Havant Borough Council

Overview and Scrutiny Committee

Feb 23

Question 1

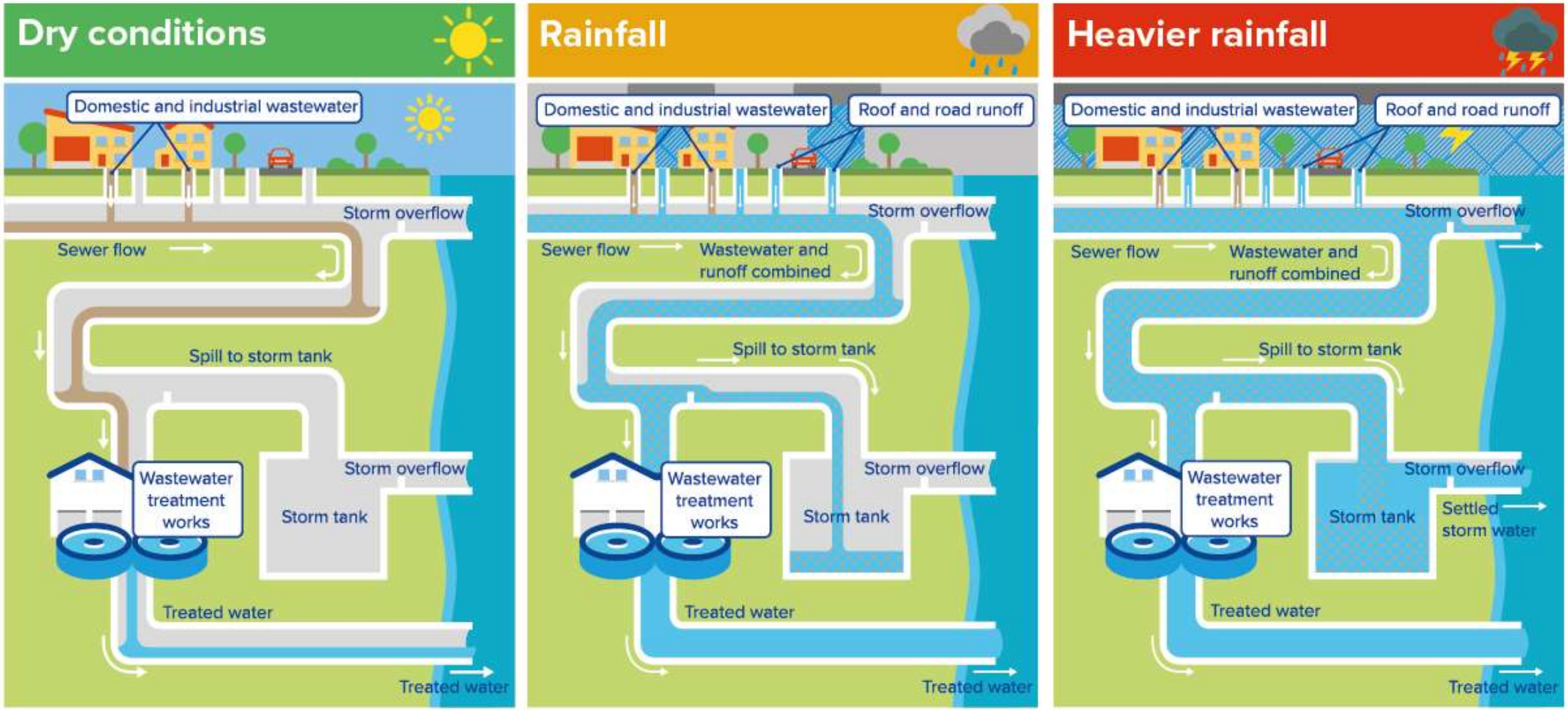
What **warnings** does the Budds Farm site get that a release into Langstone Harbour may be necessary? For example, is that from weather forecasts, the met office, or do you rely on monitors on your storage tanks to show that they are about to spill over?

Releases are automatic – the next few slides show why storm overflows are used.

There are monitors on storm tanks, weirs and other equipment that via telemetry report back – the next few slides show how data is used.

Weather forecasts are an important input to our control centre.

What are storm overflows?



No rainfall

In dry weather all wastewater is treated at Budds Farm and then released via the long sea outfall (5.7km offshore).

Small showers

In smaller rainfall events the storm tanks are used to buffer the flow before treatment. We have a total combined storm capacity of 47,580m³.

Heavy showers or small storm

In more sustained wet weather, typically untreated storm flow is combined with treated flows and released via our long sea outfall (5.7km off shore).

Large storm or sustained showers

In more extreme weather, and only once storm tank and long sea outfall limits have been reached, will we release from the short sea outfall to prevent flooding.

21,100 Olympic swimming pools worth of wastewater were treated at Budds Farm in 2020

55% of all storm releases go via the long sea outfall

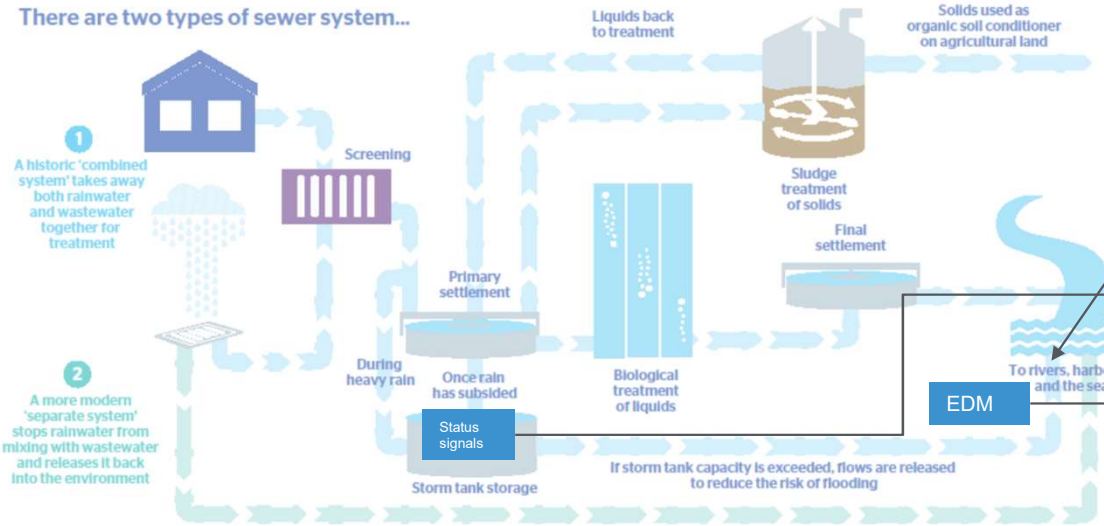
97% of both treated and storm releases are released from the long sea outfall

Up to 2465 of our customers' properties prevented from flooding by using the outfalls

5462_03.21

There are other combined sewer overflows into the harbour but these sources account for 0.1% of all releases in 2020 and have not been included in this simplified graphic.
The main release locations are the long sea outfall and the short sea outfall to the North of Langstone Harbour.

How spill reporting and Beachbuoy works at high level



Permitted overflow

EDM

Alarms are generated and received by our 24x7 regional control centre

Telemetry

ASPIRE & Spill Reporting team

Dynamic Impact Mapping

API

Third Parties (SAS)

Automatic & manual notifications to government agencies and Local Authorities

Beachbuoy online portal

Email notifications to Beachbuoy subscribers

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from Southern Water

API = Application Programme Interface

Question 2

How long does it take to disperse the released matter and from where – that's the scheduled discharges of fully treated wastewater (like how many times in every 24 hours, how much by volume and what of what quality) plus same for emergency releases when tanks are likely to overflow. And do you take account of the tide for scheduled releases of treated sewage?

Fully treated wastewater is released via the 5.7km long sea outfall. The location of the outfall was carefully selected with modelling in agreement with the EA this takes into account tides. All volumetric information is on our website for treated flows.

Beachbuoy's new functionality takes into account tides and duration \ volume of discharge so that a more accurate impact can be established for each spill.

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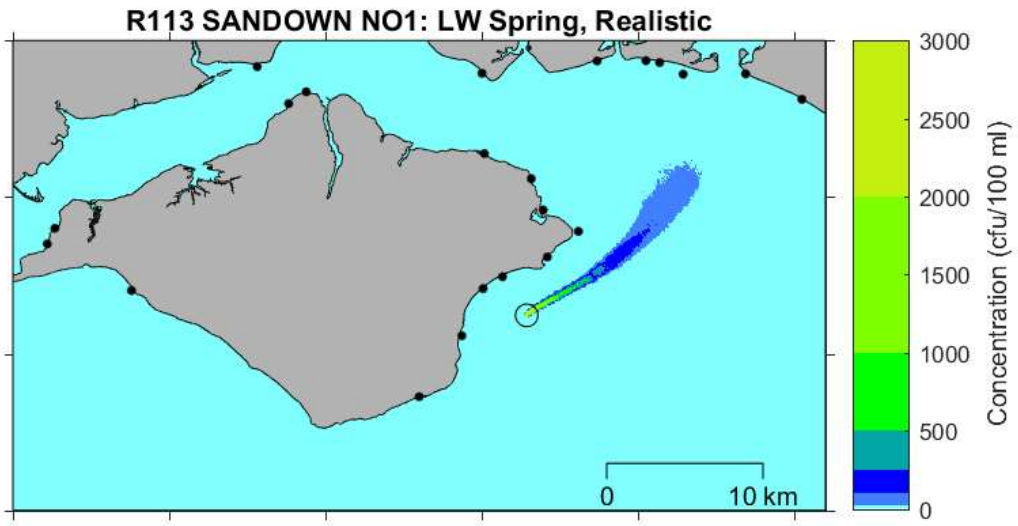
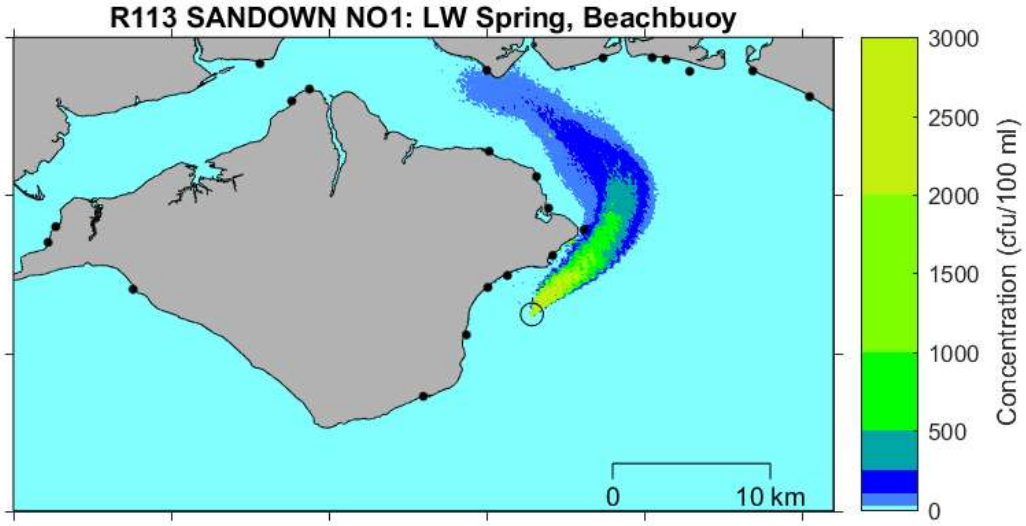
Modelling Example of Factor of Safety



- T90 = 20 hours (can be 5hrs in summer)
- Wind is 5 m/s from SW
- Release load is 0.5 x DWF at 50 million/100 ml
- Release duration is 2 hours, 20 mins



- T90 = 40 hours
- Wind is 5 m/s onshore (SE)
- Release load is 3 x DWF at 50 million/100 ml
- Release duration is 3 hours

DWF - Dry Weather Flow, T90 = time taken for 90% of bacteria to die off

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Question 3

If this fine was linked to the non-compliant discharges from Budds Farm into Langstone Harbour, how did Southern Water record these non-compliant discharges, and report them to the Environment Agency? Richard what is the point you're getting at in this question?

The fine for £90m was for discharges around the North Kent Coast and into the Solent that occurred between 2010 and 2015 and was not related to any recent discharges.

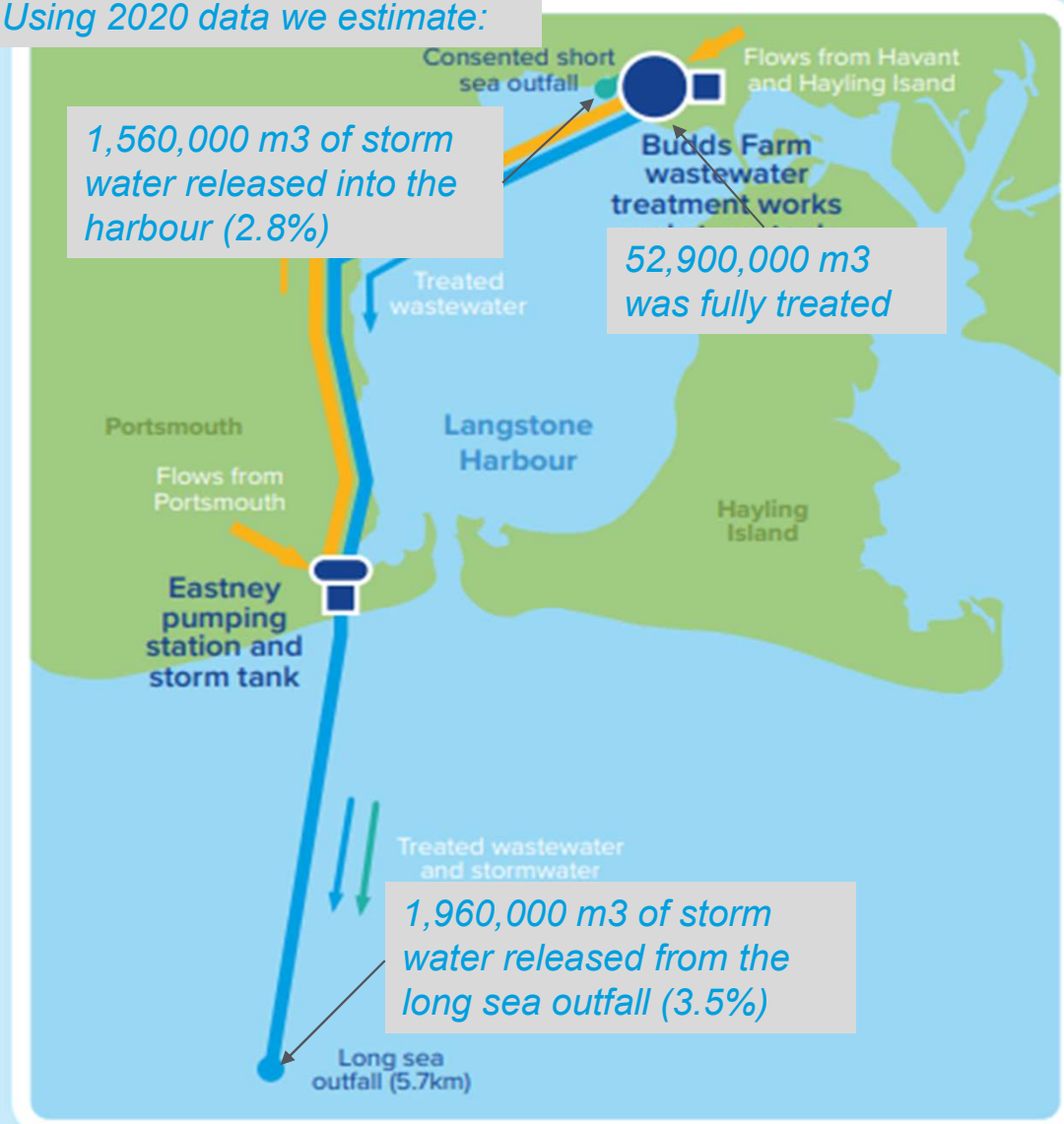
The EA receive notifications for all SWS discharges. All storm discharges are manually reviewed and are assessed against compliance with the permit, the EA also receive this information in the notification.

Question 4

Does Southern Water have the capability to calculate the volume of waste water released through all of its outlet pipes, and if so, can SW publish the amount of partially or un-treated waste water released into Langstone Harbour, for any given period of time please?

The storm overflows generally do not have flow meters \ instruments fitted, so we do not measure the storm flows. However, we can estimate these flows and volumes (the next slide shows the estimated volumes for 2020).

Using 2020 data we estimate:



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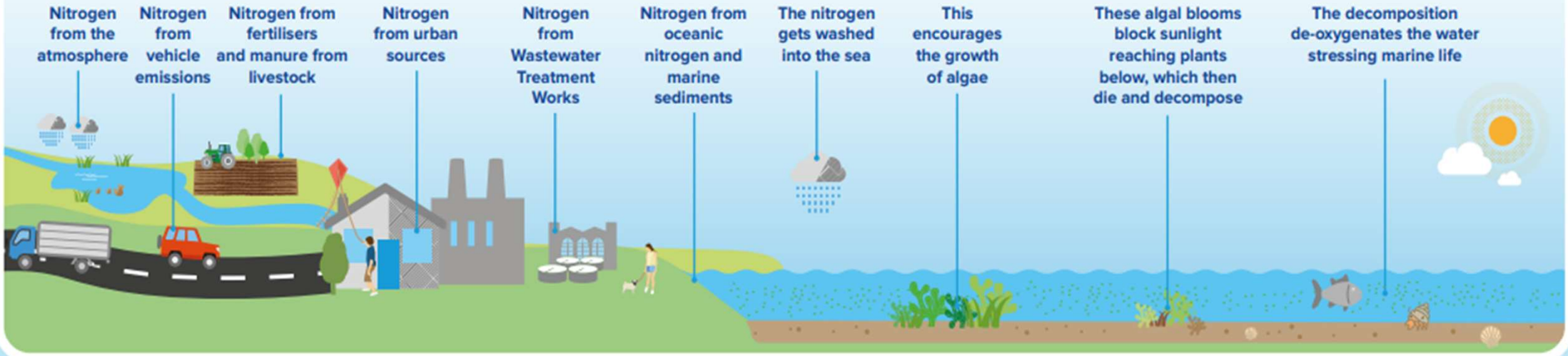
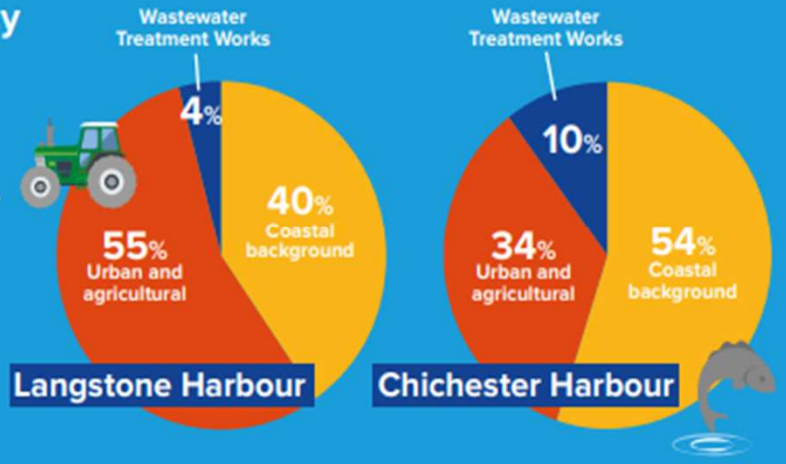
Nutrients come from a variety of sources, and when washed into the sea can endanger aquatic life and reduce water quality



Environment Agency figures show that wastewater from our treatment works is a relatively small source of these nutrients:



Source: Nitrate vulnerable zone designation 2017 - Eutrophic Waters, The Environment Agency

We're working hard to continuously reduce the amount of nutrients we release into the sea:

11

We operate nitrogen removal processes at all 11 of our wastewater treatment works releasing into the Solent.

1.1 million +

people are served by these 11 wastewater treatment works. We remove nitrogen from more people's waste than all of the other water companies combined.

Source: Southern Water

Question 5

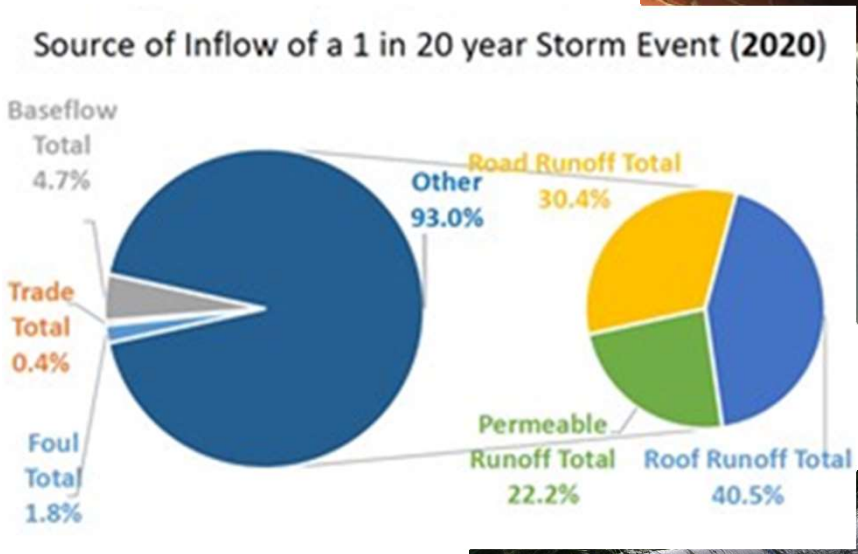
If Southern Water can calculate the volume, can you also determine the quality of the waste water, at the time of release and from where the release emanates? I ask because if this sort of information is known, it would be good for residents and visitors to the area, to know on perhaps a rated scale.

Providing volumes for each release is difficult as every release will be different. However, the next slide shows an output of a typical catchment hydraulic model.

Beachbuoy's new functionality takes into account tides and duration \ volume of discharge so that a more accurate impact can be established for each spill.

Manage and slow the flow of water

- A storm release can be 95% rain water. The main sources are roof and road run off. We need to remove and/or attenuate this water.
- We must look to slow the flow of excess rain water into the system.



Question 6

Given these non-compliant discharges can be recorded and reported to the governing body, would it be possible for Southern Water to publish 15-minute Monitoring Certification Scheme (MCERT) data on its website so the public can assess what is going on, and if not why not?

We are committed to transparency and are looking to publish this data alongside other data sets. 15min data for every MCERT flow meter is large amount of data and would take time to develop a method and associated system to report publicly. We would anticipate doing this in AMP8 (2025-2030) with the development of an external facing interactive data hub. Which will actually be required for a number of additional data sets including new water quality instruments.

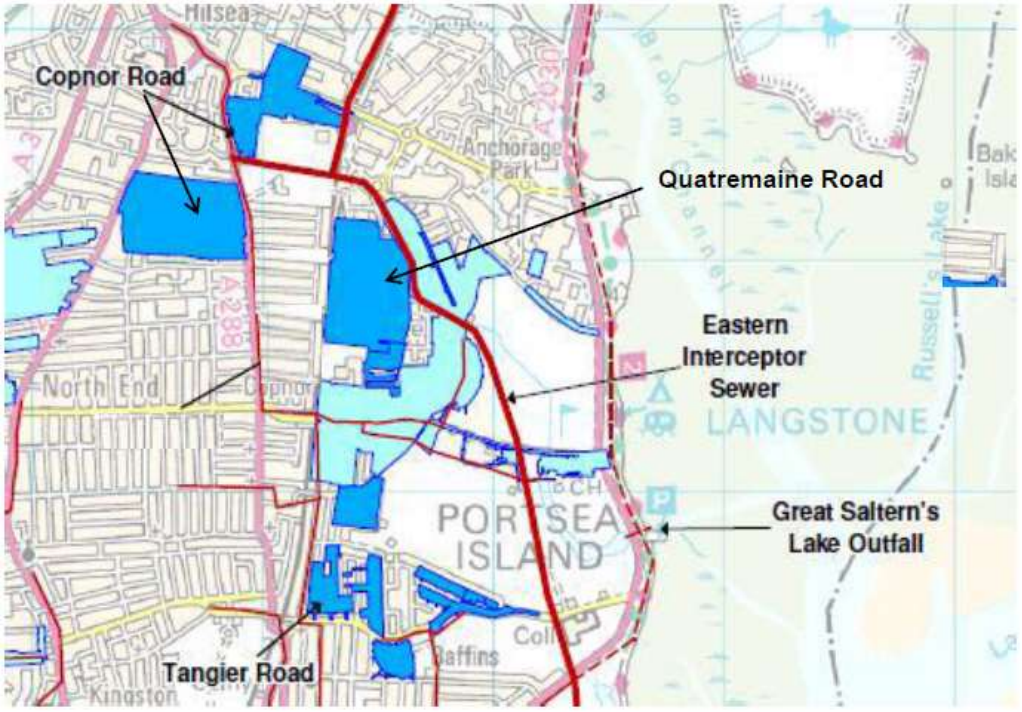
Question 7

I believe that Southern Water, save for the effects of biblical rainfall, completely cured stormwater discharges from Fort Cumberland with an investment of around £18M and in 18 months by building 40,000m3 of stormwater retention. Budds Farm currently has just 7,000m3 retention tanks. Investment plans tell us this will be increased to 10,500m3. At first glance, this very modest investment lacks serious ambition when Southern Water's own data demonstrated circa 60,000 minutes of discharges from Budds Farm in 2021. Can we equate minutes with volume here?

The storm storage at Fort Cumberland storage was built decades ago as part of the original sewerage system in Portsmouth, which released raw sewage with no treatment at sea. The main reason for improvements to releases from Fort Cumberland were:

- *60 hectares of non-permeable area removal in Portsmouth*
- *Control improvements to Eastney pumping station.*

Surface Water separation in Portsmouth in 2013 led to 60 hectares of non-permeable area being disconnected from the combined sewer reducing peak flows by 6,000 ltr\s



Question 8

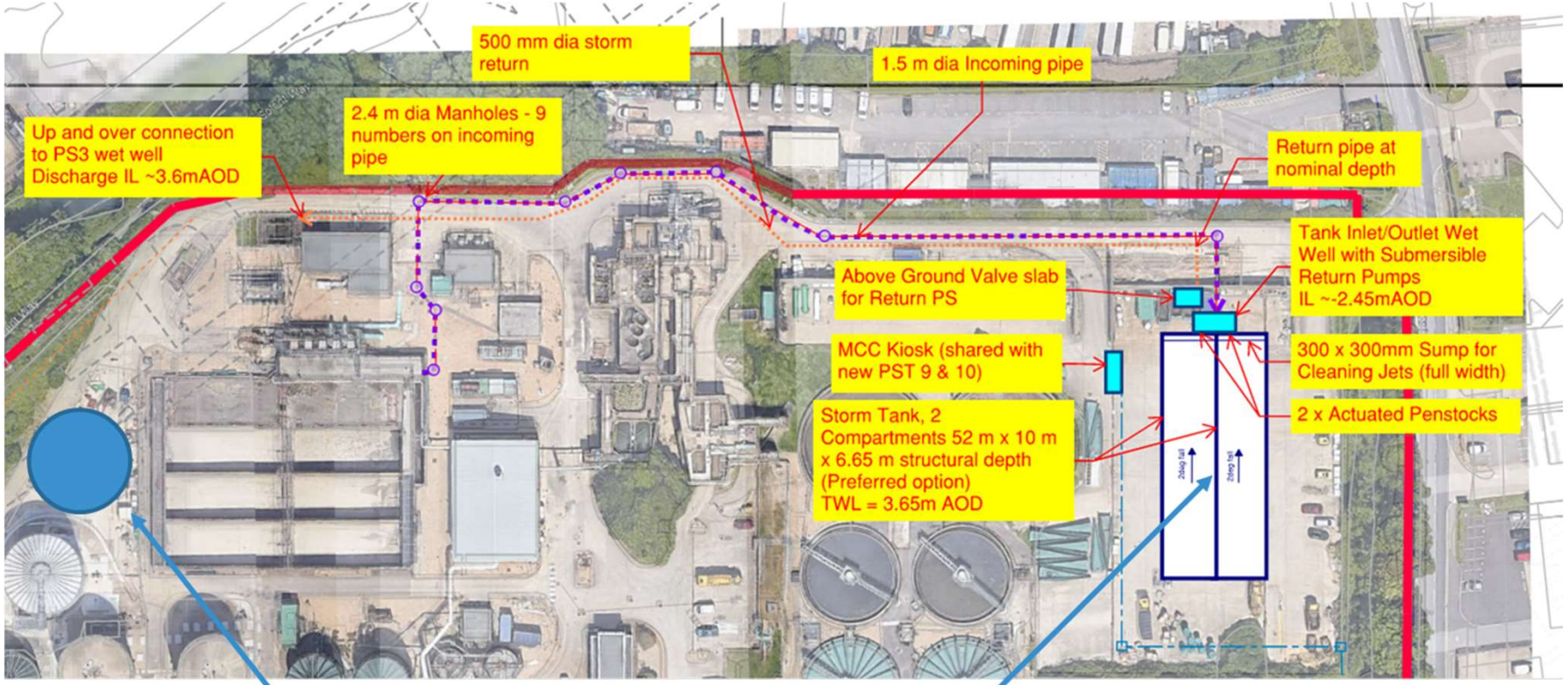
Whilst I appreciate these calculations rely on many unpredictable parameters, I would like to know what percentage reduction in Budds Farm stormwater discharges could reasonably be expected? In other words - Would this increase in size of retention tanks be enough to prevent discharges into Langstone Harbour?

The planned increases in storage at Budds farm (from 7,000m3 to 11,000m3) is expected to result in a 20-30% reduction in releases into the harbour.*

To eliminate all releases into the harbour it has been estimated a tank of over 180,000m3 would be required and a very large increase in WTW capacity to empty that tank.

* This is subject to change linked to rainfall variation in a year.

Budds Farm WwTW – Storm Tank Optioneering



S-2 – Above Ground Glass Coated Steel Tank
or
S-3 – Segmental Shaft

S-1 – 2-lane Storm Tank

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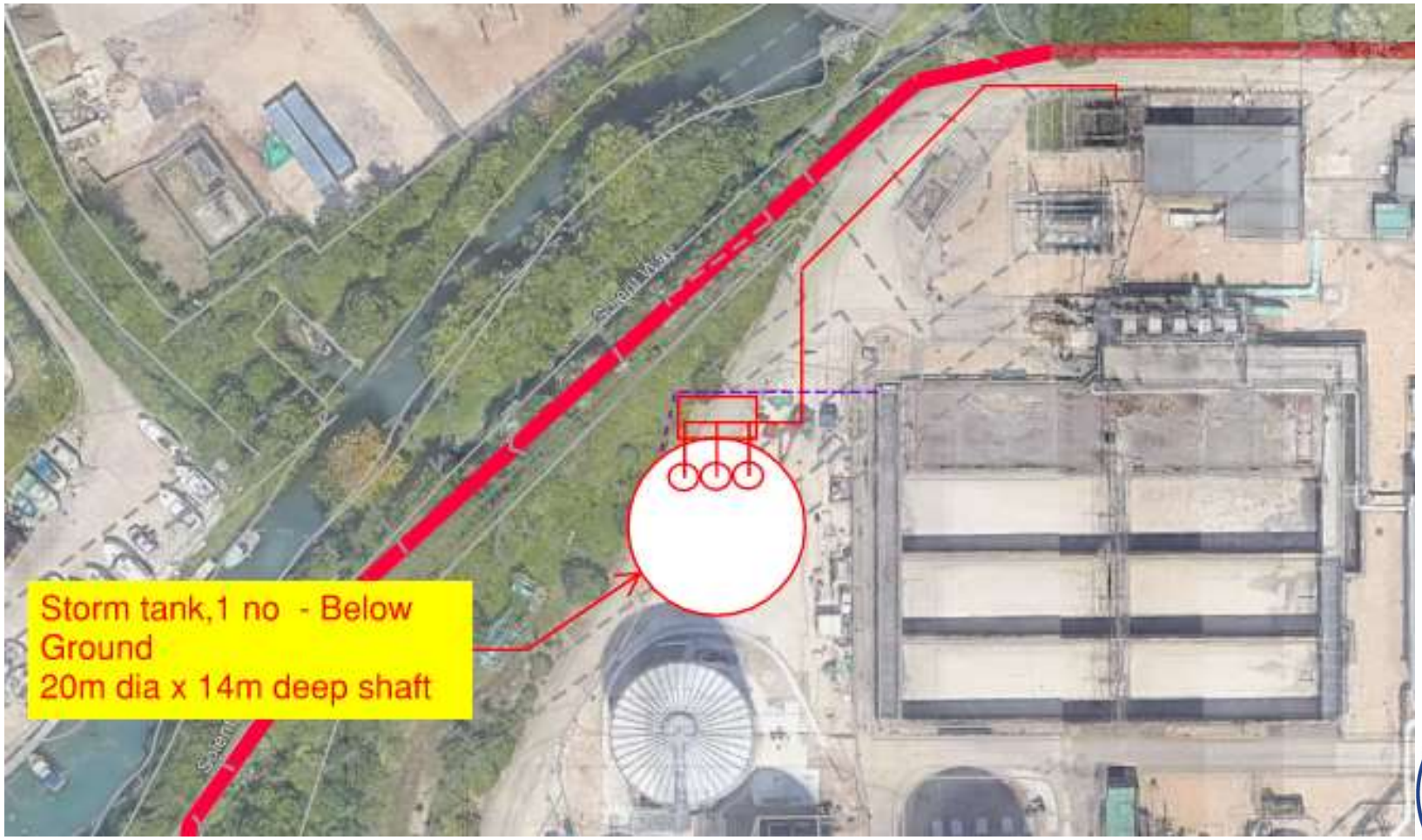
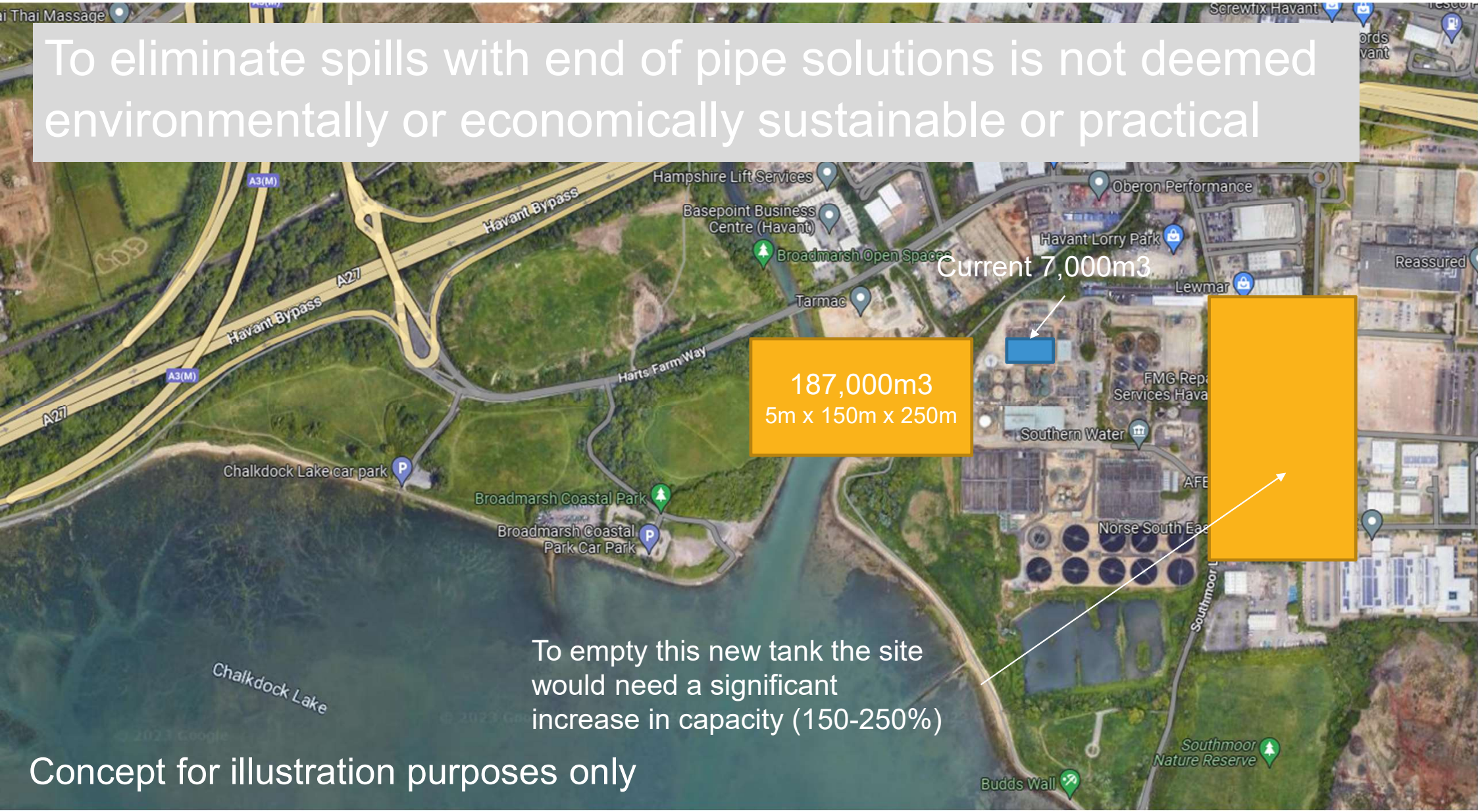
Budds Farm WwTW – Storm Tank Preferred Solution



To eliminate spills with end of pipe solutions is not deemed environmentally or economically sustainable or practical



Question 9

Southern Water, despite its assurances that it would revisit its Budds Farm investment plans at a recent Southern Water Regional Forum meeting, is still talking about nature based (i.e., low cost) solutions. Southern Water fixed the decades old serious discharge problems at Fort Cumberland with concrete. Concrete is admittedly a high carbon approach but there are no cogent arguments to support avoiding the use of concrete in this case. The reality is pollution from sewage effluent is destroying the two biggest carbon sinks in our area (i.e., the harbours themselves). Notwithstanding the above, nature-based solutions will require sufficiently clean water conditions to initially take root and of course, nature-based solutions will require decades to become effective. What will be Southern Water's approach? Will it be concrete with improved ambition to stop all stormwater discharges, or will it be nature-based solutions that could take a decade or to become effective?

Our approach is well documented and being piloted at scale with our pathfinder programme. We don't believe it will take decades to deliver nature based solutions. Our plans will ultimately be a mix of grey and green solutions.

Question 10 & 11

Hayling beaches say that the Eastney Long Sea Outfall (LSO) discharges are "scheduled to receive ultraviolet disinfection to protect shellfish beds in the near future, which will provide further protection to the bathing water." As you will know, UV disinfection is only effective on most biological agents and NOT on the c.30,000 chemicals known to be present in sewage effluent. The most well-known threat from wastewater discharges to bathing waters, is from faecal pathogens. The management at Budds Farm recently confirmed that Southern Water does not measure levels of faecal pathogens coming into the plant OR the levels of faecal pathogens in treated effluent sent to outfalls. If Southern Water is not monitoring the efficacy of removing faecal pathogens from wastewater how does that properly inform **UV investment decisions** if the levels of pollutants are unknown?

The planning phase for the installation of UV or other forms of tertiary involves detailed sampling of bacteria concentrations at the influent to the wastewater treatment and after secondary treatment. UV treatment is then designed to achieve a reduction in the concentration of bacteria at the effluent point which is agreed with our regulator. The performance of these assets (the UV lamps and surrounding equipment) is then monitored through our telemetry and on-site systems.

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Question 12

Notwithstanding that, what is the current status of any UV onsite / remote investment plans for Budds farm discharges to all outfalls?

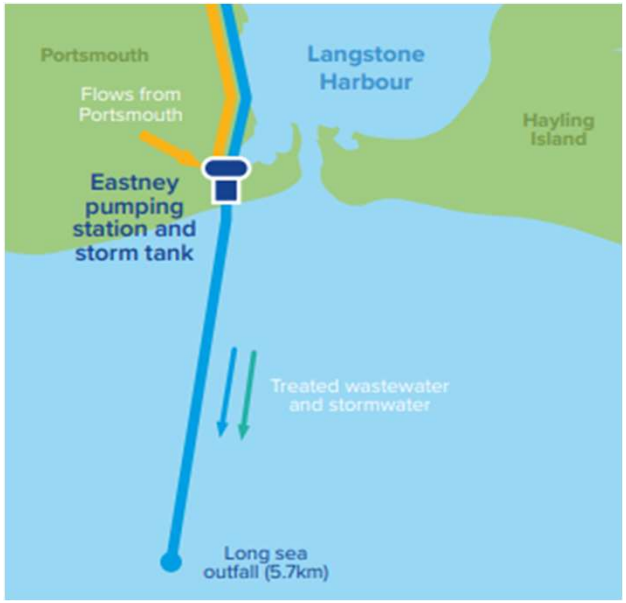
Assessments of discharges to and around Langstone Shellfish water are ongoing as part of the Water Industry Environment Programme (WINEP). UV treatment will be one of the options considered in this assessment and requires agreement with our regulators (EA and OFWAT). If successful upgrades would be made in AMP8 (2025-2030) and/or AMP9 (2030-2035).

Question 13a

Discharges from Southern Water's Long Sea Outfall (LSO) from Eastney is claimed not to affect any bathing waters. It discharges 109 million litres of wastewater and stormwater every day; where / how far out to sea is that?

466790E 93240N

5.7km



Question 13b

Southern Water hydrodynamic data obtained via Environmental Information Regulations (EIR) clearly shows that the LSO pollutes several bathing waters in the eastern Solent including all three of Hayling Island's beaches [see https://www.youtube.com/watch?v=fwYliaiqETw] claiming excellent water classification (note: classification is 100% not the same thing as actual water quality). The bathing water profiles for Hayling beaches say that "This discharge is scheduled to receive ultraviolet disinfection to protect shellfish beds in the near future, which will provide further protection to the bathing water."

The model simulation shown, which is now apparently shown on YouTube, was of a very extreme scenario which could never occur. It was carried out purely as an example to demonstrate the level of advection and dispersion in the Solent. Discharges from the LSO do not pollute Hayling Island's beaches.

Assessments of discharges to and around Langstone Shellfish water are ongoing as part of the Water Industry Environment Programme (WINEP). UV treatment will be one of the options considered in this assessment.

Question 14

When will UV treatment be installed to disinfect all LSO discharges from Budds Farm?

Assessments of discharges to and around Langstone Shellfish water are ongoing as part of the Water Industry Environment Programme (WINEP). UV treatment will be one of the options considered in this assessment and requires agreement with our regulators (EA and OFWAT). If Successful upgrades would be made in AMP8 (2025-2030) and/or AMP9 (2030-2035).

We are also working on a detailed study on potential options to reduce the impact to the harbour in the short-medium term. We hope to announce more later this year.

Question 15a

Southern Water has pledged to supply and install a Real Time Water Quality Monitoring system, sited about 40m off the beach at Hayling Island, near to the In on the Beach, at its own expense of some £50k and we thank you for that. Would you consider monitoring the water in Langstone Harbour by another of these monitoring devices, because as well as bathing water in the bathing season, we are all concerned about the Special Area of Conservation that is Langstone Harbour and further out, The Solent a Special Area for Protection?

Yes we have plans to install one in Langstone Harbour with the University of Portsmouth.

Water quality testing buoys

Update Feb 2023:

- WQ buoys are still operational despite some minor issues with hardware.
- Calibration is ongoing and proven to be very challenging and we are reviewing the data.
- We are preparing a technical document that we will publish, this will include the calibration data.
- We plan to hold a pre-briefing with key stakeholders ahead of data going live.
- We are aiming for April 23 to go live with data on our website and alongside Havant BC.

Havant BOROUGH COUNCIL

PROTEUS

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Question 15b

Trying to restrict rainwater getting into the sewer network using smart water butts and other creative "attenuation" schemes is clearly something that Havant Borough Council can help with for new development.

Agreed as the LPA HBC have a key role in ensuring new developments are of high quality from a water management point of view and establishing policies to reverse urban creep (increased hardstanding area). We are keen to continue to work with HBC and other key LPAs to encourage better development and surface water management in new and older housing stock.

One example is we must push for better control of non-permeable driveways, which actually need planning permission >5m2 (non permeable). Our experience is this is not understood and largely not enforced.

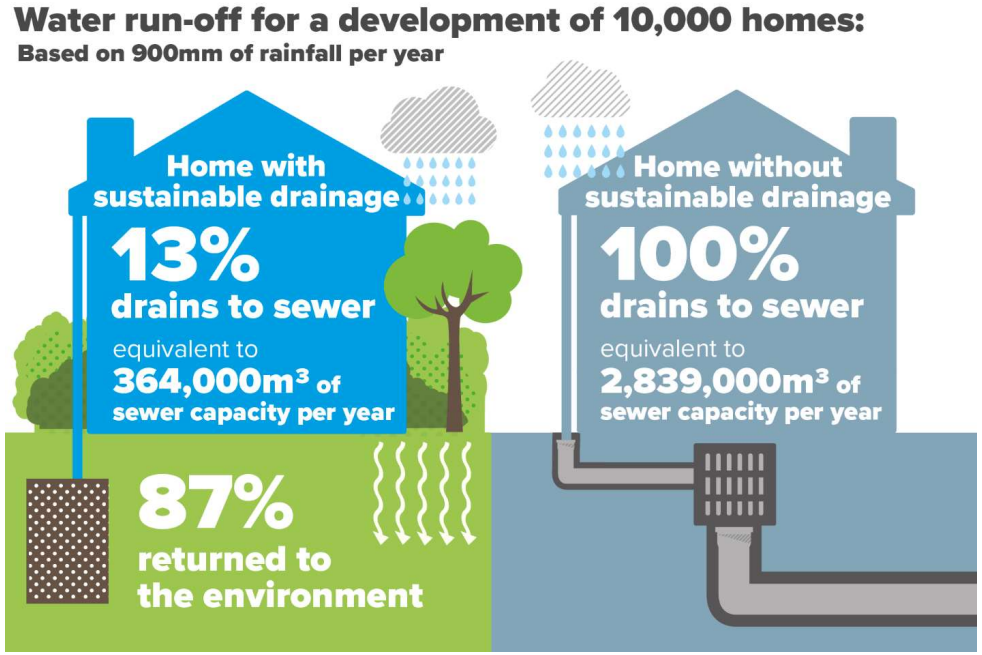
Question 16

What measures could your customers – our residents - take to help with the management of wastewater? For example, avoiding putting anything but the 3 Ps down toilets, installing water butts, not paving over ever inch of gardens, or by laying only permeable coverings for vehicle parking etc etc?

Keep as many permeable \ green spaces as you can – you need planning for a 5m2 non-permeable driveway

Understand where your downpipe goes and install leaky water butts \ planters \ soakaways. Typically half of surface water run off that enters the sewers comes from roof area.

Household slow the flow measures



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Havenstreet, IoW: Household slow the flow measures

UNESCO Biosphere Reserve & AONB

1 X pumping station

Blackbridge Brook (failing SSSI)

Designed flow12 l/s
Exceeds in storm by 6l/s

>5mm in 12hrs = release

30 releases = to 2 days of continuous release PA

184 household properties

6 non-household properties with >330m2 impermeable roof area

Highways misconnection

1. **200l slow drain water butt** (2mm valve half way up)
2. **SuDS Planters**
3. **Swale – not installed yet**

10mm and up to 35mm storm events experienced with no activation of the CSO

Significantly quicker and cheaper to implement than traditional solution which would require a land purchase

CSO usage has been significantly reduced

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Question 17

What communications do you send to customers and in what formats to get your messages across, about the management of our waste water?

We regularly meet with stakeholders and keep them informed on progress

We use digital channels such as our website, social media, and provide updates to our partners to share via their channels

Regularly hold customer drop ins/talks/events – examples of these are customer drop ins for the Pathfinder projects and a recent talk at the Brighton Sailing Club

Take customers and bathing water users around wastewater treatment sites for a tour of the process and opportunity to ask the team anything

We have been creating educational materials to help the community understand about storm overflows and the challenges with reducing their use – FAQs, animation, creating videos, graphics, etc.,

Keep the community informed on the task force's progress by publishing task force updates, through the Bathing Water Season Report, via Pathfinder technical and summary reports, via case studies – the latter due out this year

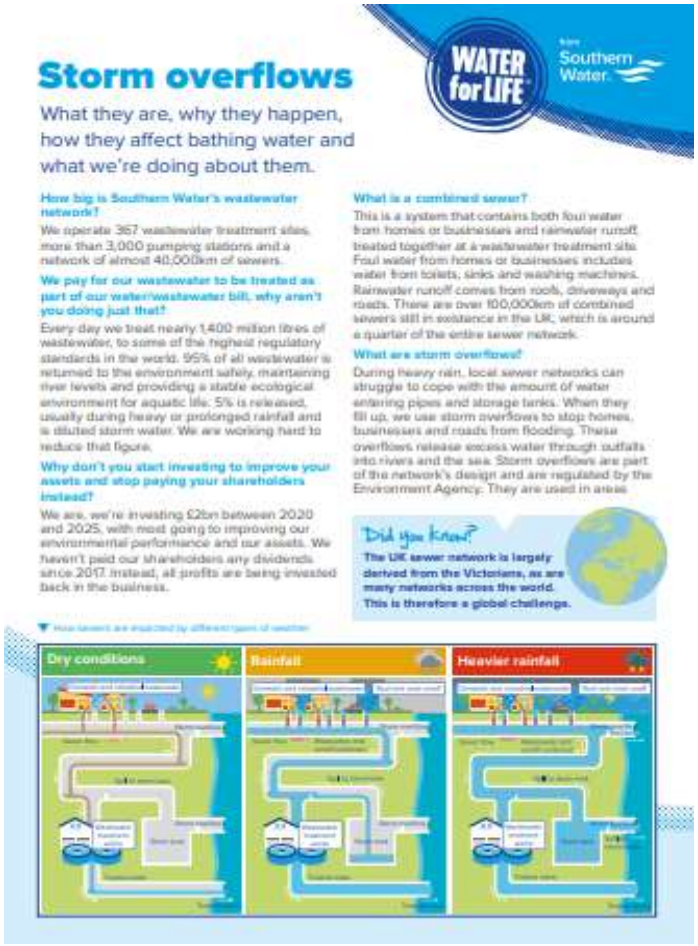
Regularly respond to media and trade press enquiries, as well as proactive media stories about latest news/progress

Attending conferences to share best practice and findings with industry colleagues

Make public previous letters we've written to the Secretary of State

Customer Communication

Web pages: Storm Overflows (southernwater.co.uk), What are storm overflows? (southernwater.co.uk)



Question 18

I understand that Budds Farm processes wastewater for Portsmouth, Havant, Hayling Island, Cosham, Paulsgrove, Waterlooville, Horndean and Hambledon. Given the increase in populations over the past 5 years (2% to now 213,000 people in Portsmouth City Council area and 1.8% to 127,000 people in Havant borough area) what increase in volume of wastewater has Southern Water had to process, and what are the projections for the next 10 years and beyond? Critically, is Budds Farm fit for the future?

SW is monitoring growth and growth forecasts for all our catchments including the latest local plans. Based on our data, Budds Farm has sufficient capacity and is able to accommodate current projections for growth over the current (AMP7 2020-25) and next investment period (AMP8 2025-30). We anticipated an upgrade being required to the following period (AMP9 2030-35).