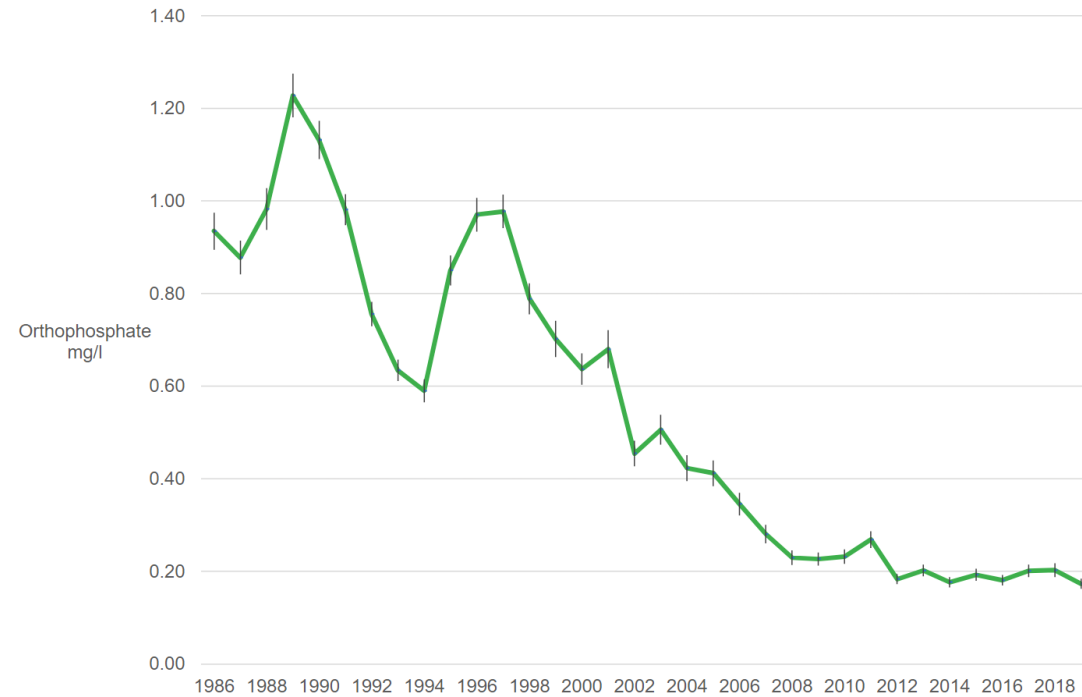
More than half of all properties in England are built like this

# Key river pollutants

## Ammonia levels (1986-2019)



## Orthophosphate levels (1986-2019)

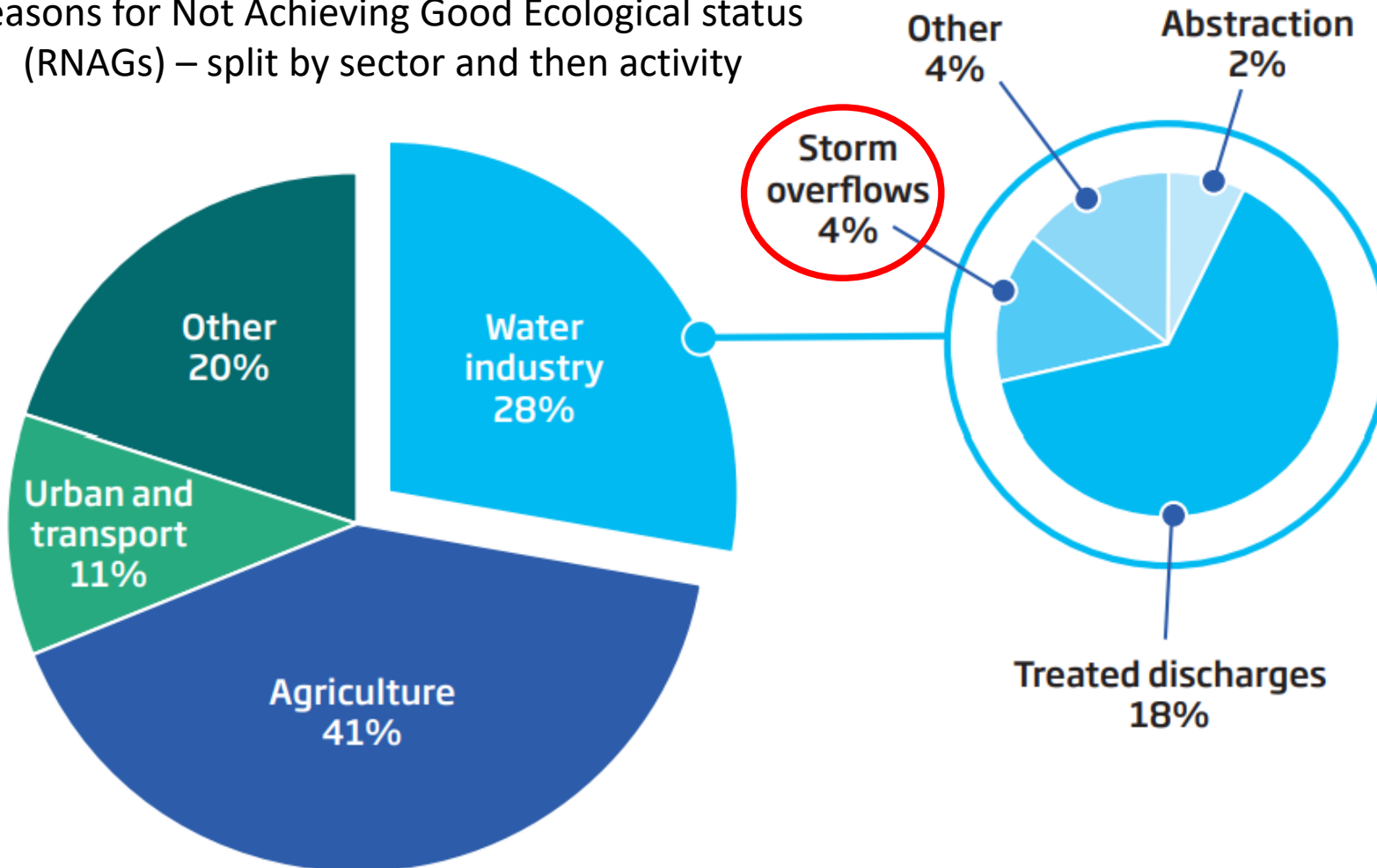


Scan the QR code to access this data



# Good ecological status

Reasons for Not Achieving Good Ecological status (RNAGs) – split by sector and then activity



In Wessex Water, storm overflows currently account for 9 of the 1074 RNAGs (0.9%)

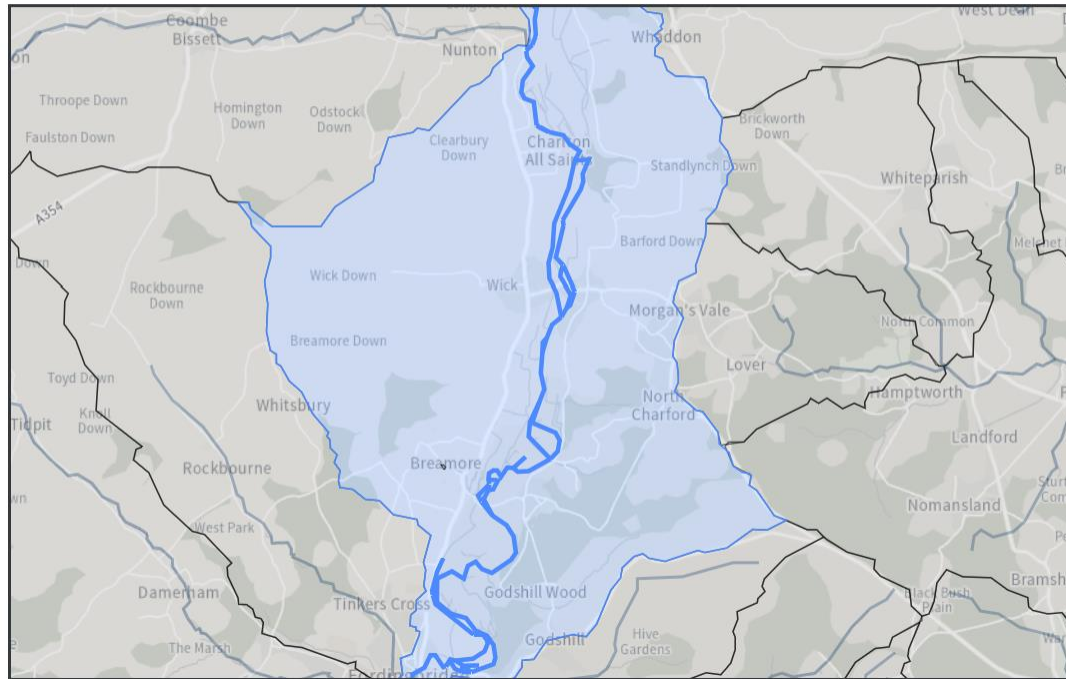
NONE in Dorset

Scan the QR code to access the source of this data



# Water quality in Hants Avon

## Hampshire Avon (Middle) Water Body



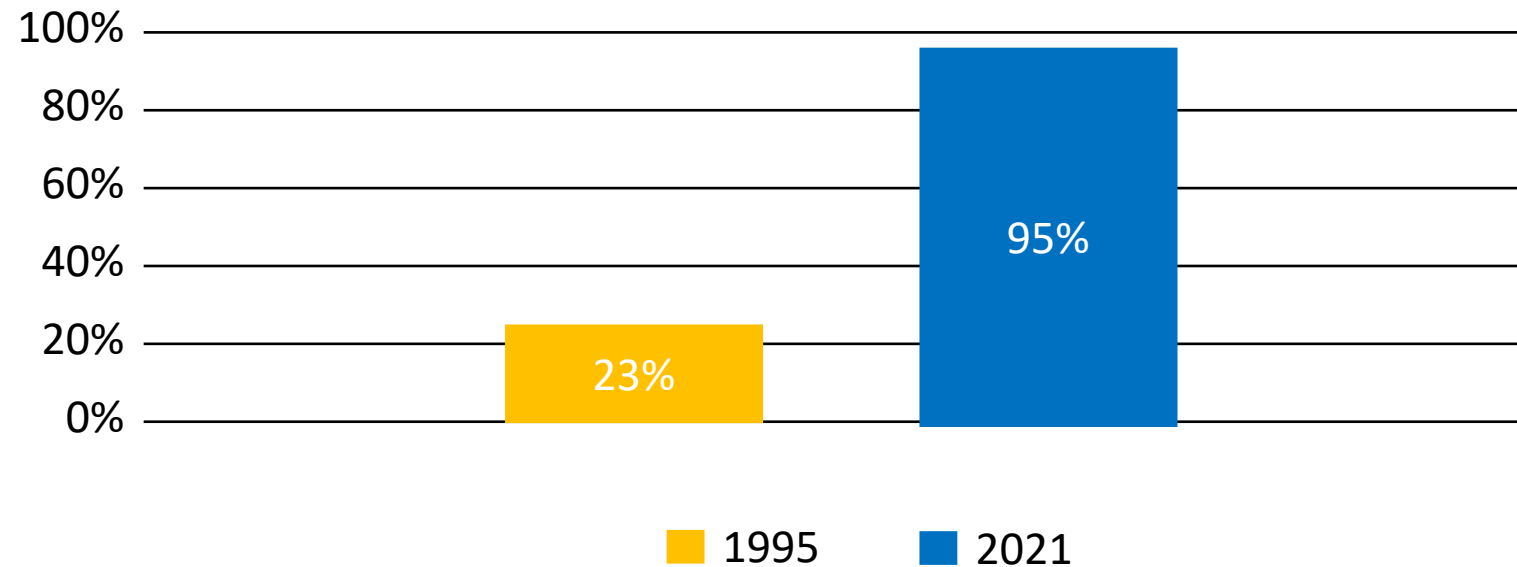
[Hampshire Avon \(Middle\) | Catchment Data Explorer](#)  
[Catchment Data Explorer](#)

Classification Item	2019	2022
<b>Ecological</b>	Moderate	Moderate
<b>Biological quality elements</b>	Moderate	Moderate
Fish	Moderate	
Invertebrates	High	High
Macrophytes and Phytobenthos Combined	Moderate	Moderate
Macrophytes Sub Element	Moderate	Good
Phytobenthos Sub Element	Moderate	Moderate
<b>Physico-chemical quality elements</b>	Good	Good
Acid Neutralising Capacity	High	High
Ammonia (Phys-Chem)	High	High
Dissolved oxygen	High	High
Phosphate	Good	Good
Temperature	Good	High
pH	High	High
<b>Hydromorphological Supporting Elements</b>	Supports good	Supports good
Hydrological Regime	Does not support good	Supports good
<b>Specific pollutants</b>	High	High
Arsenic	High	High
Chlorothalonil	High	High
Copper	High	High
Iron	High	High
Manganese	High	High
Pendimethalin	High	High
Zinc	High	High

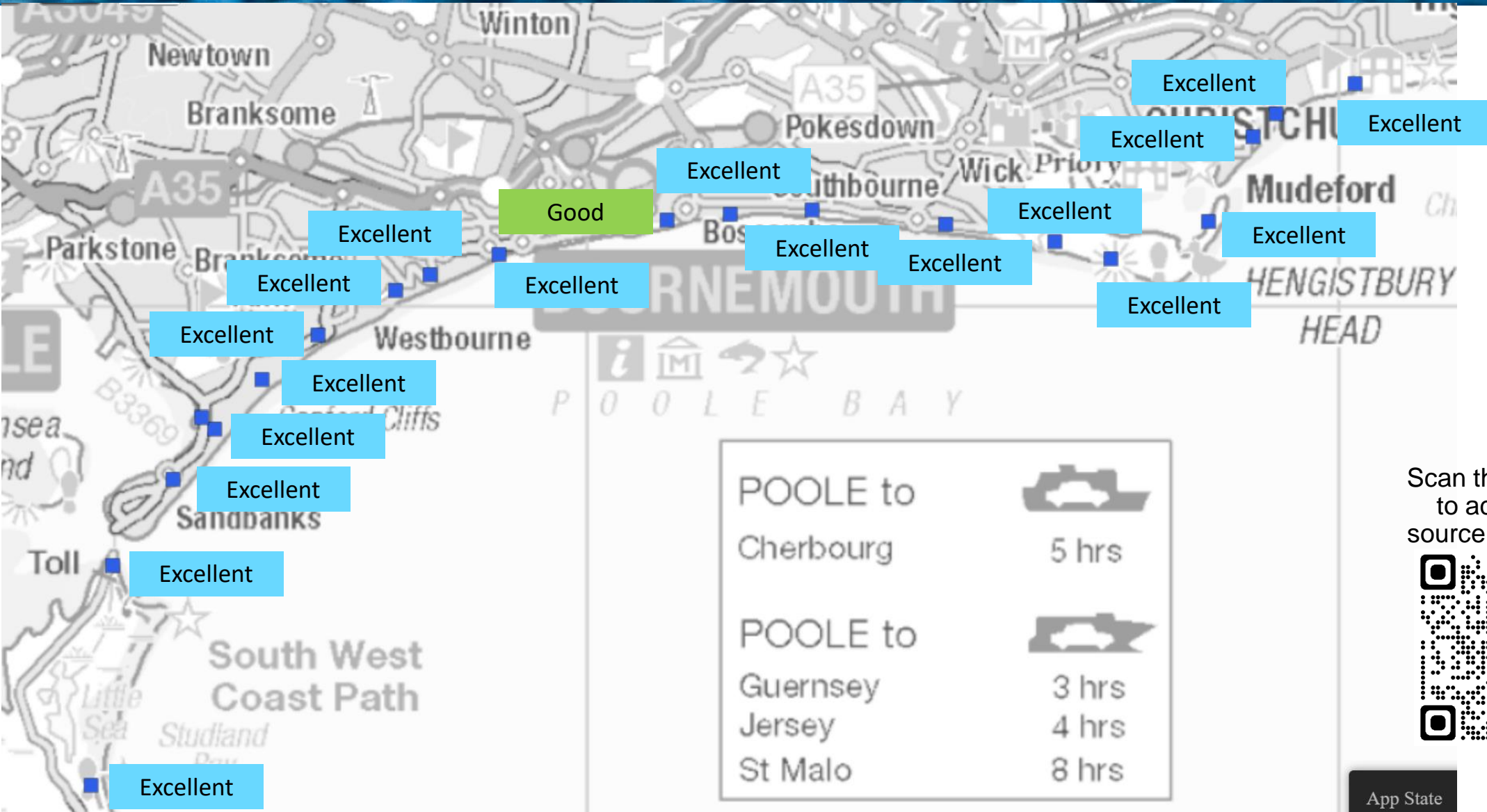


## Bathing Water Quality in England

Sites reaching the highest standards – Excellent or Good  
Source: Department for Environment Food and Rural Affairs  
(DEFRA)

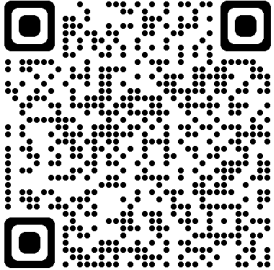


# Bathing water quality – local picture 2022



POOLE to Cherbourg	5 hrs
POOLE to Guernsey	3 hrs
POOLE to Jersey	4 hrs
POOLE to St Malo	8 hrs

Scan the QR code to access the source of this data





# Solutions.....

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# Start with the principles...

1

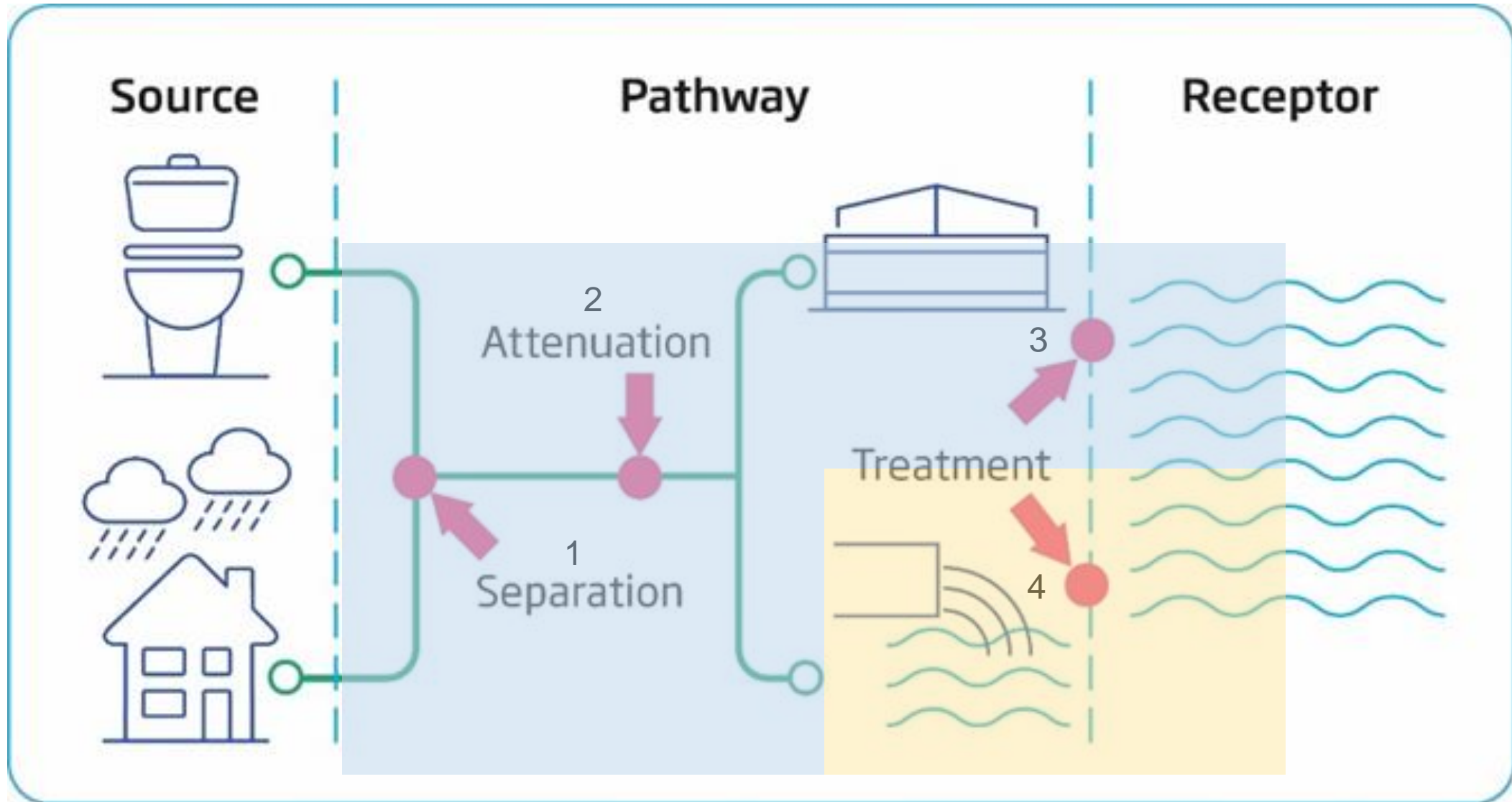
Rainwater should first and foremost be treated as a RESOURCE, captured near where it lands and reused where possible....



Rainwater should be returned to the environment AS CLOSE TO WHERE IT LANDED as possible and **never mixed with sewage**



# 4 solution options



# Solutions: relative benefits

Outcome	Solution	Relative Benefits Assessment				
		Water efficiency	Biodiversity	Customer bills	Embodied Carbon	Operational Carbon
Reduction in discharges	1. Separation (property level)	✓	✓	✓	✓	✓
	1. Separation (community level)	✗	✓	✗	✓	✓
	2. Attenuation	✗	✗	✗	✗	✗
	3. Treatment capacity increases at WRCs	✗	✗	✗	✗	✗
Reduction in harm	4. Treatment at overflow: nature-based solutions	✗	✓	✗	✓	✓
	4. Treatment at overflow: grey solutions (e.g. UV)	✗	✗	✗	✗	✗



# The best solutions...

...address the problem at source

...need changes to regulation and legislation to help them happen

Legislation amendments to enable water companies to:

- construct private soakaways
- discharge rainwater to watercourses
- seal private pipes that are letting in groundwater
- charge highways authorities for draining roads

Regulation changes to encourage water companies to:

- embark on progressive private property separation
- solve groundwater induced overflows with nature-based solutions

# Storm overflows affected by groundwater

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# Groundwater induced overflows

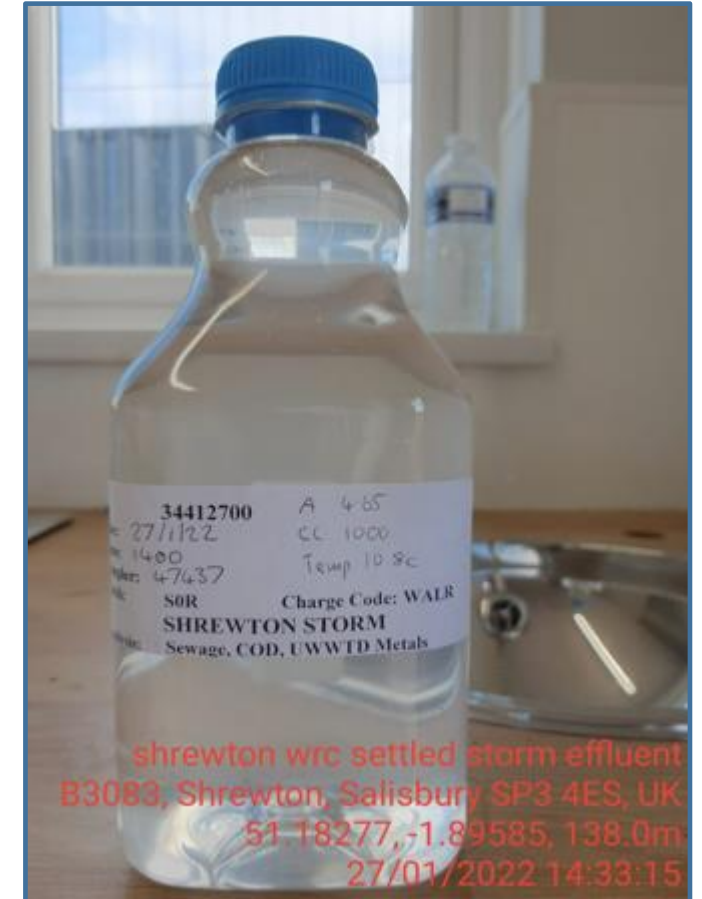
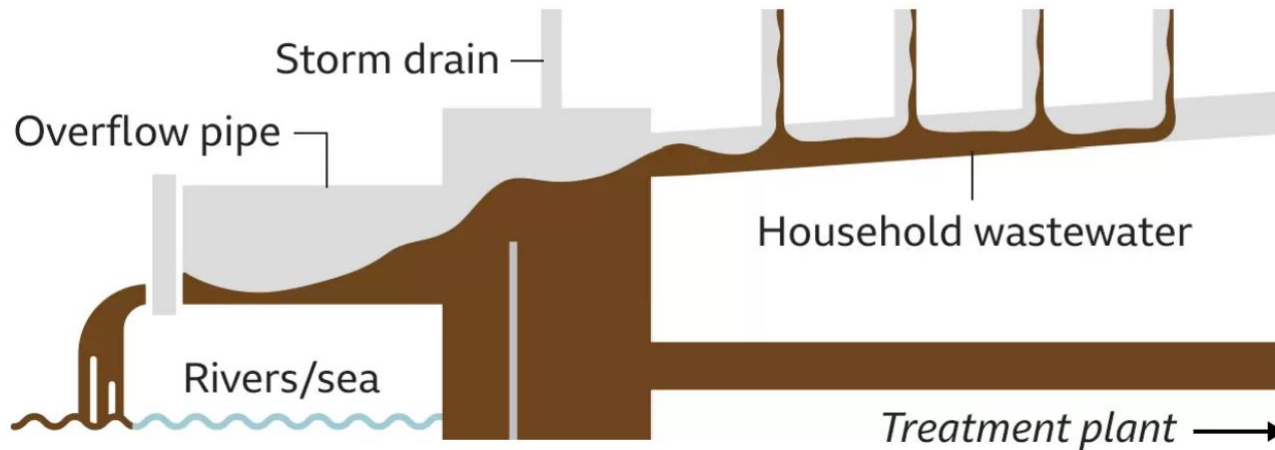
- These account for 20% of all overflows but contribute to 50% of all discharge hours
- Top 50 groundwater induced overflows account for 42% of all discharge hours

# Dry day spills....

[Water firms illegally spilled sewage on dry days - data suggests - BBC News](#)

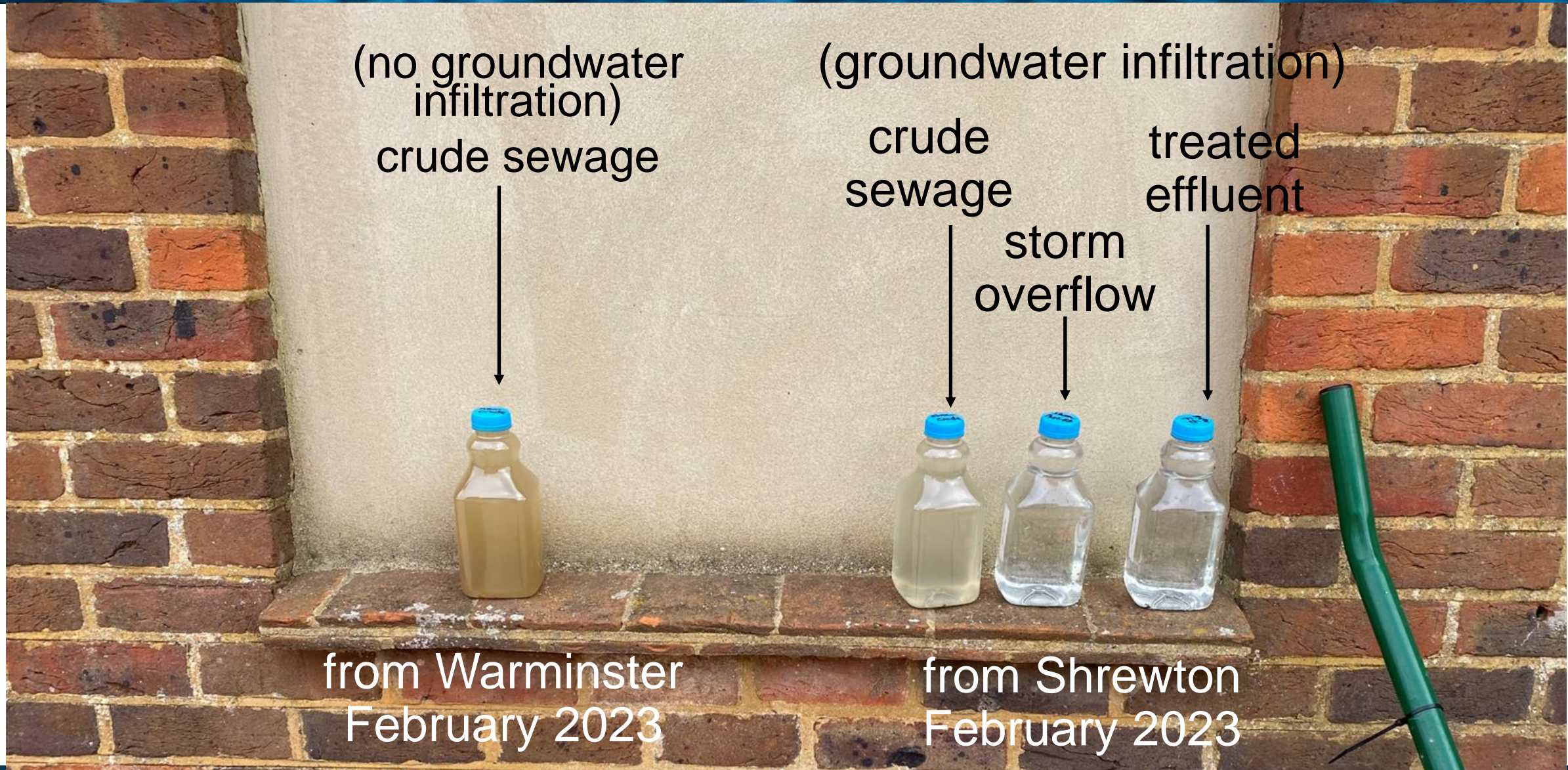
## Illegal dry spill

This is when untreated wastewater spills straight out into rivers and seas when there is no rain.





# Groundwater induced overflows





# Discharge quality

- This liquid [proclaimed as untreated or raw sewage] is actually typically cleaner than treated sewage is required to be

Parameter	Treated sewage permit (mg/l)	“raw” sewage results (mg/l)
Biochemical Oxygen Demand	45	c9
Suspended Solids	55	c16
Ammonia	15	c5

Shrewton →

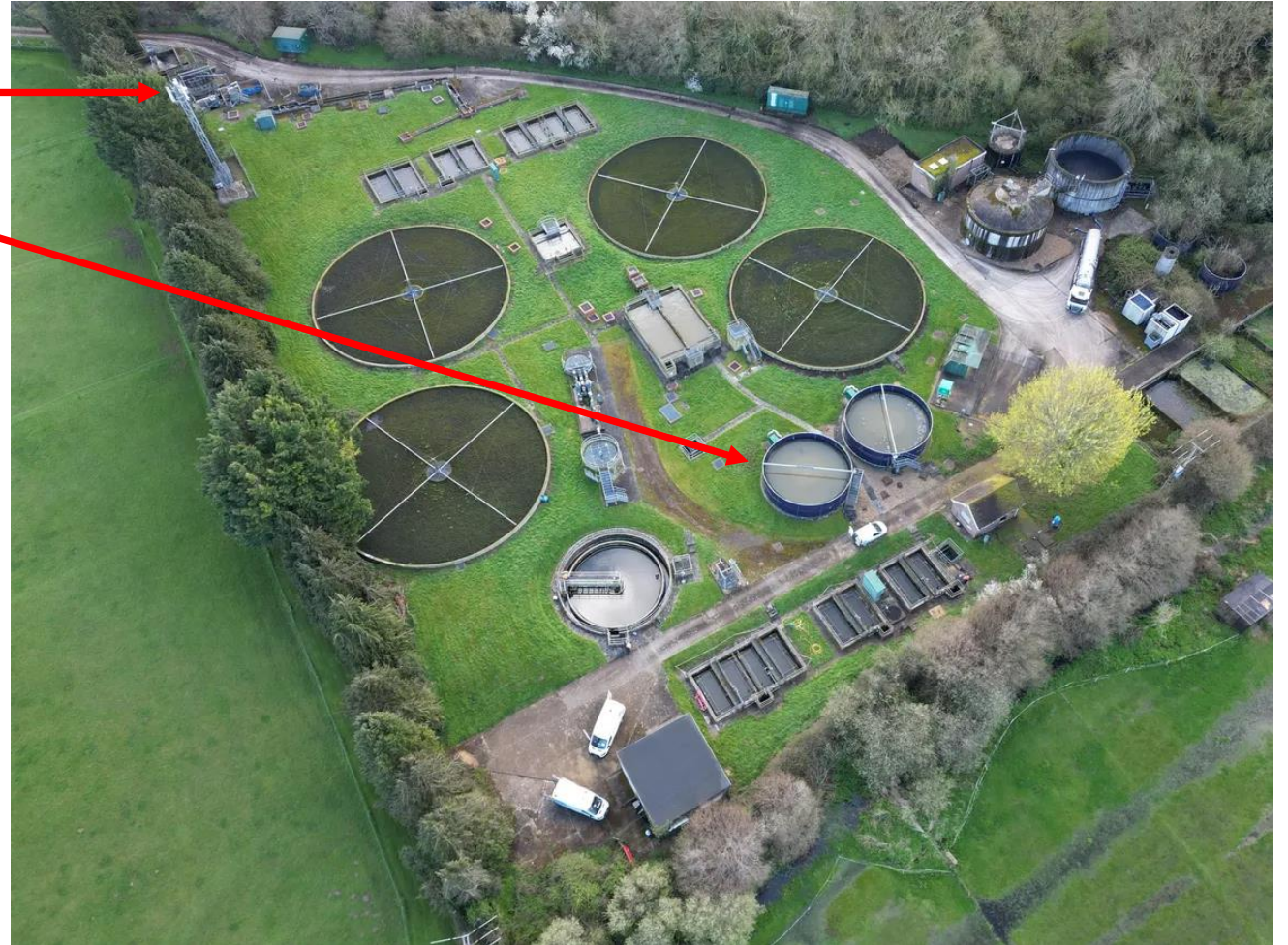
- It looks crystal clear, has no bits and no smell
- But there is no other word for it than “sewage”





# Downton storm overflow

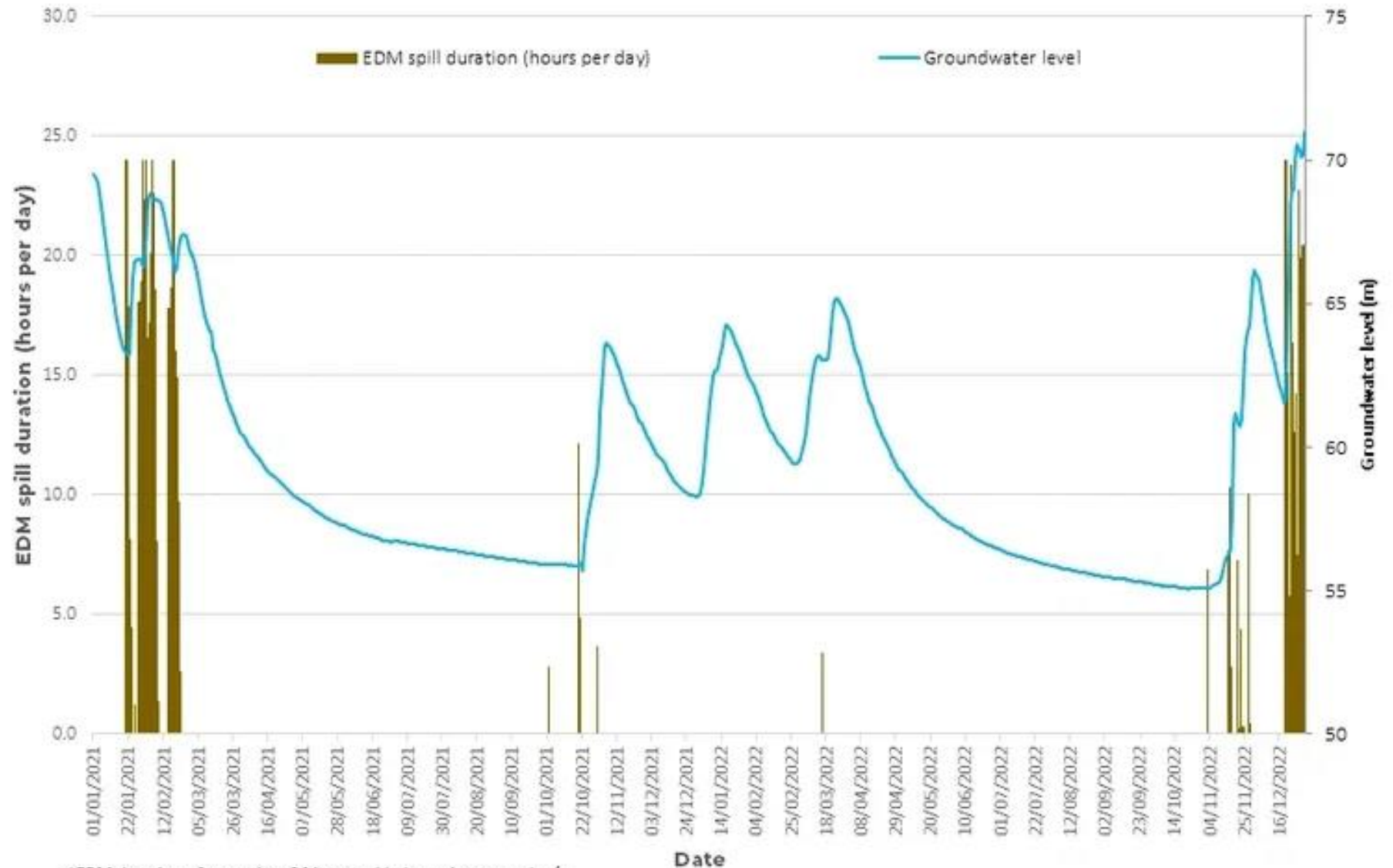
- 1 overflow in Downton
- It goes through preliminary and primary treatment





# Relationship between groundwater level and storm overflow

EDM duration (hours spilled)\* per day at Downton Moot Lane CSO 2021 to 2022 compared with groundwater levels\*\*



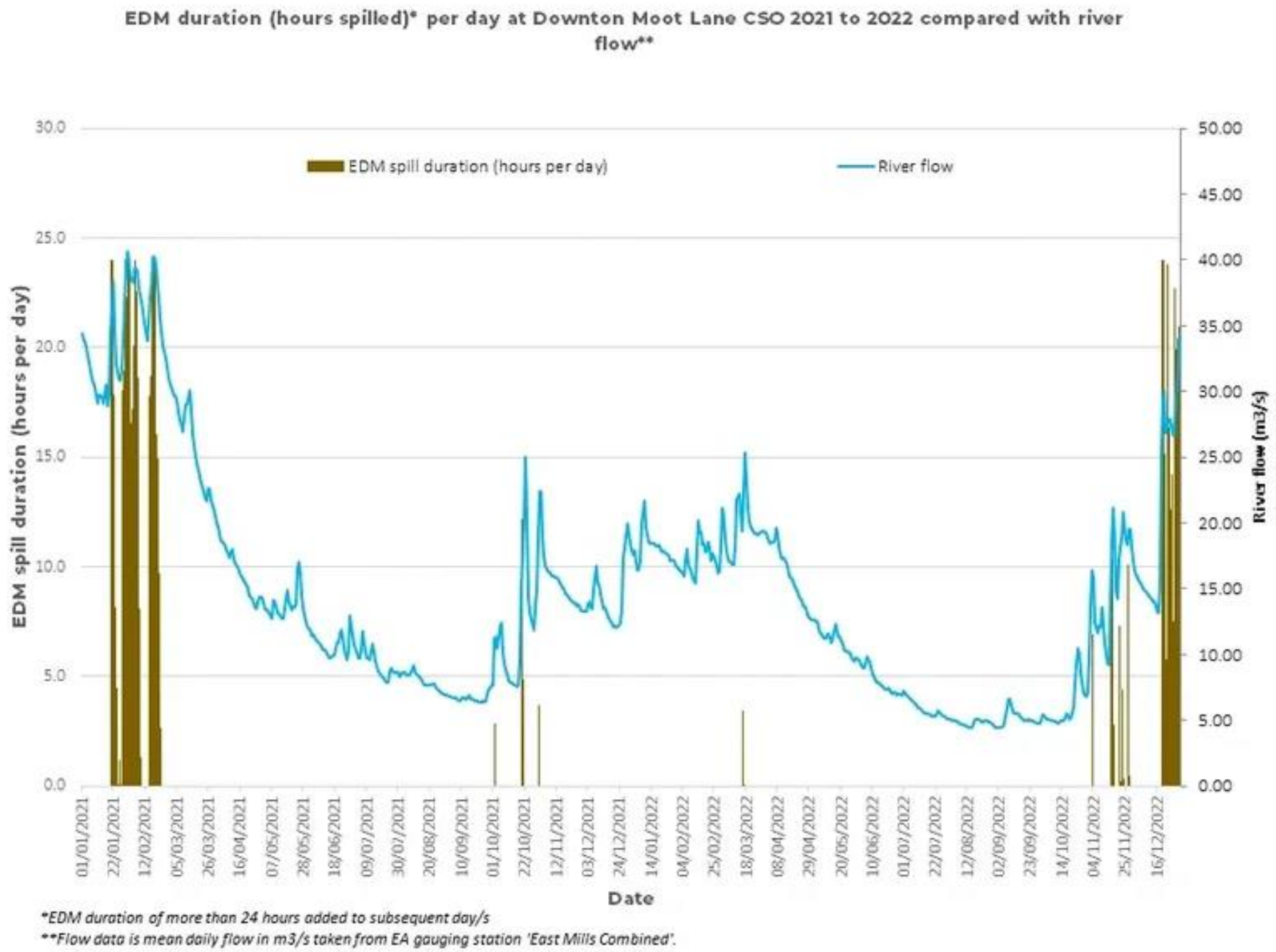
\*EDM duration of more than 24 hours added to subsequent day/s

\*\* Groundwater data taken from Homington gauging station, which is the nearest continuous gauge





# Relationship between river flow level and storm overflow



# What are we doing about them now and in the future?

aka 'Our plan'

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# Our NOW plan

- 92 projects this 5 year period - £3m/month
  - Increasing treatment capacity at WRCs
  - Increasing storage at WRCs and in the network
  - Sealing networks
  - Adding nature-based treatment solutions
- Plus
  - Rainsaver's Project in Chippenham
  - Near real-time water quality monitoring for public health
- Read about it in our  
Storm Overflows Improvement Plan



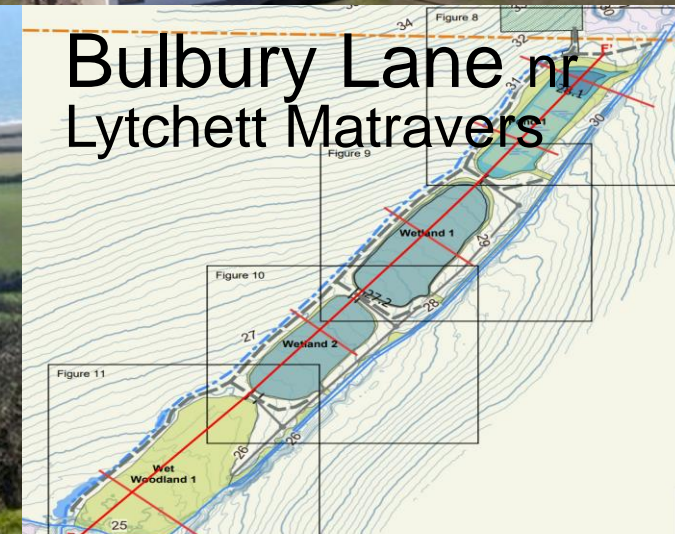
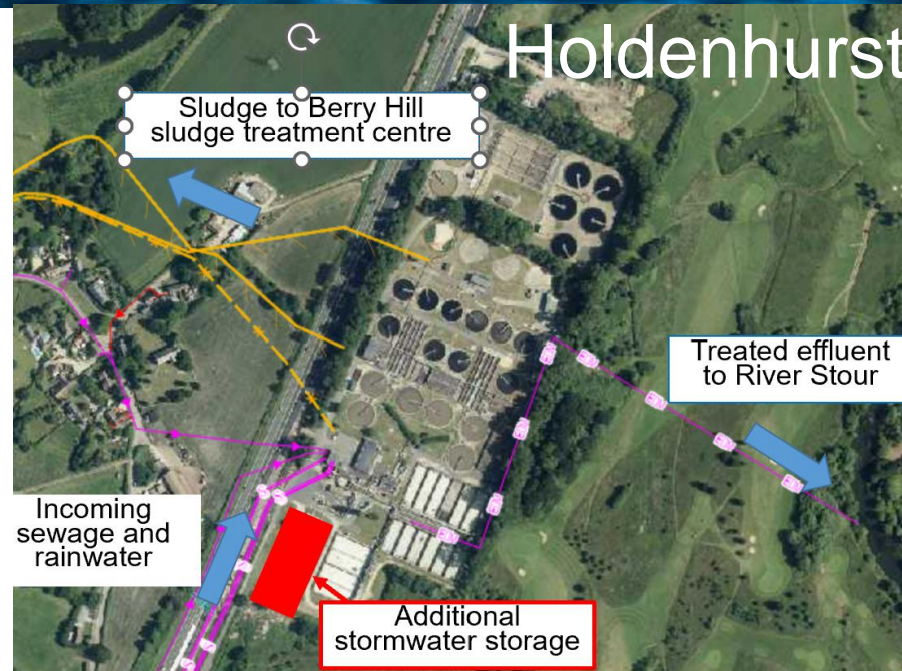


# Our NOW plan

27 ongoing projects  
in Dorset and BCP

Solutions include:

- Sewer sealing
- Storage tank construction
- Separation of rainwater
- Nature-based treatment solutions
- 'concrete' treatment solutions





# Our FUTURE plan – 2025 onwards

2025-2030 investment increase to c£7m/month

	2025-30	2030-35	2035-40	2040-45	2045-50	Total
Number of Storm overflow improvement schemes	128	174	129	142	140	712

## in Dorset and BCP

- 266 overflows
- 108 will meet the targets by 2025
- 54 more improvements in 2025-30

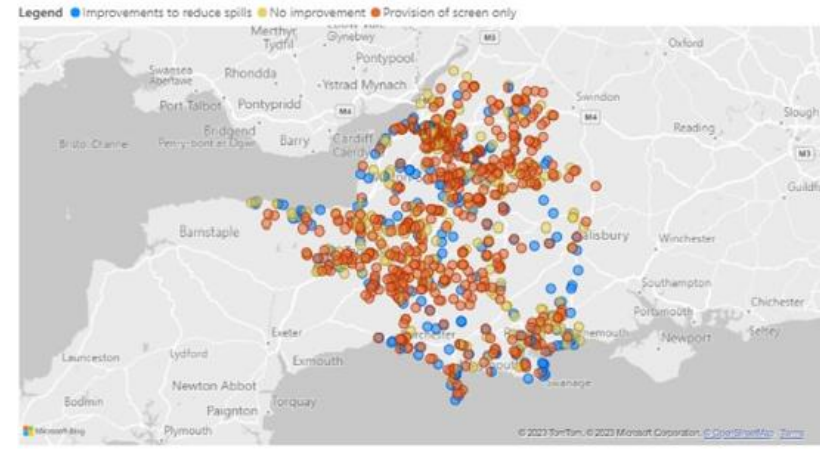
# New national dashboard coming soon



## Storm Overflow Action Plan National Dashboard (England)

Filter by:

- Water company
- Local authority
- River basin



Provides investment dates and discharge reduction predictions for each storm overflow



# Downton water recycling centre



## 2025-2030

- Phosphorus permit will be tightened from 1mg/l (currently discharging at 0.6mg/l) to 0.25mg/l
- Storm overflow will get a nature-based 'polishing' solution such as a reed-bed



**What else?**

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# River water quality monitoring

- Environment Act 2021 requires upstream and downstream monitoring of discharge points





# A new approach for public health and safety risk information

pH

Conductivity

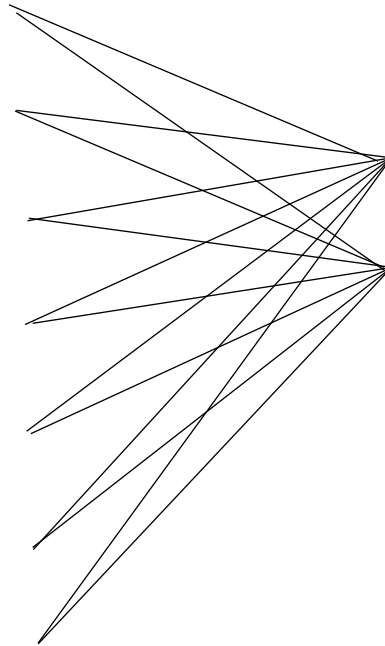
River flow

Temperature

Dissolved O<sub>2</sub>

Turbidity

Ammonia



E. Coli

I. Enterococci

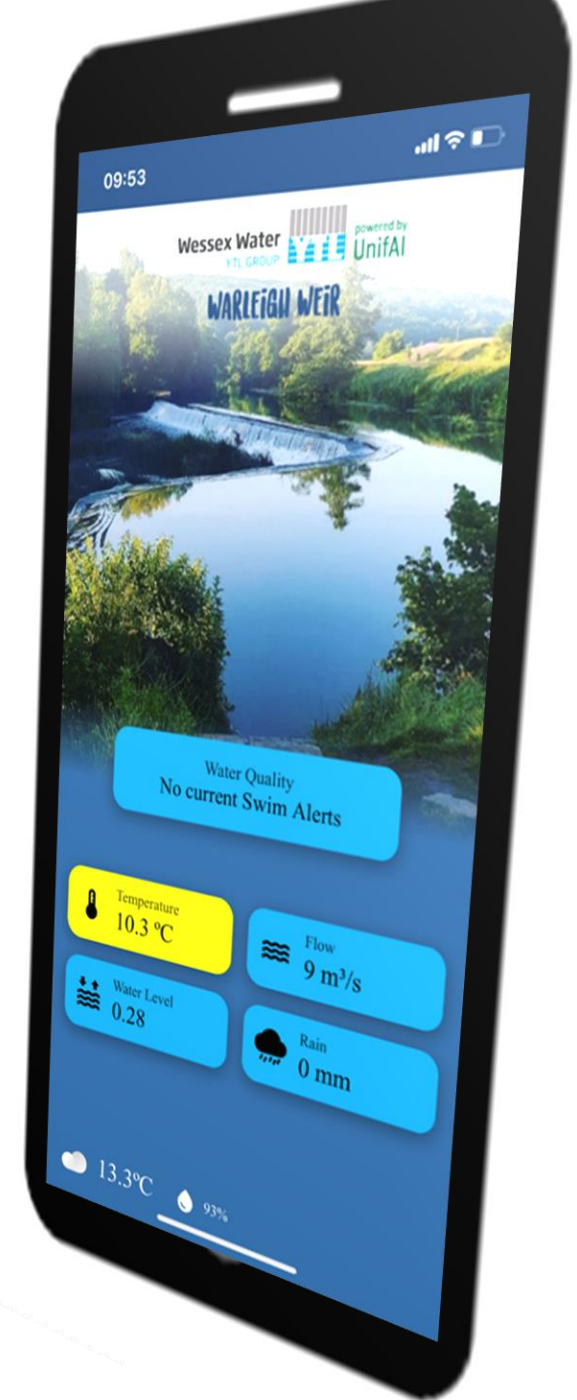


## WARLEIGH WEIR – RIVER WATER INFORMATION

Wild swimmers can find out the current water quality, temperature and flowrate at Warleigh Weir.

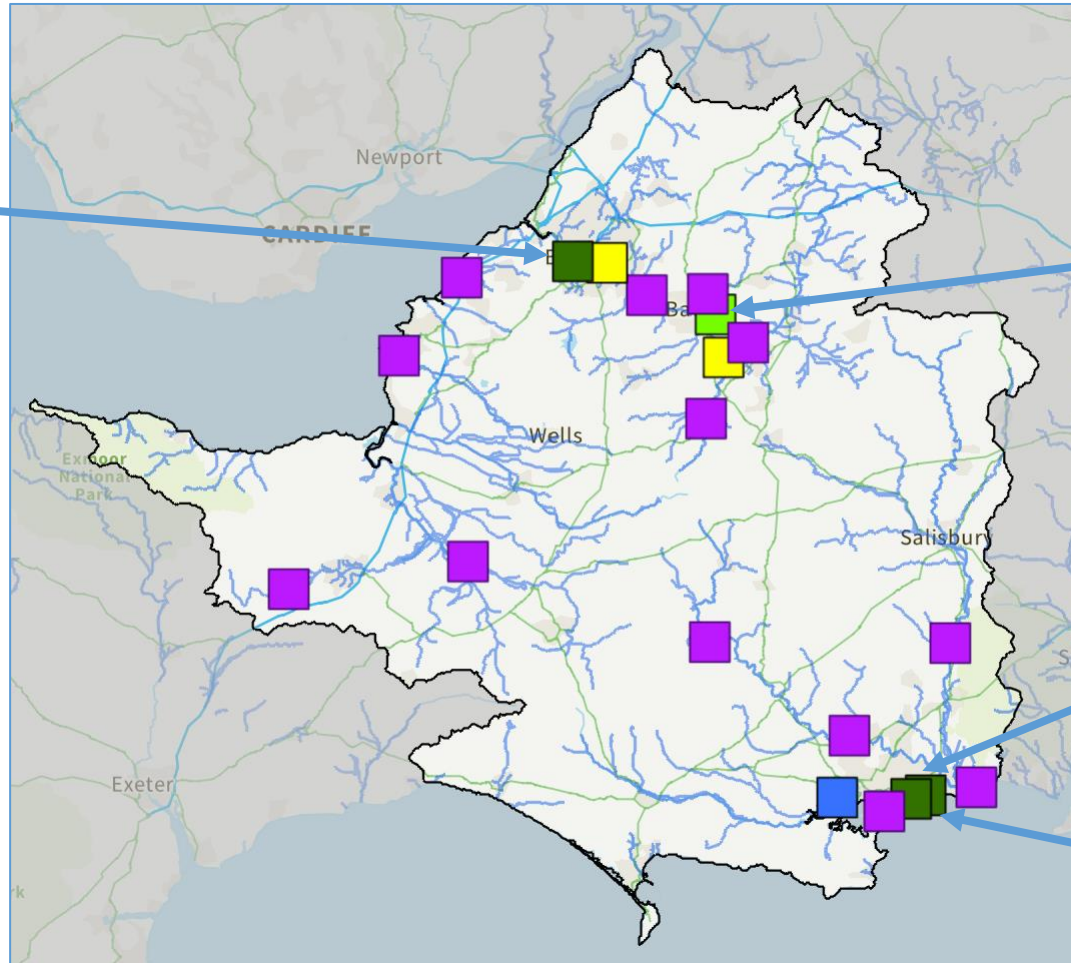


Scan me



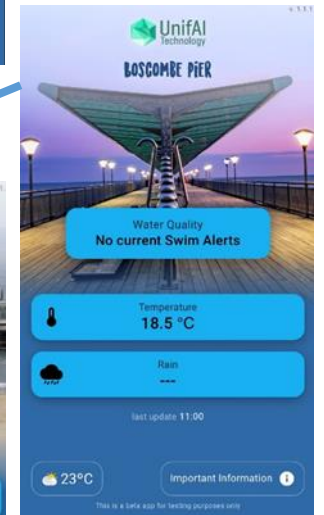
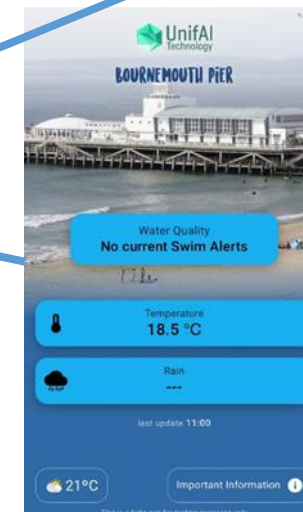


# Wider roll out



Scan me

- Realtime (Operational)
- Realtime (Learning)
- Current Monthly Sampling
- Realtime (Planned)
- Future (Ambition)





# Rainsaver trial – Chippenham 200

## Water butt



## Soaker hose



## Rain garden planter



## Rain garden



The trial will allow us to understand:

- customer attitudes and appetite,
- the optimal customer journey,
- potential solutions,
- costs of installation and effectiveness of chosen solutions, and
- pros and cons of using an external contractor.

## Soak away



## Underground water storage tank





**Thanks for listening**

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# Nutrient targets (current)

Rolling 12 Months - Since 22/09/2022						
Site	Site Id	Directives	P Permit (mg/l)	Stretch Target	Total P (mg/l)	
DOWNTON	13099	Habitats	1	-	<b>0.61</b>	

