

DEVELOPING WITH OUR WATER ENVIRONMENT



Stantec Strategic Technical Consultant, Chris Mooij looks ahead to meeting the challenges of the Water Industry National Environment Programme and explores how we can embrace a new approach to delivering the desired outcomes.



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Our understanding of how discharges to our water environment effect the chemistry and biology of our water and ultimately our communities and society has developed over the last 100 years. We have come to value our

environment more, which has changed our priorities. Once we had a mature regulatory framework, our progress has been measured through compliance with standards and in 2018 there are positives to take from the Environment Agency's report, *The State of Environment: water quality*.

- Bathing water quality has improved over the last 30 years with 98% passing minimum standards and 65% at excellent status in 2017.
- Pollutant loads to rivers from water industry discharges have declined in recent years, with reductions of up to 70% since 1995.
- Water quality in rivers has improved markedly in recent decades but has since levelled off.
- Phosphorus levels in rivers started to reduce in the mid-1990s and have been decreasing significantly since then, with this decrease is closely associated with improvements at sewage treatment works.

However, it is not all good news and there is still a long way to go. The report states:

- In 2016, 86% of river water bodies had not reached good ecological status. The main reasons for this are agriculture and rural land management, the water industry, and urban and transport pressures.
- Water quality issues were the cause of 38% of all fish test failures, and 61% of invertebrate test failures in rivers in 2015.
- Over the last decade the number of serious water pollution incidents from water companies has remained broadly the same, with about 60 incidents each year.
- For assessed river water bodies in England, 55% were at less than good status for phosphorus in 2016.
- Nearly half of groundwater bodies will not reach good chemical status by 2021. For groundwaters protected for drinking water, nitrate levels were responsible for 65% of failures to achieve good chemical status.

It is clear that the water industry has a big part to play in our water quality journey but as a result of improvements in recent decades that part is proportionally less. Today the main pressures preventing water bodies reaching good status are agriculture and rural land management (31%); the water industry (28%) and; urban and transport (13%). This source apportionment introduces the need to consider solutions more flexibly, dynamically and to account for risk. In the past it would have been clear that treating the local big discharge would provide the most effective improvement. Now it is less obvious and there is a need to consider each source in terms of its environmental drivers, size and unit cost when developing solution alternatives, if we are to get the best deal for the environment and our communities in both the short and long term.

Meeting the Challenge of the WINEP and PR19

The Water Industry National Environment Programme (WINEP) associated with PR19 picks up the themes of *The State of Environment: water quality*. In AMP7 WINEP is estimated to be £5.5 Bn with the largest investment associated with the removal of phosphorus. However, there are other areas of substantial investment including increasing flows to full treatment; increasing storm tank storage and; reducing sanitary parameters. There are also some substantial AMP7 investigation programmes that are designed to help water companies understand their contribution and manage their environmental risk by collecting the data needed to ensure that any eventual solution will be the right one.

Ofwat's PR19 methodology has shifted the emphasis for water companies. The regulator wants to see bills reduce whilst strengthening the customer's role in decision making; improving levels of service; securing resilience for our environment and; increasing innovation. This includes engaging with the community to support solutions that are welcomed, efficient and affordable.

An analysis of the PR19 requirements reveals that AMP7 and beyond will need to be delivered across 10 strategic areas. See figure 1.

Water quality is clearly a key consideration across most of these strategic areas and if we are to make real progress in delivering WINEP and the PR19 plans and meet societal priorities a different approach is required.

Putting Catchments at the Centre of a Different Approach

The AMP7 challenge for the water industry is about delivering more for less. The Environment Agency has identified future water quality pressures from population, climate change, emerging chemicals, plastics, nanoparticles and

Figure 1: AMP7 will need to be delivered across 10 strategic areas



fracking. Water companies will engage with these pressures at some level in addition to dealing with existing pressures such as ageing infrastructure and urban creep. The challenges are significant because there is more to take on board in more complex and dynamic water environment.

So, how can the water industry deliver more for less? If you accept that water companies can only get so far with commercial devices such as supply chain management, there needs to be some changes in approach, relative to previous AMP cycles. Moving forward, the industry will need to focus even more on managing environmental risk, recognising that the obligation does not end with delivering a schedule of engineering solutions. That includes proactively considering other contributors in their thinking and understanding what part they play in the overall solution. At a high level, these changes are about catchments, engagement and innovation.

In AMP6 the language changed from Outputs to Outcomes. For AMP7 it needs to change from Outcomes to Catchment Outcomes.'

If water quality issues are looked at from one perspective only there is a good chance that the solution will not be the most efficient and will not capitalise on potential synergies. There are clear efficiencies available if water quality challenges are considered holistically throughout the water cycle.

That means taking account of all the pressures, other contributors and different elements of the water cycle. Only then will concepts such as catchment management (including catchment permitting) truly come into focus. It is questionable whether the regulatory framework is in step with a more flexible, multi-stakeholder approach but it is clear that this is the industry's direction of travel, as evidenced by the Catchment Management Declaration.

It follows that to deliver full catchment solutions there needs to be valuable engagement with the community, regulators and other stakeholders.

This has many benefits and requires a regulatory framework that enables dialogue and multi-faceted solution development. It will take time and energy and there will no doubt be challenges in finalising solutions within the AMP7 regulatory schedule.

The innovation challenge will take various forms (e.g. data, technology, engagement, catchment management practices). In one sense, a move towards catchment thinking suggests more holistic, less detailed thinking. However, it is equally valid to argue that the drive for efficiency means better understanding of assets and how they impact water quality – suggesting more detail. Both are true and need to be moved forward together. There are some innovation themes emerging and one of those is data. Water companies are looking more and more to data to drive efficiency, monitor operations, understand their contribution and to develop, test and optimise solutions. The volumes of data will be huge and the industry will need the skills to collect, analyse, manage and use this data in the most effective way. The data will be generated in many different ways but will include stakeholders, system monitoring, one-off collection programmes and modelling that will test and optimise multi-faceted solution alternatives. These are likely to be key tools that will help reduce uncertainty, increase efficiency and manage catchment risk.

In conclusion, water companies have a critical role to play in supporting healthy water catchments. Some solutions will be obvious, but others will require a careful assessment of the catchment pressures. The right solution for the environment and community is more likely to be multi-faceted and will require engagement supported by a flexible regulatory approach. These more sophisticated solutions will need the evidential support that data and modelling can provide, and commissioned solutions will need discharge monitoring and environmental health checks of the receiving environment.