



APPENDIX S

WRSE further information

ABSTRACT

Further information detailing the work of the Water Resources in the South East group.

1 Introduction

Water Resources in the South East (WRSE) is a sector-wide partnership that, every five years, develops a south-east strategy for water. It was formed in 1996 as a direct result of a recommendation from the old Monopolies and Mergers Commission which (in reviewing a proposed merger of two small water companies in Kent) suggested there should be better regional co-operation when it came to sharing water.

Today, it is still going strong, and covers an area of 21,000 km² with a population of some 19 million people, and 2 million businesses.

The core membership comprises six water companies, ourselves together with Affinity Water, South East Water, Southern Water, SES Water and Thames Water) working alongside the Environment Agency, Ofwat, the Consumer Council for Water, Natural England, the Department for the Environment, Food and Rural Affairs (Defra), the Canal and River Trust, the Greater London Authority, and other partners.

2 Aim of the WRSE

The aim of WRSE is to identify how best to share the water resources at a regional level. It also looks further afield, working with neighbouring regions of the UK and their water companies to explore inter-regional water transfers.

Our work focuses on exploring opportunities across the region for existing and new water resources to be shared in the most efficient and effective way, to provide reliable, sustainable supplies at best value to customers while also protecting the environment. This is because we expect the pressure on water supplies in South East England to increase in the future due to many reasons including climate change, population growth and the need to further protect the environment.

The water supply network within south east England is a complex pattern of different water company areas and water resource zones. This is a result of the historic development and integration of local systems over more than a century, plus the fact that division of the region after privatisation did not necessarily align with catchment or water resource system boundaries.

Therefore, the fundamental approach of the WRSE is to ignore water company boundaries, and look across the region, to assess best ways to share available water.

Many of the water resource zones across the South East currently, or in the future, will experience shortfalls in water availability. However, there are also areas that have water that can be shared. By looking at a regional scale we can try to maximise the benefits of sharing of water resources across the area, and in doing so, reduce the need for new water schemes or developments, and reduce existing abstraction.

Our planning work help us to understand which options might be best for the south-east in the long-term (such as strategic schemes that are not necessarily justifiable on a single company basis but would be beneficial on a regional scale) which will help the region become more resilient to drought, outage and the environment.

With this aim in mind, the WRSE has undertaken different projects covering water and environmental assessments, which are summarised below.

3 Projects and findings

3.1 Examining the potential for environmental impacts across the region

In partnership with Natural England, the WRSE has examined the potential cumulative (or in-combination) effects of the options being considered by the member companies for their upcoming draft Water Resource Management Plans (WRMPs).

This is the first time that a collaborative regional appraisal of the potential for cumulative environmental impacts has been undertaken on a regional scale, by water companies.

The WRSE commissioned the consultancy, Ricardo, to undertake this work. After having developed a robust methodology, Ricardo first looked at the WRMPs produced for the Periodic Review 2014, and determined that no significant issues had been overlooked.

Then Ricardo used the methodology to scrutinise the feasible options under consideration by the WRSE member companies for their draft WRMPs for PR19.

The assessment found that there is potential for cumulative effects from most WRSE companies, on particular receptors and catchments. The findings included the potential inter-relationships between schemes and the impact pathway. This information can directly help each water company produce its environmental report and Strategic Environment Assessment for its draft WRMP.

These results have helped Portsmouth Water to understand the potential cumulative effect of our options when considered with others, and we have liaised with other companies as appropriate. We have been able to undertake a more in-depth assessment of the cumulative impact and identify suitable mitigation measures. We have included the findings into our environmental assessment which is now more robust as a result.

3.2 Addressing the future need for water: optimisation modelling

For the PR19 planning cycle, the WRSE is looking over a very long horizon of sixty years (from 2060 to 2080) exploring different factors such as:

- a greater range, and severity, of future droughts;
- different population growth forecasts;
- greater protection of the environment through reduced abstraction;
- effects of poor water quality
- resilience to extreme events
- reducing water demand and leakage rates still further.

This is done via several plausible “*what if?*” scenarios to examine potential future water demand using an optimisation model. An optimisation model seeks to minimize the total economic costs of meeting future water demands for these future scenarios, by selecting a portfolio of options, from a choice available to it that cover both supply and demand management schemes. Using such a model allows the development of strategies to address future water needs; it has been a standard approach of the water industry for many years.

3.2.1 The WRSE EBSD Model

Over previous cycles of work, the WRSE has developed and used its own bespoke EBSD optimisation model as a key tool to help find the least cost solutions for customers and the environment in the South East of England. The model's results have formed the basis of the WRSE regional strategy over successive years, which water companies then use to inform and guide their own long-term water resource plans.

For PR19 the WRSE has used the same model as the core approach to examine water resources but with amendments to be more strategic, look further into the future (2020 to 2080). This is because

looking further into the future helps us to make better decisions in the long run in terms of what types of options may be needed.

Another critical amendment is that the model is being used in conjunction with “Info Gap” advanced decision-making approach, to reflect latest developments in the water industry that calls for the need to ‘stress test’ model outputs to determine how the selected portfolios of options are resilient for a range of possible futures, not just the one modelled.

There have been two phases of the EBSD optimisation modelling work allowing member organisations to continuously inform our knowledge and better our understanding. This work was undertaken by CH2M to undertake this modelling work on behalf of the Group. Below is a summary.

3.2.2 *Modelling to explore all options*

This phase incorporated over 1000 potential options into the EBSD optimisation model from all member water companies, covering demand management, resource developments and transfer scheme to allow the model to select from very wide range of choices.

The purpose of this phase of modelling was to take a broad, extensive examination of all the options that have been outlined or defined but not yet implemented, taking a ‘blank sheet’ approach, to see what might be useful to meeting future water demand.

Twelve different possible future scenarios were scrutinised, based on different combinations of the key influencing factors affects the demand and supply of water, including population, the type of droughts that we might experience in the future, and whether abstraction will be reduced to protect the environment and water quality. Each scenario would require a different amount of water in the future, and the EBSD optimisation model created a *portfolio* of options that together would meet the demand.

The results showed that some options were always chosen for every scenario modelled; others were sometimes chosen; and a number were never chosen. Examining why some options are always chosen helps us to understand what schemes might be ‘no regret’ developments for the future.

The choice of options selected by the model shows where and what schemes might be the best choices, at a regional level, to develop and provide water to other areas of the region. The importance of these schemes might not otherwise be realised from single water company plan looking at a specific area. The results also highlighted which water resource zones were more vulnerable than others, indicating that it would be beneficial to increase the connectivity of the water supply network to allow transfers to take place could help move water around the region.

The stress testing of certain portfolios of options, showed that some fared better than others when assessed for their resilience in meeting conditions that are more demanding or difficult than their original scenario design. This helps us to understand what might be the *best value* choice of groups of options to implement, given the uncertainties of some key factors driving water demand, such as climate change and population.

These results have helped Portsmouth Water to understand how our options, in the early stages of WRM planning, have the potential for regional significance, and should be investigated further. We have undertaken further assessment of the results relevant to our area and customers, to and examined our network connectivity and vulnerability, and held bi-and multi-lateral discussion with other water companies and organisations based on these results, to explore water sharing and transfers. Sharing water may mean that we do not need to develop new schemes, or that it can be a shared activity. Our analysis and discussions have been instrumental in the preparation of our draft WRMP.