

DEVELOPING STRATEGIC RESOURCE OPTIONS TO TACKLE INCREASING WATER STRESS

The Environment Agency (EA) has recently launched a consultation into the determination of water stressed areas in England.



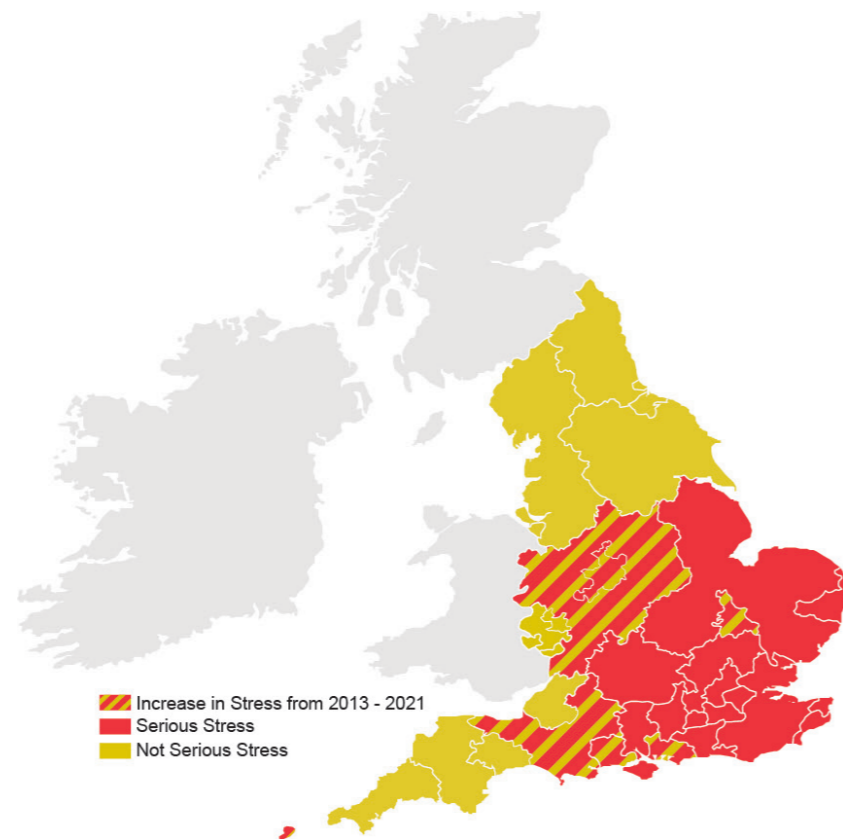
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In an update to its 2013 classification, using data from water businesses across the UK and the National Framework for Water Resources, seven new company areas are proposed to be classified as being water stressed. These fall under the scope of Severn Trent Water, South Staffordshire Water, Wessex Water, Portsmouth Water, Cambridge Water, South West Water's Bournemouth and Isles of Scilly areas, and are in addition to areas already classified by the EA as under serious water stress.

The Environment Agency's publication also includes an update to its forecast for the longer-term environmental water needs. This projects that under the enhanced scenario, with a greater protection of sensitive river flows, there would be a need to recover 2,900ML/d of abstractions.

The scale of this challenge and need for a joined up, national strategy led Ofwat to allocate up to £469m in its PR19 final determination to investigate 17 Strategic Water Resource options with a total capacity of up to 1,500 ML/d to help achieve security of supply. This will enable the nine water companies to develop

Figure 1: UK Map showing proposed changes to classification of areas of water stress.



'construction ready' solutions for AMP8 that protect and enhance the environment and benefit wider society. The solutions being delivered through a formal, gated process comprise 11 source-type solutions (reservoirs, effluent reuse) and six transfer-type solutions (river, canal, and pipeline routes).

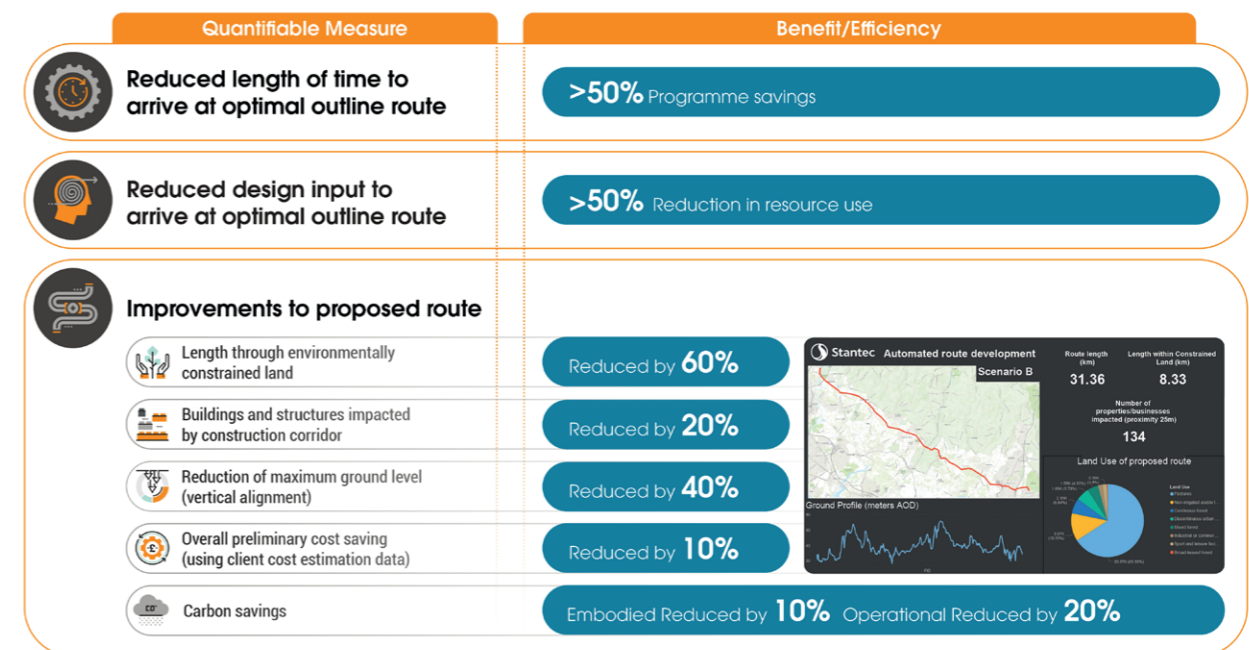
To facilitate the development of a best value set of options, the Regulators' Alliance for Progressing Infrastructure Development (RAPID) has been formed by Ofwat, the Environment Agency and the Drinking Water Inspectorate. RAPID is responsible for appraising the 17 Strategic

Resource Options (SROs) through a gated process and has, to date, evaluated the Gate 1 submission on an accelerated timeline for Southern Water's pressing need to reduce abstractions in Hampshire.

Designing in Value

The SROs are to be considered alongside other options within regional plans. This new level of planning, which sees the water companies of England grouped in to five regions, will assess how existing and new resources can be best shared to meet long term needs. As many of the SROs involve transfers between regions, the plans will be reconciled between the regions, to

Figure 2: Example Benefits of Innovative Pipeline Route Optimisation



ensure they are joined up and reflect the needs, opportunities and alternatives across the country. The proposal is that regional solutions are then adopted by the companies in their Water Resources Management Plans (WRMPs). These planning processes are seeking to produce solutions which go beyond maintaining water supplies and to deliver stakeholders' wider preferences for environmental improvements, increased resilience of supplies to climate change and shocks and to enable wider societal prosperity. It is therefore important that these objectives are incorporated within the next stages of SRO developments. The challenge is to deliver these wider benefits efficiently, not expanding scope and cost as a secondary, supplementary phase.

With many of the SROs involving transporting water long distances, they have the potential to provide value en route. The development of a new source and/or a transfer system could provide improved resilience for those customers supplied by systems in the vicinity. Cross connections could enable the new system to provide an alternative means of supply during planned outages or asset failures. Benefits could even extend to greater use of sources as drought conditions may well not be experienced simultaneously across the country, such that a resource could meet events in both the donor and recipient areas.

The planning of schemes to contribute towards Net Zero carbon and environmental improvement targets will require that they minimise their own whole life impacts whilst also providing a more sustainable source of water such that existing abstractions impacting the environment can be reduced or stopped. The operational carbon of moving water long distances can be high and therefore it is important that routes are found that minimise pumping requirements.

Maximising the value of a scheme against these criteria requires a systematic approach to capturing the opportunities. To realise this and to ensure the scheme is efficiently developed and progressed requires the use of digital planning tools. With a vast array of datasets available in GIS layers, key information on needs, opportunities and constraints can be assimilated and algorithms developed to generate solutions that optimise them. For example, Stantec's Automated Route Selector is a powerful GIS tool which will produce an optimal pipeline route with the example benefits shown in Figure 2 above.

Through these innovative techniques we can design solutions that when selected as part of regional or company plans will deliver the requirements for biodiversity net gain and net zero carbon as well as providing a resilient water supply.

Optimising solutions within a portfolio

Once the options have been considered within their regional plans it will be interesting to see how the selected portfolio operate and perform in combination. Options will have been designed in response to certain needs within the region, however, this higher-level planning may identify wider use opportunities. Needs arise at different times over the planning period and the options have different timescales for their delivery meaning that their individual usage may vary over time. Resulting operational changes will need to be considered in the next stage of SRO developments to ensure the option delivers the best possible value. This may include extending pipelines to connect to other zones of deficit or increasing certain components to meet higher combined demands.

To answer these questions, it will be important that the predicted use of all components of the plan, across the range of forecast scenarios, is carefully considered and presented. This will provide the focus for further refinement of schemes, to form regional and company plans that do not only answer the supply resilience question, but deliver a lasting legacy for customers, the environment and communities.

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