

# Storm Overflows, Ground Water & Wetlands

Joff Edevane – Pathfinder Delivery Lead Wetlands & Harbours



from  
**Southern  
Water** 

# The Clean Rivers & Seas Task Force

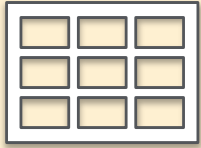
The **Clean Rivers and Seas Task Force** was set up in 2021, our aim is to **reduce storm overflows** to ensure a healthy environment and a resilient future for water.

The task force is responsible for **delivering pathfinder projects** through an **accelerated programme**.

We've built our [Clean Rivers and Seas \(regional\) plan](#).



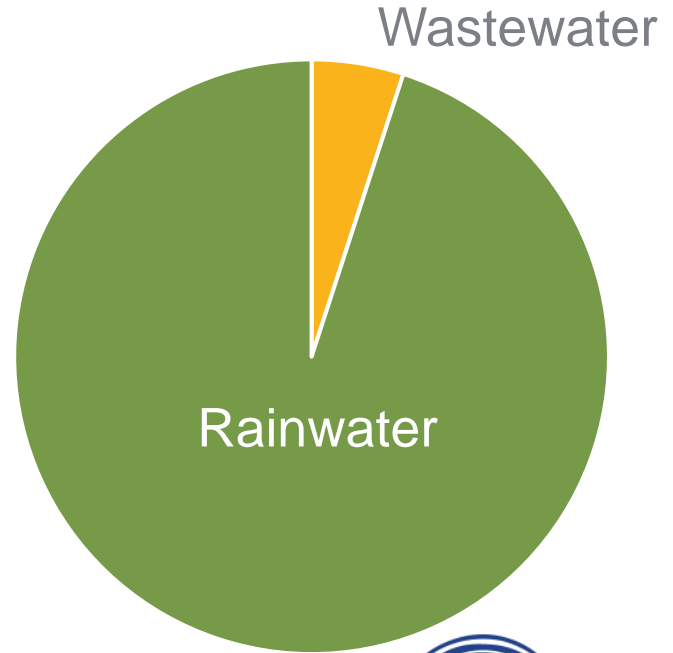
# Heavily diluted – either by rainwater or groundwater



As storm overflows typically happen when there is a huge amount of rainwater and groundwater in the system, the water is heavily diluted and usually screened before being released.



**Storm overflow releases can be up to 95% rainwater, and only 5% wastewater.** This wastewater comes from toilets, showers, and sink waste, as well as household appliances like dishwashers and washing machines.



# Why do we need to tackle them?

As well as the obvious environmental and ethical considerations, there are several other factors that have contributed to this need for change



An increase in extreme weather events



Less permeable land (degreening)



Customer feedback



The release of the government's Storm Overflow Reduction Plan.

# How do we tackle them?

There are four main ways to reduce storm overflows and the harm they cause



Source control



Infrastructure optimisation



Stormwater treatment



Building bigger infrastructure



# The problem

Ground Water + Sewers = Overflows

# Reducing groundwater infiltration

## What is groundwater infiltration?

**Groundwater** is the water found underground in the cracks and spaces in soil, sand and rock.

**Groundwater infiltration** is when water from the ground squeezes its way into the system through underground public or private pipework.

If the system is filled with groundwater then there is less space for rain and wastewater, so the sewer system is more likely to become overwhelmed when it rains. This can result in storm overflow releases.

## How do we tackle it?

1

Relining our pipework to prevent excess groundwater entering the sewer system.



2

Sealing private pipework to prevent excess groundwater entering the sewer system.



3

Monitoring with temperature sensors, boreholes and pipe cameras.



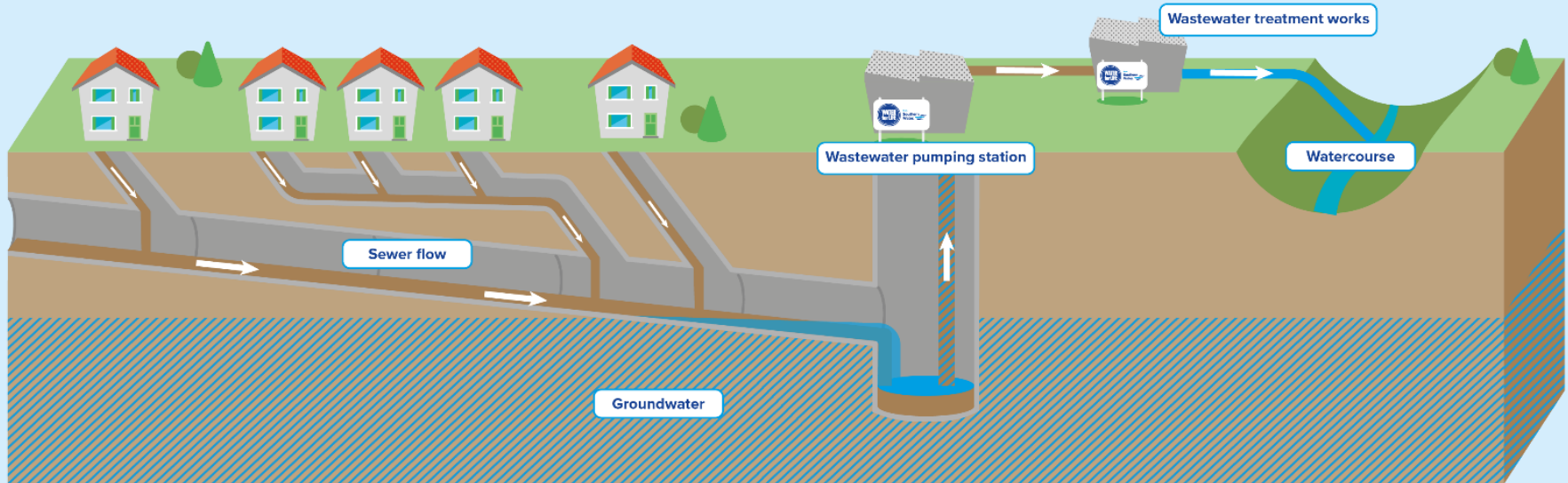
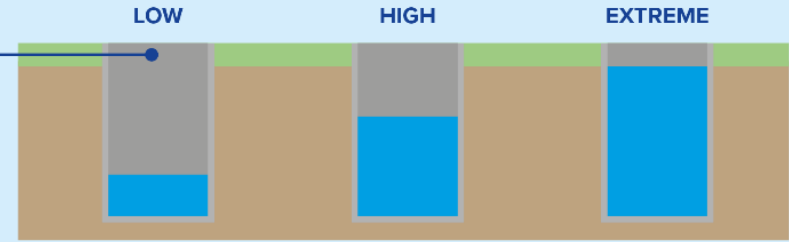
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Constructing wetlands to soak up, hold and pre-treat excess water.



## In low groundwater conditions

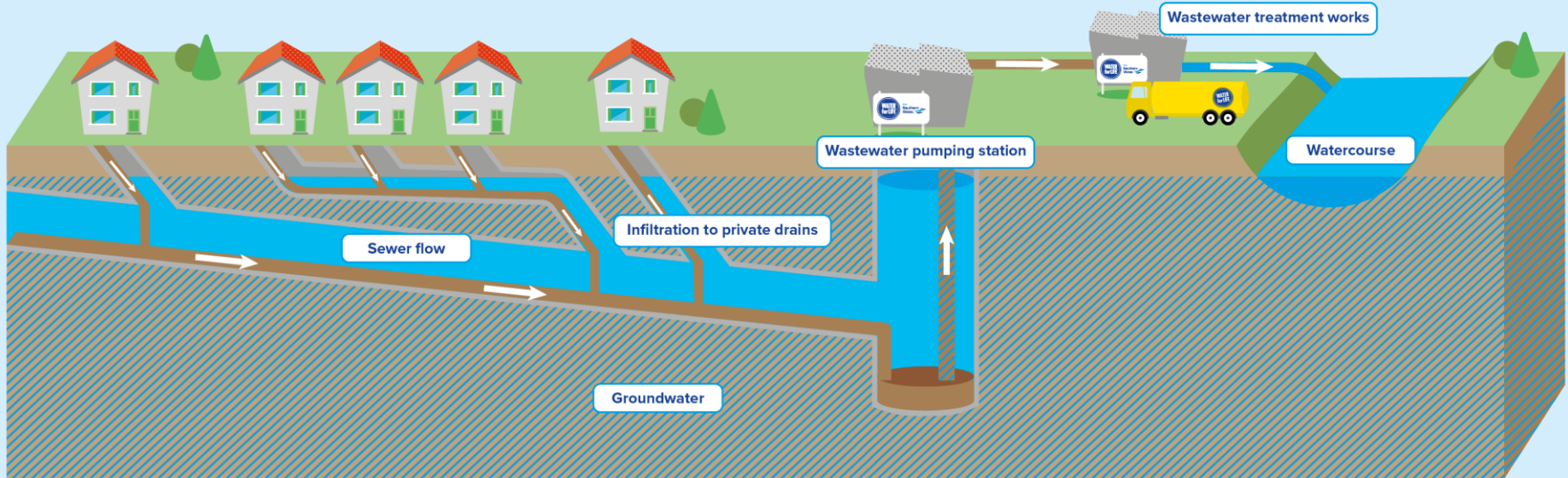
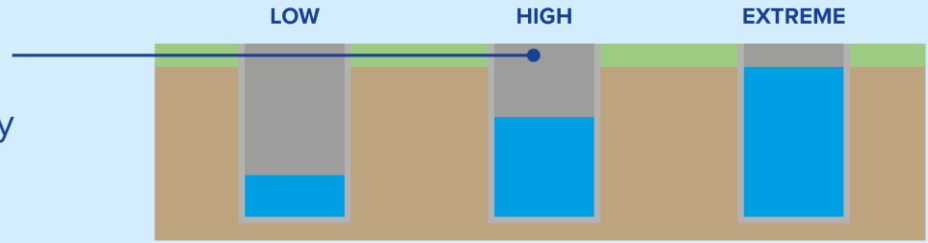
pumping stations convey the foul flow and a small amount of infiltration to the wastewater treatment works.





## In high groundwater conditions

the flow is largely infiltration. At these levels the pumps are working continuously and tankers are required to keep the sewerage system functioning.





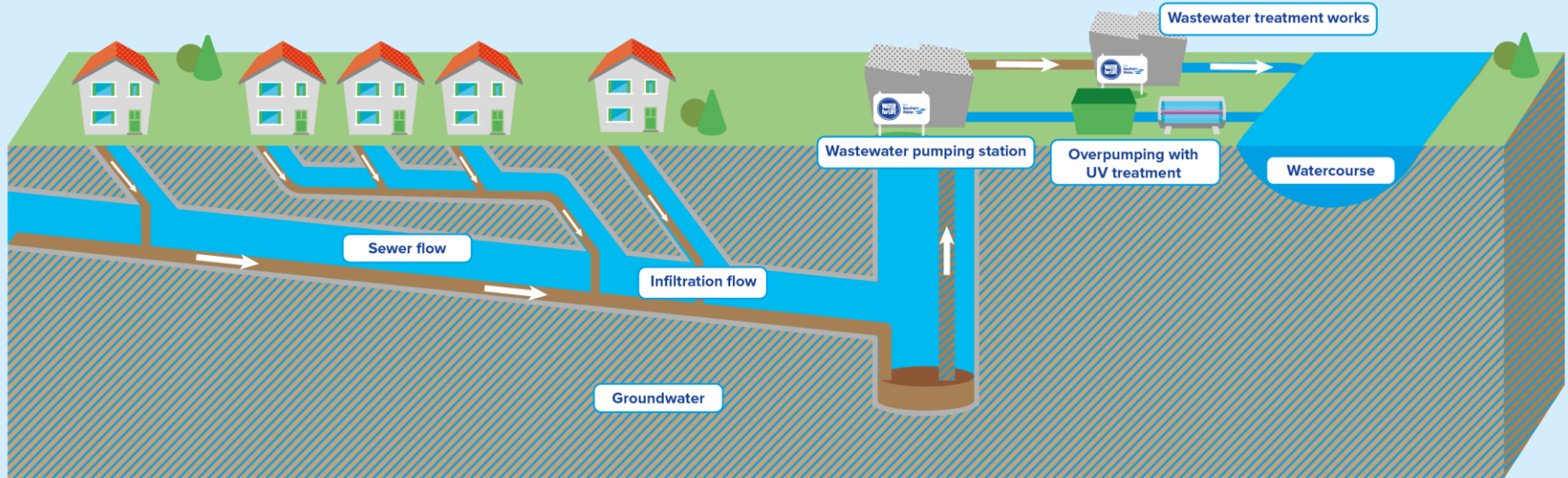
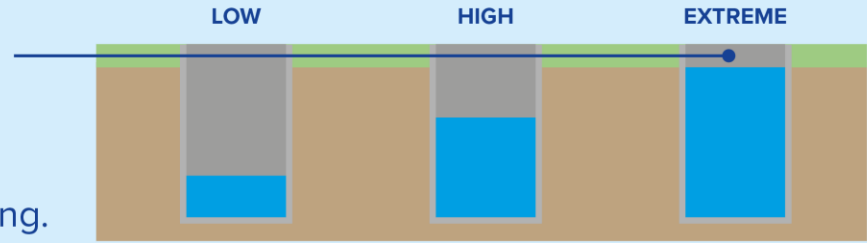


# Operational mitigation



## In extreme groundwater conditions

infiltration gets into the network through all pipes and inundates the pumping stations. Overpumping arrangements with UV treatment are used to prevent property flooding.





# Over-pumping



**Treated wastewater released here**

**WATER for LIFE**

A controlled release of treated wastewater is made here to protect local homes. As a precaution, keep clear and wash your hands should you come into contact with the water. The Environment Agency and local Environmental Health are aware.

If you have any questions, please call 0330 303 0368 and quote:   
southernwater.co.uk

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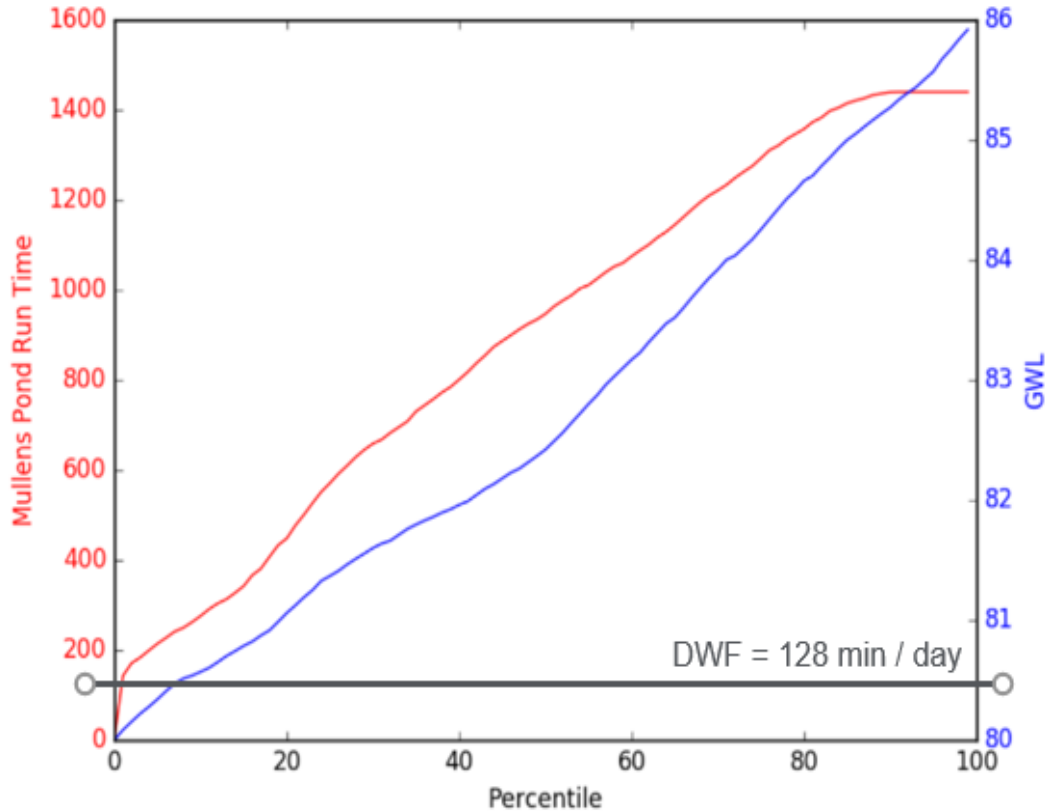
# Analysis of network performance

We have been surveying and targeting sewer rehab for decades, why hasn't it resolved the issue?



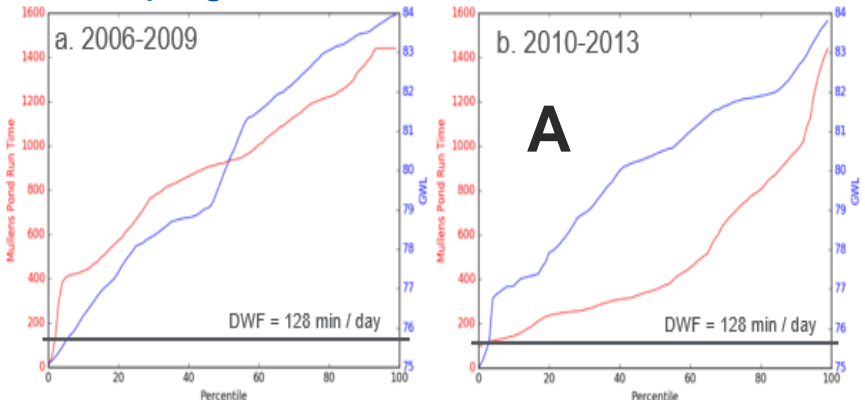
# Different analysis and approach needed...

## Groundwater vs Pump Run

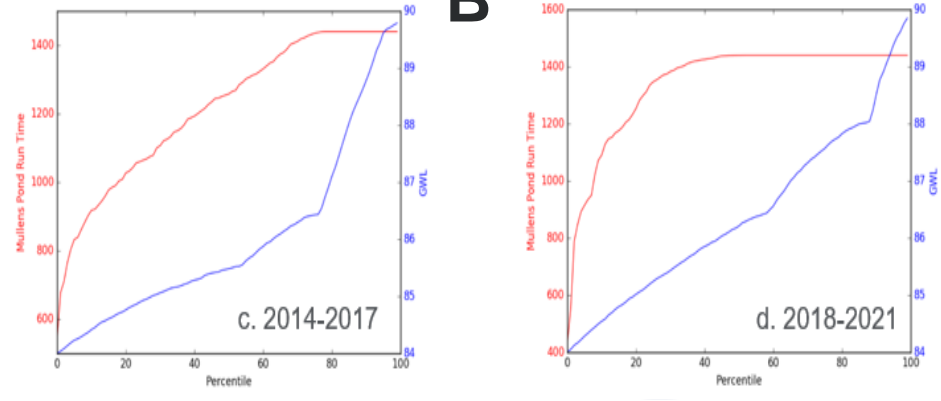
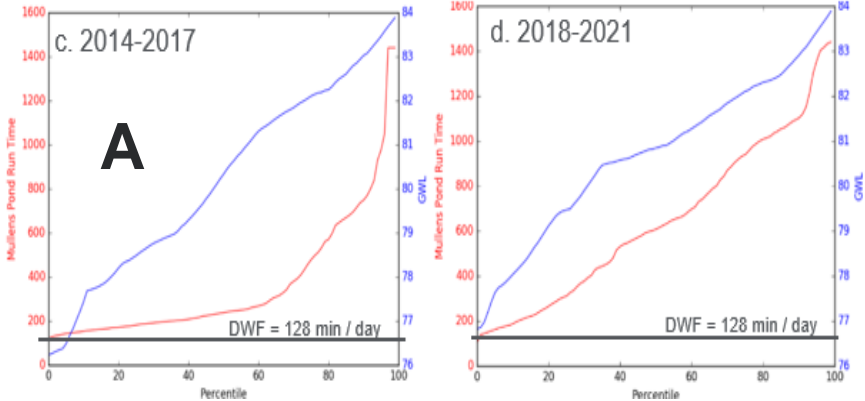
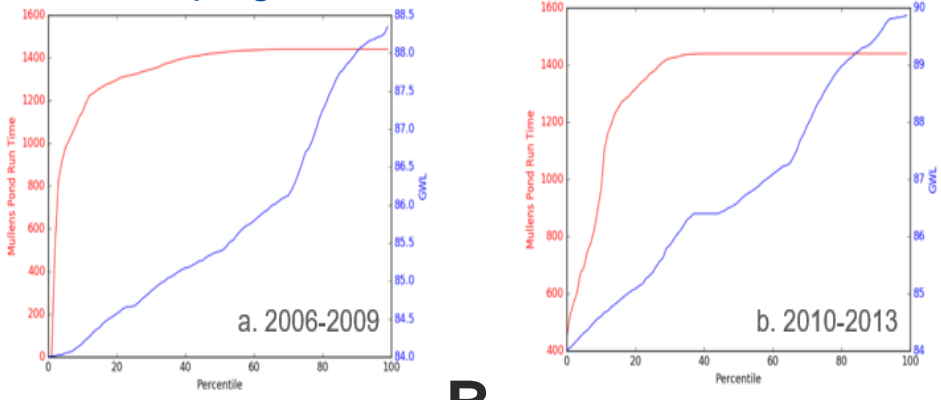


# Analysis shows rehab of the public sewer has impact at lower ground water levels but above a threshold the benefit is negligible.

Pumping station A <84mAOD



Pumping station A >84mAOD



# So what are the options for managing ground water impact

Option	Does it protect the Environment?	Would it stop the disruption?	Timescales to stop disruption
1 – Operational flow management	To an extent	No	Never
2 – Manage ground water levels artificially	No	Yes	Unlikely to deliver in this catchment
3 – Seal (private & public sewers)	Maybe	Maybe	3 years
4 – Wetland treatment	Yes	Yes	1-2 years





# What are Southern Water Plans –

# Pathfinder Approach

# Option 3 – Seal public & private sewers – Pan Parish Andover







# Pan Parish performance

- 2 year project – over 5 parishes
- Swales
- Tanker movements 38 a day for 6 months plus 3 over-pumping sites
- Now – no tankers, no over-pumping
- Used to tanker at 84mAOD, we are now just below 90 AOD with no need for tankers etc
- If you would like to talk to the Parishes involved please let us know



# Whilst we are here.... Surface water connections

1) Soakaways / swales

2) Rain planters

3) Water butts





# How can the Parish Council and Community help ?

- Access to land / properties
- Help us secure land for wetland
- Communications
  - Set up regular communication channels and forums
  - Who needs to be on that forum? Please tell us  
If safe to do so check for:

- 1) evidence of roofs connected the main sewer, we can help slow the flow – water butts, planters
- 2) Check private lateral drains – lift cover, any sign of flowing clear water when not using facilities such as sinks, washing machines and toilets
- 3) Or ask Glenn to do it



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# Timescales and Scope

Combination of patching / relining / manhole sealings and sealing of private and public network commencing Sept 2024 in Funtington catchment (phase 1)

We will concentrate on sewers that are below the highest observed above ordnance datum groundwater levels over the last 2 years if we can find a suitable bore hole or base on field observations

We have funding for the Funtington catchment first then in AMP8 we will look at the need to go further downstream towards Bosham (phase 2). Further survey work to inform phase-2 – Dec-Mar 25



# Timescales and Scope

We are looking at the 'U' shaped section

We will concentrate on sewers that are below the highest observed above ordnance datum groundwater levels over the last 2 years





## Option 4 – Wetland Treatment

Langford Lakes, Wiltshire case study –  
Will be the first wetland in the UK to be permitted  
for the treatment of a storm water overflow







# Approaches



- **Aerated wetlands.** BOD and Ammonia oxidisation, solids and some bacteriological removal
- **Free surface water wetlands – as above plus nutrients, larger footprint**
- **Increase volume of flow treated to permitted final effluent standards or**
- **Treat storm flows only to meet standards required by waterbody subject to EA / Defra agreement**



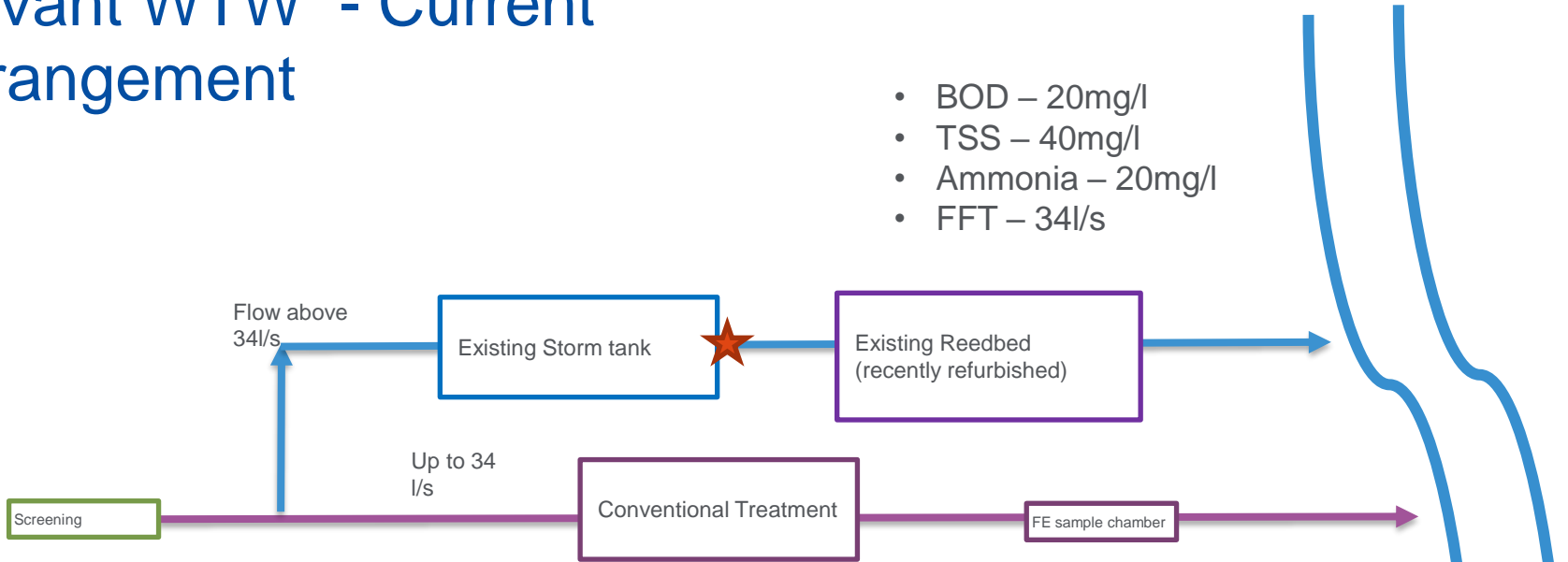
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# Case Study - Lavant



# Lavant WTW - Current arrangement

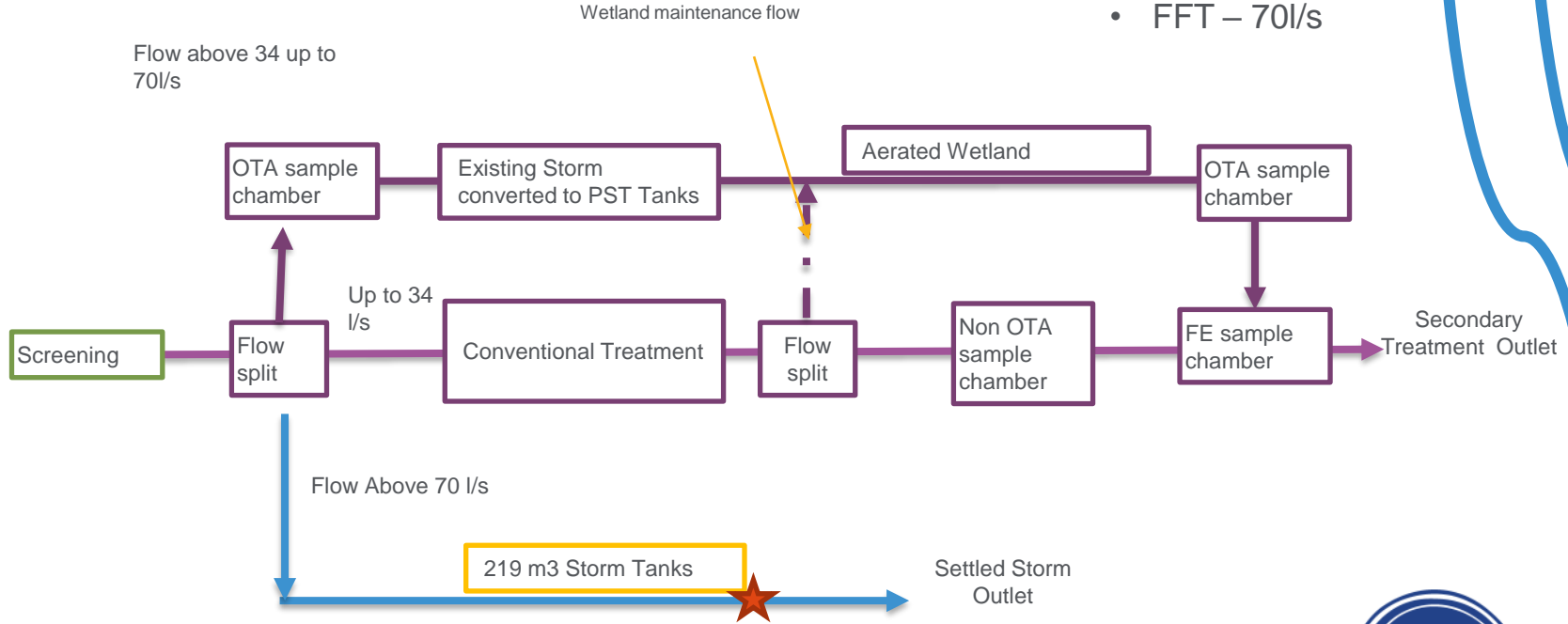
- BOD – 20mg/l
- TSS – 40mg/l
- Ammonia – 20mg/l
- FFT – 34l/s



# Lavant WTW (Phase 1 Reedbed)

30?

- BOD – 20mg/l
- TSS – 40mg/l
- Ammonia – 20mg/l
- FFT – 70l/s



Thank you and  
questions

