
Part B

Chapter B5

Maintaining the Supply/Demand Balance

Our strategy

This chapter sets out our strategy for maintaining the balance between supply and demand for water and sewerage services. Our overall objective is to ensure that:

- We can provide a continuous supply of water to our customers.
- Sewer flooding and pollution incidents are minimised.
- Sewage treatment works have sufficient capacity to meet compliance standards.

We have to address pressures which include climate change, environmental needs, and demographic change. At the same time, we need to keep customers' bills down, and have an acceptable impact on the environment and on our carbon footprint.

Our proposals are based on the most cost effective way of balancing supply and demand, assessing the service risk, costs and benefits of each option, including the costs of environmental impacts.

Providing a continuous supply of quality water

Our plan balances future service risk with the level of investment required, and includes for the AMP5 period:

- Reducing leakage beyond the level proposed in the draft plan, with a new economic level of leakage target of 453 MI/d by 2015.
- Targeting increased metering in water-stressed areas through promotion of the free meter option and by trialling a policy of metering on change of occupier in our East Midlands, Oswestry and Forest and Stroud zones.
- Increasing our water efficiency activities to achieve the AMP5 target of 16MI/d set to us by Ofwat.
- Begin delivery of AMP6 schemes that will maximise use of our existing water resources by improving our strategic grid connectivity and the resilience of our supply network.
- Dealing with 7,000 low pressure problems, and making progress on pressure problems associated with supply pipe separation.
- The least cost mix of mains renewal, active leakage control and pressure management investment required to achieve target headroom while ensuring our long term objective of not allowing leakage targets to rise in future AMP periods.

Dealing effectively with waste water

We need to increase capacity to manage the effects of growth in population, population migration, increased storm intensity, and increased surface water run-off balanced against the risk to serviceability and impacts on customer bills. Our programme includes for:

- Dealing with newly discovered, high priority flooding problems and carrying out pilot work on separating storm and foul flows;

- Providing additional sewer, sewage treatment and sludge treatment capacity where demand is growing, particularly in the areas targeted by the government for growth.

We will work with the Environment Agency to encourage more sustainable solutions to surface water drainage, in order to minimise growth in pressures on the sewerage system.

The future rate at which new sewer flooding problems arise is uncertain. Outputs prescribed by Ofwat should be set so that we take only an appropriate share of risk on this issue; which will require a different approach from that in the 2004 Determination.

Proposed expenditure in AMP5 (07/08 prices)

		Capex (£m)	Opex (£k) 2014/15	Cost Beneficial (Y / N / Not Assessed)
Water	Achieving AMP5 leakage target	12	1,270	
	Mains renewal to achieving long run leakage targets	37.5	n/a	
	Metering	37.4	1,826	
	Water Efficiency	2.6	100	
	New Development	70	1,962	
	Resolving low pressure problems	10.7	68	
	Undersized service reservoirs	7.7	n/a	
	Total	177.9	5,226	
Sewerage	Dealing with sewer flooding problems	83.5	1,439	Y
	Responding to regional development	105.0	1,293	Y
	Total	188.5	2,732	

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Chapter Overview

Introduction

This overview considers our overall objectives, some of the general pressures we face in balancing supply and demand, and the way in which we determine priorities.

The element of our sewer flooding programme to deal with newly discovered problems is included in this chapter. The full details of our sewer flooding programme can be found in Chapter C6.

Planning objectives and direction

Our overall objective is to ensure that we balance supply and demand so that:

- We can provide a continuous supply of water to our customers.
- The sewerage system has sufficient capacity so that sewer flooding and pollution incidents are minimised.
- Sewage treatment works and sludge treatment facilities have sufficient capacity to meet compliance standards, to prevent damaging effects on the environment.

We need to achieve this in a way which:

- Balances risk with investment and willingness to pay in order to derive the optimal investment strategy.
- Is least cost, to keep customers' bills at the lowest possible charges.
- Has an acceptable impact on the environment and on our carbon footprint.
- Can be achieved at risk levels which reflect customer priorities.

These objectives are incorporated in our Key Strategic Intentions set out in Part A of this Plan:

- KS11 – Providing a continuous supply of quality water
- KS12 – Dealing effectively with waste water
- KS14 – Minimising our carbon footprint
- KS15 – Having the lowest possible charges

We need to achieve these objectives against a background of increasing pressures on our supply / demand balance, as set out below.

Pressures on the supply / demand balance

Water distribution network deterioration and the impact on leakage

Since the draft plan we have strengthened our asset investment modelling approach so that we can derive the overall least cost capital maintenance and supply / demand investment strategy. Our AMP5 plan forms part of our 25 year strategy to achieve our future target headroom requirement while not allowing leakage targets to rise.

Our asset data and modelling shows that leakage will increase over time as a result of the deterioration of mains and customers' supply pipes. Our capital maintenance strategy set out in section B3 includes mains renewal expenditure to maintain serviceability. However, our analysis of leakage deterioration suggests that mains renewal to achieve base maintenance serviceability targets will not address all of the total leakage deterioration. This is due to leakage increases on customer supply pipes. Changes in legislation would be required in order for us to make significant reductions in supply pipe leakage and until this is in place we must make the equivalent leakage reductions on company-owned assets in order to achieve our leakage targets.

Our modelling shows that the least cost strategy for achieving our long term leakage target is to increase mains renewal in AMP5 and AMP6 for the leakage benefits that will be delivered in the longer term. Our analysis has shown that unless increasing leakage due to network deterioration is prevented, then our long term leakage target cannot be achieved at least cost. Our proposed mix of mains renewal, pressure management and active leakage control over AMP5 is part of the lowest whole life cost approach to achieving the long term leakage target

Population changes

The population is growing, with smaller households, and shifts in population. This will require us to plan changes in our networks and treatment works capacity for both water and sewerage. There is currently a drive from national government to dramatically increase the supply of new housing over the next 25 years.. Many towns and cities in the Midlands have been identified as growth points. There is, however, some uncertainty as to whether this projected growth will occur, particularly in the short term given the downturn in the housing market and economy at large.. We will continue to monitor trends and our plans will need to be flexible to respond to changing trends.

For the draft Water Resources Management Plan (WRMP) we based the household demand projections on the housing growth targets set out in the relevant Regional Spatial Strategies (RSS), as required by the EA's Water Resources Planning Guidelines. The RSS projections are based on Government housing targets, and represent an increase in housing provision. These long term housing growth projections are higher than the best central estimate of growth for AMP5 that we have used for our Business Plan. We have adopted an AMP5 housing growth scenario, based on new connections numbers in line with recent levels, and reverting to the RSS targets for the remainder of the 25 year period.

Our sewerage plan reflects the best information currently available and we have used this to identify all intervention options that we can reasonably infer at this time. We have chosen an approach that provides an overall central estimate that we believe provides a sensible level of provision to meet our AMP5 supply-demand obligations.

Environmental needs

We need to be able to address growing demands while also ensuring that our plans have a sustainable environmental impact. Our proposals take into account the need to contribute to climate change mitigation by managing our carbon footprint.

The Environment Agency's Restoring Sustainable Abstraction programme addresses concerns that at some locations abstraction of water could be contributing to environmental damage to rivers and wetlands. We have incorporated the Environment Agency's latest RSA requirements into our final Business Plan. However, the majority of the RSA sites are still under investigation, and any potential mitigation actions required by the Agency will not be known until 2010 at the earliest. Any mitigation work could ultimately result in the Environment Agency requiring us to reduce the amount of water we abstract from the

environment. We support such changes where the costs of alternative means of balancing supply and demand are less than the costs. However, the process for recovering the costs of any actions required by the Agency needs to be clarified, especially if mitigation includes the revocation of abstraction licences.

Over the long run, we plan to reduce the volume of surface water conveyed by our sewers to sewage treatment works. This will include working with other stakeholders and carrying out pilot work on separating flows within catchments.

Climate Change

Adapting to climate change represents a significant challenge in the long term. It is already occurring and is expected to accelerate over the coming century. In summer, there will be a significant increase in temperatures and lower rainfall, which will increase demand for water and reduce water available. There are likely to be more extremes of weather, with more frequent periods of intense rainfall, and this will put pressure on sewer capacity.

We have reviewed the effects of climate change in terms of potential severity, uncertainty of impact, and urgency of action. Since the draft plan, we have updated our water supply / demand impact assessment using the Environment Agency's recommended best practice, described as approaches 2 and 3 in their *Water Resources Planning Guidelines (December 2008)*.

Our assessment shows the need for action to adapt to climate change, in particular in terms of:

- Increasing water supply capacity and managing demand in order to adapt to hotter, drier summers – in view of the time it takes to plan and implement new resource schemes we need to make plans now.
- Increasing our ability to deal with surface water in response to more frequent and intense storms.

However, our assessment is still based on the scenarios produced by UKCIP02, and we recognise Ofwat's recent policy guidelines relating to climate change driven investment. In our final plan, climate change impacts do not drive any investment above Ofwat's significance threshold. Although our plans are not driven by climate change, our proposals for dealing more effectively with surface water will mitigate climate change impacts.

We will review our assessment of climate change impacts once the scenarios produced by UKCIP09 are published, and we will share the results with the Environment Agency and Ofwat. We will also continue to work closely with other bodies affecting our operations, including local authorities, the Environment Agency and developers, to ensure sustainable solutions are identified for problems created by the changing climate. Our plans for mitigating our carbon impact include the following:

- We will support plans to make sure that new developments are water-efficient.
- We will promote the principles of Sustainable Drainage Systems, which deal with surface water as close to the point where the rain falls as possible, in order to reduce run-off from new developments.
- We will encourage development of the discharge consent regimes which mitigate the effects of new tighter consents and the carbon emissions required through the process enhancements necessary.
- We are progressing a programme of energy efficiency improvements which will enable us to mitigate carbon discharges by delivering the required asset performance at lower power usage.

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- We will continue to develop and enhance our approach to renewable energy solutions through both our appointed (e.g. acid phase digestion) and non appointed business (energy crops).
 - We will develop our sludge strategy to reduce transportation.
 - Reductions in leakage, and reducing water use through increased metering and encouraging more efficient use of water, will reduce the amount of water we need to abstract and treat and therefore reduce energy use.

Because the impacts are uncertain, small, incremental adaptation measures are generally preferable to large one-off changes. In addition, changes which contribute to climate change mitigation are likely to be preferred to those which add to our carbon impact. We will continue to review solutions in the light of the latest climate change research.

Determining priorities

Our proposals are based on a least-cost appraisal of balancing supply and demand, considering all options for managing supply and demand, and assessing the costs and benefits of each option to establish the optimised plan for the service risk profile to meet customer aspirations. We have used an asset investment optimisation model to test our 25 year projections over approximately 1.3 million iterations in order to derive the overall least cost combination of interventions. The outputs of this asset level optimisation have then been used in the overall company optimisation process. This involved six iterations to refine our plan from Draft to Final by applying constraints of affordability and lowest possible prices.

Benefits have been determined by assessing customer willingness to pay (WTP) for improvements. We carried out a WTP survey, involving interviews with business and domestic customers, to establish their priorities and their willingness to pay for improvements in sixteen different areas of service provision. Where we are making improvements they are supported by this customer research.

We give a very high priority to ensuring continuity of service. In addition to the results from the WTP survey, our regular tracking research, and research carried out by CCWater after the loss of supplies in Gloucester in 2007, show the importance given by customers to continuity of water supply.

Assessment of costs relative to benefits is carried out through our BRITE (Balancing Risk and Investment To Excel) investment optimisation modelling, which is described in detail in Section C8.

