



Secretary of State Defra

Seacole Building,

2 Marsham Street

London SW1P 4DF

Defra ref: TO2025/27048

9 April 2026

Dear Secretary of State,

Effluent recycling – Concerns about the regulatory gap & lack of response to issues highlighted to the SoS in March & October 2025

The Water Matters community welcome the fact that the Secretary of State (SoS) has not yet approved Southern Waters rfdraftWRMP and hope that the information supplied in our previous correspondence has shown that there are better and more sustainable ways forward that the Company should be required to explore **BEFORE** the SoS approves their plan or allows them to proceed with effluent recycling. More time is needed to explore the alternatives that could provide resilience more quickly and in a way that is cheaper for customers, works with climate change, gives more time for technological advances in effluent recycling (or desalination), and for more robust regulatory controls to be put in place.

The update on the process and timescales for the effluent recycling schemes in Hampshire & the Isle of Wight provided in a letter from the Defra Ministerial Contact Unit was welcome, but it does not address any of the concerns raised in Water Matters letter to the SoS sent over a year ago on 26 March 2025, or the follow up letter sent on 7 October 2025, to **which we are very disappointed not to have received a response, especially given the large number of concerns raised.**

There are four issues of particular concern raised previously **that can only be dealt with by Defra ministers and that cannot be left to the planning application process.**

1. Failure to comply with the statutory consultation process (Water Industry Act 1991). This has denied the community affected by Southern Water's planned infrastructure, and who will have to drink the recycled effluent, the opportunity to engage at the formative stage of the plan when the Hampshire effluent recycling scheme was selected in 2021. This failure to comply with the legal requirements must be challenged by Defra.
2. The failure to properly consider all of the alternative options to effluent recycling at the formative stage of the plan when there was a material change to the final options selected. As a result, the current plan should be rejected. Moving forward without fully assessing more sustainable options would be a breach of the Paris Agreement on Climate Change to which the UK is a signatory.
3. The failure of Southern Water to include 39% (388) of public responses to their 2024 consultation on the Hampshire Waste Transfer Water Recycling Scheme in their analysis report summary means the level of public support is much lower than the figure of 23% claimed.

Ministers should intervene and insist that the report on the findings of the 2024 consultation that misrepresents the facts is withdrawn by Southern Water and replaced with an honest report of the findings.

4. The need for reform of the funding process to incentivise and drive more sustainable water source solutions going forward.

These matters are set out in more detail in our original two letters to the SoS sent on 26 March 2025 and 7 October 2025 which I have attached for ease of reference.

Regulatory gap, lack of independent audit/ control and need for action by Defra

In addition, we are very concerned that Southern Water have given residents and councillors the impression that the effluent recycling plants will be designed and operated under a highly regulated process, when the reality is that they will NOT.

- The Environment Agency have confirmed that they will only be able to regulate a very limited number of parameters in the final discharge water to the river, reservoir and coastal waters. Many of the contaminants of most concern that can pass through the treatment process will not have permit levels applied to protect the environment.
- The Drinking Water Inspectorate (DWI) will have minimal involvement in the effluent recycling plant. They will not routinely or regularly audit the plant.

Further information on the regulatory gap is set out in Appendix A. Section 1 provides more detail on the regulatory gap and Section 2 the minimal role of the Drinking Water Inspectorate (DWI) and action needed by Defra (Section 2.2).

Instead, the effluent recycling plant will be designed, built, operated, monitored and self-regulated by Southern Water or its contractors. Given the low level of public trust in water companies, the repeated failure of traditional treatment plants and pollution incidents, **it is completely inappropriate to allow a company like Southern Water to self-regulate** the complex effluent recycling treatment process which is new technology to the UK for public water supply.

As many water quality concerns associated with the effluent recycling plant will NOT be dealt with adequately by our regulators under existing legislation, **it is essential that Defra review international good practice and regulate to ensure additional control measures for effluent recycling are mandatory in the UK. This should include;**

- **Requirement for a risk assessment to be undertaken in the sewer catchment of every planned effluent recycling plant, and action taken to reduce hazards at source.**
- **Requirement for regular ongoing review with a full review at least every 5 years of the sewer catchment risk assessment, and to use the information obtained to implement a continuous program of improvement in relation to enhanced source control actions, and optimising the treatment processes to minimise risk to the environment and public health.**
- **Requiring the formation of an independent Source Control Steering Committee of approved competent experts. To be responsible for confirming the adequacy of the sewer catchment risk assessment, approving the list of actions, monitoring progress, and reporting back to the Regulators/ LPA on progress and any concerns.**
- **Requiring the formation of an Independent Scrutiny Panel to audit the effluent recycling plant design, construction, operation and monitoring data. The independent panel**

should meet at least twice a year and provide an annual report to Regulators/LPA, including any recommendations for action.

This **ongoing independent scrutiny is essential given that the water industry in the UK is privately owned, operating on a for-profit model, and the regulatory gaps in UK legislation** which was not designed to manage effluent recycling. Public trust in effluent recycling will never be achieved without it.

International examples of such control measures including the requirement for independent panels in other countries to monitor effluent recycling plants are provided in Appendix B. These examples are taken from World Health Organisation Guidance on effluent recycling. Further information on the mandatory control measures needed are described in Appendix A, Section 2.2.

Lack of national debate on a fundamental change to how we source our drinking water

The move to effluent recycling proposed in Southern Water's plan represents a fundamental change in the way we source drinking water in England. If approved, it will set a precedent and other water companies will quickly follow suit. Yet there has been **no national debate on this major change to how we source our drinking water**, even though there are very significant consequences in terms of cost to customers and the environment.

Defra should lead a national debate and insist on more robust public consultation now, presenting both sides of the argument. Instead of allowing consultation via small focus groups who are only given one side of the story before being asked for their views. Widespread public engagement is not planned by Southern Water until 2033 when it will be too late as the effluent recycling plant(s) will already be under construction. International case studies stress the importance of robust public engagement with the communities to be affected **BEFORE** schemes proceed. Defra must ensure that independent and meaningful engagement is commissioned before any decision to proceed with effluent recycling is taken.

The DWI research quoted in the letter from the Defra was focused on how to present the case for effluent recycling to get a positive reaction from the public, and we do not believe that it provides a true reflection of the public's view if they were to be presented with both sides of the argument. The outcome of the Southern Water 2022 consultation was that 48% of people rejected effluent recycling indicating they did not support it. **By the 2024 public consultation the level of support** had fallen to 23% by 2024. If all responses had been counted the level of public support would have been even lower.

We would ask that the SoS/ Defra urgently give consideration to the matters raised before the Southern Water plan is approved and provide a comprehensive response to this letter and our previous correspondence.

Yours sincerely,

On behalf of the Water Matters community

The ‘Water Matters’ community brings together residents’ groups, long-established environmental charities, and retired experts in water industry operations and ground contamination. Our concerns about effluent recycling are backed by a broad cross-section of parish and borough councillors.

Joint signatories are given below

Cllr. Philippa Gray	Cabinet Lead Finance & Governance - Havant Borough Council
Cllr. Grainne Rason	Cabinet lead Environment & Water - Havant Borough Council
Cllr. Netty Shepherd	Deputy Leader - Havant Borough Council
Cllr. Gillian Harris	Lead for Regeneration & Communities – Havant Borough Council
Cllr. James Hogan	East Hants District Council
Cllr. Jonathan Hull	Havant Borough Council
Cllr. Michael Lind	Havant Borough Council
Cllr. Amy Redsull	Havant Borough Council
Cllr Paul Tansom	Havant Borough Council
Cllr. Charles Robert	Havant Borough Council
Cllr. Chris Stanley	Chairman Rowlands Castle Parish Council
Bob Comlay	Chair Havant Civic Society
Anne Skennerton	Chairman Hayling Island Residents Association
Chris Edmond	Chairman Solent Protection Society
Libby Alexander	Chair Save our South Coast Alliance - SOSCA
Pat Brooks	Havant Friends of the Earth
Sue James	Havant Climate Alliance
Mike Owens	Hayling Sewage Watch
Dave Parham	Save Our Island and SOSCA
Sally Codling	Effluent Awareness Group
Nik Knight	Hampshire Bat Recorder
Dave Childs	Havant Thicket for Nature
Ann Buckley	Havant Thicket Reservoir Environment Subgroup & Residents Groups
Daniel Roberts	National Poo Museum (Isle of Wight)
Tracey Viney	Retired Environmental Regulator & Havant Thicket Reservoir Project Manager

Sent by email to:

emma.reynolds.mp@parliament.uk

defra.helpline@defra.gov.uk (FAO: Defra Ministerial Unit)

With copies to *MPs*

<i>Jess Fuller-Brown (Chichester)</i>	<i>Suella Braverman (Fareham & Waterlooville)</i>
<i>Caroline Dinenege (Gosport),</i>	<i>Damian Hinds (East Hampshire),</i>
<i>Paul Homes (Hamble Valley),</i>	<i>Alan Mak (Havant),</i>
<i>Joe Robertson (IOW),</i>	<i>Alison Griffiths (Bognor & Littlehampton)</i>

Environment Agency

Drinking Water Inspectorate

Ofwat (RAPID)

Appendix A

Re- Regulatory gap and lack of independent audit and control for effluent recycling

Prepared by Tracey Viney

- Retired Drinking Water Inspector (Drinking Water Inspectorate)
- Retired Environmental Health Regulator (specialisms Water Quality & Contaminated Land)
- Technical advisor to the Water Matters community

Overview

Southern Water have given residents, councillors and local councils the impression that the effluent recycling plant will be a highly regulated process, when the reality is that it will NOT.

- The Environment Agency will only be able to regulate a very limited number of parameters in the final discharge water to the river (or reservoir) and our coastal waters.
- The Drinking Water Inspectorate (DWI) will have minimal involvement in the effluent recycling plant. They will not routinely or regularly audit the plant.

Further information on the regulatory gap is set out in Section 1 and the minimal role of the DWI in Section 2.

Instead, the effluent recycling plant will be designed, built, operated, monitored and self- regulated by Southern Water or its contractors.

What happens in Hampshire and on the IOW **will set a precedent for the UK, opening the doors for effluent recycling to be adopted around the country**, despite the lack of a public debate about this fundamental change to our drinking water supply, and **NO bespoke regulations to manage effluent recycling**.

As many water quality concerns associated with the effluent recycling plant will NOT be dealt with adequately by our regulators under existing legislation, it is essential that Defra review international good practice and regulate to ensure that additional control measures are mandatory in the UK. This should include;

- **Requirement for a risk assessment to be undertaken in the sewer catchment of every planned effluent recycling plant, and action taken to reduce hazards at source.**
- **Requirement for regular ongoing review with a full review at least every 5 years of the sewer catchment risk assessment, and to use the information obtained to implement a continuous program of improvement in relation to enhanced source control actions, and optimising the treatment processes to minimise risk to the environment and public health.**
- **Requiring the formation of an independent Source Control Steering Committee of approved competent experts. To be responsible for confirming the adequacy of the sewer catchment risk assessment, approving the list of actions, monitoring progress, and reporting back to the Regulators/ LPA on progress and any concerns.**
- **Requiring the formation of an Independent Scrutiny Panel to audit the effluent recycling plant design, construction, operation and monitoring data. The independent panel**

should meet at least twice a year and provide an annual report to Regulators/LPA, including any recommendations for action.

This **ongoing independent scrutiny from the source of the water in the sewer catchment to customers tap is essential given that the water industry in the UK is privately owned, operating on a for profit model, and the regulatory gaps in UK legislation** which was not designed to manage effluent recycling. Public trust will never be achieved without it.

It is really important that Defra establish a robust mechanism for independent external scrutiny of the plant during design, construction and operation in order to protect water quality and public health.

International examples of such control measures including the requirement for independent panels in other countries to monitor effluent recycling plants are provided in Appendix B, please refer to the sections on control measures, audit and verification. These examples are taken from World Health Organisation Guidance on effluent recycling. Further information on the mandatory control measures needed are described in Section 2.2.

I would also urge you to watch the Channel 4 drama documentary 'Dirty Business' on catch-up TV using factual events to show the lack of control and regulation in the water industry, then ask you to consider '*can we trust Southern Water to self-regulate the operation of the proposed effluent recycling plant?*' Especially given their poor track record on traditional treatment plant failures, pumping station failures, automation failures and pollution events. This will be the first time this effluent recycling technology has been used in the UK for public water supply, the processes involved are much more complex than those in traditional treatment plants that Southern Water have repeatedly failed to maintain and operate without incident.

I would also like to draw the SoS's attention to the **Supreme Court judgement in the case of Finch vs Surrey County Council, which confirms that alternative options must be considered taking into account the whole life greenhouse gas emissions.** A robust alternatives assessment has NOT been undertaken for the Hampshire or IOW effluent recycling schemes. Other options to deliver the additional drinking water needed are available that would have much lower greenhouse gas emissions, be more sustainable and cheaper for customers. Moving forward with effluent recycling without fully assessing the more sustainable alternatives also **breaches the Paris Agreement to which the UK is a signatory.**

In the sections that follow I have set out the additional information that demonstrate the regulatory gap and lack of existing control measures that need to be addressed by Defra before effluent recycling proceeds anywhere in the UK.

If you have any questions on this additional submission, please do not hesitate to contact me, or if a meeting would be helpful do let me know.

Section 1 – The regulatory gap in water quality controls

It is important that the SoS, Defra and public are aware of the regulatory gap that has been confirmed during the Water Matters community discussions with the RAPID (Regulators Alliance including Ofwat & Environment Agency).

In July 2025 both Paul Hickey (RAPID Managing Director employed by Ofwat) and Richard O’Callaghan (EA Area Environment Planning & Engagement Manager) confirmed that the **Discharge Consent process regulated by the Environment Agency (EA)** for discharges from an effluent recycling plant into an environmental buffer (river or reservoir), and for the discharge of reject water from the plant into local coastal waters, **will only be able to consider the small number of parameters for which there are current regulatory guidelines. As there are no guidelines for many of the nastier chemicals of concern including forever chemicals (such as PFOS) and pharmaceuticals, there is no mechanism for setting limits as part of the EA discharge permit consenting process.**

As the EA cannot consider many of the contaminants of concern it is important that Defra make it clear to the Planning Inspectorate and the Local Planning Authority that the environmental impact of these nastier chemicals of concern to water quality and ecology (including bioaccumulation) must be considered at the time of the Development Consent Order / Planning Application, as it will not be addressed by a separate regulatory regime.

At the moment **Southern Water are exploiting this loophole** and the Environmental Water Quality Assessments published by Southern Water in 2025 for both the Hampshire & IOW effluent recycling schemes only provide an assessment for a very small number of parameters that they expect the EA to consider for the discharge consents into the environmental buffer (reservoir or river), and for the discharge of 4 times more concentrated reject waste water in to the coastal environment.

While I am aware that the planning process must not result in dual regulation. It is important that Defra make it clear to the Planning Inspectorate/ LPA that they must;

- Be aware of the regulatory gap and that wider water quality impacts/ concerns not covered by the EA discharge consent permitting process should be considered as a part of the determination of the planning application or DCO.
- Seek submission of modelling and assessment for a broader range of contaminants of concern than just those covered by the EA permitting process, to support the Environmental Impact Assessment and Habitats Regulation Assessments. This is to ensure there is a more robust understanding of the water quality risks and the potential impact on ecological & human receptors, including changes in background exposure, cumulative and in-combination effects.

Further information on some of the contaminants of concern which can pass through the treatment process is provided in Section 3.

Section 2 confirms that the DWI will not be filling this regulatory gap, making it even more important that;

- Bespoke regulations and guidance on control measures & independent scrutiny are produced by Defra specifically for effluent recycling.
- It is made clear to the LPA/ Planning Inspectorate that they should consider the risks not being addressed by other regulators and apply robust scrutiny and conditions.

The key concern here is that even if the EA and DWI operate their respective regulatory regimes effectively, this will not prevent contaminants of concern entering the environment / water source.

Nor will the existing regulatory controls provide adequate independent control and scrutiny. More detail on the actions needed by SoS/ Defra are set out in Section 2.2

Specific concerns in relation to changes in river water geochemistry

The recycling process strips the water of most of its natural minerals, turning it into a very aggressive product that can strip the metal from pipes. No information is being provided on the quality of remineralisation proposed for the effluent recycling plants. The recycled water will have to be remineralised before it can be discharged into the river or reservoir. This is an expensive process, and Southern Water will want to minimise the amount of remineralisation to the minimum they can get away with.

It is not clear as to the extent that the EA will be able to control the standard to which the recycled effluent is remineralised, or if it will be to the same standard as the existing river (or reservoir) water to prevent a geochemical change in quality and ensure there is no deterioration of water quality in the river, or impact on downstream ecology.

If the EA do not have sufficient regulatory control through their permitting process to control the standard of re-mineralisation then **Defra should consider what additional clarification in regulation or guidance is needed to ensure there is a requirement to achieve an equivalent geochemistry to that of the existing river (or reservoir) water quality. Defra should also stipulate the need for sufficient routine monitoring to demonstrate the requirement is always being met.**

Section 2- The minimal role of the Drinking Water Inspectorate

Residents and councillors may be expecting the DWI to have a key role in regulating and monitoring the effluent recycling process but that is NOT the case.

The recycled effluent will be discharged into a river or reservoir, which will act as an 'environmental buffer' for any contaminants or disinfection by-products passing through the plant. As a result, the DWI primary regulatory input will not commence until the water is later abstracted from the river (or reservoir) and piped to the existing Water Treatment Works (WTW).

Once the effluent recycling plant is operational.

- **The DWI will not routinely or regularly audit an effluent recycling plant that discharges into an environmental buffer.**
- The risk-based approach to DWI audits means that typically this is from the point where water is abstracted from the river or reservoir source.
- There will be a requirement for Southern Water to update the catchment risk assessment for the existing WTW and keep that under review. The DWI 'may' at any time audit the company's catchment risk assessment and catchment risks, but this will not be done routinely once the effluent recycling plant is operational.
- An effluent recycling plant would be treated by DWI in the same way as any other upstream risk in the catchment, it will not receive any additional special attention.
- If a risk were identified at some point in the future and the DWI felt they needed to audit the plant, then their powers would allow them to conduct an audit of the effluent recycling plant.

The Water Supply (Water Quality) Regulations (as amended) do require under Regulation 28 that the water company risk assess the river water source catchment as part of the drinking water safety plan (source to tap) approach. This would simply include an assessment of the risk to the drinking water source (the river or reservoir abstraction) from the effluent recycling plant discharging into the source upstream.

2.1 Lack of regulatory control

a) **Lack of understanding of the hazards & risks in the sewer catchment**

Under the current regulatory regime, it appears likely that Southern Water will be able to get away with using periodic monitoring data of the final effluent leaving the sewage works to assess/ model the risks and treatment required. Instead they should be required to review the risks the recycled effluent poses by undertaking a comprehensive assessment of the hazards in the sewer catchment to fully understand the risks (including transient risks), treatment needed, and whether risks can be reduced at source?

- Unless there is a sewer catchment risk assessment then the real risks from discharges into the sewers will not be fully understood, as contaminants from hazardous sources can be transient, such as discharges from liquid waste tankers. Using the Isle of Wight (IOW) scheme as an example, up to 200m³/day of landfill leachate is permitted to be discharged under SW Consent ID 16847, but this is one of very few trade discharge permits to the sewer that have been issued by Southern Water on the IOW, despite there being industries such as aerospace,

marine engineering, transport, and a large hospital etc. As a result, the Company know very little about what chemicals/ compounds are discharged into the sewers, or when hazardous substances are discharged. Introducing variable quality inputs into an effluent recycling plant can significantly impact the performance and efficiency of the recycling treatment processes.

- In drought-stricken countries that already utilise effluent recycling **published case studies make it clear that understanding the sewer catchment and reducing risks at the source premises are a pre-requisite to wastewater recycling**. Examples of source control measures required in the sewer catchment of effluent recycling plants in Australia, California and Singapore are provided in Appendix B, sourced from World Health Organisation Guidance. Some countries require real time monitoring within the sewer catchment to provide an early warning system, the requirements for real time monitoring in Singapore are detailed in Appendix B.
- **Southern Water have no plans to identify hazards in the sewer catchment and reduce the risk at source, nor to install real time monitoring in the sewers.**
- Instead, Southern Water advised they will rely solely on treatment at the Water Recycling Plant and dilution of residual contaminants in the river (or reservoir) to ensure that the water leaving the existing drinking water treatment works still meets the Drinking Water Standards.
- That does not mean that there will be no additional contaminants of concern in the drinking water leaving the WTW that could increase consumers background exposure on the IOW and across southern Hampshire, the concentrations simply must be reduced enough to meet the Drinking Water Standards. It is important to note that, for emerging contaminants of concern, including some forever chemicals, it can take years of research to establish the risk and set new drinking water standards. Further information on the ongoing development of standards for PFAS compounds, known as a 'forever chemicals' that do not degrade in the environment and can bioaccumulate are provided in Section 3.

b) DWI may not consider recycled effluent a 'new' source under Regulation 15

Regulation 15 requires sampling for a 'new' source of water

However, it is not clear if Southern Water will be required to collect monitoring data and submit this to DWI as part of an application to DWI under Regulation 15?

This is currently looking unlikely as DWI Information Letter 03/2023 on effluent recycling explains that **the effluent recycling plant will not be considered a 'new source' of water unless the recycled water makes up more than 50% of the water in the river at the point of abstraction**. Thus, in terms of the regulations **Southern Water may be able to argue that technically the recycled effluent is not a 'new source' of drinking water if the dilution in the river (or reservoir) is more than 50% and then they will be exempt from the requirements of Regulation 15.**

I think most residents and councillors would be shocked to find out that this fundamental change in the source of their drinking water supply from rivers and aquifers to recycled effluent may not be regulated as a 'new source' by DWI.

2.2 What needs to happen to provide more robust control and independent scrutiny?

If the SoS/ Defra are minded to approve the Southern Water rfdraft WRMP which includes effluent recycling plants then, to address the regulatory gap and ensure adequate scrutiny during design and operation, new regulations or national guidance are needed.

- i) To require a sewer catchment risk assessment before construction commences, to inform the design of the treatment processes required to protect the environment and public health.
- ii) To require the applicant to inspect and if necessary, issue or amend trade effluent consents on all relevant premises in the sewer catchment to the Water Recycling Plant before commencing operation, to minimise hazards at source and ensure a full understanding of all of the risks present in the sewer catchment.
- iii) To require a regular ongoing review and at least every 5 years a full review of the sewer catchment risk assessment, and to use the information obtained to implement a continuous program of improvement in relation to enhanced source control actions, and optimising the treatment processes to minimise risk to the environment and public health. The risk assessment review report and recommended actions should be provided to the LPA, EA and DWI, along with an action plan with delivery timescales.
- iv) To require the formation of an Independent Source Control Steering Committee of at least 6 competent experts approved by the Regulators/ LPA, each with relevant specialist knowledge to review the sewer catchment risk assessments (required under i and ii), along with the action plans. The Committee would be responsible for confirming the adequacy of the sewer catchment risk assessment, approve the list of actions, monitoring progress, and reporting back to the LPA on progress and any concerns.

Note: The Steering Committee should include a DWI Inspector, EA Water Quality Specialist, an appropriate local public health official, a trade effluent specialist, an effluent recycling specialist, and an informed but independent member of the public who will receive the recycled water with a relevant science or wastewater background.

This would be consistent with good practice in other countries to ensure effective source control in the sewer catchment (Appendix B). To identify the types of industries, their location, the volumes and types of wastewater discharged, the contaminants and their concentration. The risk assessment should also consider what contaminants might mix/ react together within the sewer catchment to form other contaminants of concern. As a comprehensive understanding of the contaminants present is essential to design effective treatments.

- v) **Require the formation of an Independent Scrutiny Panel to audit the effluent recycling plant during design, construction, operation and to review monitoring data. The independent panel should meet at least twice a year and provide an annual report to the Regulator/ LPA, including any recommendations for action along with minimum timescales.**

This ongoing independent scrutiny is essential given that the water industry in the UK is privately owned, operating on a for-profit model, and the regulatory gaps in UK legislation which was not designed to manage effluent recycling.

Examples of the independent panels provided in other countries to monitor effluent recycling plants are provided in Appendix B.

As well as DWI, EA specialist(s), and a public health official, the panel should include at least two independent effluent recycling specialists with a minimum of 10 years' experience in the safe operation of such plants.

This is **essential to ensure the ongoing safe operation and improvements to the treatment process over time, in line with international good practice** for challenge, audit and verification of output quality. Independent scrutiny and challenge is also fundamental to developing public trust if this new source for drinking water is to be progressed.

In the UK there is NOT robust existing legislation that can adequately ensure control of the risks related to the introduction of effluent recycling. In other countries new legislation and national (or regional) guidance has been introduced.

As the Hampshire and IOW schemes are the first effluent recycling plants in the UK to apply for planning permission, it is essential to look to guidance and good practice from other countries to establish appropriate controls needed to protect the environment and the public from new risks now and in the future, including emerging chemicals of concern.

Section 3 – Lack of information provided on contaminants of concern

Insufficient information is being provided to the public with the planning applications or consultations on the changes in water quality and contaminants of concern.

It is known from effluent recycling plants operating in drought-stricken countries that not all of the contaminants of concern are removed from the final treated sewage effluent by the recycling process.

For the proposed Hampshire effluent recycling scheme Southern Water set up a trial plant at Peel Common WWTW, then moved it to Budds Farm WWTW. An appeal was needed against the refusal of an Environmental Information Request to obtain summary data from the trial, demonstrating an initial lack of openness and transparency. Concerns that arise from a review of the data include;

- The quality of the final effluent from the sewage works entering the trial recycling plant was very variable, which poses a problem for the recycling treatment processes, as they work best when the water quality entering the plant is more consistent. Treatment can be affected by transient changes in water quality.
- There were many contaminants that passed through the treatment process in small quantities, including forever chemicals (PFOS & PFOA), pharmaceuticals (including anti-depressants), pesticides (DEET & Chlormequat), organics (phenol & toluene) and treatment byproducts (including Bromodichloromethane, Bromoform, Chloroform and Trihalomethanes, none of which were in the source water input to the recycling plant).
- Surprisingly even large particles such as bacteria were detected after treatment. As a result, the question arises if Southern Water could not operate the trial plant to stop large particles such as bacteria passing through the process what is the risk of other contaminants getting through?
- There were many contaminants of concern in the final effluent from the sewage works entering the trial recycling plant that were not tested for post treatment, as a result how effective the treatment process would have been for those substances is unknown.
- Not testing was undertaken for micro or nano plastics.

The water quality information submitted with the recent planning application to the Isle of Wight (IOW) Council in ES Appendix 10D only considers 6 parameters (ammonia, nitrate, orthophosphate, temperature, pH & Dissolved Oxygen), **the majority of contaminants of concern have NOT been assessed, even though they will be discharged into the River Yar.** No information has been provided to the IOW Council on many of the contaminants of concern, nor on their potential to bioaccumulate in the sensitive river ecosystem below the discharge point.

The same was true for the Water Quality Report submitted with the 2025 public consultation materials on the Hampshire Scheme for discharges to Havant Thicket Reservoir.

Southern Water are clearly exploiting the loophole in the current discharge consent permitting regime and only modelling the impacts for parameters for which permit levels can be set by the EA.

Specific concerns about the discharge of PFAS compounds for the IOW plant are set out below, but they would equally apply to other effluent recycling schemes, such as the Hampshire project.

Specific concerns in relation to discharge of PFAS compounds

PFAS compounds can pass through the treatment process in small quantities. These are ‘forever chemicals’ which do not degrade in the environment and there are growing concerns about health risks associated with these compounds. Research has shown that they can bioaccumulate in the environment, including a recent study by Portsmouth University in Langstone Harbour (Hampshire).

The absence of formal scientifically based standards for PFAS has created regulatory uncertainty and delays to consents. On the 3/2/2026 the government published its updated PFAS plan.

- Action 2.12: Develop scientifically robust and defensible environmental thresholds and standards for emissions to air, land and water for PFAS
- Action 3.6: Consult on the introduction of a statutory limit for PFAS in England’s public supply regulations. *(The consultation is planned for 2026)*

It takes many years to do the necessary research to develop new standards, consult on them and implement them into UK legislation or national guidance.

Due to concerns, DWI Information Letter 03/2025 sets out in Section vii how **water companies are expected to “implement a prioritised methodology to progressively reduce PFAS concentrations in drinking water”**. PFOS is one such compounds that is already known to be present in samples taken from the River Yar, the environmental buffer for the discharges of recycled effluent on the Isle of Wight.

The WFD Report (Appendix 10B)that accompanied the IOW scheme planning application confirmed on page 16 that the River Yar is already failing its water quality objective for the PFAS compound Perfluorooctane sulphonate (PFOS) and for Polybrominated diphenyl ethers (PDPE).

- Why would you want to permit new discharges which allow the water quality in this drinking water source to get even worse?
- How is the introduction of recycled water which will still contain small quantities of PFAS compounds (including PFOS) conducive to meeting the DWI requirement to reduce the risk to consumers from these compounds in drinking water?

Given that the recycled water discharge into the river and its proposed use as a source for drinking water, at a time when the safe levels of PFAS have not been established, surely it would be appropriate to wait for standards to be established before pursuing effluent recycling.

Water industry research study (UKWIR 2022) [PFAS and wastewater - prevalence, reduction options and costs](#). notes there is **evidence that Polyfluoroalkyl substances transform in the environment, in waste water treatment works and in humans to form more harmful PFAS** (i.e. they are precursors). The summary also states that; **end of pipe treatment is unlikely to be an effective treatment option, and certainly NOT without robust source control**.

Source control of discharges from industry / commercial premises into the sewer catchment must therefore be a pre-requisite required by Defra if effluent recycling is to proceed.

I would also draw Defra attention to the fact that the discharge of reject water from the effluent recycling plant into coastal waters (e.g. via the Sandown long sea outfall) will be 4x more concentrated in contaminants (including PFAS compounds) than the existing discharge. This has not been made clear in the IOW planning application documents. The impact of the coastal discharge of reject water has not been adequately assessed in the information submitted by the Southern Water to date, as once again **Southern Water are using the existing lack of regulatory control as a loophole and only assessing the parameters for which the EA can set permit limits.**

Defra need to make it clear that water companies must undertake more robust assessment and modelling of the more concentrated contaminants of concern that will be discharged with the reject water into coastal waters, including potential impacts on bathing beaches, shellfish waters, as well as ecological impacts and potential for increased bioaccumulation.

Appendix B

International examples of effluent recycling – highlighting the need for source control in the sewer catchment and ongoing independent scrutiny

All 3 examples are taken from World Health Organisation, Potable Reuse – Guidance for producing safe drinking water. All of the examples use an environmental buffer.

Perth, Australia, groundwater replenishment *(extracts)*

The scheme is **owned and operated by the Water Corporation of Western Australia, a publicly owned water utility**. Having public ownership is likely to help with consumers trust in the scheme.

CS5.2 Approach: Establishment of potable reuse scheme

The scheme will accept wastewater from the Beenyup wastewater catchment in the northern suburbs of Perth with a total inflow of approximately 135 MLD. The **majority of wastewater collected in the wastewater catchment is sourced from households. Trade waste and process wastewater from industrial and commercial customers represents approximately 2.4% by volume of the wastewater flow. By load, trade waste represents about 20% of biochemical oxygen demand, 5% of suspended solids, 25% of oil and grease, 3% of nitrogen, 2% of phosphorus and 3% of dissolved salts. The largest industrial and commercial customers are food producers and laundries, but most trade waste is from small commercial businesses. There are three significant hospitals and a number of smaller facilities that discharge wastewater into the catchment. The medical facilities' wastewater undergoes pre-treatment where appropriate and substances incompatible with the Beenyup system are not accepted.**

CS5.3 Control measures

The treatment systems for the GWR scheme will include the Beenyup WWTP, the AWRP and four recharge bores which **recharge approximately 45 MLD of recycled water into the Leederville and Yarragadee aquifers**. Groundwater will then be abstracted and treated before distribution through the Perth Integrated Water Distribution System.

Multiple treatment processes are used in series to minimize the impact that failure or poor performance of a single treatment process has on the overall ability to meet health and environmental water quality requirements.

The GWR scheme utilizes the following preventative measures to produce recycled water (Figure CS5.1):

- wastewater catchment management;
- Beenyup WWTP (primary and secondary treatment);
- advanced water recycling plant (UF, RO, UV treatment);
- storage (storage/buffer tank); and
- aquifer storage.

A **key aspect** to the successful implementation of the project was the **early engagement of the community and the clear communications between government, industry and the community** to achieve a sustainable outcome for the management of the Western Australia water resources.

CS5.3.1 Wastewater catchment management

The proportion of trade waste in the inflow to the Beenyup WWTP is low. However, the following process and procedures are implemented to mitigate any potential risk in the wastewater catchment:

- **Specification of trade waste acceptance criteria:** The trade waste acceptance criteria specify the wastewater quality that is allowed into the sewerage system. The criteria preclude amounts of substances which might interfere with wastewater collection, treatment, reuse or discharge to the environment. The acceptance criteria include alarm limits for loading of substances (by mass), including biochemical oxygen demand, suspended solids and nutrients.
- **Permitting (or registering) of commercial and industrial waste customers:** All businesses require a permit to discharge trade waste to allow discharge into the sewerage system. The wastewater from each business is characterized and risks assessed against the end-points relevant to the catchment. Permits specify the allowable waste that may be discharged and conditions of discharge, such as pre-treatment and reporting requirements.
- **Response plans for large customers:** Permits of large customers or high-risk customers contain requirements for real-time notification to the Water Corporation (commercial and industrial services) of process or pre-treatment failures which may impact on the quality of the wastewater that is being discharged.
- **Surveillance monitoring of customers with high load discharges or potential quality concern:** These customers are subject to ongoing surveillance programmes, which involve unannounced compliance inspections, and a programme to characterize loadings using automatic samplers to collect flow-weighted composite samples. The frequency of compliance inspections is determined from a risk ranking model which considers the size and nature of each business and the type of pre-treatment used. The frequency of composite sampling is determined by the size and variability of the loading. Loadings from some large customers are determined via self-monitoring to Water Corporation protocols.
- **Response plans for unusual discharges:** A procedure exists for responses to unusual discharges recorded in the wastewater collection system or at WWTPs.

CS5.7 Governance

The scheme is owned and operated by the Water Corporation of Western Australia, a publicly owned water utility. The following regulatory authorities are key stakeholders in providing the regulatory and formal requirements of the GRW scheme including; Department of Water, Department of Health, Department of Environment Regulation, Environmental Protection Authority.

An interagency working group was established to progress regulatory requirements. The working group developed the trial's regulatory framework, which defined the requirements for the ongoing regulation of GWR, using existing statutory processes where possible, and following national guidelines to assess unique aspects (IAWG, 2008)

A memorandum of understanding between the Department of Health and the Water Corporation for the GWR trial was established in July 2010, which formalized the relationship between the parties for the GWR trial (Department of Health & Water Corporation, 2010). This describes the regulatory approval and operational requirements of the GWR trial, including water quality and reporting requirements, notification of water quality events and communications protocols.

Groundwater Replenishment System in Orange County, California, USA (extracts)

CS2.3.1 Orange County Sanitation District source control programme

Source control for the system is provided by OCSD. The **purpose of the source control programme is to manage the quality of raw wastewater received by OCSD, thereby ensuring pollutants and chemicals of public health concern are not discharged to local sewers** in quantities that would compromise the quality of water produced via unacceptable interference or pass through of the wastewater and advanced water treatment processes. **Both industrial and non-industrial discharges are regulated and permitted.**

The **source control programme follows** State of California regulations for groundwater recharge reuse projects and includes the following:

- Assessing the fate of state-specified contaminants through the wastewater and advanced water treatment processes.
- **Chemical and contaminant source investigations and monitoring** focused on state-specified chemicals.
- **Outreach programmes to industrial, commercial, and residential communities to manage and minimize the discharge of contaminants at the source.**
- Current **inventory of chemicals and contaminants (including new chemicals resulting from new sources or changes to existing sources) that may be discharged into the wastewater collection system.**

CS2.3.4 Environmental buffer: Orange County groundwater basin

The Orange County **groundwater basin** aquifer system acts as the storage and transport system and **the environmental buffer** for the Groundwater Replenishment System. There have been indications of at **least temporary mobilization of some contaminants in the aquifer** from the highly treated water addition, however, these have become stabilized by:

- dilution/blending;
- time to respond to potential treatment plant upsets resulting in the recharge/injection of off-spec water; and
- additional treatment.

The regulations for groundwater replenishment with recycled water adopted by the State of California **require a minimum of two months of subsurface response retention time within the aquifer prior to extraction for potable use.** The Groundwater Replenishment System has been approved for a response retention time of three months, and also receives a 3-log virus reduction credit for subsurface retention (1-log reduction per month). Typically, **the actual subsurface travel time between the points of recharge/injection and extraction is in the order of many years.**

CS2.4.2 Verification

The OCWD must submit quarterly and annual reports to the regional board, documenting treatment plant performance, monitoring results, and compliance with permit limits and conditions. Regional board staff also perform periodic unscheduled on-site inspections and audits of the facilities.

One condition of the regional board permit is the establishment and regular meeting of an expert peer review panel (referred to as the Groundwater Replenishment System Independent Advisory Panel) to provide regular review of operations and water quality (see also Section CS2.6). The panel is administered by the NWRI, a non-profit research organization based in Southern California that specializes in organizing and managing expert panels to address complex projects, policies and technologies in the water industry. Members of the panel include experts in the fields of toxicology, chemistry, microbiology, epidemiology, hydrogeology, public health, engineering and environmental protection.

Since its establishment in 2004, the full panel has met annually (with smaller subcommittee meetings on specific topics held between annual meetings) during the design, start-up and regular operation of the system. Regulators and other interested parties are invited to attend these meetings. The product of each meeting is a report containing findings and recommendations of the panel that are transmitted to OCWD, OCSD, regulators and other interested stakeholders.

Water reuse in Singapore – NEWater (extracts)

CS4.2 Approach: Establishment of potable reuse

From its earliest days, NEWater has been supplied mainly for direct non-potable use by water-intensive industries such as wafer fabrication plants and petrochemical industries, as well as in cooling towers of commercial and public buildings. This frees up potable water for domestic consumption. A small amount of NEWater is injected into water reservoirs and supplied for Indirect Potable Reuse (IPR). Usually, IPR constitutes about 2–3% of water demand but this can be increased substantially to more than 10% when larger quantities of NEWater are injected to supplement reservoir supply during dry spells.

NEWater is supplied through a dedicated pipeline network. The network began as separate clusters where pipelines were laid from each NEWater plant to specific groups of water-intensive industries, while supplying other non-domestic users (such as commercial buildings) along the way. Off-takes were laid to the nearest water reservoir in each cluster for IPR. In 2012, an island-wide transmission system was completed, linking the four NEWater plants and various supply clusters. This improved supply reliability and allowed for greater flexibility in managing NEWater supply for both direct non-potable use and IPR.

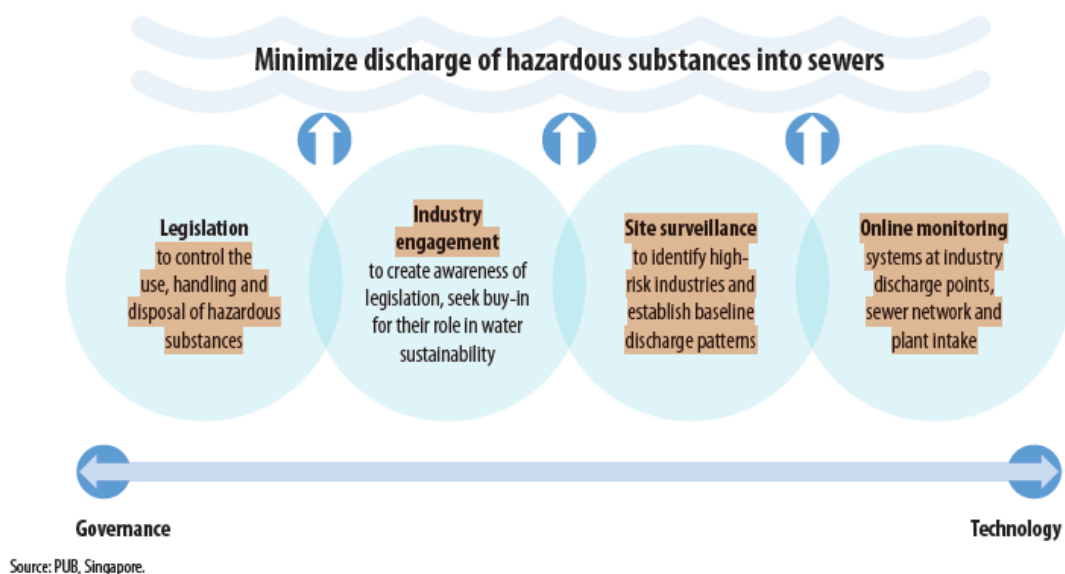
CS4.3 Control measures from source to tap

A system of multiple barriers, comprising source control and treatment, coupled with engineered storage, environmental buffers and online monitoring is in place to safeguard the quality of NEWater for IPR.

CS4.3.1 Source control

While most of the used water collected is from municipal sources, industries also discharge used water into the sewers, posing a greater risk to the quality of used water for NEWater production. PUB manages this through a multi-pronged approach as illustrated below.

Figure CS4.1 Multi-pronged approach to source control for water reuse in Singapore



Legislative power is an important lever but the key to effective management of used water quality lies in having a **comprehensive understanding of the catchment profile**, which can only be achieved through **continual engagement of industries and close monitoring of used water quality throughout the sewer network**.

PUB relies on **online VOC sensors located at strategic points in the network to provide early warnings of illegal discharges** of VOCs, such as when an industry discharges cleaning agents, used oils or solvents into the sewers. Although infrequent, such incidents require prompt intervention as most **VOCs cannot be effectively removed by the NEWater process**. They could affect water quality and **have potentially harmful effects on human health**. This early warning allows the WRP downstream to divert affected treated wastewater away from NEWater production. **In addition to VOC sensors, a compact microbial electrochemical sensor has been successfully developed**, after field testing, for online monitoring of used water toxicity. It has been installed at five factories to further optimize performance.

CS4.3.3 Storage and conveyance

The NEWater plant design includes a **product water storage tank with a minimum nine-hour retention capacity**. This provides **adequate response retention time in the event of contamination or a disruption in the treatment process**. **Water quality in the tank is continuously monitored online**.

Due to its low alkalinity, NEWater is conveyed to **non-domestic customers and reservoir injection points in pipes** that are lined with high density polyethylene. The pipeline network includes a system of service reservoirs which further increases the response retention time. Subsequently, NEWater is stabilized with lime allowing other pipes, like cement lined ductile iron pipes, to be used.

CS4.3.4 Environmental buffer and blending

NEWater is channelled into reservoirs where it is mixed with rainwater and undergoes further treatment at a water works before being supplied to households. The reservoir serves as an environmental buffer, providing a long retention time through its large volume, and allowing for natural attenuation.

CS4.4.3 Surveillance and audit

The National Environment Agency (2008) regulates drinking-water quality in Singapore according to its Environmental Public Health (Quality of Piped Drinking-water) Regulations 2008. In addition, NEWater quality is benchmarked against the following standards:

- PUB internal operational control limits;
- USEPA (2014) National Primary Drinking-water Regulations; and
- WHO Guidelines for Drinking-water Quality (WHO, 2017a).

Water quality data, operation and maintenance of plants and staff competence are audited by an internal audit panel and an independent external audit panel. Each panel convenes twice yearly.

The internal audit panel focuses on operational details such as water quality data integrity, adherence to standard operating procedures and maintenance schedules and plant staffing needs.

The external audit panel comprises local and overseas experts. It examines the overall sampling and monitoring programme, plant operations and major new projects, and recommends improvements after considering best practices and emerging concerns for drinking-water.