WORSHIPFUL COMPANY OF WATER CONSERVATORS

THINK PIECE ON THE CIRCULAR WATER ECONOMY: WHAT IT CAN DO TO HELP THE UK WATER PARTNERSHIP (UKWP)

FEBRUARY 2025

PROLOGUE

1 The Worshipful Company of Water Conservators (WCWC) is a City of London Livery Company focussed on the long-term health of our water resources and the broader related industries and their regulators, along with others who share our concern for water and the environment. Our experience and knowledge ranges from the complexities of environmental sciences, through the application of engineering to deliver the goals identified by those sciences, and the subsequent management of assets created. The WCWC's purpose is *promoting a diverse and sustainable environment.*

2 As part of that purpose the WCWC has been responding.to relevant consultations particularly on matters relating to water conservation. These are archived on its website under Policy Positions. It has been referring to issues surrounding the circular water economy in many of its Think pieces and submissions to Defra consultations. It intended to summarize these in early 2025 for the benefit of its members and to assist further submissions. It is in dialogue with the UK Water Partnership (UKWP) on this topic and this think piece serves two purposes; it draws together relevant aspects of its submissions and examines how it can assist the UKWP. It looks forward to working with the UKWP.

3 Before doing so, it is relevant to examine what UKWP has published before.

It published a paper in October 2024 with the partnership of WSP (a water engineering services firm): THE CIRCULAR WATER ECONOMY IDENTIFYING AND CAPITALISING ON THE COMMERCIAL OPPORTUNITIES FOR UK PLC. A Call to Action by the UK Water Partnership.

The Circular Water Economy White Paper Release! - The UK Water Partnership

https://www.watermagazine.co.uk/2024/11/04/uk-water-partnership-publishes-recommendations-to-support-the-transition-to-circularity-in-the-water-sector/

The press release on October 31 stated that – *The UK Water Partnership has today published a series of recommendations, in collaboration with leading multi-disciplinary professional services consultancy WSP, for unlocking system-level change for the transition to a circular water economy.*

There is increased demand for the water sector to set and deliver against robust sustainability objectives and the Circular Economy provides the framework within which these can be delivered. The United Nations Sustainable Development Goals, ISO59020, PAS2080, and the Global Reporting Initiative contribute to the ecosystem of metrics against which these objectives can be achieved and measured.

The whitepaper responds to this demand by introducing the key role that a circular economy can play in protecting nature by minimising waste and resource consumption while simultaneously regenerating natural systems.

It provides recommendations to the sector and highlights the opportunities and challenges to bringing other aspects of the circular economy to life through the absence of enabling Policy,

Regulatory and Commercial frameworks. The whitepaper stresses the importance of collaboration between different stakeholders, including policymakers, regulators, and commercial entities, to achieve this vision.

4 This was phase 1 of the UKWP Circular Water Economy Project, which had tended to look within the municipal water sector, and phase 2 involving, Veolia and Atkins Realis, is looking at Circular Economy opportunities not only across the wider water sector but linked to opportunities from other sectors. The WCWC interprets its contribution as a stakeholder in this process.

5 In this it states that *in its simplest form, the circular economy asks us to look past our traditional 'take-make-use-dispose' linear approach, to create a less wasteful and damaging, regenerative system. It embraces three key principles, to:*

- *Minimise and eliminate waste and pollution;*
- *Keep resources in use, at their highest possible value; and*
- *Regenerate nature and thereby preserve and enhance the earth's natural capital.*

These principles can be applied at all points around the urban water cycle, from abstraction, through use, treatment and discharge back to the environment. For example:

- *Catchment management can improve surface water quality and reduce treatment costs for potable purposes whilst buffering water quantity and reducing surface flooding;*
- *Demand reduction, improved water use efficiency (WUE) and water re-use create cost-saving cascades throughout the urban water cycle; and*
- *Moderation of surface water flows through adoption of Nature-Based Solutions (NBS) improves biodiversity, increases system resilience and delivers high quality amenity value.*

Another key aspect of the circular water economy is that water becomes a vector for other resources during use. Nutrients (including carbon in many forms), solid particulates and energy all find their way into the water matrix. Whilst these additions might previously have been considered 'pollution', requiring removal during wastewater treatment, there is an increasing tendency to see such inputs as recoverable resources with value– from heat to biopolymers.

Taken together, these aspects provide the water sector with multiple opportunities to transition to a circular economy, both as a consumer of raw materials and as a steward of valuable natural resources.

Opportunities are diverse, ranging from recycling or re-using water, seeking alternatives to traditional 'grey' infrastructure and the materials that enable them, opportunities for repair and re- manufacture of mechanical and electrical equipment, and the potential for resource recovery from wastewater and sewage sludge.

From a resource management perspective, the water sector is primed to explore and embed circular economy opportunities, but it cannot do it alone – it will be necessary to establish symbiotic relationships whereby organisations can directly source recovered resources from one another and create markets for recovered resources. Collaboration with partners from within and outside the sector will be essential to deliver the system-level change that is required as we transition to a circular water economy.

SUMMARY

6 This think piece draws together the suggestions made already by the WCWC as a basis for further dialogue with the UKWP. It stands ready to elaborate on its content.

7 The WCWC offers the insight that the concept of the Circular Water Economy (CWE) lies at the centre of a series of overlapping spheres of influence. Circular Economy, Water Resources, Planning and Industrial Strategy, as examples, and like so much of current government policy development, it is influenced by disparate and diverse initiatives. The WCWC has advocated in its submissions the need for more coherence and the need for an overarching National Water Strategy. This think piece outlines what it could look like could look like and that could form the basis on cooperation. Whatever is decided the immediate future is complex in terms of timing and any programme addressing CWE needs to be aware of the timeline.

8 The WCWC has pointed out the current dilemma of decision making. Neither high level philosophising without really focussed actions on the 'coalface' or 'coal face' actions without the coherence of a master plan, deliver the best outcomes. So, for example the WCWC asks where and how does the circular water economy fit into the 2023 Defra Water Plan from both perspectives?

9 The WCWC recognises the progress made by the UKWP, but it suggests that rather than a 'me to' contribution to the landscape of initiatives, one role for a WCWC-UKWP working collaboration is to understand how all the pieces fit together and contribute this to the public domain.

10 An initial step in any project is to determine what the balance of context and content is to be. Throughout the text, the WCWC identifies suggestions for the UKWP.

11 In producing this think piece and considering how all the pieces of initiatives it puts together, the WCWC observes that one problem is the definition of focus for the concept of the Circular Water Economy. It is often almost synonymous with the broader concepts of water and wastewater management. Should it really encompass all the concepts of catchment management or conversely be a feature of catchment management? Should it embrace all the concepts of water efficiency or be embedded in them? How do the circles of influence overlap? The WCWC suggests that definitions need to be more rigorous and that these issues could be part of the WCWC-UKWP collaboration.

12 This think piece distinguishes what is normally thought of as the Circular Water Economy (CWE) as effluent re-use and water use efficiency, from water as part of the concept of the Circular Economy. The WCWC suggests that a more effective location of CWE is in water resources planning and the National Water Resources Framework.

13 The term CWE needs splitting into two parallel but conversant streams; Utility CWE (UCWE) and Industrial and Commercial (ICCWE) as being more effective.

14 ICCWE would fit in with the evolving Industrial Strategy and the WCWC suggests that it and the UKWP could be more involved. Specific of immediate high-profile interest embrace recycling of industrial waters in the AI driven economy of giga factories and production of hydrogen which are becoming more demanding. Water use must be considered a sector in the industrial strategy. This would seem to fit in with the second phase of the UKWP project.

15 This think piece, in addition to the collaboration providing clarity on initiatives, suggests a number of opportunities for UKWP both in terms of 'context' of CWE and in terms of 'content' with practical projects. Decisions need to be made on how these are to be marshalled into a

single initiative. Whatever is decided, the immediate future is complex in terms of timing and any programme addressing CWE needs to be aware of the timeline.

INTRODUCTION

Definition and Existing Actions

16 The whole topic has attracted attention from many UK contributors, apart from the UKWP, against a global perspective.

Water as a Circular Economy Resource - Foresight Brief No. 033 February 2024 | UNEP - UN Environment Programme

17 There are numerous other papers, initiatives and projects. This think piece does not seek to summarize them and is aware that it could be just another voice added to a plethora of views. It is there for important that that the contribution of the WCWC is not just 'me too' and adds value.

18 For example some other contributors:

UKWIR

https://ukwir.org/final-report-for-what-does-a-circular-economy-water-industry-look-like-bq11-pathfinder-project

https://ukwir.org/prioritisation-of-circular-economy-research-opportunities-for-the-uk-and-irish-water-sector

CIWEM

https://www.ciwem.org/assets/pdf/Policy/Policy%20Position%20Statement/Circular_Economy_PPS_FINAL.pdf

Ofwat in developing PR24

Final-decision-publication-Water-recycling.pdf
How can innovation drive circularity in the UK's water sector? - Ofwat Innovation Fund

https://waterinnovation.challenges.org/wp-content/uploads/sites/3/2024/08/Ofwat-Innovation-Fund-Circularity-in-water.pdf

Individual water companies, wherein the term water recycling as a key feature of the circular water economy had been used as part of communication plans to replace the terms 'sewage' or 'wastewater treatment.'

anglian water recycling policy - Search

Where can I find more information a | Help and Support | Anglian Water
water-recycling-long-term-plan.pdf

19 The paradox is that in spite all of this activity, the Consultation by the Ministry of Housing, Communities and Local Government on the National Planning Policy Framework, and the role of water re-use infrastructure did not seem show any understanding of the deeper issues, and this think piece explores that later.

20 The typical definition of a circular water economy (CWE) is
A CWE refers to a system where water is used as efficiently as possible, with minimal waste, by reusing and recycling water throughout its lifecycle, essentially closing the loop and minimizing the need for fresh water extraction; essentially, it's a model that aims to optimize water usage by capturing and treating wastewater to be reused for various purposes instead of being discharged as waste.

Key features

- Reduce water consumption: Implementing technologies and practices to minimize water usage in all sectors, including industrial, agricultural, and domestic.
- Reuse of wastewater: Treating wastewater to a quality standard suitable for reuse in various applications like irrigation, industrial processes, or even toilet flushing.
- Rainwater harvesting: Collecting rainwater for storage and later use, reducing reliance on municipal water supplies.
- Industrial water recycling: Designing industrial processes to recycle water within the system, minimizing freshwater intake.
- Nature-based solutions: Utilizing natural systems like wetlands and riparian zones to improve water quality and manage water flow.

Key Benefits

- Water conservation: Reduces pressure on freshwater sources by minimizing water withdrawal.
- Sustainability: Contributes to long-term water security, especially in regions facing water scarcity.
- Cost savings: Can lower water bills for individuals and businesses by reducing reliance on fresh water.
- Environmental protection: Reduces wastewater discharge, minimizing impacts on aquatic ecosystems.

21 This broad approach chimes with the approach of the October 2024 UKWP report referred to in the Prologue.

22 In another more limited distinction: CWE focuses specifically on minimizing water waste by reusing and recycling water within a system, essentially closing the loop on water use, while "water resources planning" is a broader process of assessing current water availability, future needs, and potential development projects to manage water resources effectively across a region or area, including considerations beyond just reuse and recycling.

23 The first observation by the WCWC is that there is not clarity of terminology. The WCWC suggests that the latter distinction above is an enabling approach as part of sustainable water resources planning, sitting alongside other enablers, such as the Water Efficiency Roadmap and water consumption targets, about which the WCWC has made extensive submissions and more of this later. So, the terminology tends to blur between sustainable water management in general, water resources, circular water economy and water reuse. The WCWC suggests that the sphere of influence of CWE needs to be defined in a more restricted sense in order to maintain focus and would fit in with the proposal for the

collaboration between the WCWC and UKWP on providing some clarity on how ‘all the pieces fit together’.

24 Unlike other products which are reused or recycled, like paper and plastic, water is indestructible (even its splitting into a hydrogen as a fuel source is eventually reversed upon combustion). Water is already used over and over, that is the hydrological cycle. If the focus of the CWE is recovery of water, when it has been used, so that it can be used again, then it will seek to increase the number of times that water is reused. As this think piece will elaborate, effluents already pay a role in sustaining the water environment and the balance is of the opposite effects of abstraction and discharge (although both may cause threat to ecosystems). That is a major part of water resource planning, and indeed of the whole nexus of the topics of housing and economic planning, which varies from place to place.

25 It makes sense to put the issues on re-use into the dialogue on the National Water Resources Framework rather than on the Circular Economy in general, while ensuring that there are conversations between the two spheres of influence. There is a subtle difference between what is normally thought of as the Circular Water Economy (CWE) focussed directly on sewage effluent re-use and, water use efficiency (directly under the control or influence of water companies), from water as part of the concept of the Circular Economy in which non-domestic water efficiency is the focus. This may open to debate.

26 One way of marshalling thinking would be to split the term CWE into two parallel, but conversant streams. Utility CWE (UCWE) and Industrial and Commercial (ICCWE). The UCWE would be what the water utility does in terms of operational and customer service delivery and ICCWE would be what non-domestic uses do, with the interlocuter being trade effluent control and non-domestic water supplies, because these can be part of, or separate from, water utility responsibilities .There is the role of market competition to consider and UKWP might wish to look at this in relation to CWE.

https://mosl.co.uk/

This division seems to chime with the focus of the two parts of the UKWP project.

27 Whatever, this whole area has complex regulation with roles for Ofwat and the EA. Whilst understanding this is important, that is beyond the remit pro tem for the this think piece. It is important for organisations like the WCWC and UKWP to have some understanding of the broad principles of the legal framework behind any topic they address. Legislation, and the guidance thereof is complex and sometimes does not deliver what is needed. One key message is the diversity and disparity of initiatives affecting the water sector, and it has been calling for more confluence and again this fit is with the suggestion for the collaborative project.

28 The relationship of planning and water management is one such example. In the Autumn of 2024, the government consulted on a revision to the National Planning Policy Planning NPPF. The WCWC responded at length. In December, the revised NPPF was introduced and at the same time another Working Paper was launched on development and nature recovery. The political statements thereof have been controversial. As this think piece refers to later, this activity stream also works in tandem with other initiatives such as the development of the Industrial Strategy.

CWE AS PART OF WATER RESOURCES

29 Given the context set out above, the WCWC has examined the hierarchy of strategies. The WCWC suggests that a more effective location of CWE (in both aspects) might be in Water Resources Planning and the National Water Resources Framework with a principal

focus on UCWE and across connection of ICCWE. UKWP could work with the WCWC in examining this notion and be part of the conversation on the proposed revisions. This would be a very useful 'context' element of the collaborative project.

30 In December 2024, the Government announced that an update of the Water Resources Framework would be made in the Spring 2025 having worked on the draft Plans.

https://www.gov.uk/government/publications/meeting-our-future-water-needs-a-national-framework-for-water-resources

https://www.gov.uk/government/publications/a-review-of-englands-draft-regional-and-water-resources-management-plans/19b2f89b-e5ad-4387-afab-884c275437ee

https://wre.org.uk/wp-content/uploads/2025/01/WRE-Regional-Plan-2024-progress-report-final.pdf

31 What does that embrace? It is about context and not content. For example, reservoir planning is not really part of UCWE but no conversation on CWE can be clear unless the challenges of developing reservoirs are understood and that requires an understanding of the requirements of planning. Re-use of effluent has already appeared in the evolution of the National Policy Planning Framework NPPF, which is addressed below. The reach of context and content in relation to CWE needs clarity, otherwise the conversation can lose focus. There needs to be an understanding of how far UCWE includes include Water Efficiency, for example, and that is addressed later. Water Resources Planning and Planning in the general sense provides context. This suggestion is not novel.

Final-decision-publication-Water-recycling.pdf

32 One novel aspect is to put the Storm Overflow Discharge Reduction Plan into the context of UCWE (or vice versa). The WCWC has submitted extensive views on this plan and it might be an area of specific interest by the UKWP, and this will be in the collaborative project.

https://www.gov.uk/government/publications/storm-overflows-discharge-reduction-plan

Water Resources: And the Planning Framework

33 As explained earlier, the Ministry of Housing, Communities and Local Government (MHCLG) consulted on the revision of the NPPF in the Autumn of 2024 and the WCWC responded on several issues in which it pointed out that the proposed revisions did not really address the challenges faced by the water sector. The revised NPPF was published in December 2024, providing context for CWE and tangentially, also some content

https://www.gov.uk/government/consultations/proposed-reforms-to-the-national-planning-policy-framework-and-other-changes-to-the-planning-system/proposed-reforms-to-the-national-planning-policy-framework-and-other-changes-to-the-planning-system

https://www.gov.uk/government/publications/national-planning-policy-framework--2

34 The NPPF still does not address issues concerning issues concerning the activity of the water sector in ways to deliver sustainable water use. It does refer to the issue of where to place housing, for example in relation to climate change, flooding and coastal change. So, aspects like progress on the introduction of mandatory SUDS in England remain unchanged while the aspects of planning are two way.

35 The NPPF facilitates the expansion of house building and industrial growth, yet it does not address fully the impact on the water sector. Conversely, it needs to facilitate planning n water infrastructure to cope with the extended demands. There is angst around this conjunction. New reservoirs and sewage treatment works are not popular.

Campaigners vow to continue fight against Abingdon reservoir | Oxford Mail

36 One issue of popular discussion to which the WCWC has referred, is the apparent disconnect between flood management in the winter and droughts in the summer, so reservoir planning seeks to close that gap. New reservoirs harvesting flood waters means inevitable planning challenges. This connection could be a specific 'content' topic of interest to the UKWP

https://www.lincsreservoir.co.uk/assets/images/downloads/factsheets/Our-approach-to-flood-risk.pdf

37 Some older members of the WCWC remember the protests in the 1960s about what was called Empingham Water, now called Rutland Water, a now much-loved landscape and recreational asset, the closure of which during the major blooms of blue green algae in 1989 has also caused protests.

38 There can also be policy disconnects. For example, Anglian Water is facing opposition to relocate Cambridge Sewage Treatment works to replace aging plant, release vital land for the development of the City and it is still in Defra at present awaiting a Development Consent Order, when at the same time, the Treasury is promoting the Cambridge-Oxford corridor as the heart of a European Silicon Vally.

https://cwwtpr.com/

https://news.sky.com/story/europes-silicon-valley-reservoirs-and-old-trafford-at-heart-of-governments-growth-plans-rachel-reeves-to-announce-13298476

39 For such projects it is considered that the process of planning is easier if an Infrastructure Project is deemed to be of National Significance NSIP.

https://www.gov.uk/guidance/planning-act-2008-content-of-a-development-consent-order-required-for-nationally-significant-infrastructure-projects

40 A Development Consent Order ("DCO") application for consent to undertake a NSIP is made to the Planning Inspectorate which considers the application and makes a recommendation to the Secretary of State, who will decide on whether development consent should be granted for the proposed scheme.

41 The Planning Act 2008 defines the thresholds for what qualifies as an NSIP. The National Policy Statement for Water Resources Infrastructure is used to determine if a water resources project qualifies as an NSIP.

42 The Secretary of State can direct that a water resources project be treated as an NSIP if it does not meet the current requirements. The Planning Inspectorate determines the Planning Application for NSIPs. And makes recommendations to the Secretary of State. The process for determining NSIPs is different from the usual planning application process.

43 The UK government has proposed changes to the Planning Act 2008 to address water scarcity and quality issues. The proposals include amending the definition and thresholds for

water infrastructure NSIPs and this is where the issue of water re-use infrastructure, the content of CWE, becomes important, and this is why this specific topic is addressed in detail.

Water Resources: Planning and Effluent Reuse

44 The reason for dwelling on this is that the Consultation on the revision of the NPPF set out some views on such infrastructure for water reuse and there moved from the concepts of context into content which did not seem to chime with practice on water reuse. So, vigilance on the proposals or any changes to the 2008 need careful attention. The following paragraphs were included as part of the WCWC submission.

45 It made reference to water recycling for securing water supplies which it is claimed are commonly used around the world. The WCWC included these observations in its response, which also provides an insight into the views of the WCWC on water reuse in making its submission to the UKWP. The Consultation is a rather an opaque in its references. In fact, the tone is that the England is lagging behind other countries common practice and the proposal to make these projects NSIP will help fix the problem. In fact, the statement is apocryphal rather than factual as a review of the web reveals. It is important to understand that a great deal of sewage effluent is recycled through abstractions from rivers sustained by the effluents. A good example is the River Thames. These include abstractions for public water supply purposes and for agriculture.

46 In most places, if sewage effluents are used, it is more likely to be for agriculture and the barriers for direct reuse for drinking water remain. It would appear that the EU Regulation 741/2020 on the use of waste- water in agriculture remains.

47 Australia is often cited; it has low rainfall. The population is small (25 million), growing at 1.5% per annum. Water limitations are being exacerbated by climate change. By 1990, restraints placed on wastewater treatment plant (WWTP) discharges to receiving waters became an incentive for water recycling. The millennium drought (2000–2009) was a further driver for water recycling and desalination. Water reform policies led to guidelines for recycled water, including stormwater and augmentation of drinking water. Advanced purified recycled water plants for indirect potable reuse were built in Brisbane. Dual pipes for drinking and recycled water were installed in new suburbs in Sydney, Melbourne and Adelaide. Agricultural, industrial and amenity recycled water use was expanded. Seawater desalination plants were installed in Gold Coast, Sydney, Melbourne, Adelaide and Perth. After the drought, economics further influenced the future use of recycled water. Since catchment water was cheaper than recycled or desalinated water, desalination plants were mothballed or maintained at low processing rates. and Brisbane's advanced water treatment plants were shut. Water policy complacency followed. However, Western Australia, which had declining rainfall, demonstrated to an accepting community that recycled water could be used for groundwater replenishment in Perth's water supply. By 2019, drought conditions had returned to eastern Australia. Desalination plants were reactivated and Brisbane's indirect potable recycling scheme prepared for reinstatement. Regional towns faced water shortages and were looking for diversity of water supply. Reviews have been undertaken of the future for direct potable recycling, a debate that needs to be initiated with the consuming public.

https://www.sciencedirect.com/science/article/pii/S2666445320300064

Desalination is very energy intensive:

https://www.waterquality.gov.au/guidelines/recycled-water

48 In the USA, for health and aesthetic reasons, reuse of treated sewage effluent is presently limited to non-potable applications such as irrigation of non-food crops and

provision of industrial cooling water. There are no known direct reuse schemes using treated wastewater from sewerage systems for drinking.

https://www.oas.org/usde/publications/unit/oea59e/ch26.htm#:~:text=For%20health%20and%20aesthetic%20reasons,from%20sewerage%20systems%20for%20drinking

49 One of the most quoted examples is Singapore, with a very different set of resource dynamics to England. The WCWC notes the complexity, costs and restricted use even there and it is equivocal as to whether or not it is direct reuse.

https://www.voanews.com/a/east-asia-pacific_singapore-turns-sewage-clean-drinkable-water-meeting-40-demand/6209374.html

50 In 2011 the EA produced guidance on the topic. This has now been withdrawn.

https://assets.publishing.service.gov.uk/media/5a8175cee5274a2e87dbdbf7/geho0811btvt-e-e.pdf

51 A great deal of the problem in reuse is the psychological aversion to such practice, which the WCWC referred to several times, most recently in its responses to Ofwat on water efficiency. The opposition ignores the fact that many abstractions from rivers and reservoirs already contain sewage effluent as part of the river flow. So, there is a distinction between direct and indirect recycling.

52 The DWI is considering this matter. It states that '*To improve the reliability of drinking water supplies and to ensure future provision of sufficient safe drinking water, new and alternative raw water sources will need to be developed.*

A number of alternative sources of drinking water are currently being considered as part of the water companies' water resource planning. One of the options being considered is recycled water, also known as water reuse. This source of water would be blended with and augment existing raw water sources and could supplement the raw water supply to drinking water treatment works.

Water recycling can provide a continuous and sustainable source of water, which is less prone to cyclical shortages such as droughts as it reclaims the most dilute portion of treated wastewater which would normally be returned to the environment.

The water element of that process which is reclaimed is then subjected to further advanced treatment at a water recycling plant before it is either sent to an existing water treatment works (known as direct water recycling) or discharged to a river, reservoir or aquifer (referred to as an environmental buffer) where it blends with other sources of water before being abstracted and further treated at a drinking water treatment works (known as indirect water recycling). Currently there are no proposed direct water recycling schemes. However, some water companies will be developing indirect water recycling to help ensure a sufficient and sustainable supply.'

53 The proposal by Thames Water for Teddington is a good example of opposition in principle. Another good example is the proposal by Southern Water which wants to treat sewage at a plant at Havant in Hampshire and pipe it into a nearby spring-fed reservoir to boost water supplies during droughts. The scheme would ensure that less water is extracted from two globally important chalk streams: the rivers Test and Itchen. The whole scheme would cost £1.2bn, it is facing severe opposition.

https://saveourlandsandriver.org.uk/

https://www.theguardian.com/environment/article/2024/jul/13/12bn-plan-to-turn-sewage-waste-into-drinking-water-branded-a-dangerous-white-elephant

54 Sewage effluent is also recycled by using it to recharge groundwater.

https://www.icevirtuallibrary.com/doi/abs/10.1680/rose.02302.0018?mobileUi=0

55 Any direct supply of water with direct sewage origins would have to be provided via a dual pipe supply system. CIWEM has called for a Publicly Available specification on dual systems and the discussions always focus on non-potable uses with the risks of cross connections being at the front of public health concerns, and of course the operational and cost challenges of a system which would be very difficult to retrofit to existing properties. Defra started a conversation on this in the Summer of 2023 to which the WCWC contributed, yet that does not seem to have progressed

56 Much of the issues around water recycling and, in particular, sewage effluent recycling lies in a wide range of criteria which will not be resolved by the metamorphosis of recycling schemes to be NSIP. The WCWC queries what kind of plants are envisaged; this will not help AMP8. The WCWC suggests very strongly that this whole topic of recycling needs a thorough overview before any changes are made to the Framework and Guidance. Indeed, to change the Framework now might result in 'setting too many hares running.' This is definitely a topic for UKWP both in terms of 'context' within Water Resources and 'content' in terms of technology and public acceptance. A starting point might be to open a dialogue with the Water Efficiency Fund established by Ofwat and the national Behavioural Insights Team.

Water Resources: Water re-use and the Industrial Strategy

57 The WCWC pointed out as far back as the winter of 2023-24 on the role of water in economic growth in its responses to the Department of Business and Trade (DBT) consultations and in its response to the MHCLG Consultation on the NPPF. The demands of infrastructure place delivery demands on water companies as well as the environmental regulators. There is an overlap with the development of the Industrial Strategy.

https://www.gov.uk/government/consultations/invest-2035-the-uks-modern-industrial-strategy/invest-2035-the-uks-modern-industrial-strategy

58 The WCWC has been pushing for water to be recognised as a sector in the evolution of the Industrial Strategy and very important part of that would be the inclusion of ICCWE with a feature of industrial re-use practice, which would be a really useful focus for the UKWP. A starting point might be opening a dialogue with the Department of business and Trade.

59 For example the NPPF and subsequent announcements made it plain that the so called giga economy, driven by AI and renewable energy are the front of the drive for economic growth.

60 As the WCWC has pointed out giga factories and data processing centres have very large demands for water resources and this will predicated location and drive the development of water recycling in those sectors.

https://assets.publishing.service.gov.uk/media/5e4ab9be40f0b677be5fbda3/Phase_1_-_ITM_-_Gigastack.pdf

https://www.sweco.co.uk/blog/data-centre-water-usage/

https://insights.spans.co.in/innovative-approaches-to-sustainable-water-management-in-gigafactories-clu2p3xm1000rhc7xvew9k4p3/

61 This might predicate the location of such factories to water rich areas, even coastal areas which might help in coastal town recreation, yet another government policy.

https://www.gov.uk/government/publications/future-of-seaside-towns-government-response-to-the-liaison-committee-report/future-of-seaside-towns-government-response-to-the-liaison-committee-report

62 Sitting alongside of this would be the implications of a conversion to a hydrogen economy based of the production of hydrogen from water.

https://www.gov.uk/guidance/hydrogen-production-by-electrolysis-of-water-emerging-techniques

https://utilityweek.co.uk/anglian-warns-of-huge-water-demand-from-hydrogen/

63 As an aside there is already an Ofwat funded innovation project producing hydrogen as part of wastewater treatment.

https://www.anglianwater.co.uk/news/fuelling-uk-road-transport-hydrogen-production-at-wastewater-treatment-centre-given-green-light/

64 Whatever, emerging sophisticated technologies still need the practical provision of water in the most efficient way and this need is reflected in the Water Efficiency Roadmap which is discussed below. These would seem to be an excellent UKWP project.

Water Resources: CWE and Water Efficiency

65 As the WCWC suggested earlier, the term CWE should be more restricted than in some dialogue and that Water Efficiency does not sit well within that definition, even within UCWE, that does not gainsay its importance in meeting the targets set in the Water Efficiency Roadmap as set out line The Environmental Targets (Water) (England) Regulations 2022.

https://www.legislation.gov.uk/ukdsi/2022/9780348242911

66 Several initiatives to reduce per capita consumption per se as part of the Water Efficiency Roadmap lie outside the UCWE remit in spite of the definition cited earlier To provide a brief insight the WCWC has submitted suggestions to several consultations, including Water Efficiency itself and to Ofwat proposals, relating to water efficiency labelling, metering, water fittings and building regulations, which provide context for CWE rather than content. An example was the submission to proposals by Ofwat for discounts on developer contributions as infrastructure charges as part of the Environmental Incentives Common Framework.

https://www.ofwat.gov.uk/wp-content/uploads/2024/07/Consultation-on-an-environmental-incentives-common-framework-v2.pdf

67 Ofwat stated that in autumn 2023, following our June 2023 consultation, it formed an environmental incentives working group (EIWG) and invited consultation respondents to join. The role of the EIWG was to work collaboratively and collectively on behalf of relevant stakeholders to provide recommendations for the detail of the environmental incentive guidance that will sit under our existing charging rules.

Sub-group 1: Establishing a common fittings approach for levels of water efficiency equal to or below 100l/p/d.

Sub-group 2: Establishing a common framework for environmental incentives

Sub-group 3: Interaction with new appointees

Sub-group 4: Small-scale water reuse

Sub-group 5: Interaction with building regulations.

68 One section of particular interest was *small-scale water reuse and recycling schemes which can take a variety of forms. They can utilise a wide range of water sources that might otherwise be considered waste – including rainwater, greywater (water from sinks, showers and baths), and even sewage, though the latter is quite uncommon. Whichever source they use, the water typically receives an appropriate form of treatment (an extensive range of treatment technologies are available) that brings it up to a standard that is suitable for a range of non-potable applications. These applications could include toilet flushing, garden irrigation, street cleaning, clothes washing, car washing and others. In all cases, the treatment should be carefully selected and designed to ensure the water quality is suitable to be safely used for the intended application. The non-potable water is typically supplied through a dedicated distribution network (so-called 'dual pipe' or 'dual plumbing' systems). These schemes can be designed at a range of scales, from supplying a single property, up to a large mixed-use development.*

69 To be stern in definition, there is no fundamental difference between domestic rainwater harvesting and abstracting water from rivers rich with replenishing rainwater. So, although part of water efficiency should probably lie outside the strict definition of UCWE, this should lie within it.

70 This can be considered alongside other ways of dealing with rainwater through the practice of Sustainable Drainage Systems, and like many other organisations, the WCWC has been concerned about the lack of progress on mandatory requirements in England. Water collected by SUDS can be put to good use. Again, this is outside the remit of UCWE and of the Ofwat Consultation on Environmental Incentives.

https://www.susdrain.org/delivering-suds/using-suds/benefits-of-suds/groundwater-recharge.

71 Grey water recycling in homes most certainly lies within UCWE and is a feature of the roadmap and embedded the Ofwat Environmental Incentives. So, this is all about overlapping spheres of influence .And those initiatives relevant to the drive for new housing, as facilitated by the NPPF, are drawn together in the concepts overseen by the Future Homes Hub (FHH), which has produced reports and guidance and with whom the WCWC has started a dialogue, this might also be a useful partnership for the UKWP to explore (and indeed by coincidence individual members of the WCWC have been involved so far). The FHH was involved in the Ofwat Working groups on environmental incentives. They must form part of strategy or of any code underpinning the concepts of New Towns.

https://www.gov.uk/government/publications/future-of-the-subsurface-report/future-of-the-subsurface-urban-water-management-in-the-uk-annex

https://assets.publishing.service.gov.uk/media/5a74ea1fe5274a3cb286833f/gs-15-27-future-visions-for-water-and-cities-thought-piece.pdf

https://www.futurehomes.org.uk/

https://www.futurehomes.org.uk/water-efficiency

https://irp.cdn-website.com/bdbb2d99/files/uploaded/Water%20Ready_A%20report%20to%20inform%20HM%20Government-s%20roadmap%20for%20water%20efficient%20new%20homes.pdf

72 The Water Efficiency Roadmap also requires reductions in industrial water consumption, as discussed earlier and which probably do fall into the notion of integration this with other aspects of resource management into the broader concept of the Circular Economy. There are implications for Integrated Pollution Prevention and Control as set out in the WCWC responses.

https://www.gov.uk/government/collections/integrated-pollution-prevention-and-control-sector-guidance-notes

SOME UCWE CONTENT SPECIFIC TOPICS WHICH COULD BE OF INTEREST TO THE UKWP

Developing reuse and circularity as part of the drive for net zero in water and wastewater treatment

73 This is a substantial topic embracing almost all aspects of management.

https://www.water.org.uk/sites/default/files/2023-08/Water-UK-Net-Zero-2030-Routemap-Summary-updated.pdf

74 There is a drive within the agreed PR 24 Final Determinations. Innovation programmes are already in place to drive new practices and technologies.

https://waterinnovation.challenges.org/news-updates/circularity-in-water-learning-report/

Renewable energy and bioresources

75 Net zero will employ renewable energy, even some produced ‘in house’ from biogas which is produced as part of bioresources strategies. A very large proportion of sewage sludge has been converted into biosolids and used sustainably in agriculture. The impact of the Farming Rules for Water means that the willingness of farmers to use these products will lessen and hence the available ‘land bank’ is reducing and that is driving the innovation and development of other forms of bioresources as a means of coping.

76 The approach of Anglian Water is cited. It notified Ofwat that this uncertainty was a risk.

https://www.anglianwater.co.uk/siteassets/household/about-us/pr24/dd/anh_dd_025-bioresources-uncertainty-in-amp8.pdf

It has published its long-term strategy to cope with these problems.

https://www.anglianwater.co.uk/SysSiteAssets/household/about-us/bioresources-strategy-2025---2050.pdf

77 This sets out some interesting ideas for sludge exploitation. A key area of innovation is phosphate recovery. This is a valuable resource and as the demands of reduction of phosphate in effluents develop and there are concerns about phosphate run off from land (although there is a paradox insofar that no matter where phosphate comes from, it is needed to grow crops).

Technology options for AMP8 phosphorous challenge - Water Industry Journal

78 This whole area is addressed in the Ofwat Innovation Challenges. Hence it might not be an area of focus by the UKWP and WCWC working together

Artificial Intelligence

79 AI will pay an ever more proactive role, that could be a feature of CWE and could become projects of interest to UKWP and a dialogue with the WC of Information Technologists could be opened.

https://www.sandtech.com/insight/water-ai-8-ways-ai-in-water-management-creates-a-better-future/

Reticulation Replacement Programmes

80 The WCWC has pointed out that a substantial increase in relaying sewers and water mains will create larger amounts of excavation spoil to be used rather than thrown away and some innovative approaches are required.

https://www.gov.uk/government/publications/storing-and-managing-excavated-waste-from-street-works-rps-299

81 This will also test the strength of the current regulatory approaches to street works in relation to water utility reticulation. Is a conversation with the Pipeline Industries Guild worthwhile? The WCWC is just opening a dialogue with it.

Sourcing of water treatment chemicals

82 These can be produced as by-products of other manufacturing processes. Would UKWP be interested in working with an organisation representing the chemicals industry, bearing in mind the role of Veolia?

https://blog.veoliawatertechnologies.co.uk/chemical-offering

Disposal or use of water utility treatment by products such as sewage screenings and grit

83 This will test the concept of the UCWE and is worth exploring as a specific project and a dialogue could be opened with, say, the Environmental Services Association.

https://www.gov.uk/guidance/waste-exemption-t21-recover-waste-at-a-waste-water-treatment-works

THE PLACE OF CWE IN THE BIGGER PICTURE

The need for an overarching strategy

84 The dilemma of where water policy is at the moment is that there can be rhetoric and strategizing, but the aspirations will be delivered by focussed efforts in the ‘engine room’ of delivery. Conversely without any overarching strategy the individual focussed efforts become disparate and unconnected without a coherence. The WCWC has advocated the need for a strategy.

85 The WCWC has set out a number of times what such a strategy could look like .In essence it would focus more on agreeing what individual stretches will be used by local consultation and then setting use and quality objectives .Essentially developing the current system of River Basin Planning under the Water Framework Directive .And driven by a more formal system of catchment management .This would bring together all the pieces referred to in this think piece and the CWE could fit into that as part of the hierarchy under water resources. As suggested earlier, the UKWP might consider how it could work with the WCWC in addressing, summarising and promoting how all the pieces fit together. As advocated in the response to the NPPF there are several other pieces which into that framework which will require Government action, and this think piece has provided several examples.

The complexity of the timescales

86 The WCWC has attempted to pull dates together in a timeline. The Government has already stated that the intention is to implement the outcomes of the Water Commission review by the end of this Parliament in mid-2029. This will be relevant to the determination of PR29 in December 2029, but that process is likely to start in mid-2027. AMP8 starts in April 2025 and there are already policy demands and proposed regulatory changes which will impact on that and the WCWC is uncertain as to what those impacts will be and suggests that clarity is needed. For example, the impact of the Government drive for growth with 1.5 million new homes by the end of the Parliament and its drives for new industries. It may be that the processes are robust enough to cope or that there will need to be a reset. Some of the other dates over the next five years will be relevant to PR29 and AMP9 (2030-2035), and this must be sufficiently understood by mid-2027.